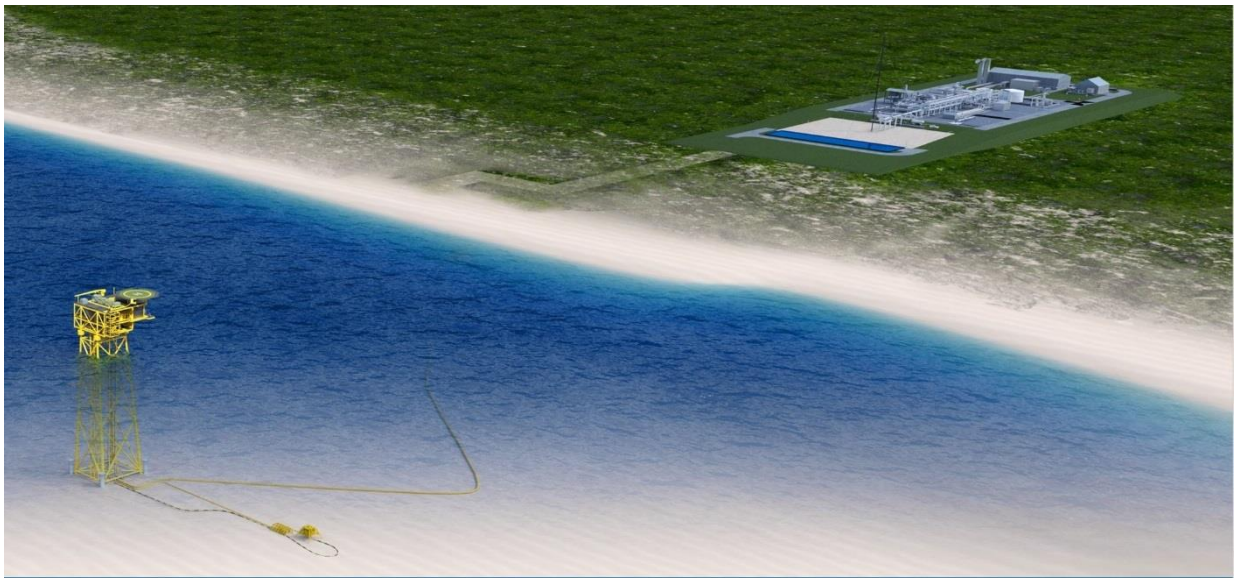

Midia Gas Development Project

Additional Environmental and Social Information and Assessment Report

Black Sea Oil & Gas SRL

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APPENDICES

Appendix 1 Drill Cuttings Disposal - Best Practicable Environmental Option

Appendix 2 Assessment of Effects on Critical and Natural Habitat and Priority Biodiversity Features

Acronyms and Abbreviations

AESIA	Additional Environmental and Social Information and Assessment
AoA	Area of Assessment
AoI	Areas of Influence
BAT	Best Available Techniques
BOP	Blowout preventer
BPEO	Best Practical Environmental Option
BREF	BAT Reference Document
BSOG	Black Sea Oil and Gas
DP	Dynamic Positioning
EBRD	European Bank for Reconstruction and Development
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EPCIC	Engineering Procurement Construction Installation and Commissioning
FEED	Front End Engineering Design
GHG	Greenhouse gases
GSP	Grup Servicii Petroliere (the Project EPCIC Contractor)
GTP	Gas Treatment Plant
H&S	Health and Safety
HDD	Horizontally Directional Drilling
IFC	International Finance Corporation
ISO	International Organization for Standardization
MEG	Monoethylene glycol
MGD	Midia Gas Development (the Project)
NUI	Normally Unmanned Installation
Project ESIA	Midia Gas Development ESIA, Xodus, 2018

PSPA	Promissory Sale and Purchase Agreement
ROW	Right of way
SPA	Land Purchase Agreement
TVDSS	True Vertical Depth Subsurface
WBDF	Water Based Drilling Fluid
WBM	Water Based Mud

1. BACKGROUND AND PURPOSE OF THIS DOCUMENT

1.1 Introduction to the Project

Black Sea Oil & Gas S.R.L. (“BSOG”) intends to develop the Midia Gas Development Project (“MGD Project” or “the project”) to produce and process gas from the Ana and Doina discoveries offshore. The Project will deliver the gas into the national gas transmission system (and from there to consumers in Romania and in the region) through an extension of this system to.

The MGD Project consists of drilling four offshore wells at the Ana field, where a small, normally unmanned platform will be installed to house the wellheads and production control facilities. A further well will be drilled at the nearby Doina field as a subsea development, with gas being routed to the Ana field platform via a subsea 18 km-long, 8” pipeline. The gas from both fields will then be brought to shore through a 121 km, 16” pipeline which will have a landfall at Vadu, Corbu Commune, Constanţa County. From the landfall site, gas will be routed through a buried 16″ onshore pipeline (approximately 4.3 km long) to a new gas treatment plant (GTP) in the Vadu area where it will be treated prior to delivery into the national natural gas transmission system.

An Environmental and Social Impact Assessment (ESIA) was completed in 2018 for the Project by Xodus and updated in 2019 (further referred to as the “Project ESIA”). The review of the Project ESIA by the potential international lenders to provide finance for the project identified a number of aspects requiring further detail and assessment.

The purpose of this Additional Environmental and Social Information and Assessment (“AESIA”) document is to supplement existing Project ESIA with additional information and assessment of selected topics, for achieving compliance with international applicable standards. Is important to clarify that the current AESIA only addresses the aspects which were considered as missing or insufficiently assessed in Project ESIA.

The key objectives of this AESIA are to assess the potential environmental and social impacts associated with the project – only for those items flagged as gaps in the Project ESIA – and, to identify measures that can be adopted to avoid, minimise or offset adverse impacts and enhance beneficial impacts.

Therefore, this AESIA report is not intended to provide complete information on the environmental and social impacts associated with the Project, but instead must be considered in conjunction with the Project ESIA performed in 2018 and amended in 2019.

2. OPERATIONAL FRAMEWORK

2.1 BSOG Internal Policies and Standards

BSOG has implemented a management system accredited to ISO 9001, ISO 14001 and OHSAS 18001. In the frame of this management system, BSOG developed a set of overarching environmental, social, health and safety company policies, as listed below, and has committed to implement these on the Project to guide and ensure conformance to the Project Requirements, Regulations and Standards. These are applicable to all activities, including the construction works program and all staff working for the Project:

- Code of Conduct and Business Ethics (BSOG-GV-POL-001-D01);
- Anti-Bribery and Anti-Corruption Policy (GOV-POL-002-D1);
- Corporate Social Responsibility Policy (BSOG–CO–POL–001–D01);
- Quality Policy (BSOG-QA-POL-001-D03);
- Employment Policy (BSOG-HR-POL-001-D01);
- Whistle Blower Policy (GOV-POL-001-D1);
- Environmental Policy (BSOG-HS-POL-002-D02);
- Health and Safety Policy (BSOG-HS-POL-001-D02);
- Major Accidents Prevention Policy (BSOG-HS-POL-004-D01).

These policies establish the framework for the Project's environmental, social, health and safety management.

2.2 Applicable Standards and Regulations

The environmental and social standards and regulations applicable to the project comprise:

- National Laws and Regulations (refer to the Project ESIA for detailed list and information);
- EU Regulations, including:
    - Regulation (EU) No. 525/2013 on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision No 280/2004/EC;
    - Regulation (EU) No. 601/2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council;
    - Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on Industrial Emissions (IED);
    - Regulation (EC) no. 1272/2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) no. 1907/2006;
    - Regulation (EC) no. 1907/2006 concerning the registration, evaluation, authorisation and restriction of chemicals, establishing a European Chemicals

Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (REACH);

- Regulation (EC) no. 166/2006 concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC; and
- Regulation (EC) no. 850/2004 on persistent organic pollutants and amending Directive 79/117/EEC.

- International conventions and protocols including:
  - Convention on the Protection of the Black Sea against Pollution, 1992, Bucharest, ratified by Law no. 98/1992 and related Black Sea Biodiversity and Landscape Conservation Protocol, ratified by Law no. 218/2011;
  - IMO Convention for the Prevention of Pollution from Ships, 1973 and the Additional Protocol from 1978, ratified by Law no. 6/1993 (MARPOL 73/78);
  - IMO Convention on Oil Pollution Preparedness, Response and Co-operation, 1990, ratified by Government Ordinance no. 14/2000 (OPRC Convention);
  - International Convention on Civil Liability for Oil Pollution Damage, 1992, ratified by Government Ordinance no. 15/2000 (CLC Convention);
  - European Convention on the Protection of the Archaeological Heritage, 1992, ratified by Law no. 150/1997 (La Valetta Convention);
  - European Landscape Convention, 2000, ratified by Law no. 451/2002 (Florence Convention);
  - Convention on the Conservation of European Wildlife and Natural Habitats, 1979, ratified by Law no. 13/1993 (Bern Convention);
  - Convention on Biological Diversity, 1992, ratified by Law no. 58/1994 (CBD);
  - Convention on Conservation of Migratory Species of Wild Animals, 1979, ratified by Law no. 13/1998 (Bonn Convention);
  - The International Labour Organisation's Core Conventions;
  - The Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS), 2001, established under the auspices of the Bonn Convention (UNEP/CMS).
- Good international industry practice standards:
  - EBRD Environmental and Social Policy (May 2014) and associated Performance Requirements;
  - The Equator Principles III (June 2013);
  - IFC Performance Standards (January 2012);
  - IFC/EBRD Worker's Accommodation: Processes and Standards;
  - Voluntary Principles on Security and Human Rights.

2.3 Best Practice Guidelines

In addition to above-indicated good international industry practice documents, the following guidelines are considered by the project:

- IFC Environmental, Health, and Safety (EHS) General Guidelines;
- IFC Environmental, Health, and Safety Guidelines for Onshore Oil and Gas Development;
- IFC Environmental, Health, and Safety Guidelines for Offshore Oil and Gas Development;

3. STAKEHOLDER ENGAGEMENT

BSOG has engaged with all key stakeholders since the early start of the project development. During the first phase of the project development, stakeholder engagement activities were related mainly to the permitting processes that started in 2014, and to the land acquisition process that was finalised in 2016.

A Stakeholder Engagement Plan was developed by BSOG in 2017 and since then it has been implemented and annually updated. The consultation and stakeholder engagement process has been performed in line with PR 1 and PR 10 of EBRD ESP 2014, IFC PS1 and the Romanian national legal requirements for different permitting purposes.

BSOG has allocated sufficient resources for implementing the SEP and especially for presenting the project impacts to local communities (Corbu and Vadu) and other key stakeholders. Engagement process was done based on the results of the identification of stakeholder's needs and interest on the project as well as based on the project's impacts.

There were no major concerns raised by stakeholder during the public disclosure and consultation meetings in relation to the project or the ESIA development process. No official complaints have been registered at BSOG so far.

A detailed description of all the stakeholders engaged activities are presented in the Stakeholder Engagement Plan (MGD-E-EN-PLN5-001-D01).

4. CONSIDERATION OF ENVIRONMENTAL AND SOCIAL ASPECTS IN THE PROJECT DESIGN

The project has adopted a methodical approach for the selection of the best case design which included consideration of alternatives in terms of project facilities' location and technological processes. The decision-making processes incorporated environmental and social considerations as outlined in the ESIA Report.

In addition to the information in the ESIA Report, this section provides further information on key environmental and social aspects that influenced the project design. This includes project facilities locations and/or routing alternatives and incorporation of Best Available Techniques (BAT). Where the case, references to other report sections providing further details have been made.

4.1 Alternative Project Facilities Location, Routing and Implementation

Midia XV block was subject to multiple 2D seismic surveys and major regional surveys between 1992 and 1994, leading to the identification of Doina field. In 1994, a Doina field site survey was performed and subsequently drilled in 1994 and 1995 (Doina-1 and Doina-2 wells). Seismic surveys and drilling were further performed in the following years which led to the discovery of the Ana field in late 2007.

In 2008, the development of the Doina field was proposed by constructing an integrated system for gas production from the unconsolidated sandstone reservoir, transfer to an onshore gas receiving terminal and delivery to the national gas distribution system. The base case for the project was determined to be the development of Ana as a production hub with Doina.

The initial Project concept envisaged the development of two interconnected production platforms with 3 wells each, a gas export pipeline with two possible landfalls (in Vadu and Navodari areas) and a gas receiving terminal.

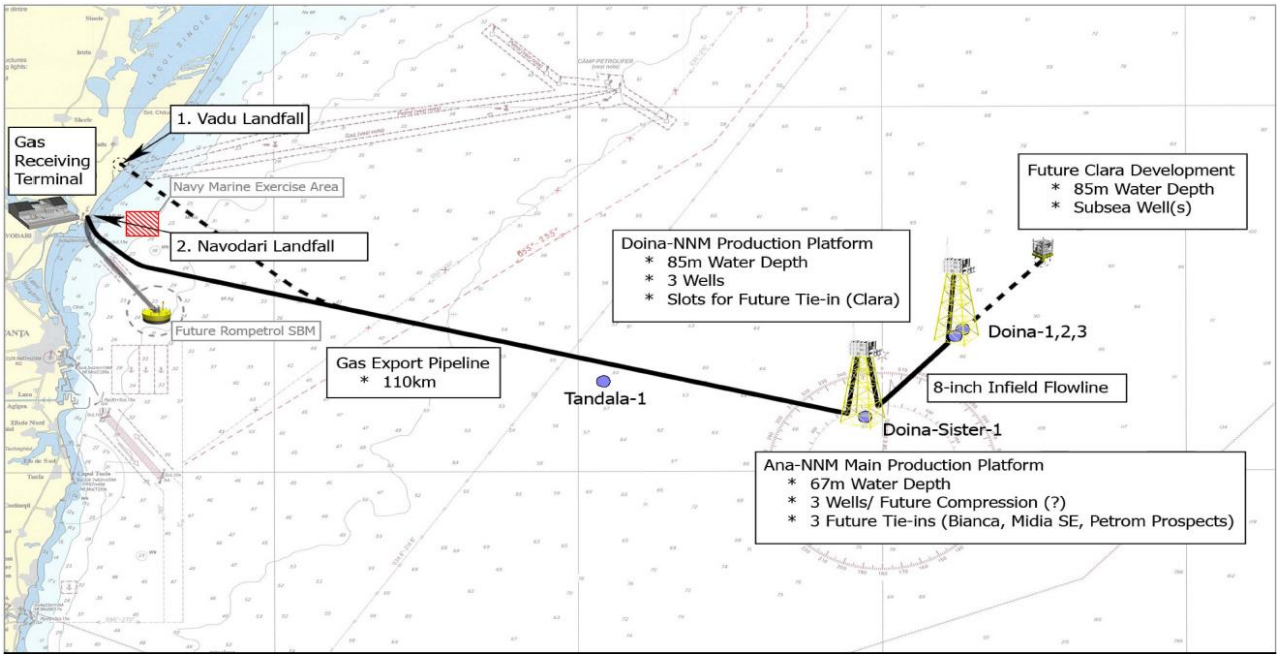


Figure 4-1 Overall Project concept and offshore pipeline routing, 2008

Source: Doina Gas Field Development Scoping Report, RSK 2008

The initial Project concept was further refined and the final MGD Project design considers the development of only one platform comprising four wells at the Ana field. At the Doina field only one subsea well will be developed which will be controlled via an umbilical from Ana platform. This resulted in avoiding the more intrusive works needed for the installation of a second offshore platform at Doina.

4.1.1 Landfall and shore approach options

There are a number of constraints to locating the landfall along the coastline in this part of the Black Sea including:

- sites of importance for nature conservation (e.g. those associated with the economic zone of the Danube Delta Biosphere Reserve);
- offshore and onshore areas used by the Romanian Military and associated safety/exclusion zones;
- areas of importance for tourism;
- nearshore limestone rock outcrops area;
- existing industrial infrastructure development and associated safety buffers triggering technical/engineering constraints for pipeline routing (*e.g.* at Capu Midia Harbour/Navodari area, offshore pipelines and crude buoy etc.);
- legal restrictions in connection to land use and permitted activities;
- "exit" options towards inland gas transmission infrastructure; and
- land availability and ability to secure land rights.

With consideration of the above, a number of offshore pipeline route options were assessing, as indicated in the below figure.

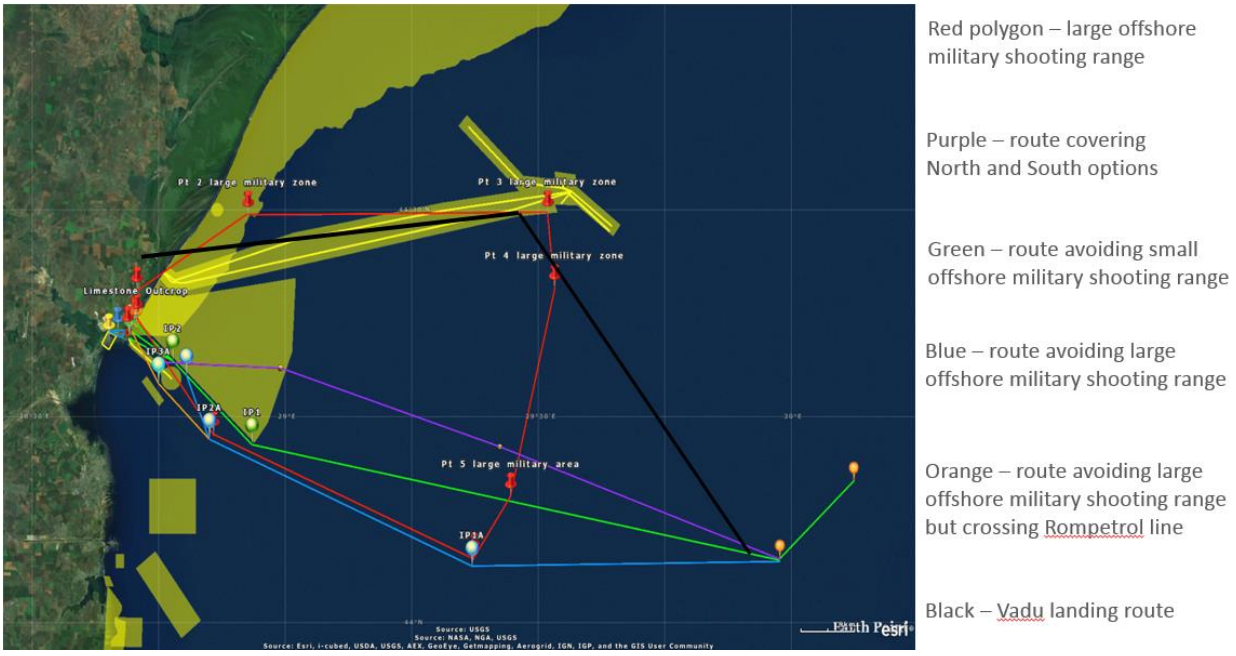


Figure 4-2 Offshore pipeline routing alternatives (Sterling Resources, 2012)

The above indicated two main landfall options being possible as follows (refer to Figure 4-3 below):

- Northern Option - landfall in the Vadu area; and
- Southern Option - landfall in the Capu Midia Harbour area.

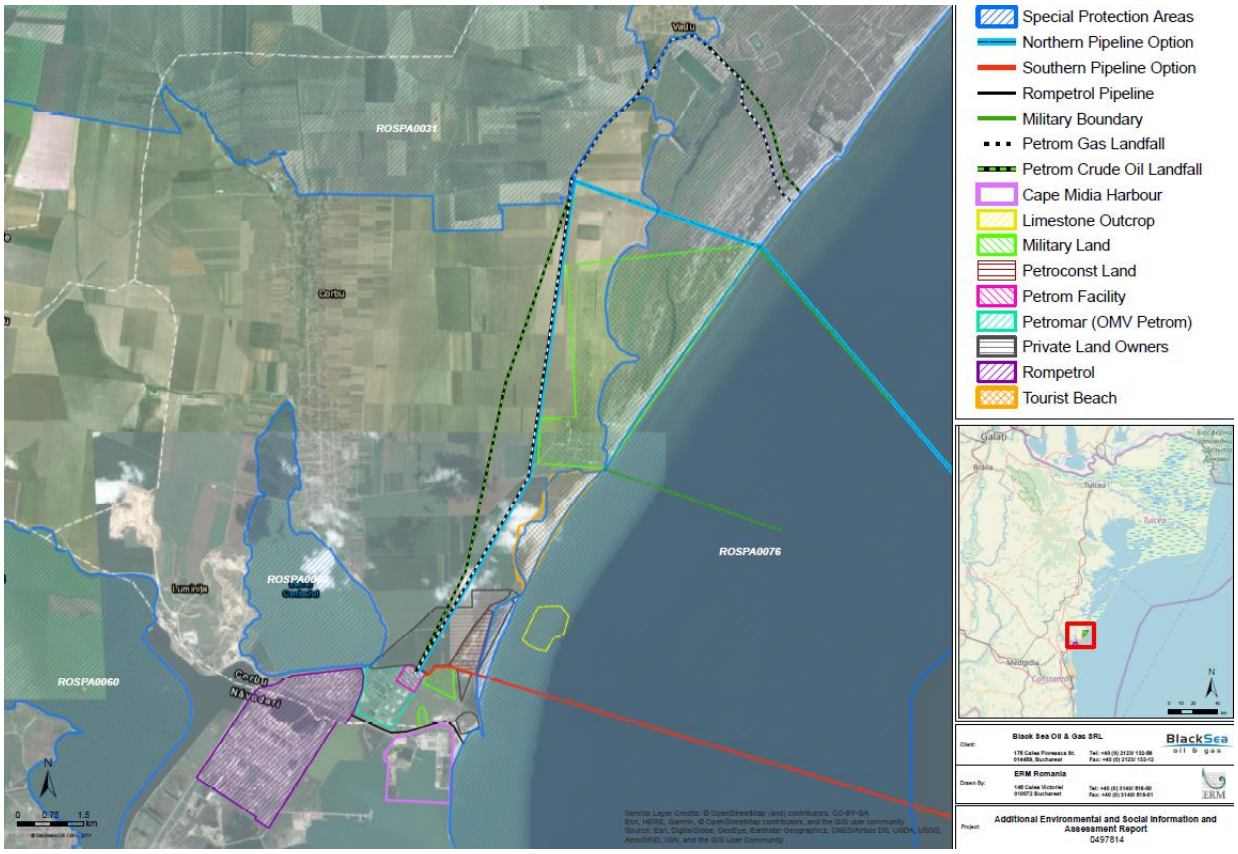


Figure 4-2 Proposed Landfall Onshore / Pipeline Routes and Key Constraints within the Study Area

It is noted that the above-indicated landfall locations and indicative pipeline routing were based on the assumption that the project Gas Treatment Station (GTP) will be located at the Midia Harbour industrial area (several location options analysed). Thus, the northern landfall option (Vadu area) was associated with an approximately 15 km-long onshore pipeline route (following the route of two existing Petrom gas and oil pipelines to the Petrom terminal at the Midia Harbour area), while the southern option was associated with an approximately 2 km-long onshore section.

Given the above, the initial Landfall and Onshore Route study performed in 2009 indicated the Southern Landfall Option as preferable. One of the main reasons for this was that it avoided the economic zone of the Danube Delta Biosphere Reserve, that the Northern Option could not avoid.

However, due to combination of constraints listed above, an appropriate location for the GTP site and associated pipeline routing could not be defined for the Southern Landfall Option.

The main objection against the Southern Landfall was raised by the military authorities. They asked for the pipeline to be re-routed to the north, to bypass the offshore firing range and to approach the shoreline at the area of two existing Petrom offshore pipelines.

Other constraints for the GTP location at the Southern landfall area included:

- Risks associated with a former asbestos production installation and associated remediation and mitigation at one of the sites envisaged for the GTP location;
- Difficulty in identifying a feasible route for the pipeline connecting the project with the national gas transmission system. Possible routing for this pipeline would have required undercrossing Corbu Lake or crossing through residential area of Corbu Commune.

The above-indicated triggered the need for a GTP site location at the Northern Landfall Option.

4.1.2 GTP Site Location and Onshore Pipeline Routing

The location for the GTP had to meet some specific requirements (*e.g.* flat land area, sufficient height above sea level, distance over 1 km from military areas (military firing range), location outside areas protected for nature conservation / other forested areas, away from the watercourses.

The GTP location was selected to meet all of these requirements, in an area where land rights could be secured. Its position in an agricultural field (modified habitat), avoided impacts on sites of importance for nature conservation and did not support flora / fauna species that triggered critical habitat.

The routing of the onshore pipeline between the shoreline landing location and the GTP site proved more challenging and was determined by the ability to find a continuous string of land plots with valid and unchallenged ownership documentation whose owners were willing to sell or grant easements.

5. CONSIDERATION OF BEST AVAILABLE TECHNIQUES (BAT) IN PROJECT TECHNOLOGY ALTERNATIVES SELECTION PROCESS

A number of technology options were considered for the onshore and offshore project components. Consideration of the Best Available Techniques (BAT) in the design represents a project commitment that has been incorporated in the design decision-making process to date and will be considered in the further detailed design stages of the project.

Exemplification of key alternative design decisions informed by BAT analysis at the Front-End Engineering Design (FEED) stage of the project is provided below.

5.1.1 Drill Cuttings Disposal Best Practicable Environmental Option

Drill cuttings and associated water-based drilling fluids, also termed water-based mud (WBM), or water based drilling fluid (WBDF) will be generated through the drilling of the Ana and Doina wells.

Alternative MGD Project drill cuttings management and disposal options considered include:

- Reinjection;
- Sea disposal, and
- Land disposal (ship to shore for re-use, recycling or disposal).

To identify the preferred drill cuttings option, a Best Practical Environmental Option (BPEO) study was performed taking into account technical, environmental, health & safety and cost aspects. The Drill Cuttings BPEO represents an Additional Impact Assessment as well as a strategic decision-making tool. The BPEO assesses the relative performance of the different options under consideration and is site and project specific with local regulations, environmental conditions and available technologies influencing the preferred option.

The BPEO assessment followed the following stages:

- Review and detail of the proposed drilling activities, type and constituents of the drilling fluids and quantities of drill cuttings to be generated.
- Present alternative drill cuttings management and disposal options including reinjection, sea disposal, land disposal (ship to shore for re-use, recycling or disposal).
- Provide a summary of the environmental sensitivities at the drilling sites.
- Perform a drill cuttings dispersion modelling for the Ana and Doina sites, analyse and present modelling outcomes.
- Assess each disposal option considering the following criteria:
  - Regulatory requirements
  - Technical feasibility;
  - Environmental considerations;
  - Cost considerations; and
  - Health & safety considerations.
- The preferred option was identified along with relevant mitigation and management approaches.

Based on the results of the options analysis, the sea disposal of water based drilling fluid (WBDF) and WBDF based cuttings has been identified as the Best Practical Environmental Option (BPEO). Whilst this option will have impacts to the aquatic environment, these impacts are not considered to be significant. Taking into account the other considerations, sea disposal was considered to be the most preferable of the disposal options having the lowest GHG footprint; being the best (most reliable) technically; having the lowest cost; and presenting the lowest health & safety hazard profile.

The BPEO Report is provided in full as Appendix 1 of this report. The BPEO findings were used to inform the development of a drill cuttings management plan as part of the overall Project Environmental and Social Management Plan (ESMP). This includes recommendations for any monitoring that may be required and link to the overall Project Biodiversity Management Plan (BMP).

The objective of the drill cuttings management plan is:

- Document the controls required for WBDF selection, use and discharge.
- Provide evidence of compliance with good international industry practices (GIIP), in particular the requirements of the IFC EHS Guidelines of Offshore Oil and Gas Development, 2015.
- Provide details of required monitoring of biodiversity.

5.1.2 BAT Consideration in Gas Venting versus Gas Flaring Selection Process

At the project FEED stage BAT analysis was employed for key design decision regarding flaring and venting to minimize the atmospheric emissions. There will be no routine flaring or venting from MGD Project offshore as there is no fuel gas system on the offshore platform.

The process requires continuous flaring or venting of gas to atmosphere in relation to the gas processing at the GTP site. The BAT assessment was performed with consideration of two options, i.e. whether to flare (including the requirement for a continuous pilot flare), or to vent to atmosphere.

The assessment included the overall technical, environmental and commercial aspects of the two options to determining the BAT solution

The scope of the assessment was to determine the BAT for the identified emission streams, including:

- The emergency disposal of relief or blowdown streams; and
- The smaller but routine or continuous emissions of hydrocarbons from:
  - dynamic seal leakage at the Compressor Turbine;
  - Triethylene glycol (TEG) regeneration;
  - Monoethylene glycol (MEG) regeneration;
  - flash off from the water/MEG mixture produced from the slug catcher, and
  - continual consume of pilot gas to maintain both LP and HP flare headers air free in the flaring option only.

The BAT assessment of flaring versus venting aimed at finding a balance between the project requirements from a technical stand point and the environmental objectives and requirements.

The assessment took into consideration the Annex III of the European Directive 2010/75/EU on Industrial Emissions (integrated pollution prevention and control) in defining the Criteria for determining best available techniques.
Based on this, the BAT assessment was based on five drivers, each allocated with a weighting reflecting the priority and importance in the selection process, as indicated in Figure 4-3 below. The environmental and social driver was allocated a higher weighting (30%) than the other drivers (17.5% each) to reflect the importance of the associated assessment criteria.

Driver	Driver Weighting	Assessment Criteria
Environmental and Social Impact	30%	> Atmospheric emissions (particularly GHG emissions) > Waste generated > Bio-Diversity Impacts > Local Community Impacts – visual > Local community impacts - noise
Engineering Practicability	17.5%	> Operability of the technology > Reliability of technology (i.e. downtime risk/maintenance requirements/spares) > Technology > Constructability and materials
Health and Safety	17.5%	> Occupational safety > Intrinsic safety (operational controls) > Public health and safety
Reputation and Stakeholder Objectives	17.5%	> Regulatory Compliance > Company Compliance > Control, monitoring and reporting > Reputation > Risk to development schedule and delivery of licence commitments > Risk of undertaking activities that do not meet stakeholder expectations
Cost	17.5%	> CAPEX > OPEX

Figure 4-3 Flaring vs Venting BAT Assessment Criteria (Xodus, 2017)

The overall scoring as result of the assessment indicated venting as the preferred technology which was taken further and selected for the project design.

5.1.3 Gas Processing BAT Review

Upon completion of the FEED stage of the project a BAT Assessment of the gas processing at the project GTP was performed (ERM, 2019) to confirm and supplement previous BAT assessments made and inform the further stages of the project.

The BAT assessment was carried following three main steps:

- Review of European guidance for BAT to determine what constitutes BAT for the key project components, including design and management controls for the operational phase;
- Compile techniques that constitute BAT;
- Evaluate the Project's design against the BAT requirements; and
- Provide any recommended actions based on the results of the assessment.

The following European BAT Reference Documents (BREF) were reviewed in as part of the assessment:

- *European Commission (2015), Best Available Technique (BAT) Reference Document for the Refining of Mineral Oil and Gas*. This applies to the natural gas refining process taking place onshore and the associated infrastructure. It does not apply to the offshore exploration and the transportation of crude oil and natural gas such as the Project's pipelines.

Aspects considered included:

- Management organization;
- Energy efficiency (design, process control and maintenance, combined heat and power);
- Air emissions and monitoring;
- Wastewater discharge and quality monitoring;
- Water consumption;
- Waste Management;
- Noise;
- Soil and groundwater.

- *European Commission (2009), Reference Document on Best Available Techniques for Energy Efficiency.* Applicable to the entire installation.

Aspects considered included:

- Energy Efficiency Design and Management;
- Process Integration;
- Process control;
- Monitoring and measurement;
- Optimization of Combustion, compressed air systems, pumping systems, heating, ventilation and air conditioning systems and lighting systems.

- *European Commission (2006), Reference Document on Best Available Techniques on Emissions from Storage.* Applicable to the storage and transfer or handling of liquids, liquefied gas or solids used.

Aspects considered included:

- Tanks design, location and layout, inspection and maintenance, application of dedicated systems;
- Tanks safety and risk management, operational procedures and training, corrosion prevention, operational procedures and instrumentation to prevent overfill, leak detection, containment and fire protection;
- Storage of packaged dangerous substances;
- Transfer and handling of liquids and liquefied gases;
- Storage, transfer and handling of solids.

The *Reference Document on Best Available Techniques on Large Combustion Plants* was scoped out for the BAT assessment since the combustion plants will not exceed the applicability threshold of 50 MWth.

The assessment identified no deviations from the BAT measures set out in the above-indicated applicable BREFs at the stage the assessment was performed. Some of the BAT requirements could not be confirmed given that key equipment selection is contingent to the subsequent detailed design stage and certain operational and management systems were not in place. In the case of those requirements that could not be assessed, the BAT Assessment provide specific guidance for planning future design and management measures to ensure the BAT requirements identified as applicable to the project are considered and implemented.

5.2 Project GHG Emissions Consideration in Alternatives Analysis Process

GHG emissions aspects have been incorporated in the analysis of the alternatives considered for the selection of technologies employed in both the construction and the operational stages of the project.

5.2.1 Construction stage aspects

For the construction stage, key aspects considered related to the elevated GHG emissions associated with the offshore and onshore transportation and technology employed for project execution. Thus, as indicated in paragraph 4.2.1 above, GHG emissions was a key aspect considered in the decision-making process regarding drill cuttings disposal.

Drill cuttings reinjection option is associated with the emissions to air of pollutants and GHG associated with the fuel required to power the drilling unit and the platform supply vessel for the period required to drill an additional disposal well (assume an additional 28 days based on similar length of time required for the MGD Project wells). Energy would also be required to slurrify and pump cuttings down the well.

Shore disposal of the drilling cuttings is the most GHG-intensive option of the three considered. In this option the power supply vessel would make the 105-120 km journey to port and back to the rig around twice a week (a 1-day return trip) to discharge full bins and stock up with empty ones. Historical fuel consumption of marine diesel by the platform supply vessels used by BSOG in 2018 for the exploration drilling campaign was on average 6 tonnes of fuel per day when in the field standing by at the rig location and 11 tonnes per day when in transit to and from the port. Using an estimated 128 days drilling duration for all five wells, and the historic average fuel consumption figures, the vessels required for cuttings bins storage in the field will consume approximately 948 tonnes of fuel and in the

process emit approximately 3,080 tonnes CO_2e[1]. Onward road transport of cuttings to the disposal landfill (located approximately 375 km from the port) would require 50 to 75 truck movements from the port to the point of disposal and back. Vehicle emissions generated from the combustion of diesel fuel for these HGV movements would emit approximately 61 to 62 tonnes CO_2e[2]. Other pollutants such as nitrogen oxides, sulphur oxides and particulate matter would also be emitted.

The selected sea disposal method has the lowest power requirements of the three options considered and does not imply transport requirements. Emissions to air of pollutants and GHG from the combustion of fuels are therefore the lowest in the case of the sea disposal option.

5.2.3 Operation stage aspects

The MGD Project committed to implementing energy efficiency BAT and consequently minimise GHG emissions during the operation stage. The BAT Assessment performed confirmed alignment with the energy efficiency BAT at the FEED stage and provides specific guidance for ensuring BAT implementation during subsequent stages.

Main technological alternatives considered for the operation stage with increased relevance from the perspective of the project GHG footprint are related to the selection of best option for the continuous hydrocarbons release to atmosphere from the GTP. GHG emissions aspect has been incorporated in the decision-making process for the selection of the hydrocarbon release via flaring or venting. Details on the GHG emissions aspects associated with this process and the rationale for the best-case selection is provided in section 4.2.2 above.

5.2.3 Overall project GHG footprint

Drilling and installation emissions make up the bulk of the offshore construction GHG emissions, whereas operational emissions are dominated by onshore emissions.

Overall project GHG footprint has been conservatively estimated for a considered 20-year project lifetime as part of the Project ESIA as follows:

Project Phase	Offshore (t CO_2 equivalent)	Onshore (t CO_2 equivalent)	Total project emissions over 20-year lifetime (t CO_2 equivalent)
Construction	23,588	6,598	30,186
Operation (20-year)	23,364	744,527	767,891
Decommissioning	14,154	6,598	20,752

[1] Estimated using emission factor of 3,249.28 kg CO_2e / tonne of marine gas oil (Department for Business, Energy & Industrial Strategy, 2018. UK Government GHG Conversion Factors for Company Reporting).

[2] Estimated using emission factor of 1.09934 kg CO_2e / km for a 100% laden >17 tonne rigid HGV (Department for Business, Energy & Industrial Strategy, 2018. UK Government GHG Conversion Factors for Company Reporting).

Total	61,106	757,723	818,829

6. PROJECT OVERVIEW

A detailed Project description is provided in the Project ESIA. This section provides only an overview of the Project components focused mainly on the construction stage to inform the additional assessment performed in the frame of this AESIA.

Further details on various processes and project components is provided as needed in the subsequent topic-specific sections to allow understanding of associated impacts and inform the assessment and mitigation required.

6.1 Location and Project Development History

The Ana field is located in the offshore Romanian Black Sea approximately 105.4 km of Constanta Harbour, in Block Midia XV. It is one of nine hydrocarbon discoveries made since exploration began in the area in 1976. The water depth at the proposed location is +/- 69.2 m.

The Doina field is located in the offshore Romanian Black Sea approximately 120 km east of Constanta. The structure lies within Midia Block XV with water depth at the proposed location of 84.3 m.

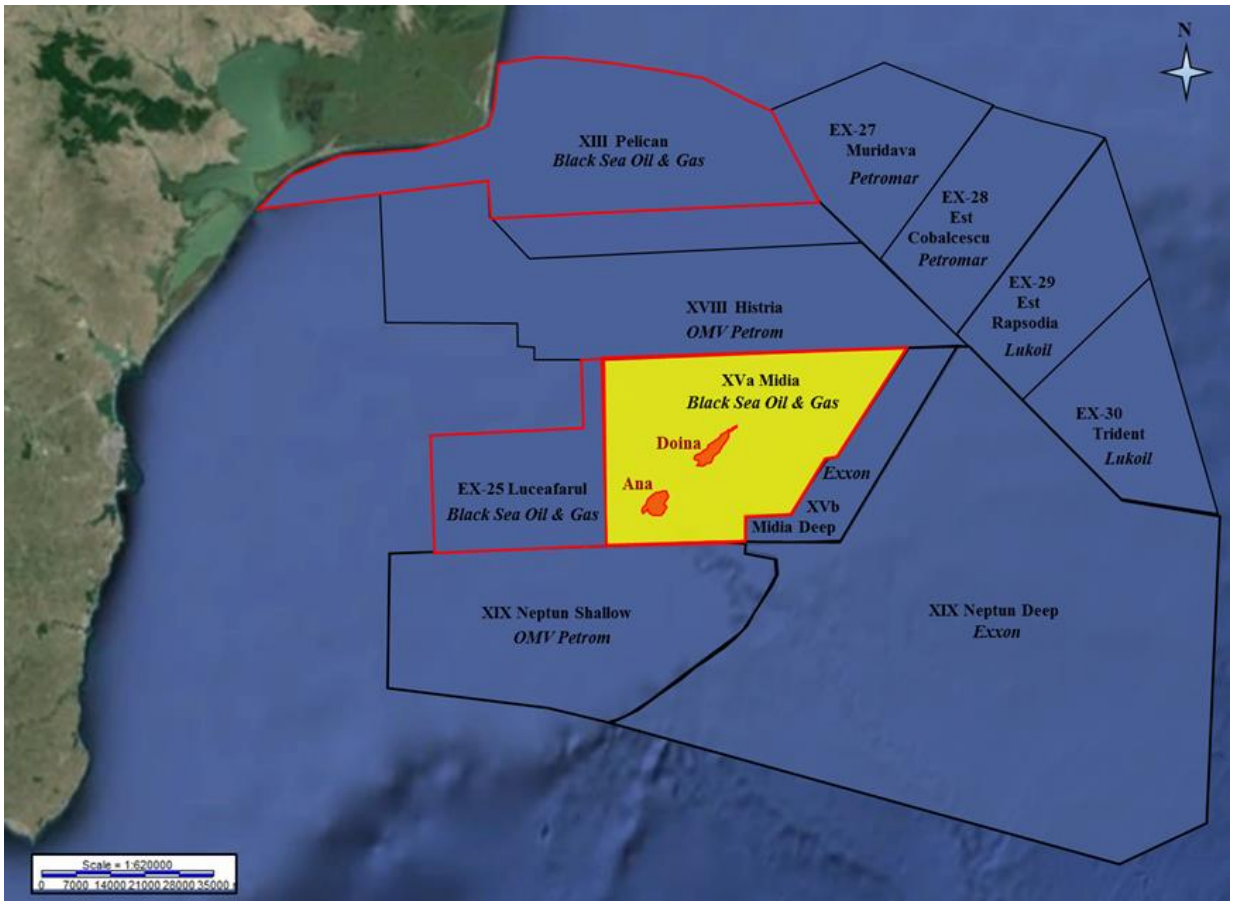


Figure 6-1 Ana & Doina Fields Location Map – Midia XV Block

The Doina field was discovered by the Doina-1 appraisal well, drilled in 1995. The well was drilled in a water depth of 84 metres and encountered a 30-metre gas column within unconsolidated Pliocene sandstones. A further appraisal well (Doina-2) was drilled, which flowed at rates of up to 0.5 MSm^3/d

of production gas that was nearly pure methane. Other two appraisal wells were further drilled in 2001 (Doina-3) and 2008 (Doina-4).

The Ana field was discovered by the Doina Sister (subsequently renamed Ana-1) well in 2007 and is located to the South-West of Doina along the same fault trend and at the same reservoir level as Doina. The well was drilled in a water depth of 69 metres and encountered a 50-metre gas column within Pliocene sandstones. A further appraisal well (Ana-2) was drilled in 2008.

In summary, within the Ana and Doina area, two exploration wells (Doina-1 and Ana-1, formerly known as Doina-Sister-1) plus four appraisals (Ana-2, Doina-2, Doina-3 and Doina-4) have been drilled to date. These six (6) wells are essentially vertical with the exception of Ana-2, which was drilled as a deviated appraisal well.

6.2 Overview of Project Components

The MGD Project consists of 5 production wells (1 subsea well at Doina field and 4 platform wells at Ana field) a subsea gas production system over the Doina well which will be connected through an 18 km pipeline with a new unmanned production platform located over Ana field.

The location of the five production wells in relation to the exploration wells drilled to date is shown in Figures 5-2 and 5-3 below.

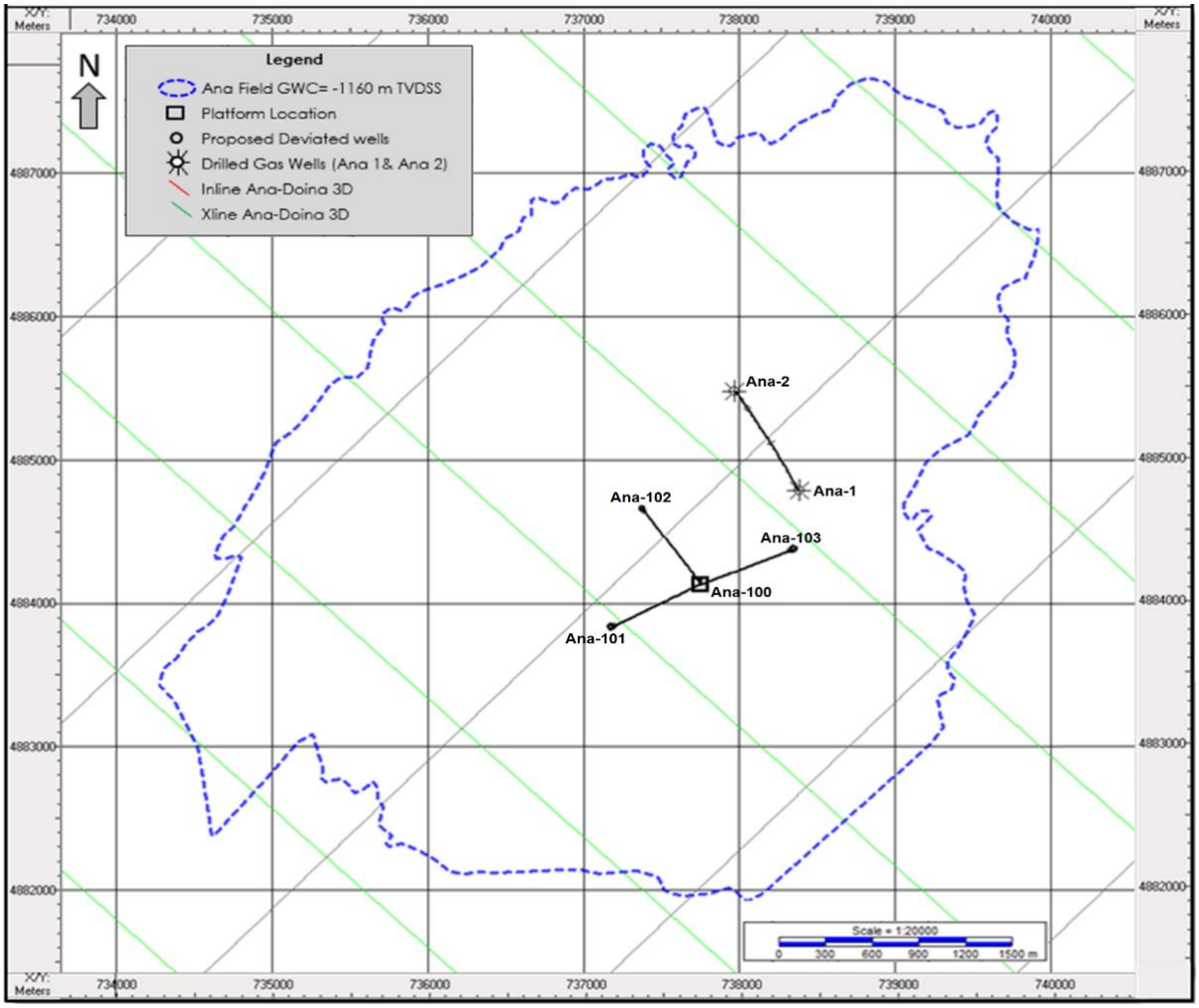


Figure 6-2 Ana Field Location Map showing the existing wells (Ana-1 and Ana-2) and the planned well trajectories.

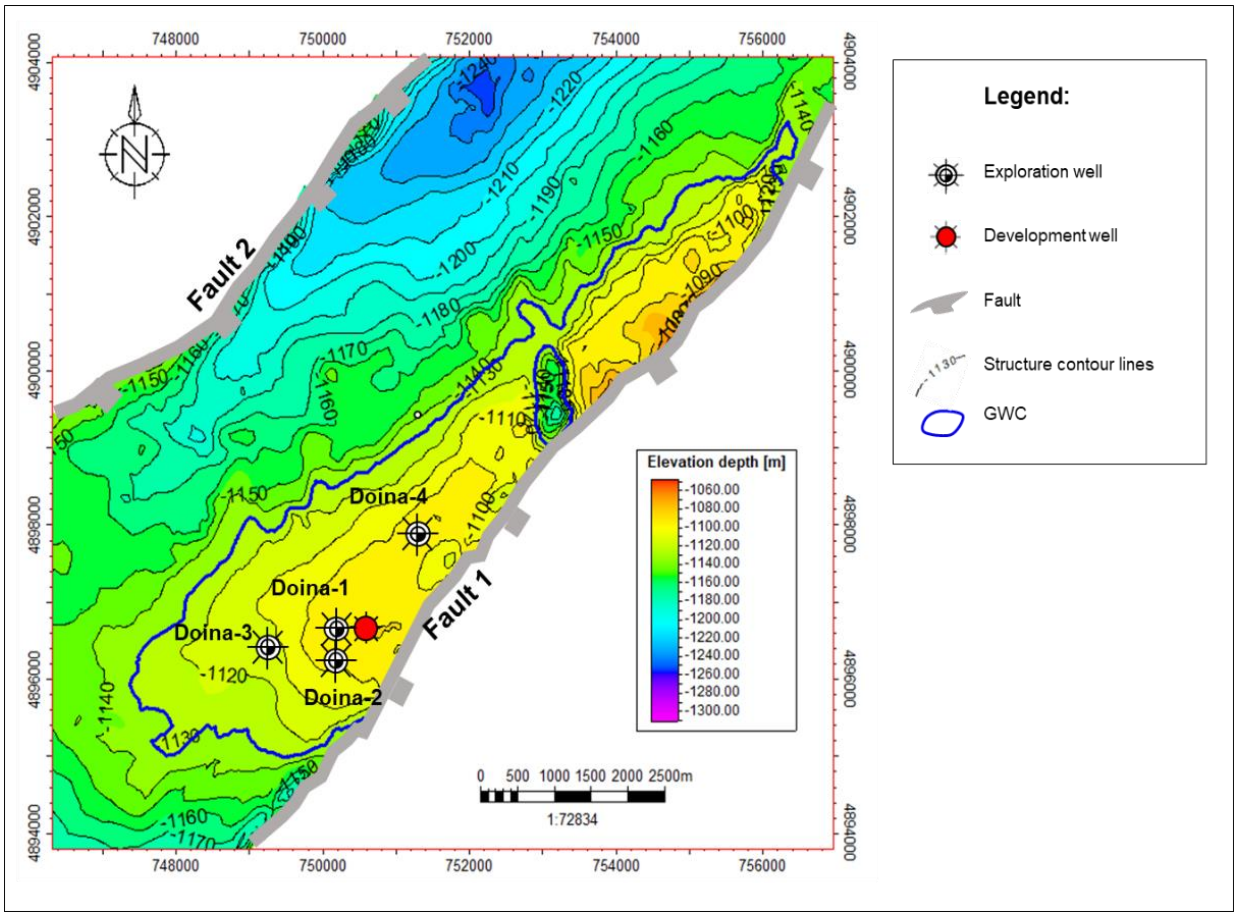


Figure 6-3 Doina Field Location Map showing the existing Doina wells and the planned Doina-100 Production Well location.

A 121 km subsea pipeline will ensure the delivery of the gas from Ana platform to the shore, where a 4.5 km underground pipeline will connect to the new gas treatment plant (GTP). The processed gas will be delivered into the NTS operated by Transgaz at the gas metering station to be found within the GTP. The planned first gas production date for the Ana and Doina fields is Quarter 1 of 2021.

The overall development is represented in Figures 5-4 and 5-5 below.

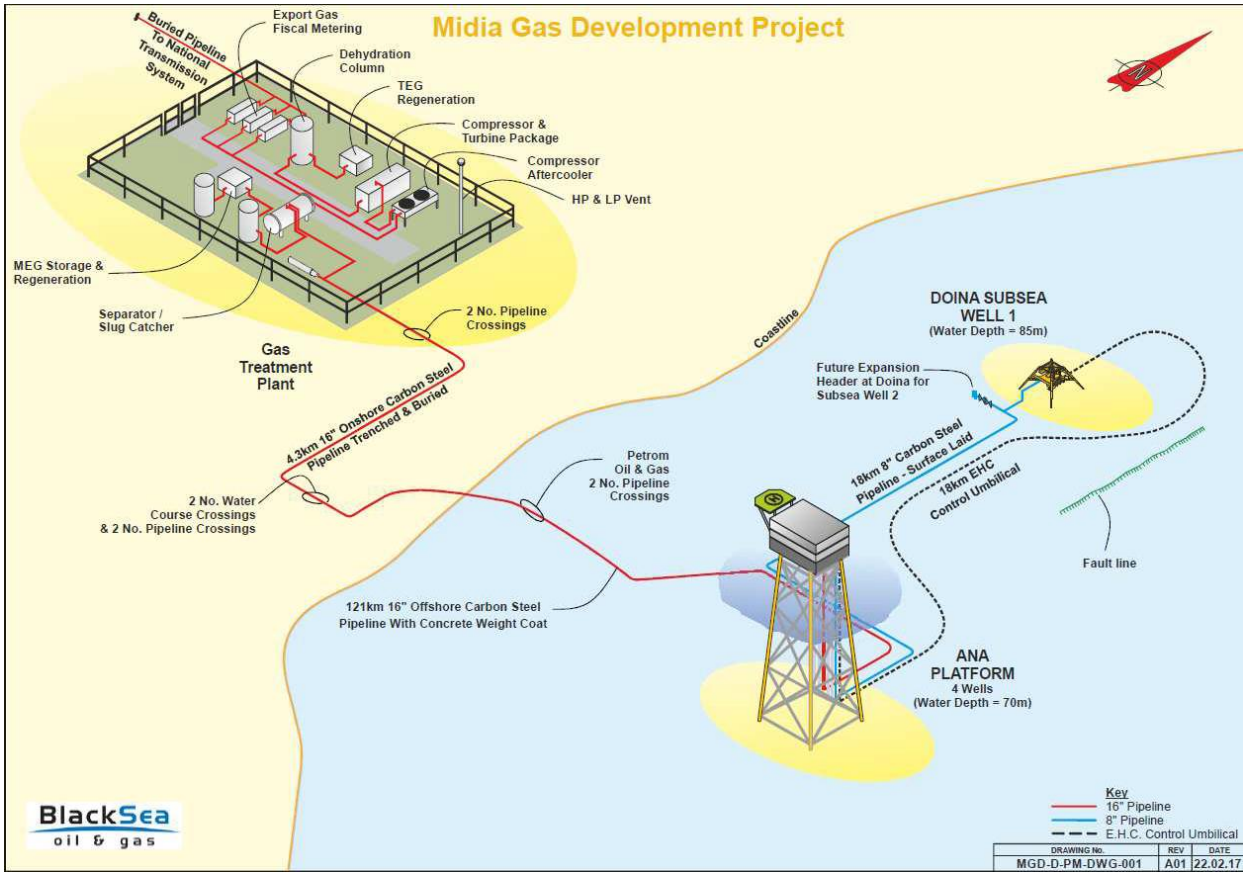


Figure 6-4 Overall Schematic of the Midia Gas Development Project

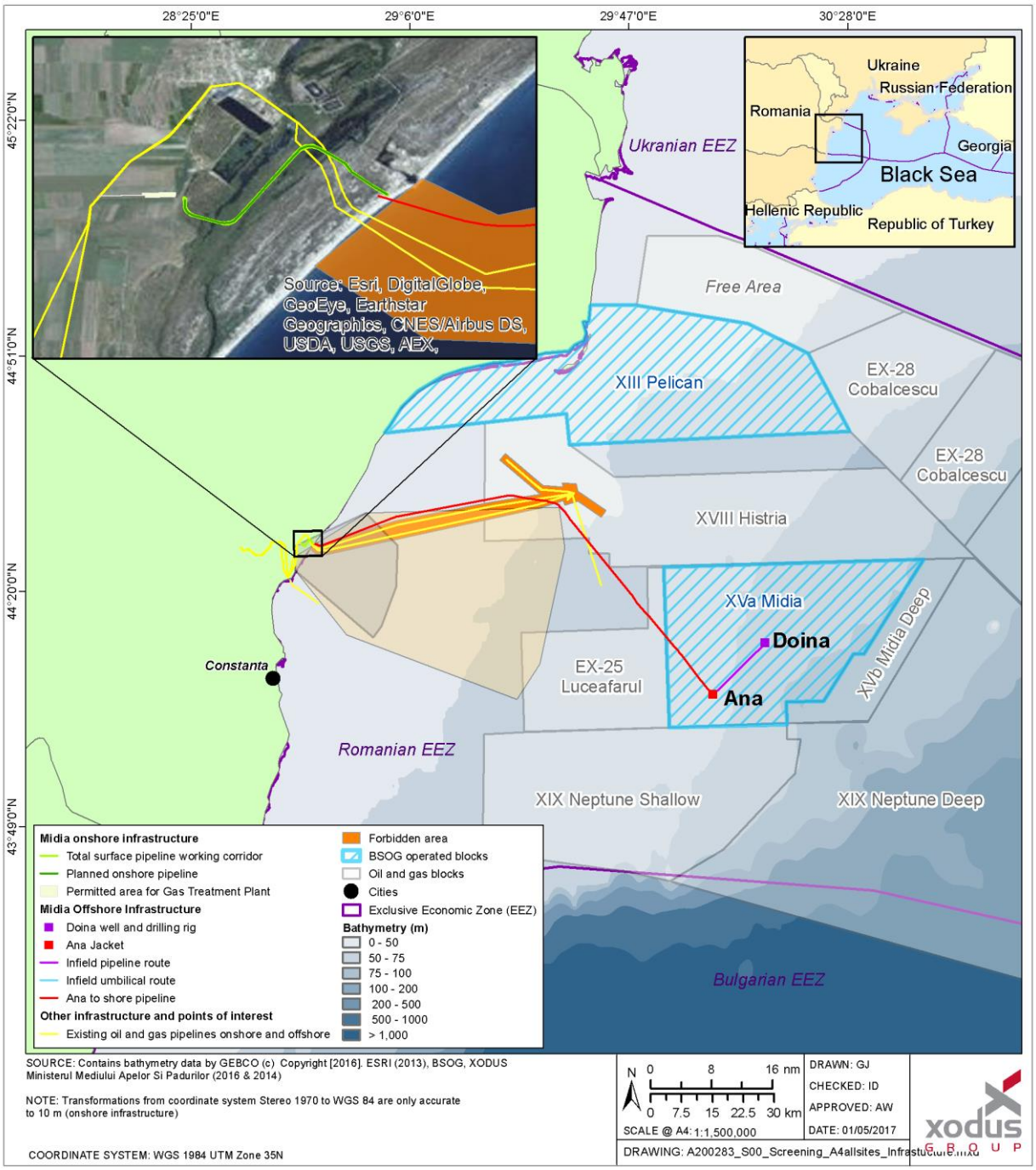


Figure 6-5 Project location

The main Project components are briefly summarized below. For a more detailed Project description, please refer to the Project ESIA Report.

Ana Offshore Installation (Ana Platform)

- Ana Platform will be a small, normally unmanned installation (NUI), hosting four wells, 109 km from shore. The jacket will be a 4-legged, x-braced steel structure with one pile per leg, attached via skirts. Mud-mats will also be installed in order to provide stability and assist in offshore installation.

- The platform will import production from the Doina subsea production system and mix it with Ana production prior to routing the combined production fluids to the Ana to GTP subsea pipeline.

- The topsides will host production support facilities for the Ana and Doina fields, including diesel driven power generators, cold vent, chemical storage and injection pumps for MEG / corrosion inhibitor (CI), temporary refuge, local equipment room, lifeboat, facilities to enable temporary installation of pig receivers and launchers, crane, a helideck, control and safety systems, telecommunication system and minimal other facilities.

- The platform is designed to be started up, controlled and shut down from the onshore GTP control room with minimal requirement for intervention by offshore personnel (limited to re-start of the platform following an emergency shutdown and bunkering of fluids to the platform).

Drilling

- Four near vertical wells for Ana in a water depth of 69.5 metres, each terminating at a depth of approximately 1135 metres TVDSS (true vertical depth subsurface),

- One vertical well for Doina in a water depth of 84 metres, terminating at a depth of approximately 1110 metres TVDSS.

Offshore Pipelines and Subsea Facilities

- Doina Subsea consists of one production well and a subsea gas production system (Xmas tree) controlled via an 18 km-long electro-hydraulic-chemical (EHC) umbilical from the Ana Platform. Utilities for the Doina subsea Xmas tree including Electric power, Control signals and hydraulic power are provided via the EHC umbilical between Ana and Doina.

- Doina to Ana infield pipeline: 18-kilometre-long, 8-inch carbon steel pipeline from Doina subsea to Ana platform, continuously inhibited against hydrates with monoethylene glycol (MEG) delivered through the umbilical.

- Ana to shore pipeline: 121-kilometre-long, 16-inch carbon steel pipeline with concrete coating for stability, continuously inhibited against hydrates with MEG.

GTP and Onshore Pipeline

- Shore crossing: Horizontally directional drilled (HDD) shore crossing.

- Shore to onshore gas treatment plant pipeline: 4.5 km-long, trenched and buried 16-inch carbon steel pipeline, continuously inhibited against hydrates with MEG.

- Onshore gas treatment plant (GTP) with:

  - Pig receiver.

  - Slug catcher/separator.

  - Single stage turbine driven compressor (with scrubber and air-cooled aftercooler).

  - Triethylene glycol (TEG) dehydration of gas.

  - Fiscal export gas metering.

  - Export pig launcher.

  - MEG regeneration and storage.

- Control room, complete with integrated control and safety system and telecommunications system that enables remote control of offshore facilities.
- Power generation.
- Utilities (fuel gas, diesel, instrument air, nitrogen and drains).
- Fixed firefighting system.
- Cold vent.

6.3 Project Infrastructure Installation and Construction

6.3.1 Ana Platform Installation

The jacket and topsides will be executed at an existing shore yard belonging to the main contractor. The contractor's Production Facility & Shipyard, in Agigea Harbour is the regional market leading facility specialized in construction engineering and fabrication for offshore facilities.

The jacket will be transported to site on Contractor's Bigfoot 2 transportation barge. After the jacket is lifted off the Bigfoot 2, the Bigfoot 2 will return to Contractor's fabrication yard to load the deck. The piles will be transported on a separate transport barge.

Prior installation operations a seabed survey will be performed to assure clearance.

The jacket and topside will be installed using GSP Neptun floating crane in a T-bone configuration with the GSP Bigfoot 1 pipe-lay barge. The Bigfoot 2 will bring the jacket to the bow of the Neptune and be secured. The jacket lifting slings will be attached to the Neptun's main block, and sea fastening will be cut. The Neptun will lift the jacket, and the Bigfoot 2 will be towed away. The crane will continue lowering the load until the jacket floats. The jacket will be held in position by two tugs, and the side lifting slings will be disconnected. The Neptun will then connect to the upending slings, following which the jacket legs will be flooded. Following upending, the jacket will be positioned and lowered until the bottom of the jacket rests on the seafloor. The Neptun will then release the jacket from the hook. The GSP Neptun will then be unmoored from the GSP Bigfoot 1 and be towed to the fabrication yard for the deck load out.

The Bigfoot 1 will then proceed with piling operations. Following piles' installation, the jacket will be levelled, and the skirt pile sleeves will be grouted. Jacket appurtenances will then be installed.

Same arrangement of Neptun floating crane and Bigfoot 1 used for the jacket installation, will be utilized for the deck installation.

6.3.2 Drilling

Detailed description of the wells design and operation is provided in the Project ESIA.

The proposed drilling strategy for the Ana and Doina fields is to drill four (4) production wells into the Ana field from the proposed Ana wellhead platform plus one (1) production well into the Doina field from a subsea location.

The reservoir target depths for each well have been selected to minimise the potential for formation water production by placing the well terminations above the BSOG calculated gas-water contact levels within each reservoir (gas water contact of 1,160 m TVDSS for Ana and 1,130 m TVDSS for Doina).

The production from the wells is predicted to be greater than 99.5% methane with no co-produced liquids and no contaminants. As a result, a simple design has been selected for these wells that is analogous to other Black Sea shallow water wells.

Seismic investigations carried out on Ana and Doina fields showed indications of shallow gas. As a result, further detailed investigations were carried out in 2016 at the proposed location of the Ana jacket and the Doina-100 subsea wellhead. The investigations consisted of high resolution seismic, borehole drilling (shallow holes to circa 5 metres depth local to Doina and two deeper holes to 128 metres depth local to Ana) and seabed profile plus magnetic surveys. The results showed that, while no shallow gas was encountered during borehole drilling, the Ana wells would cross an area with a high potential for containing shallow gas, resulting in the proposed Ana platform location being moved approximately 70 m to avoid this area. No significant indicators of shallow gas were found at the proposed Doina-100 subsea well location. However, the well location was moved as the original location was found to be situated on the hanging wall of a major normal fault. The original planned trajectory of the well would have crossed this fault at approximately 132 metres TVDSS and a new location was selected to avoid potential drilling problems that could arise if the well was drilled through the fault.

The wells will be drilled via a jack-up rig, GSP Uranus. The Ana-100 and Doina-100 are true vertical wells. The Ana-101, Ana-102, Ana-103 are slightly deviated.

An 8-1/2-inch pilot hole will be drilled through the conductor pipe down to the planned end depth of the surface casing for the Ana-100 and Doina-100 wells. The pilot hole will then be enlarged to 17-1/2-inch and the 13-3/8-inch casing run and cemented in place. As drilling of the Ana-100 well will fully determine the potential risk of shallow gas, it is not planned that pilot holes will be drilled for the subsequent Ana-101, 102 or 103 wells.

After installing the 13-3/8-inch casing, a blowout preventer (BOP) shall be connected to the casing and a drilling wellhead installed. After installation of the BOP stack, two independent barriers will be in place that will provide well integrity at all times. To prevent the well flowing through the drill string, a float shall be placed at an appropriate location in the drill string. In addition, drill pipe safety valves will be located on the rig floor matched to the in-hole drill pipe. Sufficient mud weighting agent (Barite for the majority of the well with Calcium Carbonate for the reservoir section) shall be kept on the rig at all times. Once the production casing is installed and cemented, it will be drilled out and the resultant hole under-reamed to 16-inch and an open hole gravel pack will be run into the completion to minimise sand production. The well will then be tested using a drill stem test completion. Following successful testing, the production tubing will be run, the BOP removed, and the Christmas tree installed.

Annex 1 of this report (*Drill Cuttings Disposal - Best Practicable Environmental Option*) provides additional information on the wells execution and discusses the impacts associated with the drilling cuttings disposal during the project execution.

6.3.3 Shore Approach and Crossing

The nearshore export pipeline will be installed using horizontal directional drilling (HDD) to create the bore path.

Directional drilling will be performed from shore to offshore (land-to-sea approach). The pipeline will then be ‘pulled’ from installation vessel through the bore path.

The onshore HDD equipment set-up site will be kept at a small, approximately 25 x 40 m footprint on a land plot adjacent to and partially overlapping the onshore pipeline right of way (refer to Figures 5-6 and 5-7 below).

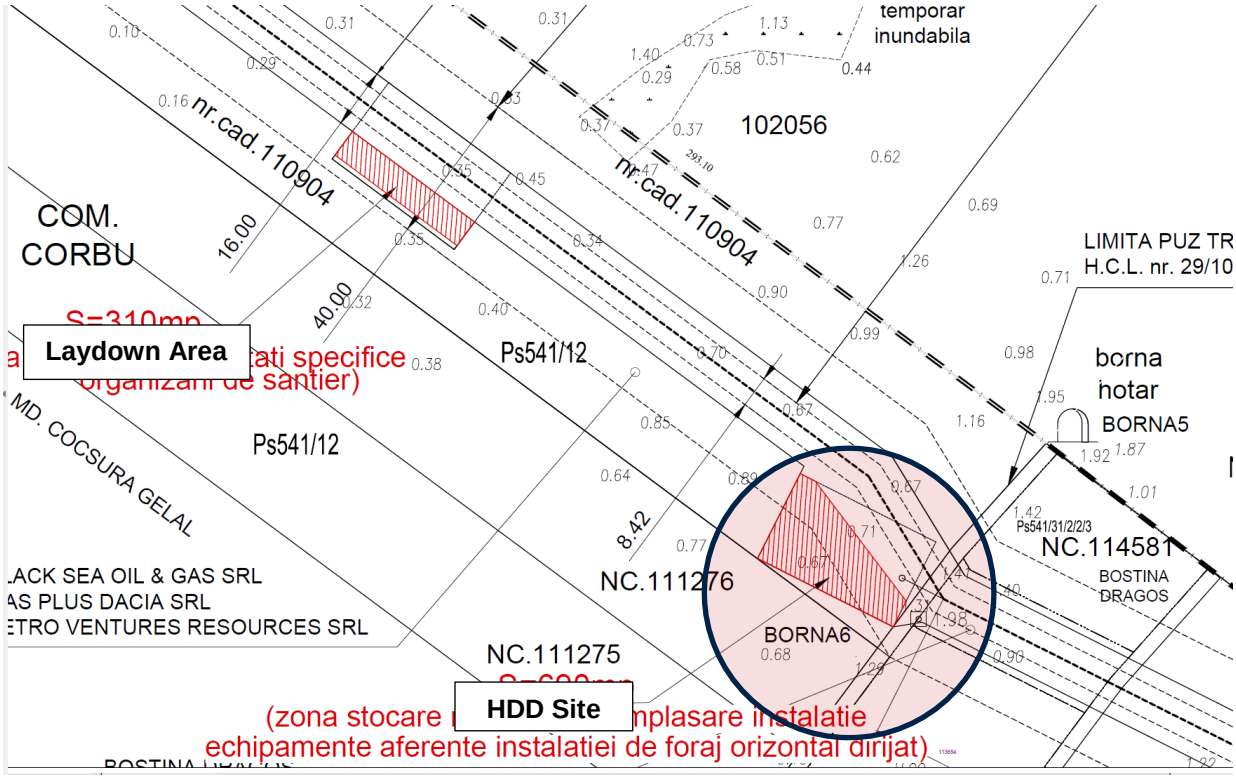


Figure 5-6 Shore crossing HDD site location

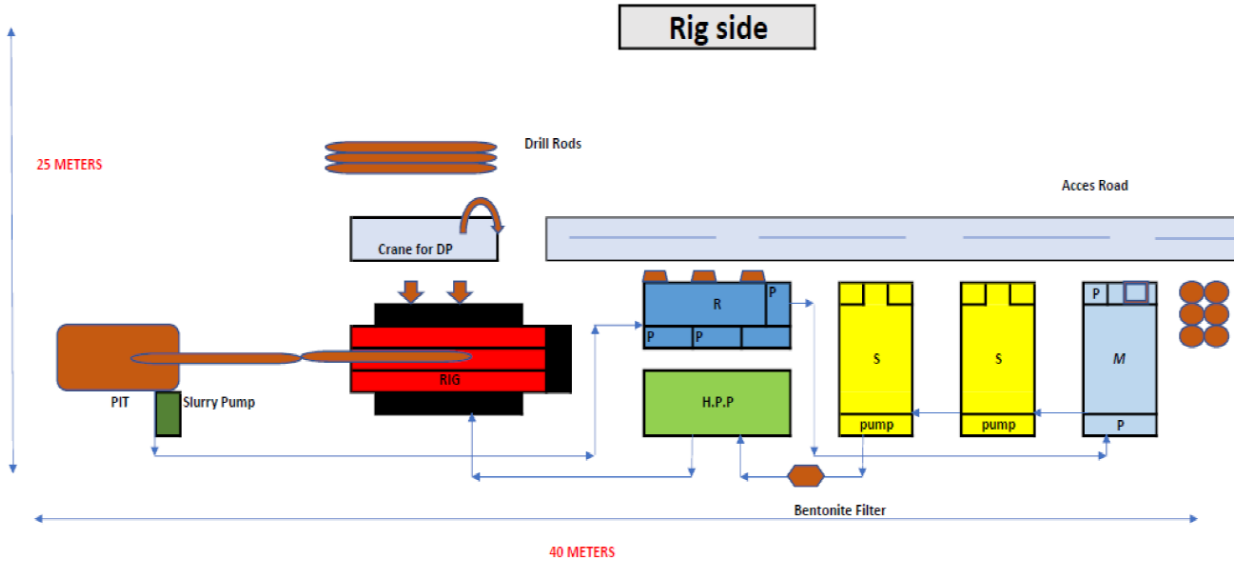


Figure 5-7 Shore crossing HDD site – typical rig arrangement

At its pop-out location offshore (located at approximately 1,300 m from the shore, at a water depth of 5 m), a pre-trenched section will be required which will be backfilled following pipeline installation, to ensure the pipeline is buried for the full extent of the nearshore region.

Source: HDD Shore Approach and Crossing Design Report, Xodus 2017

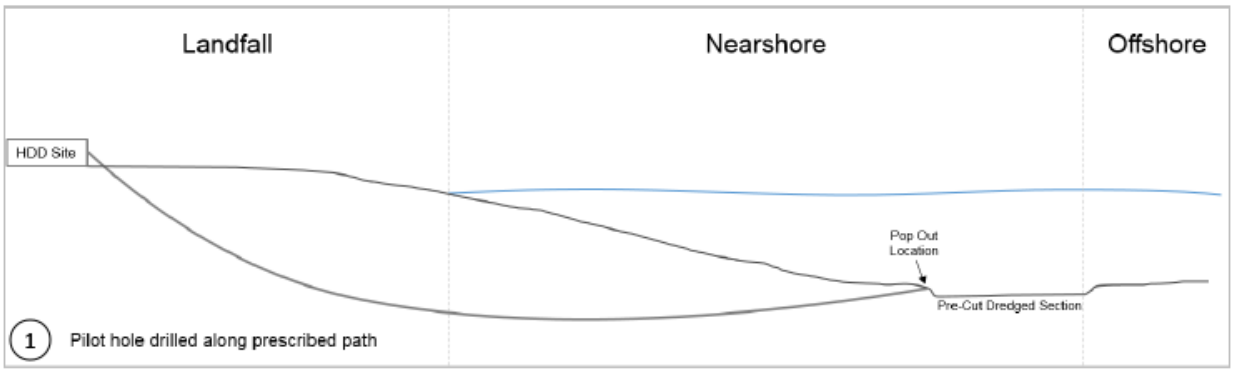
Figure 5-8 Shore Approach at Vadu

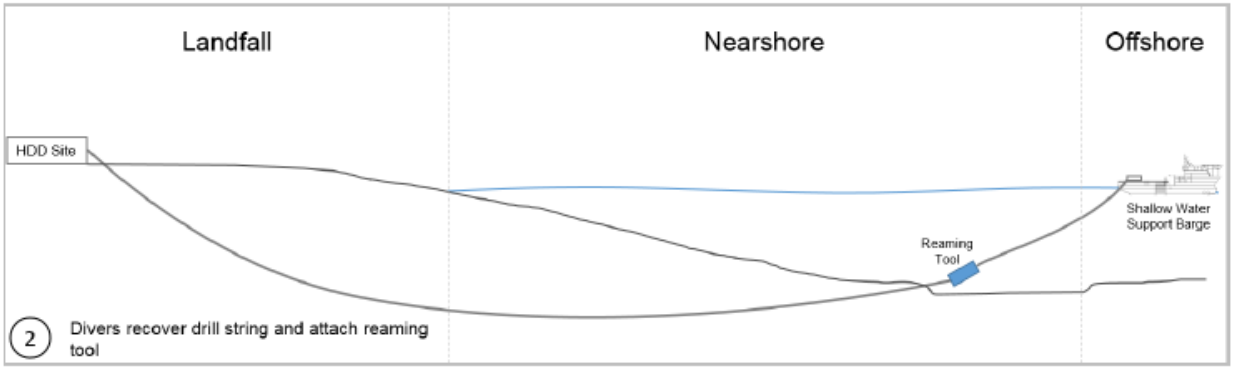
A pilot hole is drilled along the prescribed path using a hydraulically driven ‘‘mud motor’’ which drives the cutting head. Having successfully run the pilot bore, the pre-reaming stage begins. The reamer tool is attached at the exit end (via diver) and opens out the hole as it is pulled back by the rig. The drill rods are attached behind the reamer as it is pulled back to allow for additional reaming or pull back. The pipe to be installed is attached to the final reamer by means of a swivel to avoid rotation.

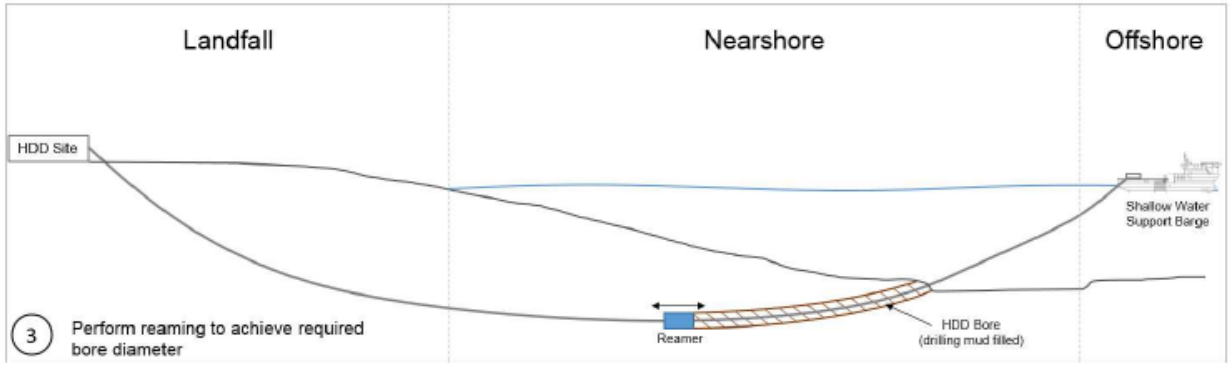
A seawater-based 100% bio-degradable, bio polymer fluid will be used to advance the HDD. In order to minimize drilling fluids consumption, the entry pit will be as small as possible (10 to 15 cubic meters). All surface volume will be reduced to rig intermediate storage units only (60 cubic meter). Additional high-performance solids control equipment will be used to generate as dry as possible cuttings discharge. As a seawater-based mud system will be used, there will be no requirement for trucking of fresh water to advance the HDD.

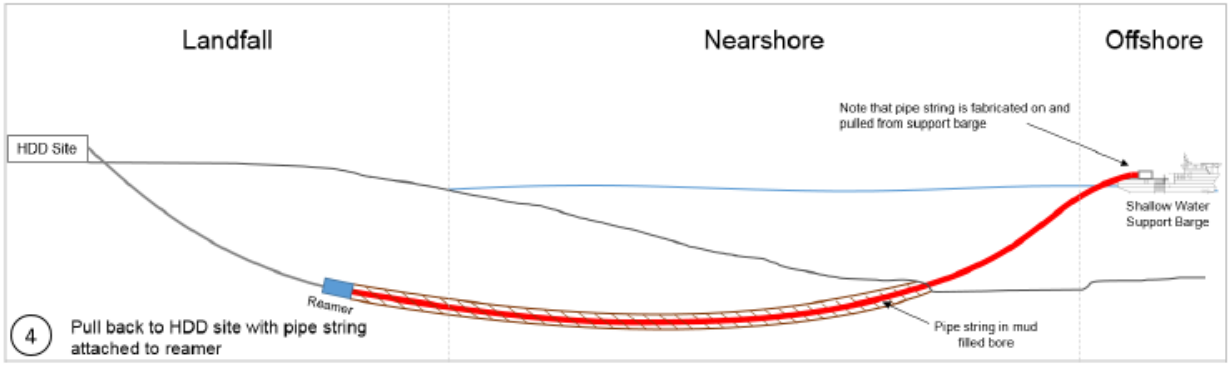
The drill cuttings will be stored intermediately on a storage area on site to further dry out and then finally disposed on a licensed landfill. The drilling fluid will be continuously recycled during drilling and reaming and therefore be reused.

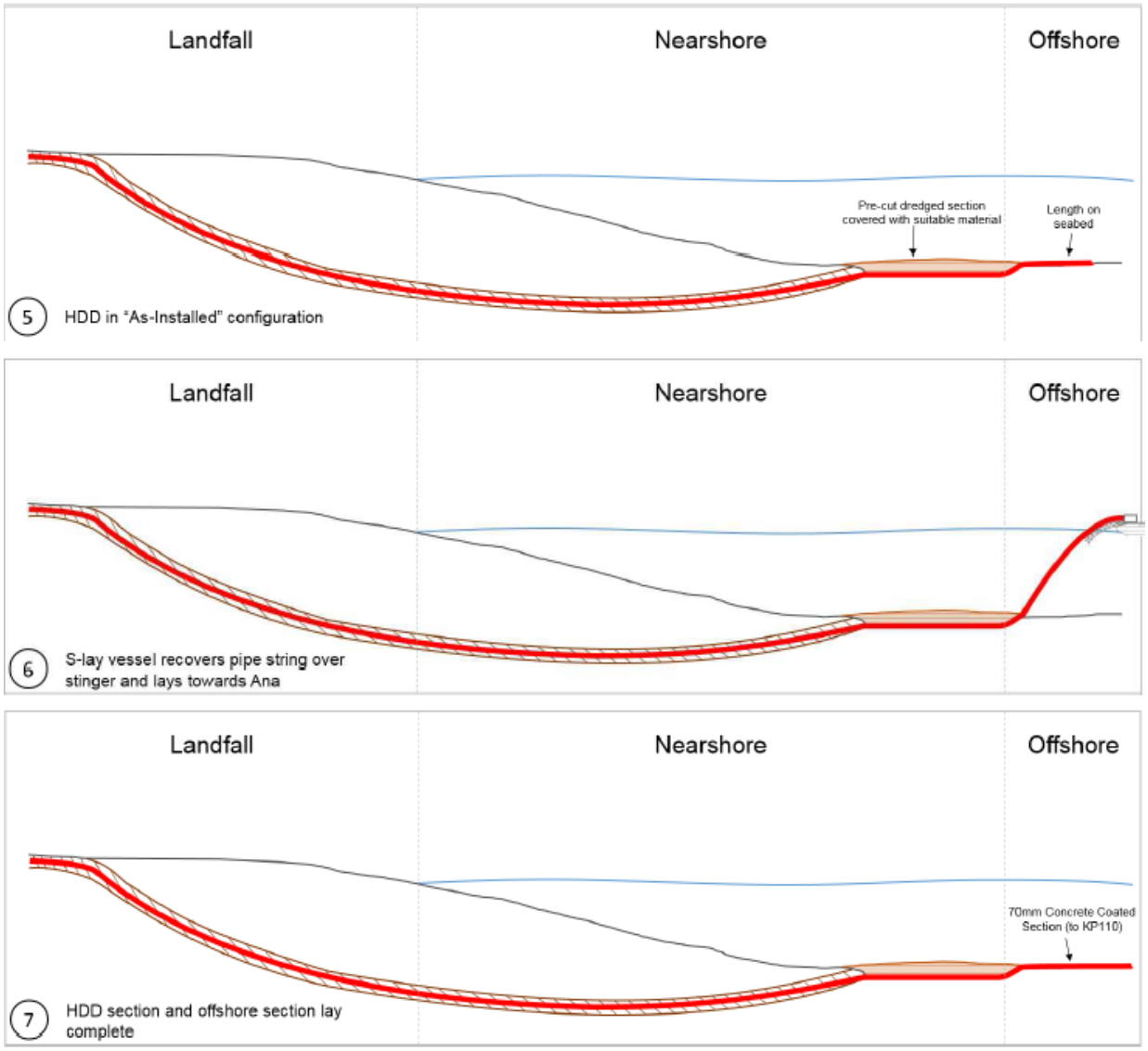
The phases of the shore crossing, and nearshore pipeline section construction are represented in Figure 5.9 below.


Landfall
Nearshore
Offshore
HDD Site
Pop Out Location
Pre-Cut Dredged Section
1
Pilot hole drilled along prescribed path


Landfall
Nearshore
Offshore
HDD Site
Shallow Water Support Barge
Reaming Tool
2
Divers recover drill string and attach reaming tool


Landfall
Nearshore
Offshore
HDD Site
Shallow Water Support Barge
Reamer
HDD Bore (drilling mud filled)
3
Perform reaming to achieve required bore diameter


Landfall
Nearshore
Offshore
Note that pipe string is fabricated on and pulled from support barge
HDD Site
Shallow Water Support Barge
Reamer
Pipe string in mud filled bore
4
Pull back to HDD site with pipe string attached to reamer



Source: HDD Shore Approach and Crossing Design Report, Xodus 2017

Figure 5-9 Near-shore HDD pipeline installation

6.3.4 Offshore Pipeline Installation

A pre-lay survey will be performed, by a dedicated vessel, before any pipeline installation works occur. Ana–shore pipeline will be then laid from the shore crossing to Ana Platform, while the Ana –Doina pipeline will run between Ana platform and Doina Subsea Well.

The Ana-Doina pipeline (18 km) and offshore segment of the Ana Platform – GTP pipeline (121 km) will be surface laid onto the seabed, with concrete mattresses for protection at the two crossings of existing OMV Petrom offshore pipelines.

Installation of both offshore pipelines will be performed by the S-lay technique, utilising GSP Bigfoot 1 pipe-lay barge.

The shore crossing string will be laid by the pipelay vessel and pulled through the HDD bore by the HDD rig. The pipelay vessel will then recover the end of the pipe string and lay out to Ana platform. Once pipelay has progressed sufficiently, the shallow water crane vessel will backfill the exit pit and the transition trench.

During pull-in operations the pipe-lay barge will operate in anchors mode, due to shallow water limitations. After the shore pull-in operations, the pipe-lay barge will continue laying the pipeline towards Ana platform. One supply vessel will be utilized to supply pipe joints during this work stage. Once sufficient water depth is available, GSP Bigfoot 1 will will recover the pipeline and continue laying it towards Ana platform in DP (Dynamic Positioning) mode.

The pipelay operation involves the onboard welding of pipe joints to form a pipeline which is then lowered off the stern of the barge as the barge moves forward.

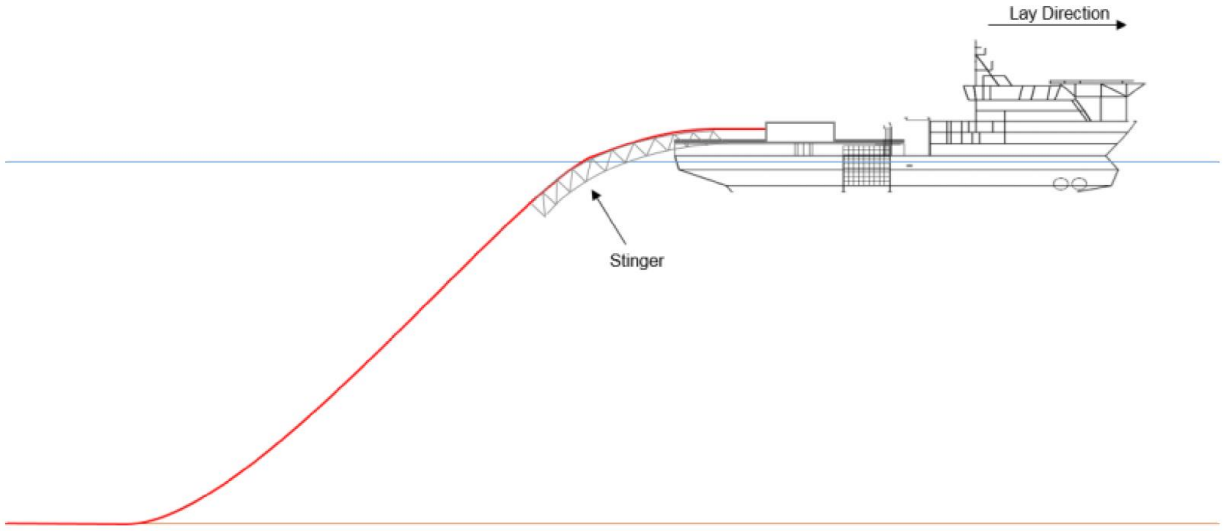


Figure 5-10 Offshore pipeline installation using the S-lay method

The pipeline curves downwards towards the seabed forming an 'S' shape in the water. The curvature in the pipe is controlled at the barge stern by a stinger (curved structure) and the stresses/strains in the pipeline are controlled by the thrust of the barge.

The umbilical between the Ana Platform and the Doina well will be trenched alongside the Ana to Doina pipeline. The GSP Bigfoot 1 will be used to install the umbilical. The umbilical will be laid from a reel drive on the vessel's deck using roller boxes and an over boarding chute. The umbilical will start with pull through Ana J tube, using the pull-in wire pre-installed in the J tube and the pull-in winch on the platform. At the completion of lay, the umbilical will be laid out. The vessel will then install the Doina umbilical termination assembly and complete the subsea connections of the umbilical (using saturation diving).

Following installation, the Ana – Doina umbilical will be trenched using a trenching spread.

6.3.5 Gas Treatment Plant Construction

The GTP construction will initiate with establishing the temporary construction camp. First will be established the access road and the camp office with required utilities, laydown area, enclosed storages fabrication shelter as necessary, and the perimeter will be fenced. The construction camp will not include workforce accommodation facilities.

The site area will be cleared and graded. The topsoil will be stored separately at the dedicated area of the site construction camp (see Figure 5-11 below).

Excavation of GTP facilities foundations will commence, followed by installation of piles, formwork, steel fixing and concrete pouring. Following initial concrete curing, formwork will be stripped, and areas

adjacent to foundations will be backfilled and compacted, in accordance with specifications. The sequence of foundations' construction will be based on access considerations and equipment delivery schedules. Larger equipment items and prefabricated buildings will be unloaded from transportation onto their permanent (cured) foundations directly, and then checked. Ancillary and shipped loose items will be installed, along with access platforms and ladders.

Site buildings will be constructed following completion of their foundations. Concrete paving will be installed in equipment areas. As foundations are completed, the installation of buried piping, including firewater and drainage systems, will progress.

Once heavy construction activities have completed, open areas will be finished in accordance with the specifications. Temporary storage, laydown areas and other temporary construction camp facilities will be dismantled/removed when no longer required and the areas reinstated.

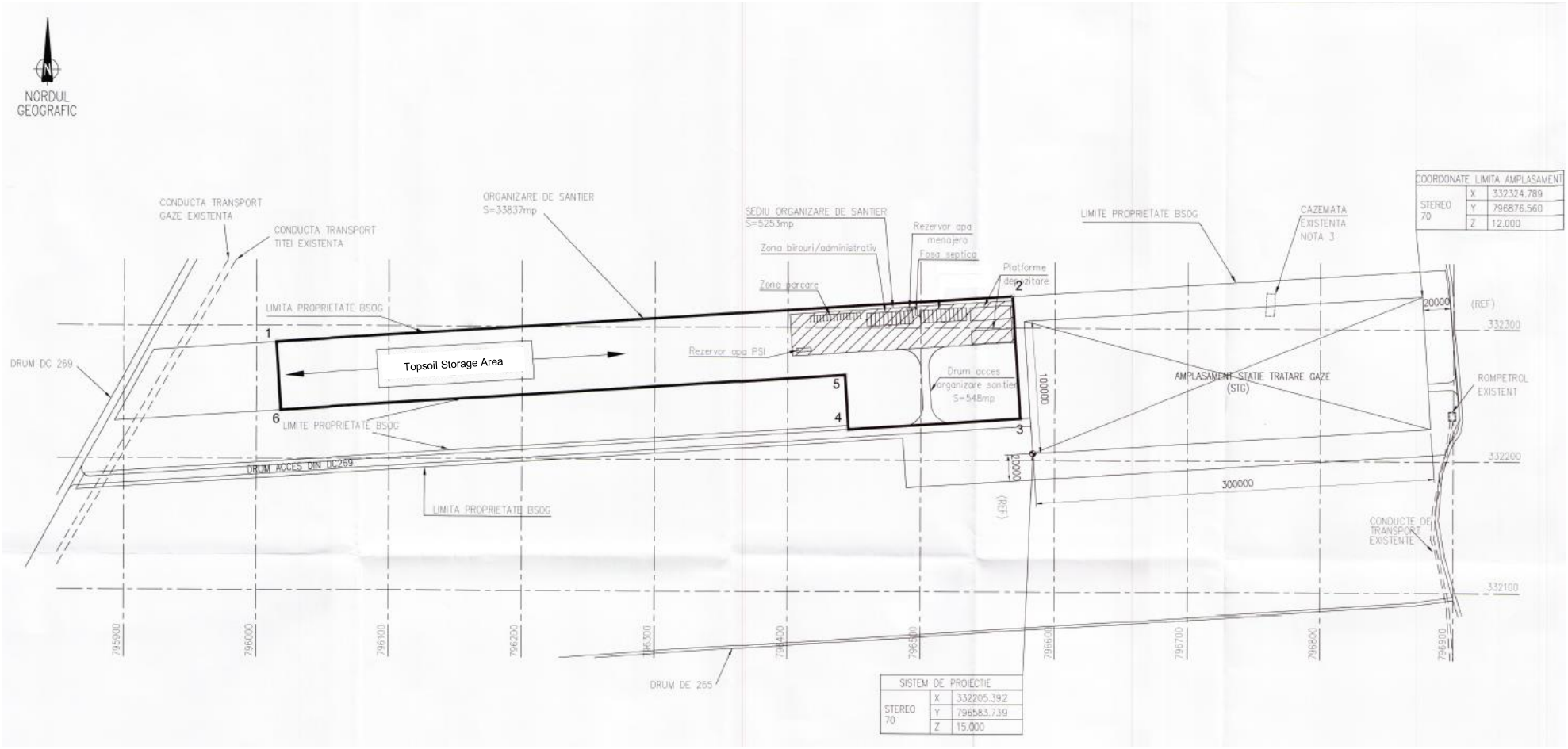


Figure 5-11 GTP construction camp organization

6.3.6 Onshore Pipeline Construction

Pipeline Construction

The Project was permitted based on horizontal directional drilling (HDD) at beach crossing from approximately 1.3 km offshore to approximately 150 m onshore and open cut for the rest of the onshore pipeline route. Technical changes were proposed during subsequent design stages to include horizontal directional drilling (HDD) across the water bodies. The existing project design includes onshore pipeline construction based on HDD at the beach crossing and across the watercourses as presented in Figure 5-12 overleaf.

In order to align with international financing standards (particularly IFC PS6 and EBRD PR6), additional measures to avoid, reduce and mitigate impacts on biodiversity are proposed by BSOG comprising the following:

- An additional section of HDD to extend beach crossing HDD approximately 1.3 km inland. As a result of the angle of approach of the offshore pipeline and the secured land plots, the additional HDD will require an exit pit (25 m x 30 m) from the beach crossing and a re-entry pit (25 m x 40 m) for the additional section of HDD.
- The additional section of HDD will extend to the start of the HDD under the first watercourse crossing, with an exit pit (25 m x 30 m) before the entry pit for the watercourse HDD crossing.
- Extending the HDD at the second watercourse crossing approximately 500 m to avoid impacts on SCI Annex I area of habitat.

These proposed changes including the critical habitat areas the proposed changes aim to avoid are detailed in Appendix B Assessment of Effects on Critical and Natural Habitat and Priority Biodiversity Features**Error! No text of specified style in document.**.

The proposed changes are subject to technical feasibility studies on the HDD approach, and being able to secure revised permitting for the changes to the Project approach. However, BSOG is committed to developing the Project as outlined above to avoid and reduce impacts on critical habitat.

Any subsequent changes to the Project approach necessitated by the technical feasibility studies, or re-application of permitting documents, will be assessed through BSOGs Management of Change procedure, and the rigorous application of the mitigation hierarchy in line with IFC PS6 and EBRD PR6 and the outcomes of such updated assessment will be publicly disclosed.

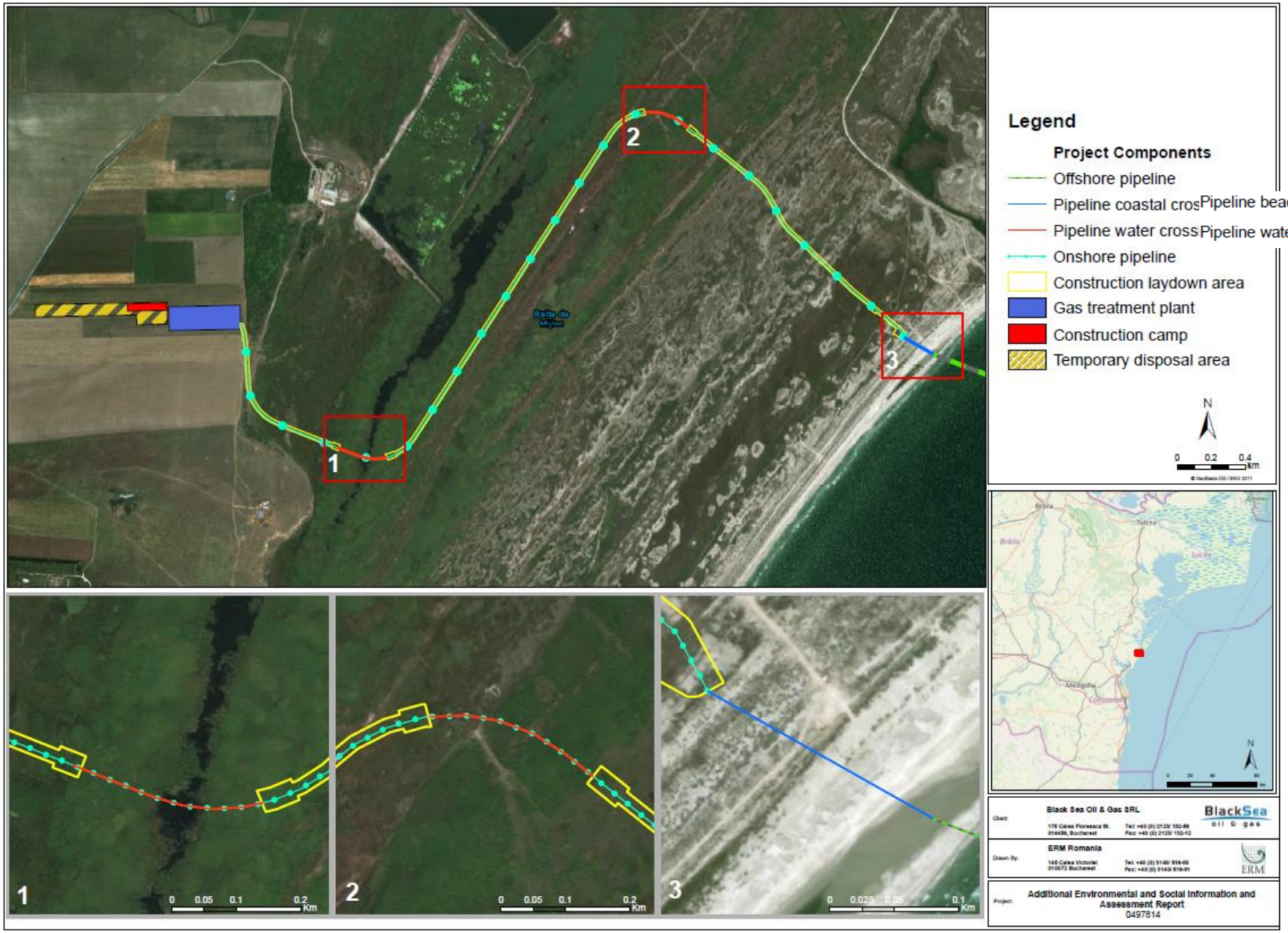


Figure 5-12 Onshore pipeline route

Construction activities will be carried out within a temporary working area along the pipeline route. Typical equipment to be used include:

- Excavators;
- Articulated dump trucks;
- Tracked dumpers;
- Side booms;
- Mobile welding stations.

Offices at the Gas Treatment Plant and Shore Pull-in site will be used to support the onshore pipeline construction.

The onshore pipeline right of way (ROW) will be accessed via existing dirt roads and from the GTP site (refer to Figure 5-17 below). Construction of new temporary access roads to access the pipeline ROW is not needed.

A 16 m wide right of way (ROW) will be required for the installation of the onshore pipeline section. The configuration of the pipeline installation ROW is represented in Figure 5-13 below:

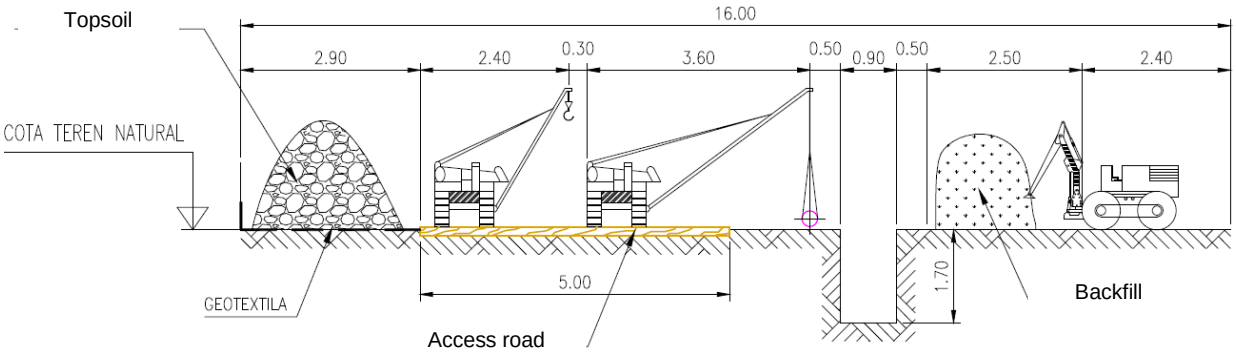


Figure 5-13 Schematic of open cut pipeline installation ROW

The stages of pipeline construction are the following:

- Route survey and benchmarks installation
- Topsoil removal, clearing and grading:

○ the topsoil is removed and stored along ROW limit, on a geotextile sheet, as indicated in Figure 5-5 above,

○ the ROW is graded to allow equipment and vehicle movement.

- Stringing

○ Coated Pipes are strung along the ROW on soft earth/sand filled bag and wedge in such a way that bottom of coated pipe remains above ground.

○ Pipes are to be supported at minimum two locations (see Figure 5-14 below).

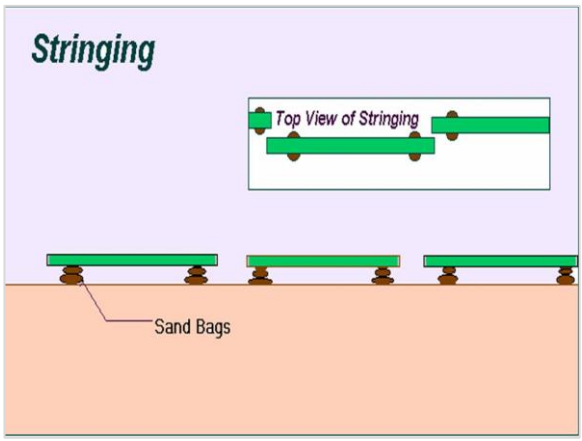


Figure 5-14 Stringing arrangement

- Trenching

○ Trench excavation will be carried out along the center-line of the pipeline.

○ In the vicinity of existing OMV Petrom pipelines crossings manual digging will be employed only.

- Pipeline Welding

○ Successive pipe joints will be fitted using an internal line clamp, and root and hot passes welded before the clamp is moved to the next joint. Subsequent passes will be deposited by following welding stations. Automatic welding will be used for all passes.

○ Initial and following welding stations will be supported by pay welders having adequate power generation and carrying welding machines and welding gas supplies.

○ Welds to the ends of the water crossings strings and to the shore pull section and the Gas Treatment Plant section will be made manually.

○ Automatic ultrasonic testing will be performed.

- Field Joint Coating

○ Weld areas will have field joint coating applied. The cut-back areas of coated pipes where weld joints are made are to be coated with heat shrinkable sleeves.

- Lowering in

○ Side booms will lower completed sections of the pipeline into the trench (after trench inspection)

○ Trench bottom shall be free from debris, stones, roots, stakes, rigid material etc.

○ Lowering shall commence as soon as possible after completion of the field joint coating.

○ Before lowering in, a complete check by a full circle holiday detector for pipe coating and field joint coating is carried out. Any damage will be repaired.

○ Ends of the lowered pipeline section shall be closed with night cap to prevent ingress of water, mud etc.

- Backfilling

  - Backfilling shall be carried out immediately after pipeline lowering in the trench to avoid coating exposure to adverse weather conditions and potential pipeline movement in the trench.

  - Backfill material shall not contain any hard materials lumps of soil that maty damage the pipeline or the coating or may leave the voids in backfilled trench.

  - Compaction is applied after backfilling.

- Completion

  - After backfilling and completion the ROW is reinstated using the stored topsoil.

Water pools crossing

Pipeline water crossing methodology will be finalized following an engineering study by the contractor. At the stage of this assessment HDD is the preferred crossing method, although other trenchless crossing options are also considered. Open trench method is kept open as an option to be employed in very dry weather conditions when water bodies would be expected to disappear. Given existing planning of pipeline construction (February – April 2020) the dry weather conditions are highly unlikely to occur and HDD has been considered the employed water crossing method for the purposes of this AESIA.

At the beginning of construction, temporary foundations will be established for the HDD unit, and roller beds will be laid out on the opposite sides, to the lengths required for the pipe strings. Pipe joints will be laid out alongside the roller beds on temporary supports and welded and corrosion-coated. Completed strings will be transferred to the roller beds using side booms and pipeline roller cradles.

The HDD crossing stages are the following:

- Pilot hole drilling

  - A gyro steering system will be used to monitor the profile during pilot hole drilling.

  - A mud motor will be installed to rotate the bit and will act as a reversed screw conveyor pump.

- Reaming

  - On completion of the pilot hole drilling, a reamer for hole enlargement will be connected to the drill string to enlarge the plot hole and allow pipeline placement.

- Pipe installation

  - After the completion of the reaming operations the assembly will be recovered at the exit point and then it will be connected to the pre-fabricated pipe string, to be pulled through the bore.

  - A pulling assembly consisting out of a centralizer, swivel-joint and a U-joint will be connected to the drill string will be used to install the pipe into the pre-drilled hole.

The HDD water pools crossing is represented in Figure 5-15 below:

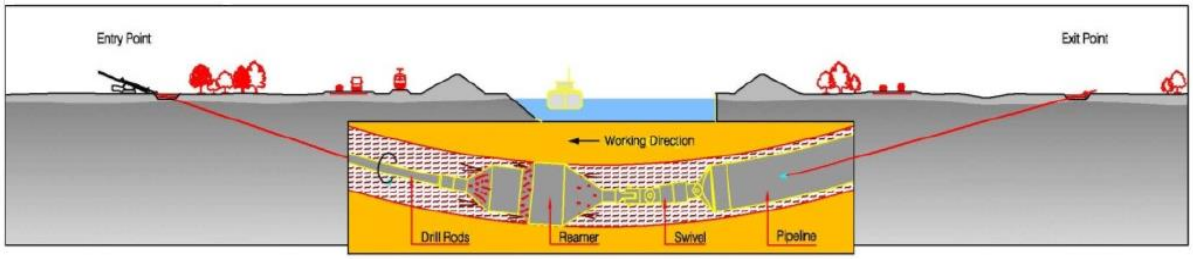


Figure 5-15 HDD water pools crossing

6.4 Project Temporary Facilities

Temporary facilities that will be required during construction activities will include the following:

- Temporary construction camp with an area of 33,837 m^2 at the GTP site (refer to section 5.3.5)

  - The temporary construction camp will include all required facilities including materials laydown areas, construction equipment and vehicles parking, temporary office facilities, warehouse, etc.

- Temporary pipeline construction laydown area of 310 m^2 at the GTP site (refer to Figure 5-6)

The construction sites will be accessed using the existing public roads, the existing dirt tracks and the onshore pipeline ROW (refer to Figure 5-17 below. Construction of new temporary access roads to access the project construction site is not needed.

Workforce accommodation will be ensured within existing guest houses and provision of temporary construction accommodation camps is not envisaged.

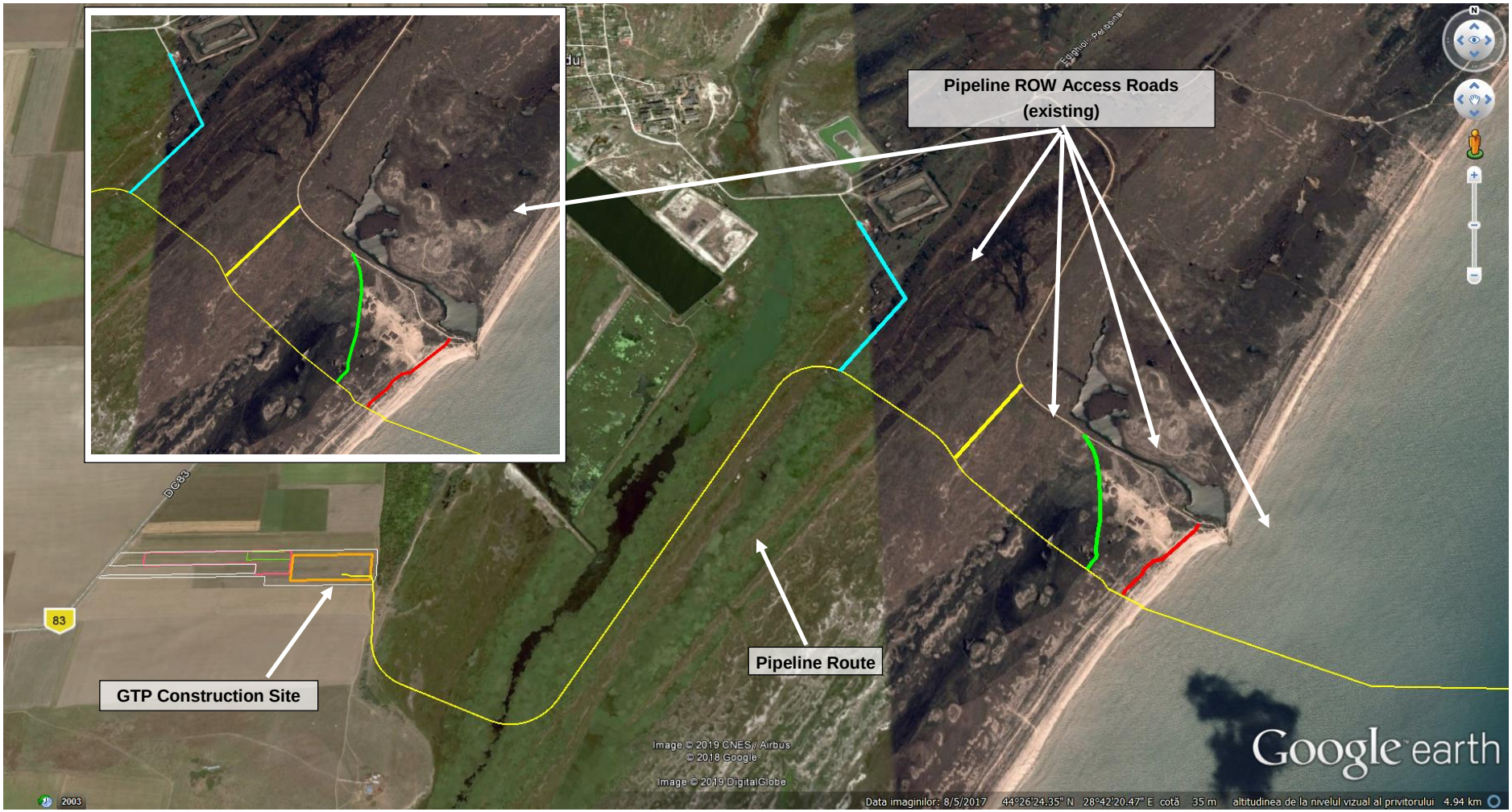


Figure 5-17 Onshore pipeline ROW access

6.5 Project Execution Duration and Timing

The Project execution time schedule and duration according to planning at the time of this AESIA is provided below.

Construction Activity	Timeline	Duration (days)
Offshore Structures Fabrication (at Contractor yard)	April 2019 – June 2020	423
Offshore Structures Transportation and Installation	May 2020 – June 2020	32
Drilling	July 2020 – February 2021	207
Offshore Pipelines and Umbilical Installation	February 2020 – March 2021	382
GTP Construction	May 2019 – February 2021	643
Onshore Pipeline Installation	February 2020 – April 2020	56

Table 5-1 Indicative Construction Time Schedule

7. ASSOCIATED FACILITIES

In accordance with international ESIA practice, the Area of Influence of a project includes not only the core project components but also any Associated Facilities related to the project. Associated Facilities are facilities that are not funded as part of the project and that would not have been constructed if the project did not exist and without which the project would not be viable.

In the context of the MGD Project, the pipeline ensuring the connection of the project with the national gas transmission system (also referred to herein as the "connection pipeline") represents an Associated Facility in line with the above-indicated.

7.1 Overview of the Associated Facility

The Associated Facility project, titled "Extension of the Romanian transmission system for taking over gas from the Black Sea shore", consists of the construction and operation of a 24.37 km-long, 20" diameter (Dn 500) gas pipeline. The Associated Facility will be constructed and operated by the National Gas Transmission Company Transgaz S.A. (Transgaz). Transgaz is the sole operator of the Romanian national gas transmission system.

According to Transgaz, the purpose of the Associated Facility project is the extension of the national gas transmission system "to create an additional point for taking over gas from the Black Sea offshore production blocks".

The pipeline follows a general south-east to north-west direction, between the MGD Project GTP at Vadu area and the "Transit 1" pipeline of the national gas transmission system. The indicative route of this pipeline is provided in Figure 6-1 below.

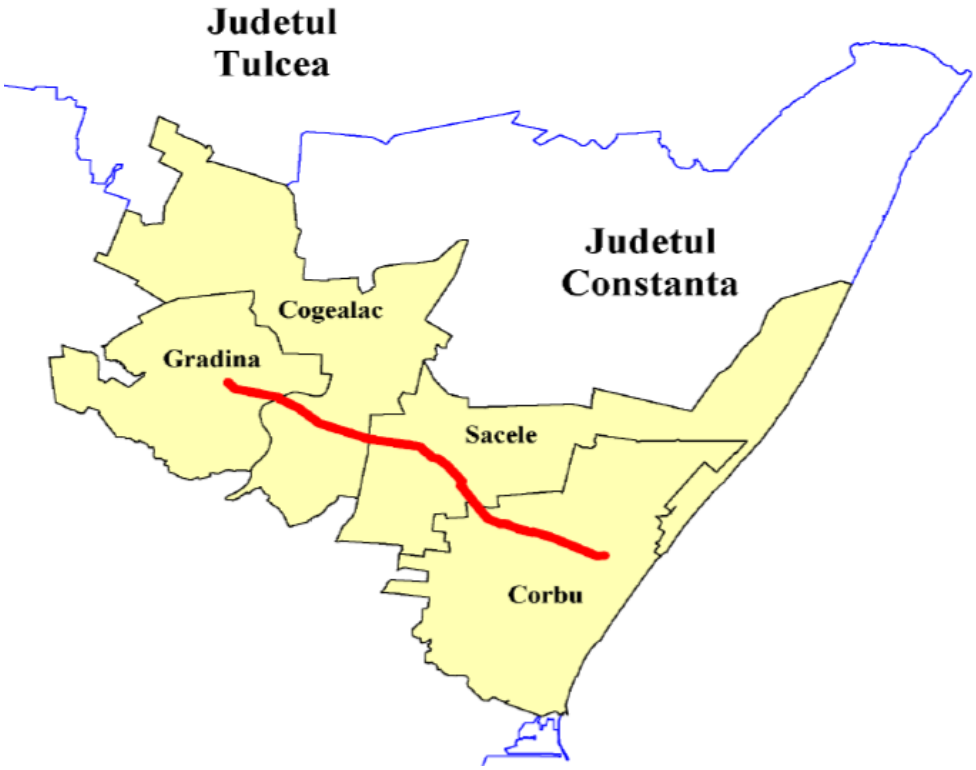


Figure 6-1 Transgaz pipeline route (Transgaz, 2017).

7.2 Associated Facility Background.

7.2.1 Connection pipeline route assessment

The GTP connection with the national gas transmission system was initially considered an MGD Project component and envisaged to be constructed and operated as integral part of MGD Project.

Hence the potential route options for this connection pipeline were analysed in the frame of the MGD Project and, once the preferred route was selected, the project moved to the stage of investigating the land acquisition aspects.

Two route alternatives were analysed in 2015 by BSOG for the connection pipeline as shown in Figure 6-2 below.

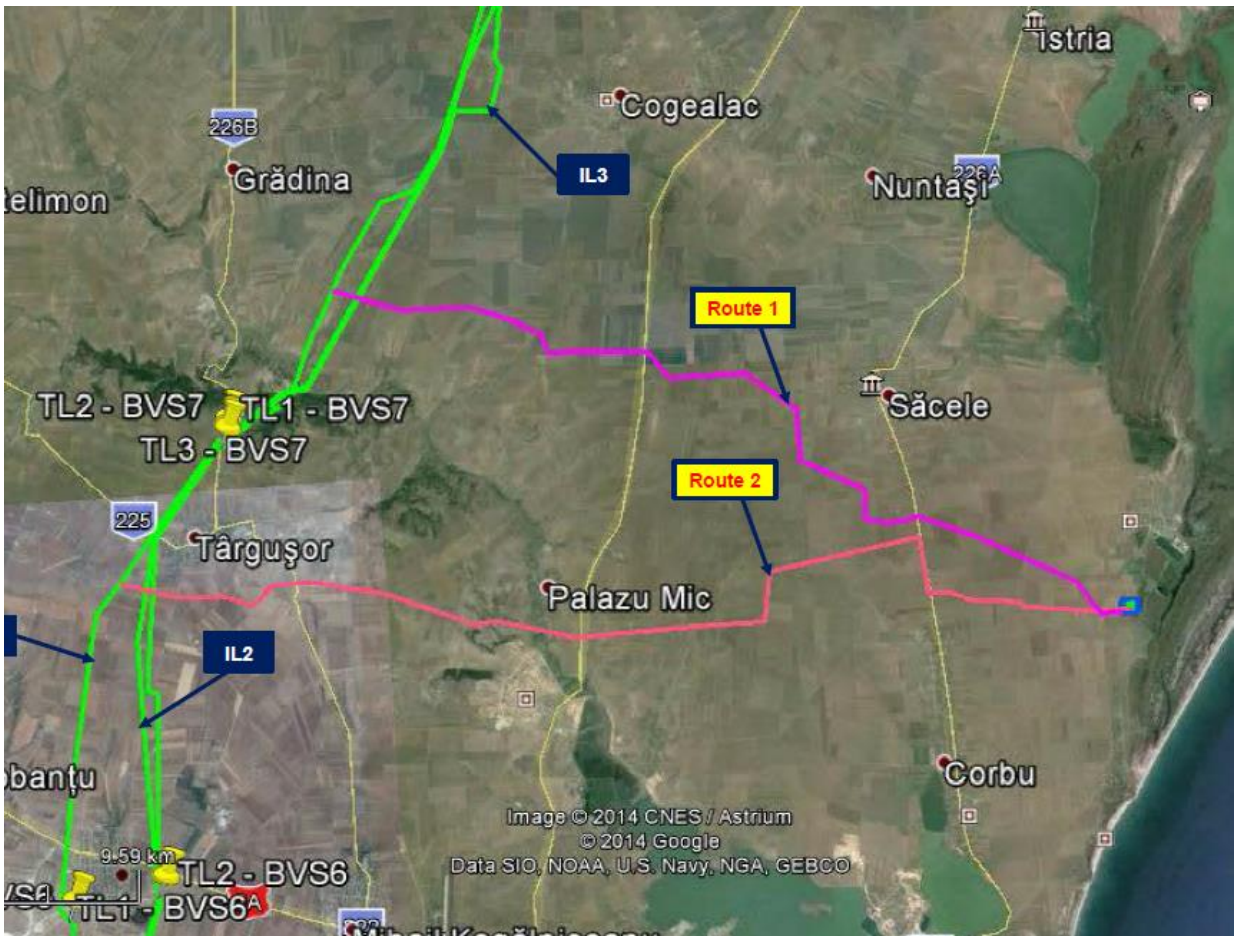


Figure 6-2 Pipeline routes connecting the project with the national gas transmission system. Alternatives analysed (BSOG, Route Selection Appraisal, 2015).

The route selection process took into consideration the following primary constraints:

- Geographical constraints, including watercourses, wetlands, forests, mountains, steep slopes etc.
- Geological constraints, including landslides, gullying and erosion, sinkholes etc.
- Infrastructure constraints, including roads, railways, power lines and electrical infrastructure, tourism infrastructure, inhabited areas, windfarms, military infrastructure etc.

- Environmental constraints, including Sites of Community Interest, Special Protection Areas, Important Bird Areas, Ramsar Sites etc.

For each of the two potential pipeline routes the above-indicated constraints were identified and mapped within a 5 km-wide corridor, see Figures 6-3 and 6-4.

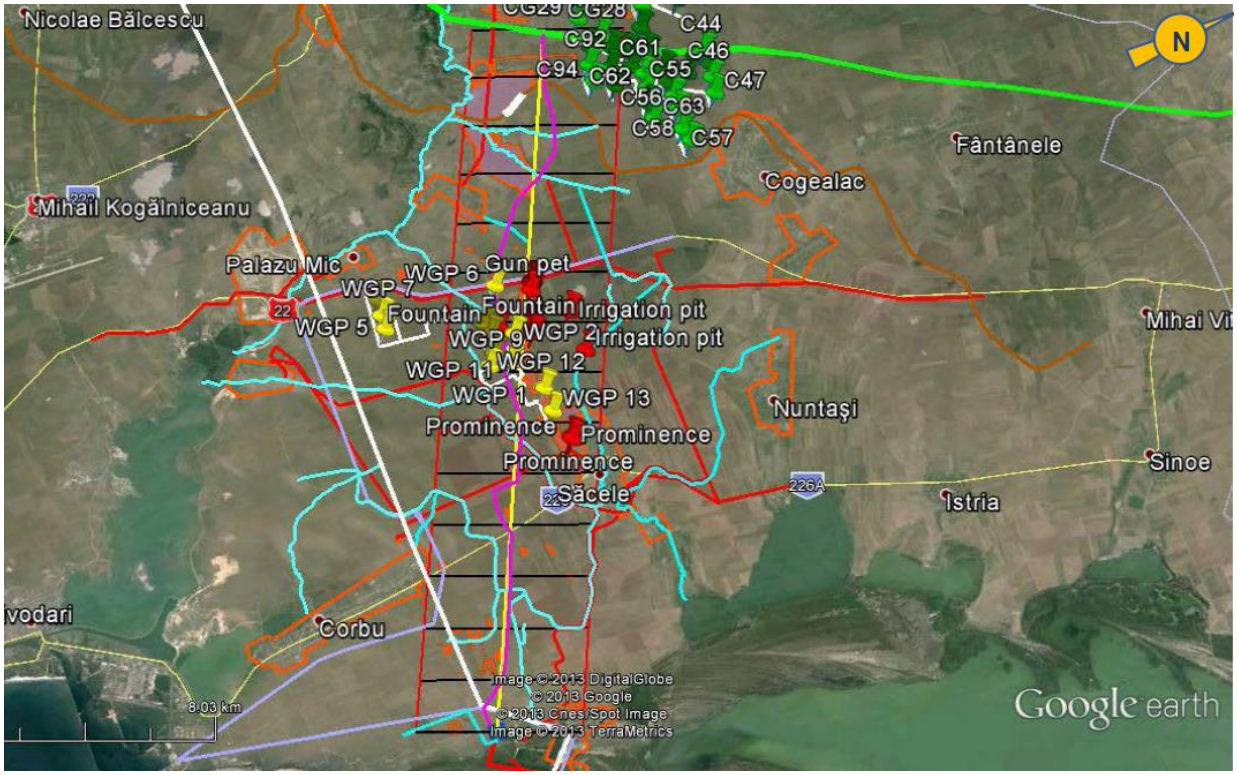


Figure 6-3 Connection pipeline Route Alternative 1. Constraints mapping. (BSOG, Route Selection Appraisal, 2015).

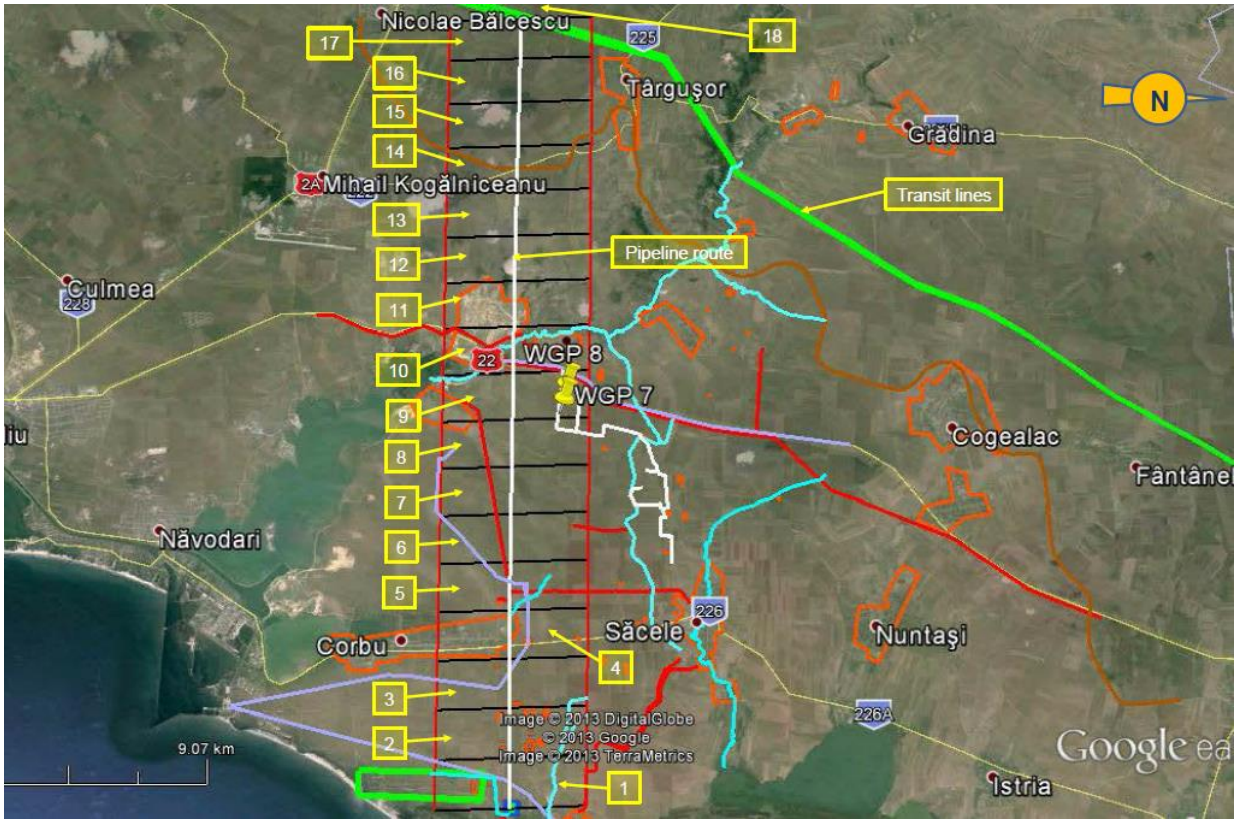


Figure 6-4 Connection pipeline Route Alternative 2. Constraints mapping. (BSOG, Route Selection Appraisal, 2015).

Upon constraints mapping, each route alternative was weighted against a number of criteria including: overall pipeline length, number of road crossings (different weighing for dirt, gravel, asphalt roads), number of railway crossings, number of waterbodies crossings, number of built up/populated areas to be avoided, pipeline length on steep slopes, pipeline length in environmental-protected areas, in wetland areas, in areas of geological constraints, number of buildings to avoid.

Based on the assessment performed, the Route Alternative 1 (northern route alternative) obtained a better overall score and was selected as the preferred route for the pipeline connecting the project with the national gas transmission system. This route alternative was proposed for further assessment and refining during subsequent MGD Project development stages.

With respect to environmental constraints, the selected Route Alternative 1 interferes with one designated site on a length of 10.3 km while Route Alternative 2 crosses three designated sites on a total length of 16.9 km. In addition, the selected Route Alternative 1 crosses only three irrigation channels, while Alternative 2 crosses two irrigation channels and two natural water bodies (a Creek and the Casimcea River). Both alternatives avoid settlements or inhabited areas.

7.2.1.2 Connection pipeline carve out of the project. Third party's reliance on the Connection pipeline.

With the 10-year Development Plan of the National Gas Transmission System (period 2017 – 2026), the connection pipeline was considered by the authorities an extension of the national gas transmission system, to enable acceptance of offshore Black Sea gas production. Transgaz, the national gas transmission system operator, was therefore legally mandated to build and operate the connection pipeline as an additional entry point to the national gas transmission system. The development of the connection pipeline project was therefore taken over by Transgaz and was subject to an open season procedure for the allocation of transmission capacities.

As an outcome of the open season procedure, the MGD Project will use approximately 90% of the connection pipeline capacity for the initial 4 years of operation, i.e. until 2024. After 2024 the use of the connection pipeline capacity by MGD Project will gradually decrease to an estimated 2 % of the transmission capacity in 2034.

Third parties may use the additional transmission capacity by tying in at any Transgaz-accepted location on the connection pipeline route, or by using the MGD Project offshore and onshore infrastructure. MGD Project has therefore the ability to unlock other gas discoveries in the Black Sea by avoiding the need for construction of extended offshore and landfall gas transmission infrastructure.

7.3 MGD Project Influence over the Associated Facility

Based on a cooperation agreement, BSOG handed over to Transgaz all the proprietary information available in relation to the connection pipeline project, including the route assessment and all supporting information/field surveys outcomes.

Transgaz made use of this information and took into consideration the outcomes of the assessment performed for the connection pipeline route selection. The preferred route as determined based on the assessment performed by BSOG represented the basis of the connection pipeline design, as further refined by Transgaz. The design of the connection pipeline was therefore influenced by the outcomes of the BSOG assessment, the route with less environmental impacts being selected. The final route of the connection pipeline is illustrated in Figure 6-5 below:

Figure 6-5 Connection pipeline Selected Route (Transgaz, 2019).

Up to the taking of the final investment decision (FID), the relationship between BSOG and Transgaz was based on a Cooperation Agreement defining the roles and responsibilities of the two parties in relation with the interface between the connecting pipeline and the MGD Project. Based on the agreement, BSOG was able to provide inputs and agree with Transgaz on technical aspects related to the interface between the two projects.

The impact assessment performed for the MGD Projects takes into account the potential cumulative impacts of the two projects (i.e. in relation with the construction traffic through the communities and with potential biodiversity impacts at the GTP construction site area) and the environmental and social management plans aim at implementing by BSOG the identified mitigation measures in cumulative context.

In this respect, BSOG can also continue to make suggestions to Transgaz for their further consideration and point out the benefits in respect of managing environmental and social risks or impacts associated with the connection pipeline, but BSOG cannot take responsibility for the further action or inaction of Transgaz on any particular matter particularly as this pipeline is not an MGD connection pipeline but represents state-owned national gas transmission infrastructure.

The MGD Project Grievance Mechanism also takes into account the connection pipeline development and provides for a process to deal with grievances received but pertaining to this Associated Facility. Any such grievance would be recorded in the BSOG grievance register and redirected to Transgaz for resolution in the frame of their grievance process. An answer providing information on the grievance transfer and the contact details of the relevant Transgaz representative is also sent to the person that filed the grievance.

8. ADDITIONAL ONSHORE NOISE INFORMATION AND ASSESSMENT

8.1 Introduction

Potential noise impacts associated with construction and operation of the onshore pipeline and the GTP include:

- Construction activities, including vehicle traffic to and from the site, will create noise that may impact the local residents;

- Operational noise generated by normal GTP operations may cause a disturbance to local residents for the duration of GTP operation.

This assessment of the impact of noise on the local environment has been conducted based on modelling conducted by Auditeco (2018) to inform the statutory EIA for the GTP.

8.2 Regulations and Guidance

The relevant permit condition for the construction period contained in the Environmental Consent for the building of the GTP (dated 5 March 2018) is:

- "the noise level will be observed, according to the Romanian Standard SR no. *10009/2017 Acoustics - Permissible Limits for Noise level in the Environment*, corroborated with Art. 16, par. (1) of the Annexe to *Order no. 119/2014 for the approval of the hygiene and public health norms regarding the environment where the population live*"

Article 16 of the Annex to Order no. 119/2014 for the approval of the hygiene and public health norms regarding the environment where the population lives (Order no. 119/2014) comments on the noise levels at residential receptors. Order no. 119/2014 has been replaced since the conception of this project with Order no. 994/2018 regarding the modification of Order no. 119/2014 for approving the Norms regarding hygiene and public health of the population.

Order no. 994/2018 differentiates the noise requirements between daytime hours (07:00 – 23:00) and night time hours (23:00 – 07:00)[3] as follows:

- During the day, the level of the sound pressure level (LAeqT) should not exceed 55 dB(A) at the exterior of a residence.

- During the night, the level of the sound pressure level (LAeqT) should not exceed 45 dB(A) at the exterior of a residence.

Order 994/2018 does not provide threshold levels for the noise at the boundaries of the industrial facilities. Therefore, in line with the permit condition, the applicable threshold level at the GTP site boundary is in line with Romanian Standard SR no. 10009/2017:

- Permissible limits of noise level at the limit of functional areas: equivalent continuous sound pressure limit, LAeqT of 65 dB(A) for industrial area.

[3] While Order no. 994/2018 replaces Order no. 119/2014 there are no changes regarding the applicable threshold levels provided by Order no. 119/2014. Similar daytime and nighttime threshold levels were provided by Order no. 119/2014.

8.3 Discussion of potential impacts

8.3.1 Noise Terms

The following noise terms and definitions are used in this assessment:

A-weighted decibel (dBA) The human ear system does not respond uniformly to sound across the detectable frequency range and consequently instrumentation used to measure noise is weighted to represent the performance of the ear. This is known as the 'A weighting' and annotated as dBA.

Sound Pressure Level (L_p) Sound pressure level is a logarithmic measure of the energy of a particular noise relative to a reference sound pressure. Generally, it is notated as L_p but in practice other subscripts are used to more define the sound pressure level index, e.g. L_{Aeq} (see below).

Sound Power Level (L_w) The sound power level is a logarithmic measure of the rate at which a particular source radiates acoustic energy (noise) and is a function of the level of acoustic energy radiated by a source and the surface area that is radiating the energy; as such it can be thought of as a constant property of the source itself and not influenced by the environment or the distance to the source. Since the sound power level is not influenced by any external factors, it is a useful way to rank order sources within a particular area.

Equivilent continuous noise level (L_{AeqT}) The sound pressure level at a measurement point is rarely steady in time and therefore noise indices have been developed which help to quantify this variation. The equivalent continuous A-weighted sound pressure level, LAeq,T is the index that represents the total sound energy measured over the time period, T. The LAeq is the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period.

Percentile noise levels (L_{A10}/L_{A90}) When listening to noise which occurs out in the open (e.g. from road traffic, aircraft, birds, wind in the trees etc.), it is common experience that the noise level is not constant in loudness but is changing in amplitude all of the time. Therefore, in order to numerically describe the noise levels, it is beneficial to use statistical parameters. It has become practice to use indices which describe the noise level which has been exceeded for a certain percentage of the measurement period. Percentile noise levels are notated LA90, LA50, LA10 etc. depending on the percentile used.

Octave bands A range of banded frequencies whose upper frequency limit is twice that of its lower frequency limit. For example, the 1000 Hertz octave band contains noise energy at all frequencies from 707 to 1414 Hertz. In acoustical measurements the Sound Pressure Level is often measured in octave bands, in order to describe the spectral content. A particular octave band is generally referred to by it's centre frequency i.e. 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz etc. The sound pressure level of sound that has been passed through an octave band pass filter is termed the octave band sound pressure level.

8.3.2 Background Noise Survey

A background noise survey was conducted by Auditeco Ges (Auditeco) on 21-22 November 2017. This survey measured noise at 12 locations, as specified by Xodus during the FEED study. The locations represent the nearest noise sensitive properties to the GTP development. The locations of these noise-sensitive receptors are shown on Figure 7-1.

Figure 7-1 Noise-sensitive receptor locations close to the GTP

Noise measurements were conducted in the daytime (07:00 – 23:00) as well as during the night (23:00 – 07:00). During the survey the following noise metrics were recorded: L_{Aeq}, L_{A90}, L_{A10} in dB(A) as well as octave band L_{eq} measurements in (dB). In addition, weather conditions for each reading where recorded including: wind speed (average and maximum) m/s, wind direction, temperature degrees C, humidity and cloud cover. A summary of the noise measurements is provided in Table 7.24.

Table 7-1 – Noise levels measured during manned noise survey

Location	Time interval	Noise metics			Comments
		L_{Aeq}, dB(A)	L_{A90}, dB(A)	L_{A10}, dB(A)	
Corbu_A	12:10 – 12:15	43.8	36.1	50.2	Wind, dogs barking, domestic activities, light traffic (4 c[1])
	19:00 - 19:05	40.5	31.2	46.2	Wind, dogs barking, domestic activities, light traffic (3 c)
	23:05 - 23:10	35.7	30.2	40.2	Wind
	02:16 - 02:21	36.8	30.1	42.7	Wind, dogs barking
	05:06 - 05:11	35.6	30.5	41.3	Wind, dogs barking
Corbu_B	12:23 - 12:28	44.6	39.5	52.4	Wind, dogs barking, domestic activities, light traffic (5 c)
	19:11 - 19:16	42.5	34.2	47.4	Wind, dogs barking, domestic activities, light traffic (2 c)
	23:15 - 23:20	40.3	33.2	45.8	Wind, dogs barking

Location	Time interval	Noise metics			Comments
		L_{Aeq}, dB(A)	L_{A90}, dB(A)	L_{A10}, dB(A)	
	02:25 - 02:30	37.2	32.4	43.8	Wind
	05:16 - 05:21	43.0	36.1	48.5	Wind, dogs barking, light traffic (4c)
Corbu_C	12:33 - 12:38	45.6	41.1	50.3	Wind, dogs barking, domestic activities, light traffic (4c)
	19:20 - 19:25	44.4	37.2	50.0	Wind, dogs barking, domestic activities, light traffic (2c)
	23:24 - 23:29	43.3	37.7	48.2	Wind, dogs barking, light traffic (2c)
	02:34 - 02:39	37.2	32.1	44.6	Wind, dogs barking
	05:25 - 05:30	40.8	34.2	47.9	Wind, dogs barking, light traffic (3c)
Farm_SW	12.54 - 12:59	37.3	32.2	42.2	Wind, no identified activities
	19.34 - 19:39	35.8	31.3	39.8	Wind, no identified activities
	23.41 - 23:46	34.9	29.9	39.5	Wind, no identified activities
	02:55 - 03:00	34.9	29.2	40.0	Wind, no identified activities
	05:43 - 05:48	34.6	29.5	40.4	Wind, no identified activities
Farm_SE	13:15 - 13:20	37.4	33.0	43.3	Wind, no identified activities
	19:53 - 19:58	36.0	30.9	40.5	Wind, no identified activities
	23:54 - 23:59	36.7	31.6	42.8	Wind, no identified activities
	03:09 - 03:14	35.2	30.2	39.6	Wind, no identified activities
	05:49 - 05:54	34.5	29.7	40.2	Wind, no identified activities
GTP	13:36 - 13:41	36.5	31.5	42.2	Wind
	20:09 - 20:14	35.3	29.8	40.9	Wind
	24:11 - 24:16	34.5	29.6	40.7	Wind
	03:16 - 03:21	34.2	28.7	38.6	Wind
	06:05 - 06:10	33.5	28.6	37.9	Wind

Location	Time interval	Noise metics			Comments
		L_{Aeq}, dB(A)	L_{A90}, dB(A)	L_{A10}, dB(A)	
Farm_NW	13:55 - 14:00	37.3	32.2	42.7	Wind, no identified activities
	20:25 - 20:30	36.3	31.4	40.3	Wind, no identified activities
	24:25 - 24:30	36.0	30.4	40.7	Wind, no identified activities
	03:32 - 03:37	36.0	30.5	42.3	Wind, no identified activities
	06:19 - 06:24	35.3	31.0	39.1	Wind, no identified activities
Farm_NE	14:14 - 14:19	40.4	36.8	44.4	Wind, domestic activities
	20:39 - 20:44	37.8	32.8	42.5	Wind, no identified activities
	00:42 - 00:47	34.6	28.8	40.2	Wind, no identified activities
	03:45 - 03:50	49.0	42.1	54.2	Wind, loud dogs barking
	06:26 - 06:31	36.5	30.6	41.1	Wind, no identified activities
Vadu_A	14:25 - 14:30	49.4	44.2	54.2	Wind, light traffic (3c)
	20:58 - 21:03	36.0	32.4	40.6	Wind, domestic activities, light traffic (2c)
	00:56 - 01:01	36.4	31.5	41.0	Wind
	04:01 - 04:06	35.3	30.7	40.2	Wind
	06:35 - 06:40	43.3	36.5	46.2	Wind, dogs barking, domestic activities, light traffic (4c)
Vadu_B	14:35 - 14:40	43.4	37.9	48.3	Wind, domestic activities, light traffic (3c)
	20:09 - 20:14	34.2	30.2	39.0	Wind, dogs barking
	01:06 - 01:11	33.9	30.0	37.1	Wind
	04:11 - 04:16	34.1	29.8	38.2	Wind, domestic activities
	06:44 - 06:49	38.1	32.6	42.1	Wind, domestic activities, light traffic (4c)
Vadu_C	14:44 – 14:49	50.3	44.2	54.5	Wind, domestic activities, light traffic (3c)
	20:20 – 20:25	37.9	33.8	41.7	Wind, dogs barking, light traffic (2c)
	01:15 – 01:20	36.3	31.2	41.5	Wind (1c)
	04:20 – 04:25	35.7	29.3	40.6	Wind, domestic activities

Location	Time interval	Noise metics			Comments
		L_{Aeq}, dB(A)	L_{A90}, dB(A)	L_{A10}, dB(A)	
	06:54 – 06:59	46.6	41.4	50.3	Wind, domestic activities, light traffic (5c)
Restaurant	15:17 – 15:22	38.3	34.2	43.4	Wind, sea waves
	20:46 – 20:51	37.2	32.5	44.2	Wind, sea waves
	01:38 – 01:43	35.5	31.8	39.7	Wind, sea waves
	04:41 – 04:46	34.5	31.6	37.5	Wind, sea waves
	07:19 – 07:24	34.1	30.3	38.1	Wind, sea waves
[1] c represents the number of cars that passed during the measurement					

8.3.3 Construction Noise

The project is not located in a residential area; the closest residential area is located over 2 km north of the proposed site. Four farms are located within 500-700 m from the GTP site (refer to Figure 7-1 above) and were considered sensitive receptors as part of this assessment. There are no other sensitive receptors in the immediate vicinity of the site. The following activities can represent noise sources for sensitive receptors during the construction phase:

- Transportation of materials, pieces of equipment and installations necessary for performing works;
- Construction activities performed on the site during the construction phase.

All construction activities are due to be carried out during daytime hours (07:00 – 23:00). Only exception is the pipeline pull-in stage of the HDD (or any other critical activities that may come up and only driven by safety reasons), operation that has to be performed continuously. The duration of pipeline pull-in will be between 1 up to 2 days per borehole and will not be associated with elevated noise levels. In addition to the pipeline pull-in, no other noise-generating operations will be performed concurrently.

Based on the above the noise from construction activities has been assumed not to cause any impact at residential receptors in the local area. Impact at the farms within 500 – 700 m distance is not considered significant.

8.3.4 Operational Noise

An overview of the planned development is shown in Figure 7-2 below.

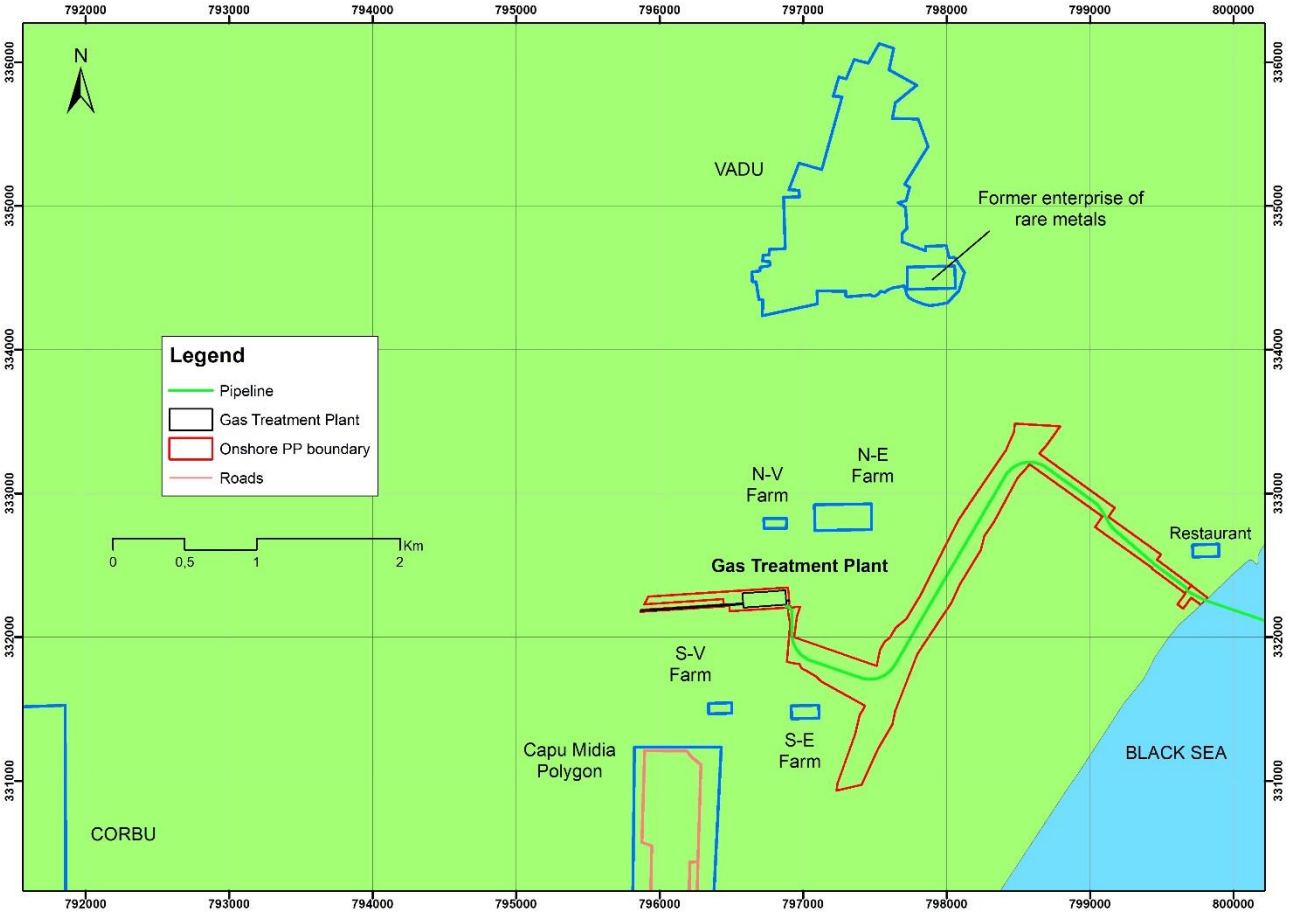


Figure 7-2 Location in the territory of the PP and of the sensitive receptors in its vicinity as well

Noise modelling of the GTP has been conducted by Auditeco using SoundPLAN 7.1. It is understood that input data was taken from the following sources made available by BSOG:

- The design document developed by the designer of the GTP (document A-200283-S00-M-SPEC-003);
- The maximum allowable noise level provided to pump manufacturers, an LAeq of 80 dB(A) at 1 m from the item;
- The Philosophy of Mechanical Design, A-200283-S00-M-PHIL-003 document; and
- The noise level taken from producers of similar pieces of equipment.

The noise levels for equipment items, taken from this documentation, are shown in Table 7-2. The location of these items is shown in Figure 7-3.

Table 7-2 - Sources of noise during GTP operation

Item reference	Item	Sound Pressure Level (SPL), dB(A)	Way of operation
1	2 electro-generators GP-G-60-1A/1B	79 at 1 m from the walls, 97 at the exhaust pipeline	Continuous
2	TEG regeneration module GP-Z-45-01	80 at 1 m from the walls	Continuous
3	Compressor module GP-Z-32-01	75 at 1 m from the walls	Continuous
4	Turbines GP-WC-32-01	80 at the discharge surface	Continuous

Item reference	Item	Sound Pressure Level (SPL), dB(A)	Way of operation
5	Pumps for the LP KO Drum GP-P-35-01-A/B Pumps for the HP KO Drum GP-P-35-02-A/B	75 to 1m 75 to 1m	Continuous Continuous
6	Electro-generator group GP-Z-63-01	80 at 1 m from the walls	Spare
7	2 pumps for fire water GP-P-40-01A/B	80 at the walls	Spare
8	MEG regeneration module GP-Z-44-01	80 at the walls	Continuous
9	Pumps for transferring MEG GP-P-44-01 A/B Pumps for injecting MEG GP-P-44-02 A/B Pumps for loading MEG GP-P-44-03 A/B	75 to 1m 69 to 1m 80 to 1m	Continuous Continuous Continuous
10	Pumps for transferring Diesel fuel GD-P-53-01 A/B	76 to 1m	Continuous
11	Phase separator GP-V-44-01	76 to 1m	Continuous
12	Inert gas generator GP-Z-52-01	80 to 1m	Spare
13	Instrumental air module GP-Z-51-01	80 to 1m	Spare

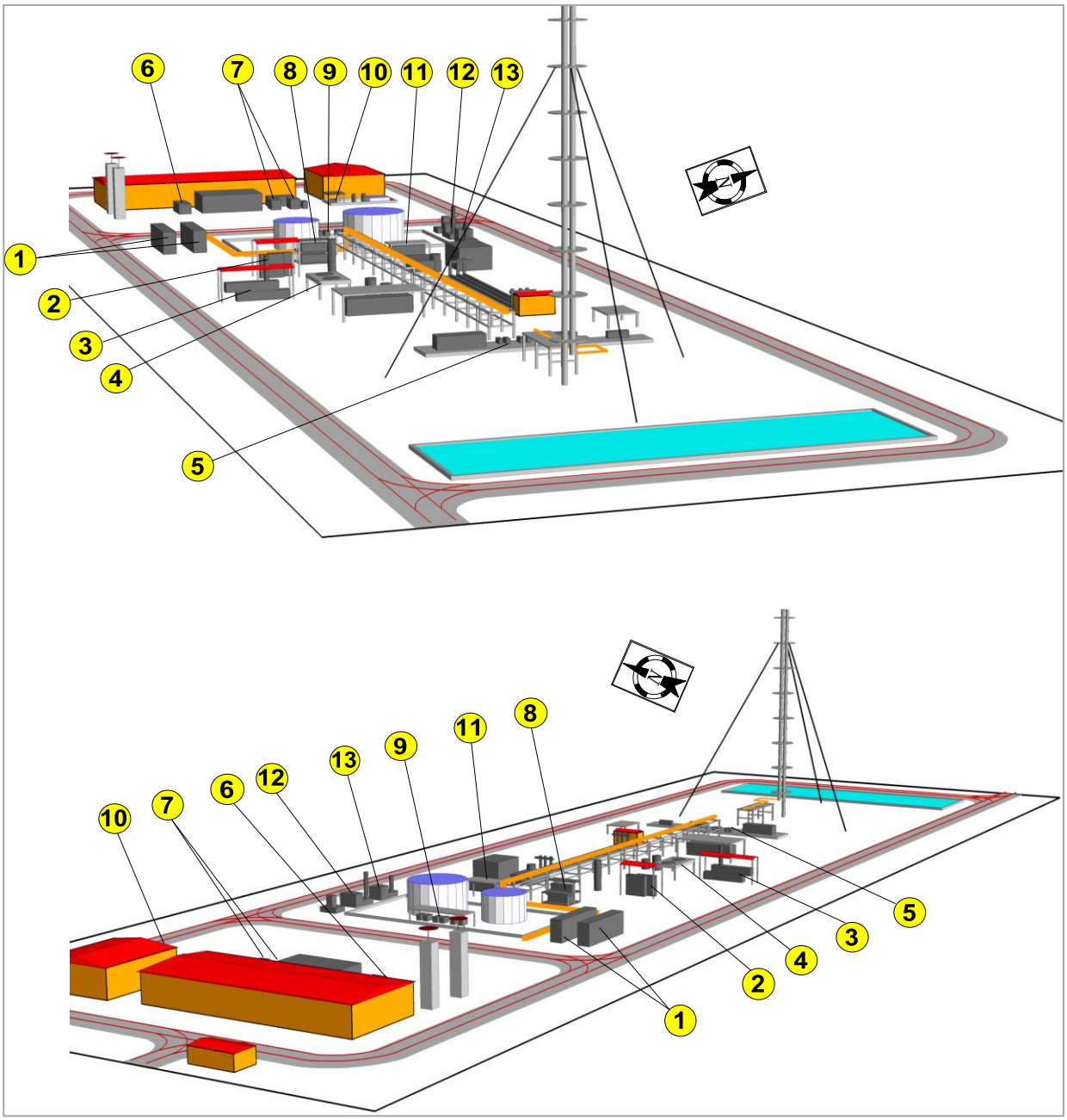


Figure 7-3 3D representation of the digital model of GTP, indicating the noise sources associated with its operation

The outputs of the noise modelling conducted by Auditeco in SoundPLAN has been used to determine the noise level at site boundary and at the noise sensitive receptors. Figure 7-4 shows the noise map provided within the site boundary. The noise map in the far field is shown in Figure 7-5.

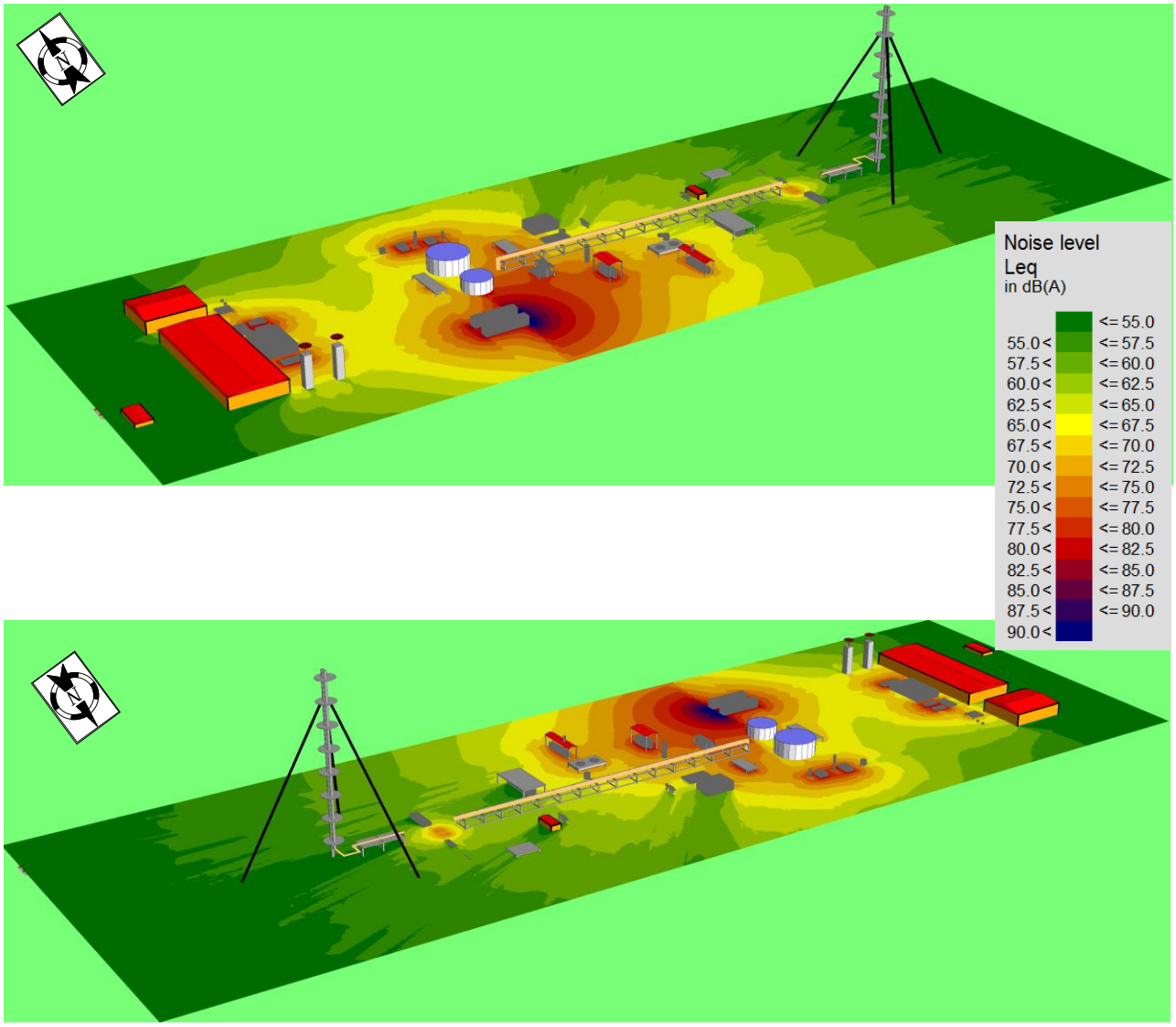


Figure 7-4 Noise predictions made over the GTP site [provided by Auditeco]

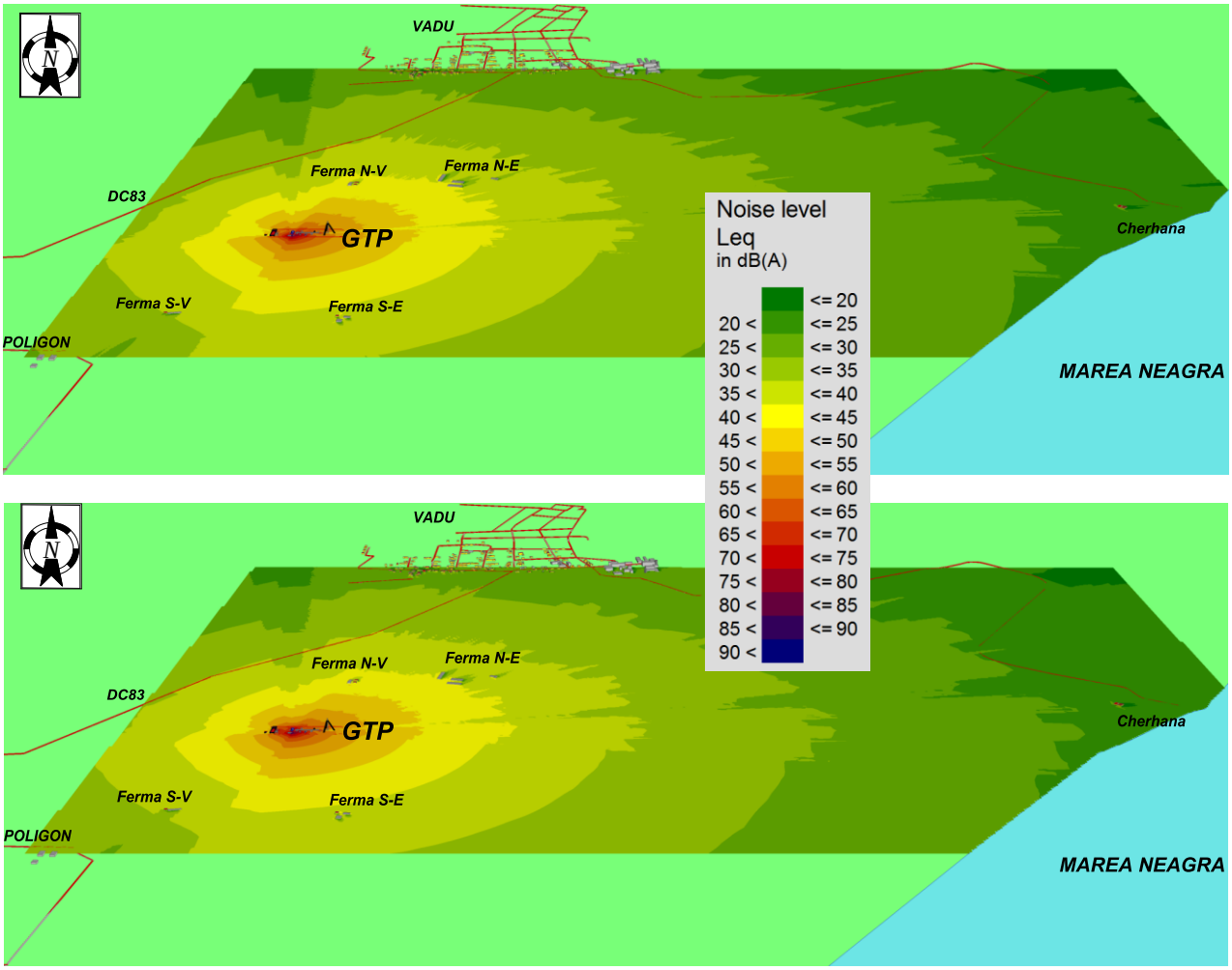


Figure 7-5 Noise predictions over the local area. The upper figure presents the situation with only continuously running sources. The lower figure shows all equipment items running. [provided by Auditeco]

Following considerations were employed order to assess the impact of the GTP site on the surrounding area and noise sensitive properties in the local area.

If the applied noise limit is exceeded at any of the noise sensitive locations, the scale of the impact will need to be considered. In considering the impact it is useful to note that a 3 dB change in noise level is commonly taken as the 'just noticeable difference' threshold for noise change in the environment, whereas a 10 dB change is commonly accepted as a doubling in loudness. Taking this into account, the following relationships between noise level and perceived loudness have been assumed:

- A less than 3 dB change in noise level does not produce a perceptible change in loudness in the environment;
- A change in noise level between 3 and 5 dB is perceptible;
- A change in noise level of 5 – 10 dB has been taken as being clearly perceptible; and
- A 10 dB change constitutes a doubling in subjective loudness and therefore extremely noticeable and potentially intrusive.

From this description the following criteria have been derived to describe the magnitude of the impact:

Magnitude of Impact	Exceedance of the noise level above the applied limit
Negligible	≤ 0 dB and ≤ 3 dB
Minor	> 3 dB and ≤ 5 dB
Moderate	> 5 dB and ≤ 10 dB
Major	≥ 10 dB

The predicted noise levels at the site boundary and at the sensitive receptors, taken from the noise model, are presented in Table 7-3. Two situations have been modelled: one with only continuously running equipment in operation and one with all equipment running (including spare items).

Table 7-3 - Estimated values for the noise level around GTP

Receptor	Leq, normal dB(A)	Leq, all equipment dB(A)	Applicable threshold level		Magnitude of impact
			Night time dB(A)	Day time dB(A)	
Vadu	27.5	28.5	45	55	n/a
N-E farm	40.5	41.1	45	55	n/a
N-W farm	41.5	42.0	45	55	n/a
S-E farm	38.3	39.0	45	55	n/a
S-W farm	34.8	35.5	45	55	n/a
Restaurant on the beach	23.5	24.0	45	55	n/a
GTP boundary (maximum)	73.0	73.2	65	65	Major

As shown in the table, the noise level at all of the local farms is predicted to be within the applicable threshold level. Without mitigation, the maximum noise level at the site boundary would exceed the applicable threshold level. Mitigation of these noise levels will be discussed in the following sections.

Using the modelling provided by Auditeco, the source of the exceedance of the noise limits appears to be due to the generator exhaust. Applying mitigation to this item will have the largest effect on the noise limit exceedances.

8.4 Management and mitigation measures

8.4.1 Construction Noise

Noise from the construction of the GTP is not expected to cause a significant impact at the local noise-sensitive properties due to the distance of these properties from the construction activities.

A Pollution Prevention and Control Plan including adequate measures to minimise noise levels during the construction stage will be put in place for the project as part of the overall ESMP.

In developing the Pollution Prevention and Control Plan the following good practice regarding noise management should be followed:

- Transporting materials to the site only during daytime hours, between 07.00 and 23.00. Avoiding receiving and transporting materials between 23:00 and 07:00 wherever possible;
- Developing a work management plan that keeps all activities within daytime hours and limits as much as is reasonably practicable operations that are conducted during the night;
- Keeping haulage routes, on the site and en-route to the site well maintained;
- When moving material, minimising the height that any of the material is dropped from;

- Avoiding unnecessary revving of engines and switching off equipment when it is not required;
- Starting up plant and vehicles sequentially rather than all at once;
- Ensuring that all items of construction machinery are maintained regularly to manufacturers recommendations and used correctly; and
- Reducing the impact of the equipment that is used on the site by insuring that low noise equipment is used on the site and in transporting equipment to the site.

8.4.2 Operational noise

The detail design of the project will be based on an Environmental Philosophy (MGD-E-GGEN-EN-PHL-001-B1) aimed at informing the design contractor's team of the environmental requirements to be met during the detailed design process and to ensure that impacts on the environment and nearby communities are mitigated adequately.

According to the detailed design Environmental Philosophy, mitigation measures considered for noise minimization include:

- Installing silencers on the routes of the burned gases towards the evacuation stacks.
- Installing cases or acoustic screens wherever possible (pumps, power generators, turbines etc.).
- Providing soundproof screens at the boundary of the treatment plant (in the vicinity of the electrical generators located in the south) in order to observe the 65 dB(A) site boundary limit.

The detailed design Environmental Philosophy considers performing further noise studies during the detailed design stage based on actual equipment vendor data to ensure that the applicable threshold levels are met and to provide the required detail for the above-indicated mitigation measures.

Further general advice for consideration during the detailed design stage to ensure that noise levels from individual equipment items are reduced and above indicated measures are successful are provided below.

When specific items of equipment are defined, factory acceptance testing should be completed to ensure that the limits that are imposed on the individual equipment manufacturers are met.

Generators

Based on the noise modelling conducted by Auditeco, and the data that has been provided, the main source of noise on the GTP will be the generator exhausts.

All generators should be included in acoustic enclosures. Acoustic enclosures should be designed ensuring that the required airflow to the generator is not impeded. Particular care should be taken when designing and installing an enclosure to ensure that the whole enclosure reaches the same acoustic specification including door and window seals, panel joints and ventilation pipework. Air inlets and outlets should include mesh grilles to ensure that foreign objects do not enter.

The noise level from the exhaust of a generator is generally high; to reduce this the exhaust pipework should include a silencer and be acoustically lagged. The noise on the GTP site is dominated by the noise from the exhaust pipework of the electro-generators GP-G-60-1A/1B (see Table 7-2). Reducing the noise level from this exhaust is likely to have the largest effect on the noise levels.

Pumps

Noise from pumps can be generated by the pump body and the pipework on either side of the pump. Care should be taken when selecting a pump to avoid cavitation being generated. When selecting pumps, the lowest noise pump that is fit for purpose should be selected.

Pump noise is generally dominated by the intake cooling fan. Low noise pumps contain fan impellers with modified angles of attack to reduce the noise generated inside the pump body. Pumps which incorporate an absorptive intake silencer are also available.

Engines

The combustion noise generated by an engine is difficult to reduce; as for the noise produced by generators, it may be necessary to include engines within their own enclosure. For large engines it may be prudent to design the enclosure as a building with restricted access. The walls and ceiling of such a building should be designed to reduce the noise transmitted to outside the building.

Pipework

Ways to reduce the noise level from pipework include: sizing the pipework to minimise flow rates; increasing the distance between noise-generating items and pipe bends; avoidance of sharp pipe bends that can cause flow turbulence; and utilising acoustic lagging on the pipework.

Transport

Transport frequency should be reduced at night, between 23:00 and 07:00, and further speed limits imposed at these times. Speed limits will be applied to vehicles and heavy vehicles on the access road. Transporting of materials will be planned to reduce the amount of traffic.

8.5 Residual impacts

To confirm the efficiency of the proposed mitigation, the noise modelling was performed for a GTP design including installation of a 5m-high acoustic soundproof panel at the generators area one of the proposed mitigation measures included in section 7.4.2 above. Modelling outcomes indicate noise levels at the site boundaries at levels below the 65 dB(A) threshold level (Figure 7-

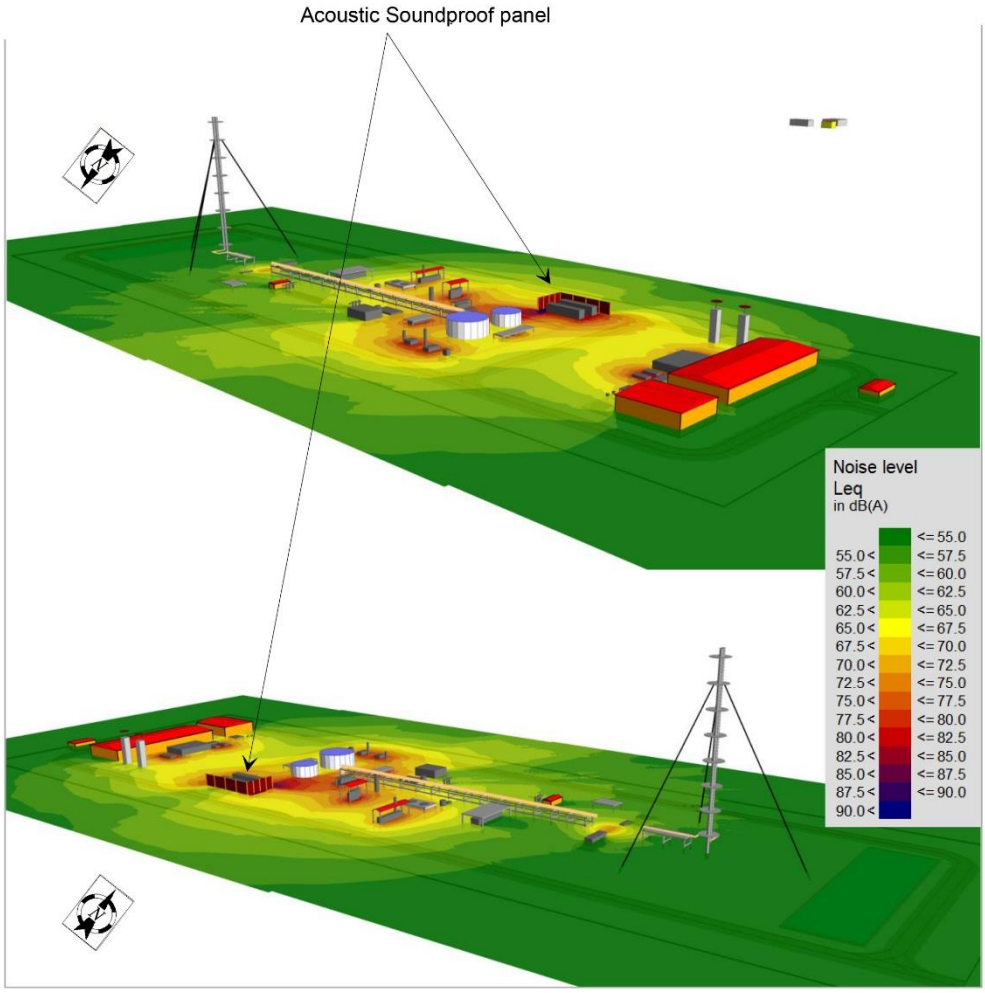


Figure 7-6 GTP site noise predictions with acoustic soundproof screen installed at the generators area [provided by Auditeco]

The implementation of the mitigation measures indicated above will ensure that the operational noise levels at the GTP site boundary are within the applicable threshold levels.

Monitoring of noise levels is required to confirm conformance with the relevant regulatory limits, including quarterly measurements of noise levels at the site boundary during construction works, in line with the applicable local standards.

9. ADDITIONAL BIODIVERSITY INFORMATION AND IMPACT ASSESSMENT

The assessment of the project impacts on the critical and natural habitat and priority biodiversity features (PBF) is provided as a stand-alone report in Appendix B to this AESIA Report.

The assessment included in Appendix B builds on the Project ESIA and provides additional information and assessment of the project impacts, with particular reference to the requirements and standards included in the European Bank for Reconstruction and Development (EBRD) Performance Requirement 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources (PR6) and the International Finance Corporation (IFC) Performance Standard 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources (PS6).

The assessment has informed the preparation of a Project Biodiversity Management Plan (BMP) and a Project Biodiversity Action Plan (BAP).

The general approach taken comprised the following steps.

- The Project site was defined (onshore and offshore) and Areas of Influence (AoI) of the Project identified.
- Areas of Assessment (AoA) were identified based on landscape / seascape features. The AoA included the AoI, but also extended beyond it. The boundaries of the AoA followed logical boundaries (eg coastlines, protected area boundaries, extent of natural habitat). Habitat was not considered further if it was within the AoA, but beyond the AoI and there was no pathway of effect between it and the project activities.
- Information on biodiversity features from the findings of a desk study and baseline surveys and consultations undertaken to inform the ESIA, were used to identify areas of natural and modified habitat in the Area of Influence (AoI).
- Candidate biodiversity features within the AoA that could trigger critical habitat were identified, along with the habitat types supporting them that occurred in the AoI and where that habitat extended beyond it. The numbers of priority species / proportions of populations in those habitats were then estimated (based on percentage of total species range, baseline survey results and expert judgement), to confirm if critical habitat was triggered under IFC PS6 Criteria 1-3 and EBRD Criteria 2-4. Ecosystems, areas and underlying ecological processes that met IFC Criteria 4-5 and EBRD PR6 Criteria 1, 5 and 6 within the AoA were also identified.
- Based on the above, ecologically appropriate areas of analysis were identified (encompassing the AoI) with a definable habitat / management boundary, that contained critical habitat. Where possible, areas were drawn up to encompass several features rather than individual ones. This helped identify “hotspot” areas of critical habitat of importance for a wide range of features.
- In the case of wide ranging species (eg marine mammals, migratory fish species), likely to spend a significant part of their lifecycle outside of the AoA, the potential for the project to affect the survivability of the species or population was assessed.
- In the AoAs, priority biodiversity features, were also identified based on the criteria in PR6.
- The impacts on natural and critical habitat, and priority biodiversity features and losses of each due to the Project, were identified.
- The approach to the assessment has been informed by the guidance included in the EBRD Guidance Note 6 (2014) and the 2012 edition of IFC GN 6 as the Project commenced prior to the updated guidance note for IFC PS6 published in February 2019.

The Project was permitted with an HDD beach crossing from approximately 1.3 km offshore to approximately 150 m onshore and open cut for the rest of the onshore pipeline route. Technical changes were proposed during subsequent design stages to include horizontal directional drilling (HDD) across the water bodies. The existing project design includes onshore pipeline construction based on HDD at the beach crossing and across the watercourses.

In order to align with international financing standards (particularly IFC PS6 and EBRD PR6), additional measures to avoid, reduce and mitigate impacts on biodiversity are proposed by BSOG comprising the following:

- An additional section of HDD to extend beach crossing HDD approximately 1.3 km inland. As a result of the angle of approach of the offshore pipeline and the secured land plots, the additional HDD will still require an exit pit (25 m x 30 m) from the beach crossing and a re-entry pit (25 m x 40 m) for the additional section of HDD within the SCI Annex I habitat 1410 Mediterranean salt meadows.
- The additional section of HDD will extend to the start of the HDD under the first watercourse crossing, with an exit pit (25 m x 30 m) before the entry pit for the watercourse HDD crossing.
- The additional section of HDD will reduce direct temporary impacts of the SCI Annex I habitat 1410 Mediterranean salt meadows, as well as direct loss of *Phragmitetum australis* with *Typhetum latifoliae* and *Elymetum gigantei* with *Halimionetum verruciferae* natural habitats by replacing open trenching with HDD.
- Extending the HDD at the second watercourse crossing approximately 500 m under the area of SCI Annex I habitat 1410 Mediterranean salt meadows to avoid impacts on this area of habitat.

In addition, pre-construction check surveys survey will be undertaken to identify micro-siting options within areas of natural habitat along the existing section of open cut pipeline installation. Micro-siting will seek to move the route into areas of *Phragmitetum australis with Typhetum latifoliae* habitats where this is more easily restored than areas of the *Elymetum gigantei* with *Agropyretum elongati* habitat.

The proposed changes are subject to technical feasibility studies on the HDD approach, and being able to secure revised permitting for the changes to the Project approach. However, BSOG is committed to developing the Project as outlined above to avoid and reduce impacts on critical habitat.

The assessment presented in Appendix B of this document is based on the scheme as set out above.

Any subsequent changes to the Project approach assessed in this document necessitated by the technical feasibility studies, or re-application of permitting documents, will be assessed through BSOGs Management of Change procedure, and the rigorous application of the mitigation hierarchy in line with IFC PS6 and EBRD PR6. The outcomes of such updated Critical Habitats Assessment will be publicly disclosed together with the ultimate project design by BSOG.

10. ADDITIONAL SOCIAL INFORMATION AND ASSESSMENT

10.1 Introduction

The current chapter aims at providing additional information to supplement the existing data and impact assessment included in the ESIA document. The chapter is focusing on, providing additional social baseline data, clarification and strengthening the line of reasoning for the potential social impacts identified and assessed already. The below sections are therefore addressing aspects related to: workforce engaged during the construction phase of the project, vulnerable groups, economic activities performed in the project area of influence, traffic and transport activities and associated impacts, land acquisition and cumulative social impacts.

10.2 Project Area of Influence

From social perspective, the project area of influence differs for the onshore and offshore section.

The onshore activities during both the construction and operation stages will have direct impacts on the population living in Corbu and Vadu communities and beach users. The traffic and transportation activities performed for the onshore section of the project will impact the road users on the project materials and equipment supply route as well as on the workers commuting route. Thus, the Area of Influence (AoI) is considered to comprise:

- Vadu beach– no restrictions for public access on Vadu beach will be imposed during construction (beach pipeline crossing will be executed by HDD) or operation.
- Onshore pipeline section – area of influence is considered to be the construction corridor (16 m) and the areas dedicated for the HDD rig equipment (690 m2 additionally required adjacently to the pipeline construction corridor) and pipeline laydown areas. All these will be located on BSOG-owned and/or secured land, and relevant for the 56 days-long construction period occurring between February and April 2020 only. An 8 m-wide protection zone will be established along the onshore pipeline route during the operation phase. However, restrictions applicable for the protection zone relate to execution of constructions that may affect pipeline integrity, while the public access into the area will not be constrained. Therefore, it is considered that the project AoI will not comprise the pipeline route during the operation stage of the project.
- GTP site – located on BSOG-owned land. The area of influence will be limited to areas subject to potential visual and noise impacts. Based on this, the area of influence is considered to be limited to Vadu community.
- Project traffic and transportation activities – the area of influence is limited to road users and communities located along the following roads (refer to Figure 9-10, section 9.7):
  - Agigea - Ovidiu segment – this is entirely covered by A4 motorway
  - Ovidiu - Midia Harbour/Navodari Segment – covered by road E87 and part of DJ226
  - Midia Harbour/Navodari - Project Site segment – covered by road DJ226, DC83 and local roads inside Vadu

The *offshore activities* performed in the construction period will have a temporary direct impact on the sea users that will be active within the pipeline construction corridor and around Project offshore facilities. During construction stage, the area of influence is therefore considered to be the area subject to access restrictions during pipe lay and Ana and Doina offshore facilities installation, and will be limited to:

- 200 m each side of the alignment of the offshore pipeline segment under construction (this is limited to 100 m each side on the nearshore section of approximately 8 km), and
- 500 m around Ana and Doina offshore facilities.

During operational period, the project activities will have a direct impact on sea users navigating close by Ana platform. During operation the area of influence is considered to be the restriction 500 m zones imposed around Ana and Doina offshore facilities.

10.3 Project Workforce

The aim of this chapter is to supplement the information provided in the Project ESIA on the MGD Project workforce-related aspects.

10.3.1 Project Local Content

BSOG selected a Romanian company, Grup Servicii Petroliere (GSP) as the main EPCIC contractor. Contractor's project management and support organization will be based in Romania, and the majority of the personnel used will be Romanian.

The Contractors' team will be drawn from:

- Contractor's current staff;
- Contractor's former employees;
- Staff recruited directly and through established recruitment agencies;
- Staff from Contractor's partners including predominantly local companies.

The local content in relation to the Project construction will be determined by the following aspects:

- The fabrication work will be performed at the Contractor's yard in Agigea Harbour, Romania where the vast majority of the personnel is Romanian.
- Contractor's construction vessels will be crewed, predominantly, with Romanians.
- While Contractor will undertake much of the detailed design outside Romania, part of detail design scope will be undertaken within Romania.
- Most of the personnel and equipment for the onshore construction works will be Romanian.

Furthermore, the Contractor procures most of its routine supplies in Romania. While a definitive estimate of local content amounts will depend on the final design and scope of work, the Contractor currently expects that Romanian content will amount to between 70% and 80% of the total Contract value. The Contractor will report on local content to BSOG on a format commonly agreed.

10.3.2 Worker accommodation

In line with the EBRD PR 2, the provided worker accommodation shall be appropriate for its location and be clean, safe and, at a minimum, meet the basic needs of workers. In particular, the provision of accommodation shall meet good international industry practice. Workers' freedom of movement to and from the employer-provided accommodation shall not be unreasonably restricted." Transportation to the site will be organized by the Contractor as required.

A Workforce Accommodation Management Plan addressing the workforce accommodation aspects will be implemented for the Project. The plan will be aligned with the Workers' Accommodation: Processes and Standards Guidance Note by IFC and the EBRD(August 2009) to ensure that workers benefit from adequate housing facilities that will provide:

- Clean and sanitary rooms and dormitories;
- Separate sleeping places for men and women;

- Clean, separate sanitary facilities provided for both men and women;
- Conditions that will prevent overcrowding;
- Kitchens that respect legally imposed hygiene norms and standards.

Different worker accommodation needs are applicable during the construction and operation phases of the project, as briefly explained below.

Construction Phase

At peak of construction activities, a workforce of approximately 100 persons is estimated as being required for the onshore construction (including GTP site and onshore pipeline execution).

As local contractors will be employed for the project execution, it is currently estimated that the number of construction staff requiring provision of accommodation will be in the range of 20% of the onshore construction workforce. Consequently, at peak of construction activities, it is envisaged that only 20 up to 30 construction staff will require provision of accommodation by the project. The accommodation of this workforce will be ensured within existing guest houses in the nearby settlements and provision of temporary construction accommodation camps is not envisaged. Only facilities holding official accommodation licenses will be used.

Construction staff needs for the offshore construction works varies greatly with the type of operations executed. Accommodation of the workforce will be ensured on the vessels employed at the various construction stages. It is currently envisaged that the vessels used for project offshore construction are GSP Bigfoot 1 and GSP Falcon.

According to current estimation up to 180 staff (including vessel and construction crews) will be accommodated on GSP Bigfoot 1 and up to 130 staff on GSP Falcon. These vessels are provided with cabins having capacities of 1, 2, 4 and 6 beds, all with private sanitary facilities, as well as with all required auxiliary facilities including staffed kitchen, mess rooms recreational and fitness rooms, prayer room etc.

Operation Phase

A workforce comprising 20 – 24 persons, will be required for the operation of the MGD project. This permanent workforce will be concentrated at the GTP facility, while a number of employees will perform regular maintenance and, if needed, emergency interventions on the pipeline and the Ana Platform. No need for worker accommodation provision by the project is envisaged during the operation stage.

10.4 Vulnerable People

10.4.1 Definition of Vulnerable Groups and Persons

Project vulnerable groups and people are “people who, by virtue of gender identity, sexual orientation, religion, ethnicity, indigenous status, age, disability, economic disadvantage or social status may be more adversely affected by project impacts than others and who may be limited in their ability to claim or take advantage of project benefits. Vulnerable individuals and/or groups may also include, but not be limited to, people living below the poverty line, the landless, the elderly, women and children-headed households, refugees, internally displaced people, ethnic minorities, natural resource dependent communities or other displaced persons who may not be protected through national

legislation and/or international law." [4] Vulnerable groups and persons are present in nearby communities but there are no MGD project related activities that create further vulnerabilities.

10.4.2 Demographics

The Corbu commune is situated 23 km north of the city of Constanta, on the shoreline of the Black Sea and is comprised of the villages of Corbu, Vadu and Luminita. A mainly rural settlement, it has a population of 5689 people according to the 2011 National Census, with an ethnic structure comprised of a Romanian majority of 5,299 persons (93%), followed by a small Roma minority comprised of 45 persons (0.79%), and followed by 5 Turkish ethnics (0.09%), 4 Lipovans (0.07%), and 3 others (0.05%).

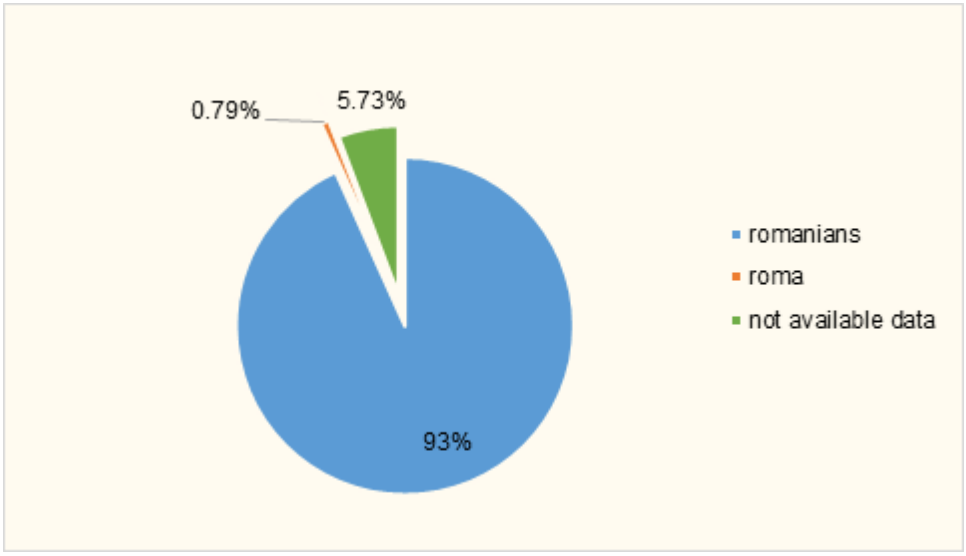


Figure 9-1 Ethnic structure in Corbu AU, 2011 (Source: Population and Housing Census, 2011)

While religion was not an obligatory category in the 2011 census, 88.6% of the inhabitants of Corbu AU declared themselves to be Romanian Orthodox, the dominant religion in Romania. Other religious orientations present are Adventists (3.46%), Baptists (1.56%), Catholics (0.23), Pentecostals (0.21%) and Muslims (0.18%) as shown in Figure 9-2. Corbu Commune has advised that there are three Orthodox churches, two Adventist churches and one Baptist church.

[4] Definition according to EBRD Environmental and Social Policy 2014. A similar definition is provided by IFC PS1 regarding the disadvantaged or vulnerable status which "may stem from an individual's or group's race, color, sex, language, religion, political or other opinion, national or social origin, property, birth, or other status".

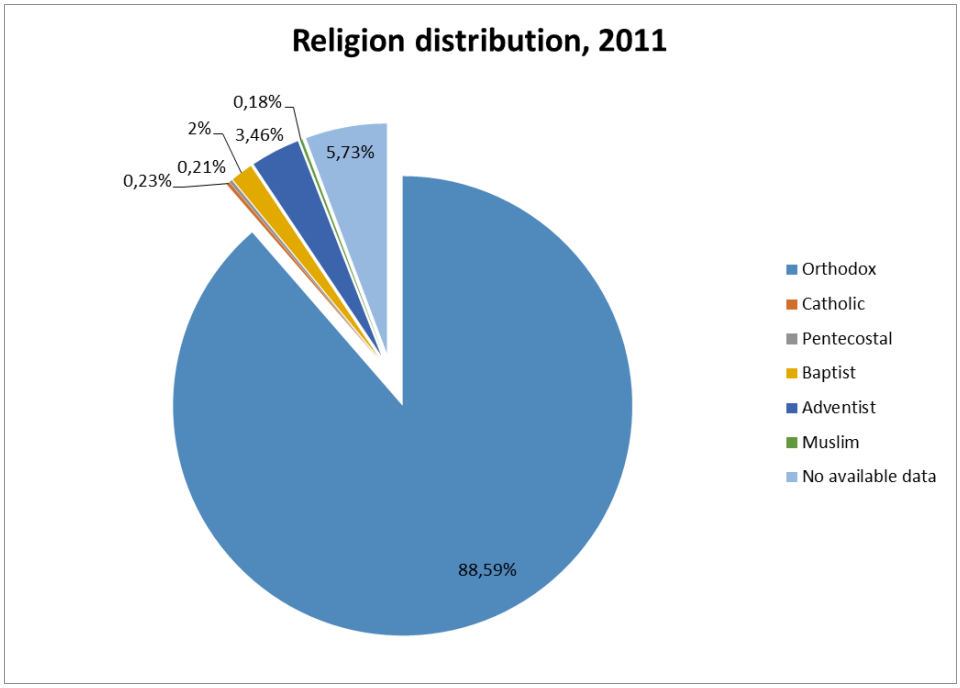


Figure 9-2 Religion distribution in Corbu AU, 2011 (Source: Population and Housing Census, 2011)

Regarding age distribution, the largest age group (46%) is 30-59 years. Approximately 40% of the inhabitants is under 30 years of age and 18% is under 14 years, while people aged over 60 represent 16% of the population.

Males outnumber females in all age groups except for the over 60 years, but the difference is most pronounced in the 30-59 age group where the ratio of males to females is 53:47, compared to 51:49 for the under 14 age group.

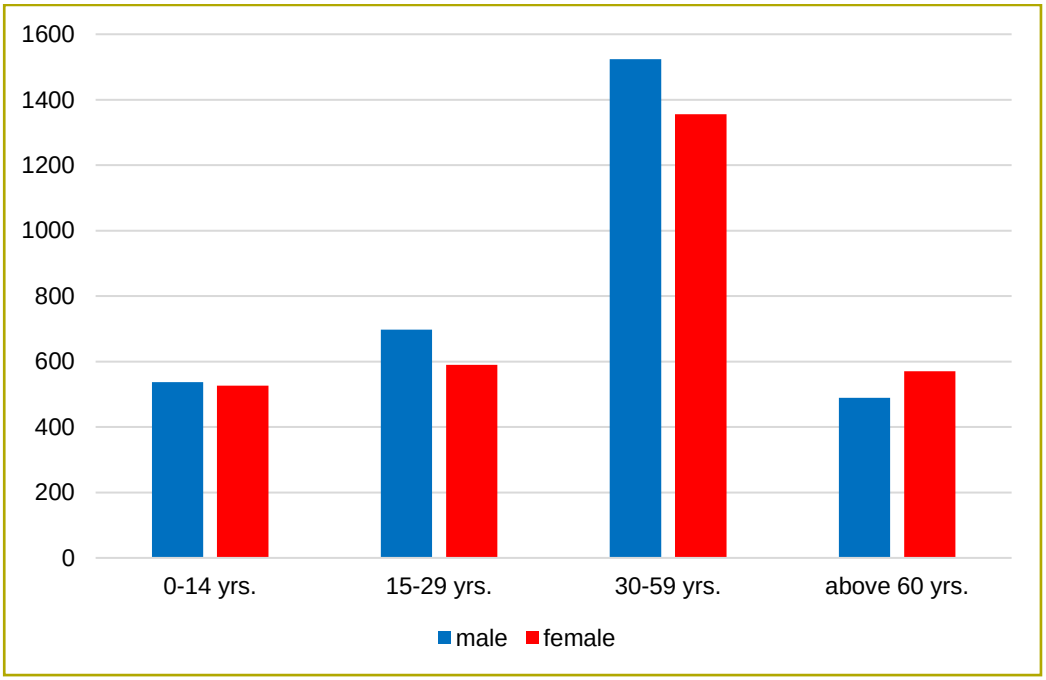


Figure 9-3 Gender and age distribution, 2016 (Source: NIS processed data, 2016)

The data retrieved from the Constanţa County School Inspectorate indicate that there are five school units in the Corbu Commune (comprising Corbu and Vadu settlements). Four educational units are

active in Corbu village (two primary/secondary schools and two kindergartens) and two in Vadu village (a primary school and a kindergarten).

The table below shows the list of educational units and their location:

No.	Name	Location	Address
1	"Gheorghe Lazar" Primary/Secondary School	Corbu	Principală Street, No. 27
2	"Vasile Alecsandri" Primary/Secondary School	Corbu	Culturii Street, No. 8
3	No 1. Corbu Kindergarten	Corbu	Principală Street, No. 100
4	No 2. Corbu Kindergarten	Corbu	Ioan Stanei Street, No. 49
5	Vadu Primary School	Vadu	Şcolii Street, No. 15
6	Vadu Kindergarten	Vadu	Şcolii Street, No. 15

Table 9-1 Educational units in Corbu Commune (Source: Constanţa County School Inspectorate)

Figure 9-4 Kindergarten in Corbu AU (Source: Site visit to the onshore location of the Midia Gas Development (MGD) Project, July 2017)

Only 4 of the educational units listed above are located in the proximity of the roads that will be used for the Project traffic. These are: the Gheorghe Lazar Primary School and Kindergarten no.1 in Corbu and Primary School and Kindergarten in Vadu. 470 children in total attend the schools and kindergartens in Corbu and 69 attend primary school and thekindergarten in Vadu.

10.4.3 Vulnerability analysis in Relation to the Project

Socio-economic impacts refer to the project related activities that can cause disturbances to everyday social and economic activities of the local community. While considering these impacts it is important to note that while a certain group may be in a social risk situation (i.e. ethnic minorities, the

unemployed, the elderly, single mothers etc.), their vulnerability in relation to the project should be considered in relation to project activities.

In this respect, the purpose of this chapter is to asses if there are any project-related impacts that might have a differentiated impact on specific groups of people or that have the potential to create vulnerabilities. The following aspects have been considered during this analysis:

a) Project Location and Land Use

Since the construction activities will take place at a considerable distance from the villages (closest construction activities performed at approximately 1.3 km from the limits of Vadu residential area, refer to Figure 9-5 below), there will be no direct impact on population during the construction activities other than the traffic-related impacts as discussed in section 9.7.

Construction activities will take place on land that is owned by BSOG or with the right of way already acquired. BSOG managed to secure sufficient land (see section 9.5) to ensure that the construction corridor/area will not impact any neighbouring land plot.

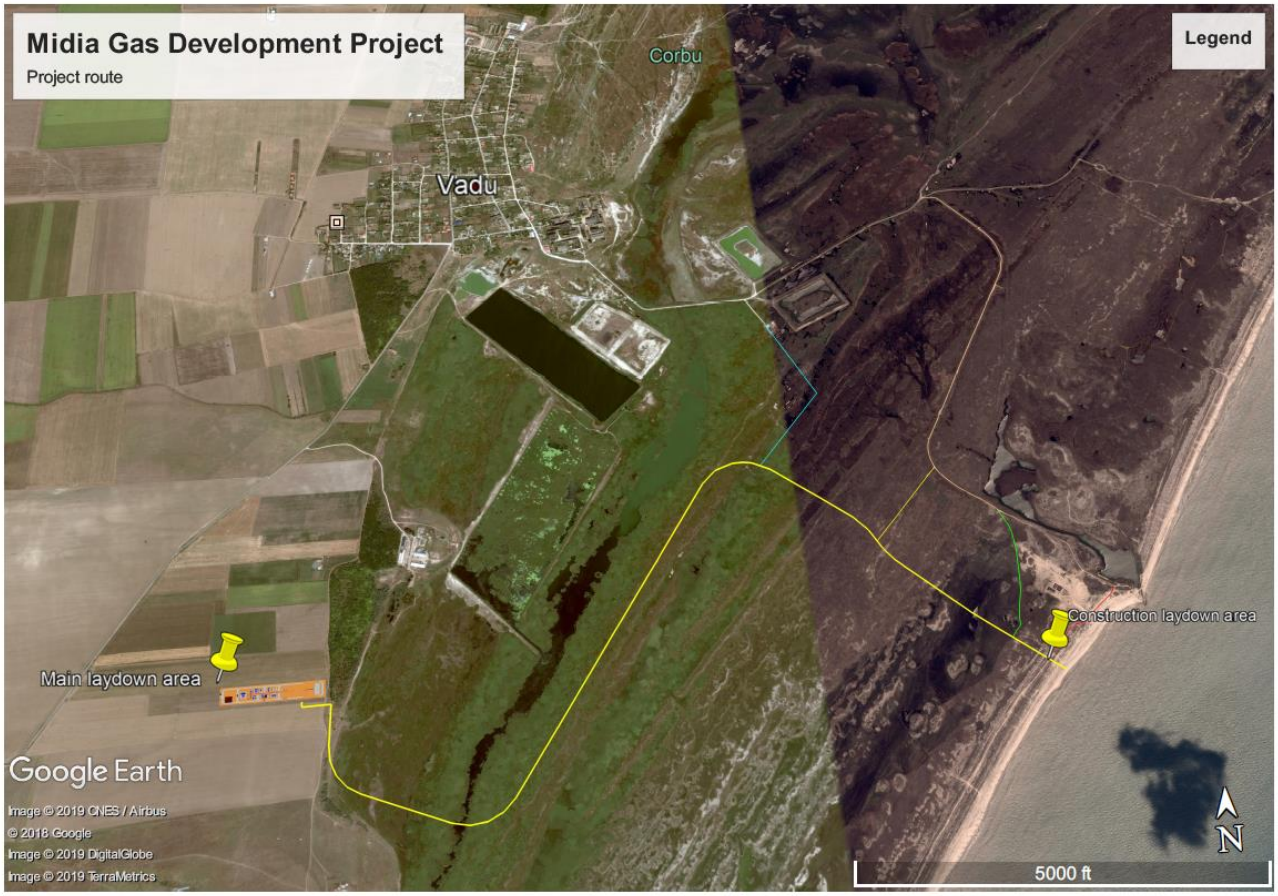


Figure 9-5 - Project location (Source: Google Earth, 2019)

The land acquisition process is typically one of the most relevant aspects that might generate situations of vulnerability. The land acquisition process was performed via direct negotiations and compensations were paid to all rightful owners at full replacement cot. There were no complaints registered in relation to the project land acquisition process. Thus, there are no vulnerability situations that have been generated by this. As BSOG has already acquired/secured the necessary land for all the project activities and no further land acquisition is required, no vulnerable persons/groups could be considered as vulnerable from land acquisition/land use perspective.

b) Impacts Related to Traffic and Transportation

Regarding traffic and transportation, BSOG will make use of existing access roads and no new roads to access the project area are required. In case needed, BSOG will ask permission for construction of new access road that will be located on public land, however no such new roads are currently considered as being necessary. The main impacts associated with the project traffic and transportation are related to:

- level of noise and dust;
- increased traffic.

These impacts are detailed in chapter 9.7.

As indicated in the beginning of this chapter there are categories of persons that are considered vulnerable due to their social status or social risk situation that they might experience. One of such group of vulnerable persons is considered to be the group of children enrolled in schools and kindergartens situated in the proximity of the roads affected by the project traffic and transportation activities. These pupils are considered as being vulnerable (in a social risk situation) and additional measures are envisaged by the MDG Project to minimize potential project impacts on them. These measures aim at avoiding road accidents due to the project traffic and transportation activities and include:

- traffic management measures:

  - A Traffic Management Plan will be developed for the project and all project staff including contractors and sub-contractors will comply with the provisions included in this plan.

  - Specific speed limitations are already enforced, and appropriate traffic signs provided for the general traffic in Corbu, but there are no speed limit traffic signs on the road sections affected by the project traffic in Vadu. Another sensitive road section is represented by the school and kindergarten area in Vadu, where there is no marked road crossing. The project will collaborate with the local authorities to ensure provision of adequate traffic signing in Vadu. Based on consultations performed, further speed limit restrictions may be enforced for the project traffic through the Traffic Management Plan.
  - Schedule the transportation of heavy equipment and materials to avoid the time periods when children travel to and from school (i.e. during 7-8 a.m. and 12-14 p.m.)

- Measures related to awareness raising:

  - Awareness program on traffic-related risks and risks associated with approaching active construction areas in the schools and kindergartens in Corbu and Vadu, in line with the SEP provisions.

- Health and safety measures:

  - Adequate marking the construction perimeter (especially along the pipeline construction corridor) by installing adequate safety/warning signs
  - Enforce adequate site security measures during construction period to prevent public access in the construction perimeter.

c) Livelihood Impacts

National Institute of Statistics in 2016 data report that the unemployment rate in Corbu commune (including Vadu) is very low, around 1%. The main economic activities performed by the residents are related to:

- Agriculture;
- Tourism;
- Fishing.

The project will have little impact on the livelihood of the Corbu and Vadu residents, whom will be able to carry out their day-to-day activities with little disturbance, for all the projects' lifespan. The potential livelihood impacts on vulnerable groups or people are divided by economic sector and discussed below (for a further discussion on economic displacement see Chapter 9.6):

Agriculture

As noted, all land needed for the construction of the pipeline and associated facilities has been acquired and adequate compensation at full replacement cost were provided by BSOG, as detailed in Chapter 9.5. This means that the construction work will have no impact on any agricultural activities in the area.

Tourism

Residents of Vadu whom are currently performing economic activities related to tourism (offering accommodation facilities for tourists, restaurants, etc.) may potentially experience a reduction of number of clients in case the beach crossing activities will take place during summer touristic season. According to the existing project schedule the beach crossing will be executed in between February and April 2020, i.e. outside the touristic season. Any potential impacts may occur in case the beach crossing execution schedule would be changed and would overlap with the touristic season (June 1st – Sept 15th), yet there is no evidence that such potential impacts will create vulnerabilities or would result in differentiated impacts on any stakeholder categories. The impacts will be felt the same by all residents.

Fishing

Drilling activities will have a limited impact on the fishing performed nearshore and offshore. While there is no evidence that fishing in the Black Sea is a vital economic activity for any residents, most of the commercial fishing being performed in the Corbu Lake which is situated more than 15 km away from the MGD Project location, impacts on local nearshore fishermen shouldn't be discarded. Regardless of these impacts, there is no evidence that they will create situations of vulnerability, all fishermen will be impacted in the same way.

10.4.4 Conclusion

The highest potential for vulnerability in relation to the project would have been generated by the land acquisition process. Since all the land required for MDG project implementation was already secured by BSOG and no further land acquisition is foreseen, no situations of vulnerability related to this aspect will be considered for this project.

The MGD Project will generate a potential situation of vulnerability for the local school children. Mitigation measures addressing this aspect consist of enforcement of adequate traffic and construction site management measures (including construction traffic speed limitations and associated traffic signage, heavy construction traffic avoidance of times when children travel to and from school, control measures of public access in construction areas) as well as delivery of an awareness program in the schools and kindergartens in the communities.

10.5 Land Acquisition

10.5.1 Legal requirements of relevance for MGD Project

According to Romanian legislation, holding land rights is one of the prerequisites of obtaining the construction permit for any kind of investment. The land rights over privately owned lands pursuant to which the construction permit may be granted are (i) the ownership right or (ii) easement rights i.e. the superficies right or the right of way.

In case of acquisition of land rights, the transfer of ownership or the granting of easement rights respectively, are valid only in case these are done via a deed authenticated by the notary public. Publicity is assured by the registration of the transfer documents and updating of information re the holders of the ownership and/or easement rights with the Land Book.

Over land areas belong to the public or private property of the state or of administrative-territorial units, the titleholders of offshore petroleum concession agreements, benefit of a legal right of way for the laying of pipeline and associated infrastructure.

10.5.2 Land acquisition needs and limitations

Finding and setting the location and layout of the necessary infrastructure for the development of the Ana and Doina gas discoveries was one of the actions commenced in the early stages of the project.

In relation to the onshore component, the location and layout of the infrastructure has been determined by a series of factors, the most relevant being:

(i) offshore pipeline landfall point

The offshore routing of the pipeline from the location of the production wells and platform to the shoreline set the location of the landfall.

(ii) legal restrictions in connection to land use and permitted activities

The existence of the onshore and offshore military areas, various onshore and offshore infrastructure, environmental protected areas, cultural heritage areas and permitted use (Rompetrol offshore pipeline and crude buoy, Midia harbor, OMVP Lebada complex, etc.).

(iii) “exit” options towards inland gas transmission infrastructure

The ability to connect MGD Project to the transmission system via new developments of the national gas transmission system namely, to build the required connection pipeline.

(iv) the ability to secure land rights

Finding a continuous string of land plots with updated, valid and unchallenged ownership documentation whose owners were willing to sell / grant easements.

10.5.3 Acquisition of private land

The acquisition of the private lands was a transparent process conducted directly by the company between 2012 and 2016. A number of 11 land plots for the onshore pipeline was acquired between 2012 and 2014 and 3 more land plots for the GTP were acquired in 2016.

The information about the lands and the owners was obtained from the maps and public records available at Corbu Commune and the Land Book and from the verbal information provided by the landowners and community members of Corbu Commune.

Prior to engaging in discussions on acquiring land rights, the company made a full disclosure of its identity and intention to develop the MGD Project to the local authorities and to each and all landowners and community members of Corbu Commune.

The historical existence in Corbu-Navodari area of an extended oil and gas pipeline network belonging to OMV, Rompetrol and Transgaz, the OMV Petrom gas treatment plant and the Rompetrol refinery made MGD Project not to be regarded as an alien element or a novelty for the community and the landowners.

After the performance of the relevant investigations related to the validity of the ownership documentation, confirmation of plot location and permitted use and confirmation of landowners' willingness to sale, direct negotiations with each landowner in relation to the price were carried out.

Also, prior to the execution of the ownership transfer documents an extensive title due diligence process was carried-out by a third-party law firm.

As confirmed by the string of title documentation, all land plots were subject to several ownership transfers before being acquired by the company. As such, none of the company's sellers were the first owners of the lands i.e. the beneficiaries of the reinstatement of the ownership right over lands abusively taken over by the communist regime between August 1945 and December 1989.

The transaction structure applied for all lands was:

(i) execution of the promissory sale and purchase agreement having attached the superficies right (PSPA) for which a down payment out of the agreed price was paid. The term set for finalizing the acquisition was set on a case by case scenario, from 6 to 12 months, time in which under the benefits of the superficies rights the company was allowed to perform various permitting actions; and

(ii) execution of the sale and purchase agreement (SPA), before the lapsing of the term sent in the promise, and payment of the price balance.

Publicity was ensured for both PSPAs and SPAs, which were registered in the public records held by the Land Book immediately after execution and further the SPAs were registered with the Tax Direction of Corbu Commune.

In approaching the landowners both options for obtaining land rights were put forward by the company. However, all owners confirmed that knowing the life duration of such infrastructure (some of the petroleum facilities in Corbu-Navodari area dating back to 1975) the sale of the land was the only option to be considered. In addition, the willingness to sell was in relation to the entire land plot areas. As a result of this, "no orphan land"[5] situations occurred from MGD Project land acquisition.

[5] Orphan land refers to plots of land severed or bisected by the project infrastructure, and the portion of the plot that is not acquired or rented by the project is rendered uneconomic, unviable and/or inaccessible due to its (small) size or location.

The private land plots acquired by the company have a total area of approximately 94 ha and had at the time of the acquisition the following legal destination:

No.	Plot	Surface (rounded) m^2	Legal destination
1	Land plot 1	20.000	pasture
2	Land plot 2	50.000	non-productive
3	Land plot 3	50.000	non-productive
4	Land plot 4	250.000	non-productive
5	Land plot 5	50.000	non-productive
6	Land plot 6	50.000	non-productive
7	Land plot 7	250.000	non-productive
8	Land plot 8	50.000	non-productive
9	Land plot 9	50.000	non-productive
10	Land plot 10	20.500	pasture
11	Land plot 11	45.500	farming
12	Land plot 12	21.000	farming
13	Land plot 13	20.000	farming
14	Land plot 14	10.000	farming

Table 9-2 Land plots acquired by BSOG

Except for Land plots 11 to 14, which were farmed by a third-party farming enterprise, none of the lands were used before or at the moment of their acquisition by the company.

In 2017, in addition to the acquisition of the above-mentioned private lands, the company was granted the superficies right over a surface of 1.000 m^2 of land having the legal destination of pasture (located between the company's lands and the beach) needed for the pipeline.

10.5.4 Land users

Since all the land necessary for the MGD Project has been already secured (via land acquisition) there are no land users that will be further impacted by the project. The land area where the GTP will be built is currently cultivated by the former land owner. BSOG has an agreement with this person that he can cultivate at no cost the BSOG-owned land until the construction will start.

10.5.5 Exercising the right of way over public lands

The public lands to be undercrossed by the onshore segment of the pipeline are: (i) the beach which is public property of the state and (ii) local access roads, swamps and easement right pasture plot which is public property of Corbu Commune.

The total area of the afore-mentioned types of public lands to be crossed by the onshore segment of the pipeline is of 0.6 ha.

Pursuant to the applicable legal provisions, the beneficiaries of the right of way exercise such rights via the delivery of a Notice to the Ministry of Finance for the public property of the State and to Corbu Commune for the public property of the administrative-territorial unit.

The public land plots to be crossed by the onshore segment of the pipeline are:

No.	Plot	Owner	Affected area m^2	Legal destination
1	NN 525	The State	1.458	beach
2	De 541/31B	Corbu Commune	66	road
3	De 541/31A	Corbu Commune	88	road
4	De539/78	Corbu Commune	469	road
5	De539/79	Corbu Commune	617	road
6	De539/80	Corbu Commune	169	road
7	HB 525	Corbu Commune	1.040	swamp
8	De522/9	Corbu Commune	841	road
9	HB 520/1/1	Corbu Commune	1.128	swamp
10	P248/29	Corbu Commune	510	pasture
11	De265	Corbu Commune	120	road

Table 9-3 Land plots for which BSOG secured right of way rights

10.5.6 Grievances related to land acquisition

In case of grievances related to the land acquisition process and the exercising of the legal rights of way, any third party may use the Grievance Procedure made available by the company. Title and right related claims can also be made by way of court proceedings. No claims or grievances related to the acquisition of private lands, the exercising of the rights of way or the proposed use for the lands have been made up to the date of this Report.

10.6 Economic displacement

This subchapter discusses the potential economic displacement situations that may be generated by MDG Project in relation to loss of assets or resources, and/or loss of access to assets or resources that may lead to loss of income sources or means of livelihood.

10.6.1 Situations of Economic Displacement

This chapter provides additional information and assessment of potential situations of economic displacement to supplement the Project ESIA and propose any additional mitigation measures as needed.

As explained in the Project ESIA, the main economic activities in Corbu Commune are agriculture and tourism. A total of 201 businesses are registered in the Corbu Commune, of which 54 are agricultural

businesses (vegetables and livestock production farms, poultry processing farm, granary) and the rest shops, pharmacies, funeral services and restaurants etc.

We have broken down potential economic displacement according to the 3 main economic activities:

Agriculture

All land needed for the construction of the pipeline and associated facilities has been acquired by BSOG, as detailed in Chapter 9.5. This means that the construction work will have no further impact on any agricultural activities in the area. The acquired land for this project was only partially used for agricultural purposes. As indicated in section 9.5.3., only 4 land plots out of 14 in total, have been used as farming land plots. These land plots were in use by a third-party large agricultural production enterprise. No situations of economic displacement were generated by the acquisition of these land plots. Furthermore, BSOG has granted permission to the former land user of the plot acquired for the construction of the Gas Treatment Plant to make use of the land at no cost until construction work starts.

Further consultations with local stakeholders have not provided any evidence of grazing or any other agricultural activities that might be affected by the project.

Upon construction finalization, only the GTP site will be fenced. All other project-affected land plots will be restored to their initial conditions. As no physical barriers preventing access will be put in place, the previous land use of these land plots will not be constrained.

Tourism

Tourism is an economic activity that is growing in both Corbu and Vadu. Acording to the registry of the Ministry of Tourism as of 15.02.2019 there are 14 tourist accommodations in Corbu, yet field observations have confirmed that the real number of accommodations is far greater. While there are no official listings in Vadu, an online search (see Figure 9-6 bellow) has identified 6 tourist facilities while field observations made in the frame of this assessment indicate that the actual number is higher.

Figure 9-6 Tourist accommodations in Vadu listed online (Source: Booking.com, 2019)

While new developments related to tourism is by any means modest, as local population is using their private houses for hosting tourists, there are some new pensions or guest houses that are being built near Vadu. Three such constructions might be of relevance for the Project:

- The most advanced construction is that of a guest house (see Figure 9-7 below) being built on the road connecting Corbu and Vadu, across from the MGD Project Gas Treatment Plant site.

- There are 2 approved Urban Zoning Plans (land use/zoning documents officially registered at the local municipality and indicating firm development interest) for the construction of private tourist accommodations in the project area, one nearby Vadu and one towards Corbu. According to the local authorities the construction of one of the planned tourist facilities is uncertain due to permitting reasons.

Figure 9-7 - Guest House under construction in Vadu (February 2019)

There are three operational restaurants in Corbu Commune, two in Corbu and one located on Vadu beach, approximately 400 m from the MGD Project pipeline route (Figure 9-8).

Figure 9-8 Restaurant on Vadu beach (February 2017)

Positive impacts of the MGD Project on the restaurants in the area may be associated with increased revenues as result of the use of their services by the project construction workforce during the construction stage.

On the other hand, according to the Project ESIA the restaurant located on the Vadu beach may experience a temporary decrease in revenues due to a reduction in the number of clients as result of the project onshore pipeline construction activities, in case these will be performed in the touristic season (June 1st – September 15th). Execution of the beach crossing construction activities outside the touristic season was proposed in the Project ESIA as mitigation measure to address this potential impact.

The existing project execution schedule is aligned with the proposed mitigation, considering the beach crossing execution between February and April 2020. Therefore, the above indicated potential impact is not expected to occur.

While the current plans are to avoid the beach crossing activity during the summer months, BSOG will continually review project activities and potential impacts to local population. If this review process indicates that there are potential impacts to the locals, in particular any that could impact livelihood, a Livelihood Restoration Plan (LRP) will be developed based on the Livelihood Restoration Framework, addressing any loss that might be generated by the project 3 months in advance prior to start of such activity.

The LRP will be elaborated while taking into consideration the following steps:

- Step 1. Census and economic survey: for collecting information about the social, economic and other conditions of the PAP. It is usually performed by applying a questionnaire.
- Step 2. Establishing an institutional framework: a simple and straightforward stakeholder mapping should be performed. All stakeholders should be analysed considering their interest and influence in the MGD project. The PAP is in the centre of stakeholder mapping and all consultations, as the subject of interventions.
- Step 3. Developing a plan of interventions: define the affected persons and determine the entitlements for all economic displacement situations.
- Step 4. Implementation: the implementation of the LRP will need to take into consideration the needs of the PAP and assure that the PAP is involved and properly informed about the process.

- Step 5. Monitoring and evaluation: defines the schedule for monitoring activities such as site visits, meetings with the PAP and project implementation unit, responsibilities for monitoring and evaluation and the output and outcome indicators for the intervention.

A management of change process will be put in place for the project to ensure that in case of project schedule changes triggering above indicated impacts, the required mitigation and LRP are defined and implemented.

Tourists are typically coming to Corbu and Vadu for the remote and beautiful beaches in the area.

The beach stretches over more than 4 km and the project impact as result of the beach crossing will be only indirect given that:

- the beach crossing will be constructed using HDD method and the beach will not be physically affected;
- the pipeline beach crossing will be performed (as per the project schedule) outside of the touristic season (between February and April 2020), and
- there will be no access restrictions imposed to the beach users during construction and operation stages of the project.

Based on the above, the impact of the project on the beach tourism will be minimal and associated with the temporary noise disturbance during the operation of the HDD equipment employed for the execution of the beach crossing.

Nearshore Fishing

Consultations with local stakeholders have confirmed that there are no formal fishermen businesses registered in Vadu. Most of the informal fishing is performed on the Corbu Lake, not impacted by the MGD Project. However, field observations made in the frame of the environmental and social impact assessment of the project indicate that some small scale fishing is performed by local residents in the proximity of the project area. This small-scale fishing is mainly performed using small boats (see Figure 9-9 below) and fishing nets located on poles placed on the shallow waters close by the shore.

Figure 9-9 - Fishing boats near the shore in Vadu (2019)

The fishing techniques employed, using boats and nets allow a certain level of mobility. This allows them to move from the area that may be temporarily restricted during the offshore pipeline laying. Such restrictions would be temporarily required 100 – 200 m each side of the alignment of the offshore pipeline segment under construction and would occur starting approximately 1,300 m from the shoreline. The potential impacts on the fishing activities will therefore not be significant given that nearshore fishing is limited due to the proximity to the military training area, performed closer to the shoreline than the HDD exit of 1,300 m offshore and limited in time.

Any fishing nets potentially located nearshore will not be physically impacted as the shore crossing will be performed via HDD with the exit point located approximately 1300 m into the sea.

During the operational phase of the project, nearshore fishing will not be restricted in any way by project activities.

10.6.2 Conclusion

The MGD project will not generate any further situations of economic displacement if the current construction schedule is maintained. As discussed in this chapter, the impacts on tourism, fishing and agriculture arising from the Project activities are minimal and do no require any further mitigation. While the current plans are to avoid the beach crossing activity during the summer months, BSOG will continually review project activities and potential impacts to local population. If this review process indicates that there are potential impacts to the locals, in particular any that could impact livelihood, a Livelihood Restoration Plan (LRP) will be developed based on the Livelihood Restoration Framework to address any loss that might be generated by the project, 3 months in advance prior to start of such activity.

10.7 Onshore Traffic and Transportation

This chapter discusses the road traffic impacts associated with the MGD Project and identifies the mitigation measures required to minimize the impacts on the local community.

10.7.1 Roads Used by the Project

The majority of the materials and equipment required for the Project will be transferred to the construction site from Midia Harbour area, located to the north of Navodari Town and approximately 20 km south of the GTP site. Other project-related traffic will be associated with transfer of equipment and materials from the Constanta Port/Agigea.

The route to be used by the MGD Project traffic is illustrated in Figure 9-10 below. For the purposes of this assessment the traffic route is divided on 3 main segments based on the category and type of the road on each of these segments:

Segment 1 – from Agigea/Constanta Port to Ovidiu

- This segment corresponds to A4 Highway, a new 4 lane motorway bypassing the city of Constanta. The direct access to the port makes this road very convenient for transportation of materials.

This segment is green-highlighted in Figure 9-10

Segment 2 – from Ovidiu to Midia Harbour/Navodari

- This segment corresponds to Roads E87 and DJ 226 and is in very good physical conditions. This route segment crosses Lumina settlement bypassing the city of Navodari, to Midia Harbour area, and except a short 2-lane section it is a 4-lane road.

This segment is magenta-highlighted in Figure 9-10.

Segment 3 – from Midia Harbour/ Navodari to Project Site

- This segment will see most of the construction traffic and corresponds to a section of Road DJ226 crossing the entire Corbu village and then the local road DC 83 (passing by the project GTP site) to the southern area of Vadu village and further on towards the landfall area of the project. Except its initial section at Midia Harbour area which is a 4-lane road, the DJ226 road is a 2-lane asphalt road in relatively good condition, crossing Corbu Commune. The DC 83 section of this segment is a 2-lane narrow track (6 m-wide) asphalt local road with surface defects in paving such as potholes and cracking. The section between Vadu and the landfall area of the project is a gravelled local access road.

This segment is blue-highlighted in Figure 9-10 below.

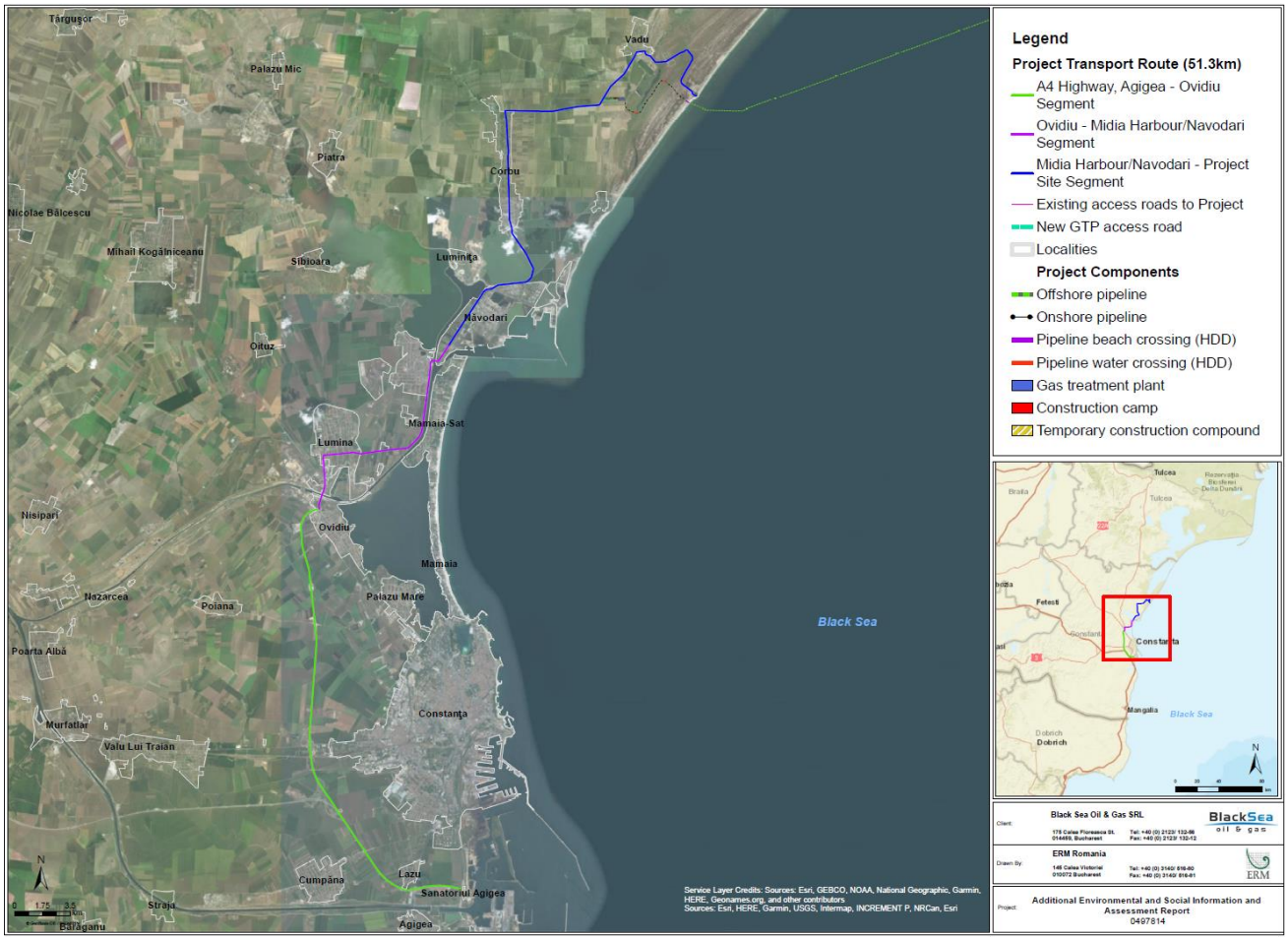


Figure 9-10 Project Traffic Route

10.7.2 Additional road traffic baseline information and assessment

Based on the expected project road traffic needs and the existing conditions in terms of traffic load and road conditions on each of the above indicated route segments, no relevant traffic contributions by MGD Project are expected on the first two segments corresponding to the route from Constanta Port to Midia Harbour. The scope and focus of the assessment will be on the route segment between Midia Harbour and the MGD Project area, illustrated in Figure 9-11 overleaf.

This route segment represents the main traffic route used by the local residents of Vadu and Corbu for commuting to Navodari or Constanta for work, and also the main route used by tourists to Vadu beach. Traffic pattern also includes transportation of pupils from Vadu village to the secondary school in Corbu in the morning and back in the afternoon.

Public transportation on this route segment consists of 30-minutes frequency bus communication between Vadu and Corbu villages. with 30 minutes), as well as public access to the beach.

Field observations indicate that the traffic on this route segment consist mostly of light vehicles. While heavy traffic is present, it is relatively uncommon as most heavy traffic is associated with the industrial facilities at Midia Harbour/Navodari area, and to limited extent further north towards Corbu.

The proportion of heavy traffic in Corbu is relatively low and limited to approximately 4 trucks in one-hour interval as compared to approximately 160 light vehicles in an interval of one hour. Consultations

with the local police representatives indicate that there are no traffic issues such as traffic jams, high traffic during rush hours or during tourist season.

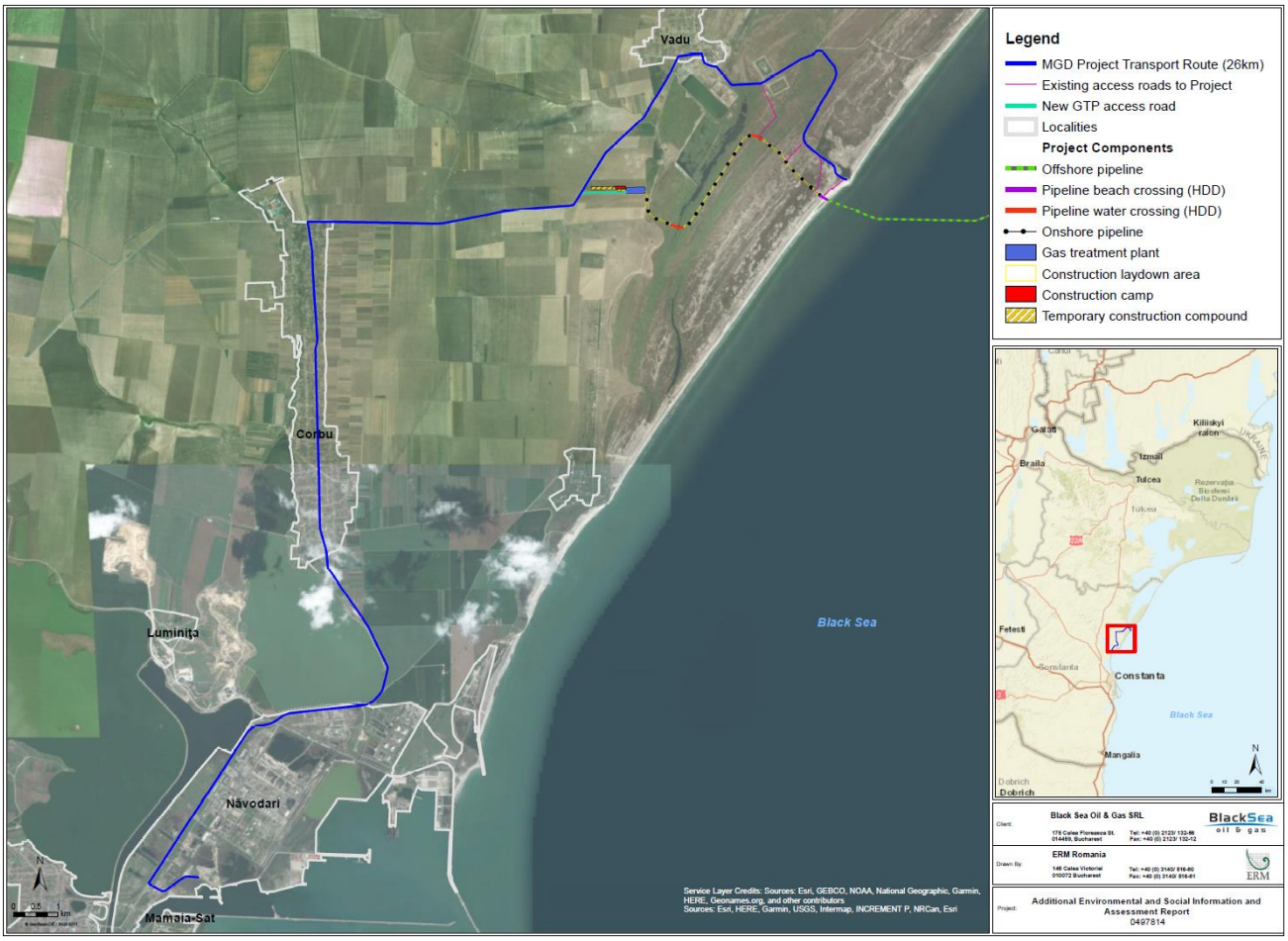


Figure 9-11 Main Project Traffic and Transportation Route

In Corbu there is a 40 km/h speed limitation for trucks and speed bumps are installed at each pedestrian crossing (refer to Figure 9-12 below). The roads width is sufficient to safely accommodate heavy traffic.

Figure 12 – DJ226 Road conditions in Corbu

The 8 km-longDC83 road section from Corbu to Vadu village and the access road to project landfall area from Vadu village is a 2-lane road but narrower track, with a total with of 6 m (refer to Figure 9-13 below). The road surface presents defects in paving such as potholes and cracking and without centerline and lane markings.

Figure 9-13 – DC83 Road at entry to Vadu village

DC83 road section can accommodate the MGD Project traffic, including transportation of equipment, pipe segments, trucks etc. but may induce traffic disturbance when oversized or heavy equipment project traffic will occur on this segment and requiring adequate mitigation and management.

MGD Project traffic impacts are associated with the construction stage of the project. During operation the project traffic would be largely associated with the 20 – 24 GTP site staff commuting and not considered relevant.

The project onshore facilities construction activities would last approximately 22 months in total.

The project traffic volume during the onshore facilities construction stage has been conservatively estimated as follows:

- Workforce transport (based on 100 people to be transported): 4 buses/day, or 6-7 minibuses /day (assuming 17-seats minibuses used);
- Catering: 4 minibuses/day;
- Construction materials/supplies transportation: 2 trucks/day average, 5 trucks/day maximum;
- Other construction equipment traffic (e.g. cranes, etc.): 1 ride/day;
- Miscellaneous (e.g. staff travel to site etc.): 4-5 light vehicles return trips daily.

Project construction traffic will contribute to infrastructure degradation, may induce traffic disturbance and increase safety risks.

The analysis below assumes:

- Most employee and commuter traffic would occur during the morning (approximately 07:15 to 08:15) and during the afternoon (approximately 17:00-18:00);

- Truck, equipment trips and other project traffic would be distributed evenly throughout the day.

Given that the DC83 is the only connecting rode between Vadu and Corbu and DJ226 represents the main route used by the local residents of the two settlements for commuting to the cities of Navodari and Constanta, the local residents' sensitivity to the project traffic is considered to be *High*.

The project-related traffic volumes would likely cause some changes in daily non-project travel patterns, will contribute to the degradation of existing roads and would result in increased safety risks. However, given that the MGD Project construction traffic volume is relatively reduced, these project activities would not prevent or substantially alter typical daily activities of the local community members. The magnitude of project construction traffic and transportation impacts is therefore considered *Small*.

As a result, if not mitigated, project construction would have an overall *Moderate* impact on traffic and transportation, including congestion and delay, degradation of road infrastructure, and road safety risk.

10.7.3 Mitigation Measures and Residual Impact

A Project-specific Traffic and Transport Management Plan is to be implemented and to include measures addressing the following topics:

- Timing, volume, speed, and authorized routes for project-related traffic;

- Speed restrictions applicable to project traffic at specific road sections including schools and kindergarten areas;

- Collaboration with local authorities for ensuring adequate traffic signage on road sections affected by project traffic.

- Road repairing required prior to and after construction, as well as maintenance required during construction;

- Temporary traffic management measures, such as

  - Enforce specific speed limit restrictions on road sections at risk (e.g. in Vadu school/kindergarten area), in consultation and agreement with local authorities;
  - Provision of adequate traffic signs and road marking (including crossings and lane markings) in Vadu, in consultation and agreement with local authorities;
  - Schedule the transportation of heavy equipment and materials to avoid the time periods when children travel to and from school (i.e. during 7-8 a.m. and 12-14 p.m.)
  - Delivery of awareness program on traffic-related risks and risks associated with approaching active construction areas in the schools and kindergartens in Corbu and Vadu, in line with the SEP provisions.
  - Ensure adequate marking the construction perimeter (especially along the pipeline construction corridor) by installing adequate safety/warning signs
  - Enforce adequate site security measures during construction period to prevent public access in the construction perimeter.
- Planning of materials transport to reduce the amount of traffic;
- Identification and reduction of transportation safety risks;
- Vehicle inspection, maintenance and cleaning;
- Dust, air emissions, noise abatement requirements and measures
- Provision of information and consultation with community members regarding the construction schedule and roads affected by project traffic
- Communication in advance of heavy construction traffic through communities
- Community awareness program on traffic-related risks, in line with the SEP provisions
- Handling of road accidents;
- Driver training, and
- Internal monitoring and reporting.

Implementation of the mitigation measures indicated above is expected to render residual impacts to *Negligible - Minor* significance.

10.8 Cumulative Impacts

This section discusses the potential cumulative social impacts of MGD Project with respect to the development of the gas pipeline to connect the project with the national gas transmission system (the connection pipeline).

The connection pipeline is a new project, to be implemented by Transgaz, the national gas transmission system operator. The connection pipeline has a length of 24.37 km and follows a general south-east to north-west direction, from the MGD Project GTP at Vadu area and the national gas transmission system connection point at Gradina area, Constanta County. The location of the two projects is represented in Figure 9-14 below (for further details on the connection pipeline please refer to section 6 of this report).

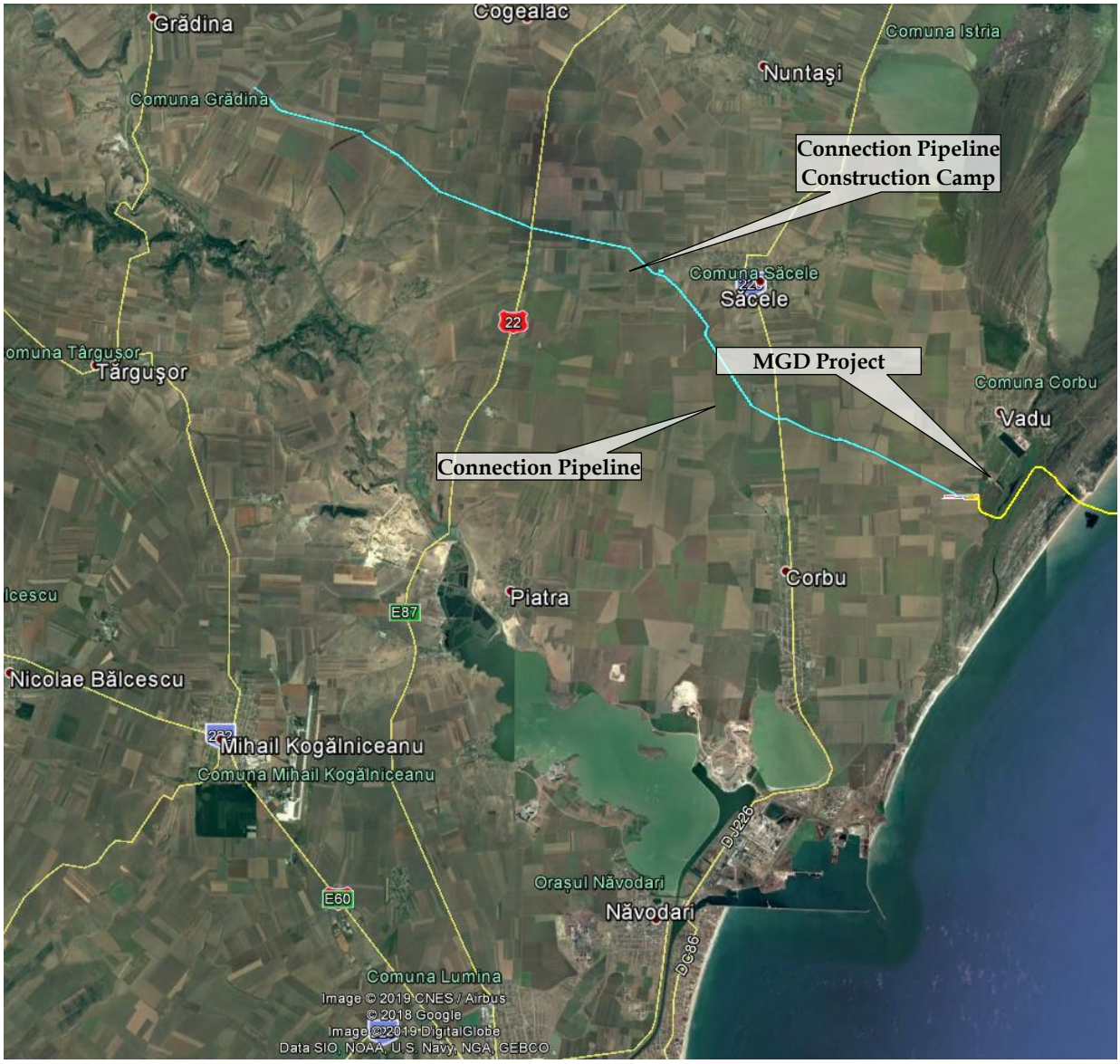


Figure 9-14 Connection pipeline and MGD Project location (Source, Google Earth 2019).

10.8.1 Spatial boundaries for assessment

There is limited information with respect to the organization of the connection pipeline construction activities given that, as informed by Transgaz, these have not been defined into sufficient detail yet.

According to Transgaz information, the construction camp will be established at the 12 kilometer point (kp) of the connecting pipeline on an area belonging to Sacele Commune. The construction traffic will be ensured using the roads network in the area and the construction right of way.

With consideration of the infrastructure available in the area, for the purposes of this assessment it is assumed that, similarly to MGD Project, the materials and supplies for the connection pipeline construction will be ensured from facilities available in Navodari and Constanta area, south of the two projects.

It is reasonable to assume that the access of the connection pipeline construction right of way will be ensured by using the following routes:

- The main route used will comprise National Road 22 (E87) and local road DC82 to access the construction camp, the central and western sections (approximately two thirds) of the connection pipeline right of way;
- The eastern section of the connection pipeline will be accessed:
  - From the construction camp using local road DC82 and Road DJ226 via Sacele to the south to northern limit of Corbu
  - From Corbu on DC83 to access the easternmost right of way section and connection point at the MGD GTP site. Vadu village, located north of the connection pipeline route, would not be affected by the construction traffic and transportation.
  - From south using Road DJ226 trough Corbu and further to the north to access the eastern section of the connection pipeline right of way

Based on the above, and with consideration of the MGD Project AoI the spatial boundaries considered for the purposes of this assessment are defined as follows:

- Road DJ226 segment from Navodari trough Corbu and DC83 road further to the MGD Project GTP site, from the perspective of construction traffic (refer to Figure 9-15 below), and
- Vadu settlement for construction workforce-related impacts.

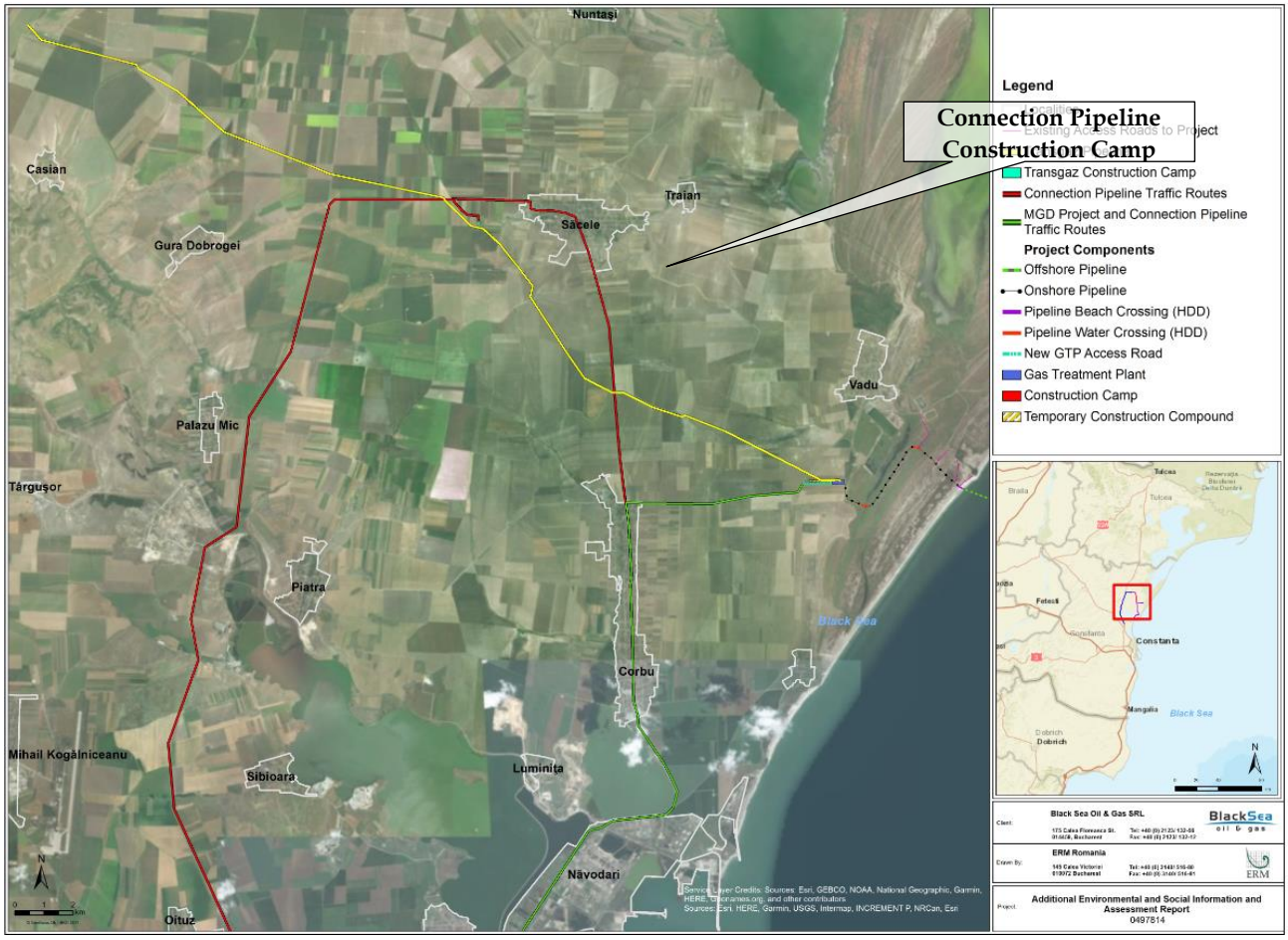


Figure 9-15 Onshore pipeline ROW access

Temporal boundaries for assessment

As informed by Transgaz, the connection pipeline construction activities will last 11 months and are scheduled to initiate in the fourth quarter of 2019.

With consideration of the connection pipeline route, and the location of the construction camp it is reasonable to assume that National Road 22 (E87) will be the main road used to access the approximately two thirds of the construction pipeline construction corridor.

Therefore, it can conservatively be assumed that the construction traffic of the two projects through Corbu will overlap for a period of up to 3 months. The DC83 segment from Corbu to the MGD GTP site will likely be simultaneously used by the two projects for a shorter period, estimated at 2 months for the purposes of this assessment.

Similarly, a period of 2 months is conservatively assumed in terms of the simultaneous presence of construction workforce required for the two projects in Vadu village area.

10.8.2 Potential cumulative impacts and identification of additional mitigation measures

The objective of this assessment is to determine whether the combined effects of MGD Project and of the connecting pipeline project may result in significant cumulative impacts requiring further mitigation in addition to the measures already considered for MGD Project. Further, in case such significant impacts are determined, identify additional mitigation measures and management measures to be implemented to render them acceptable.

The relevant aspects considered for assessment in cumulative context as identified and narrowed down to above indicated spatial and temporal boundaries are:

- The combined construction traffic and transportation trough Corbu settlement and further to the MGD GTP site
- The simultaneous presence of the construction workforce of the two projects in the area of Vadu village.

No information on the construction traffic associated with the connecting pipeline is available from Transgaz, given that this aspect was not yet defined.

Given the location of the connection pipeline construction camp and the pipeline routing, the transport of the majority of materials and supplies will be ensured via National Road 22 (E87). For the purposes of this assessment, it has conservatively been assumed that the connection pipeline construction-related traffic volume via Road DJ226 trough Corbu and further on DC83 to the GTP site area will represent approximately half of the MGD Project Construction traffic. The workforce-related traffic associated with the connecting pipeline construction on the above-indicated route would not be significant given that most of such traffic will be in relation with the construction camp and following a different route.

Therefore, the estimated cumulative MGD Project and connection pipeline project construction traffic volume, to occur for a period of up to three months on the above-indicated route segments will be:

- Construction materials/supplies transportation: 3 trucks/day average, 8 trucks/day maximum;
- Other construction equipment traffic (e.g. cranes, etc.): 2 rides/day;
- Miscellaneous (e.g. staff travel to site etc.): 6-8 light vehicles return trips daily;
- Workforce transport: 4 buses/day, or 6-7 minibuses /day (assuming 17-seats minibuses used);
- Catering: 4-5 minibuses/day.

Based on the above, the connection pipeline construction would not add significant traffic volume on the route segments analysed. It is therefore considered that the mitigation measures indicated in section 9.7.3 are adequate to address the cumulative traffic impacts.

Additionally, BSOG will coordinate with Transgaz on the construction traffic planning associated with the connection pipeline interface with the MGD GTP and easternmost section of the connection pipeline.

As informed by Transgaz, at peak of the construction activities, the associated connection pipeline workforce is estimated at 40 persons. It is expected that the majority of this workforce will be accommodated at the construction camp located at the central section of the connection pipeline, east of Sacele Commune. Only part of this workforce is expected to be required over a period of approximately two months for the construction activities at the connection pipeline interface with the MGD GTP and the easternmost section of the pipeline. Their presence in Vadu village area will be associated with the construction activities at the pipeline right of way, approximately 2.5 km south of Vadu village limits. In addition to the traffic-related aspects discussed above, no cumulative community-related impacts on the local residents of Vadu are expected as result of the connection pipeline and MGD Project construction.

11. ADDITIONAL CULTURAL HERITAGE INFORMATION

11.1 Study Area

The Cultural Heritage assessment performed for the project was based on a staged approach comprising desktop data review and fieldwork including geophysical surveys for the offshore areas and walkover reconnaissance and intrusive surveys for the onshore areas.

The studies and survey work and data analysis were performed by specialist teams from the History and Archaeology Museum Constanta (MINAC) with specialised support for the offshore surveys and diving.

The onshore desktop review addressed a wider area comprising the Corbu Commune, while the offshore one was made in relation to the continental shelf of the Black Sea. Fieldwork study surveys performed included an area extending up to 1.5 km of the project onshore components, while for the offshore project components it comprised a corridor with a width of 400 meters along the offshore pipelines i.e. 200 m each side of the pipeline alignment (except the nearshore segment on a length of approximately 8 km where the investigated corridor was 200 m) and 500 m around Ana and Doina facilities location.

11.2 Cultural Heritage Baseline

Cultural Heritage assets were identified through a range of different sources and fieldwork studies. These involved:

- a desk-based data review (cultural heritage database, cartographical, topographical, orthophoto maps and satellite imagery) and analysis;
- consultation with relevant local and national authorities;
- consultation with local communities as part of the permitting process; and
- field reconnaissance surveys and intrusive archaeological survey works for onshore areas.

During the permitting process for the onshore components of the MDG Project, BSOG has been consulting the representatives of local communities and the representatives of Ministry of Culture responsible for cultural heritage aspects. No intangible cultural heritage elements have been identified in the study area.

The Cultural Heritage baseline of the project as documented on the basis of the above is detailed further in the subsequent subsections of this chapter.

11.2.1 Offshore Cultural Heritage Baseline

Desktop studies

The basis of the initial desktop study was the List of historical monuments approved by Minister of Culture Order No. 2828/2015.

The existing listing of historical monuments and archaeological sites started in the early ‘90s and that the List is updated periodically via Order of the Minister of Culture. From a practical perspective, the inclusion of certain areas / items on the list was done only based on preliminary data. In certain areas, the need to set a degree of protection for any potential heritage item to be found in such area along the lack of more precise information on the location of the historical monuments and archaeological sites, generated the classification of a very large area. In respect of the MGD Project, such areas are the entire offshore of the Black Sea.

In line with the national regulatory provisions, once an area is included in the List, any project to be carried out in the listed area/location t must follow a specific and highly regulated permitting process in order to obtain the permission for project execution and operation.

The review performed identified six historical monuments and archaeological sites on the Romanian continental shelf of the Black Sea, namely one submarine archaeological site and five submarine archaeological vestiges (refer to Table 10-1 below).

No.	Site Code	Outline description	Location	Age
1.	CT-I-s-A-02561	Submarine archaeological site	Black Sea Romanian continental shelf (Constanta county)	
2.	CT-I-m-A-02561.01	Submarine archaeological vestiges	Black Sea Romanian continental shelf (Constanta county)	Medieval Age
3.	CT-I-m-A-02561.02	Submarine archaeological vestiges	Black Sea Romanian continental shelf (Constanta county)	The Roman-Byzantine era
4.	CT-I-m-A-02561.03	Submarine archaeological vestiges	Black Sea Romanian continental shelf (Constanta county)	Roman Age
5.	CT-I-m-A-02561.04	Submarine archaeological vestiges	Black Sea Romanian continental shelf (Constanta county)	Hellenistic Age
6.	CT-I-m-A-02561.05	Submarine archaeological vestiges	Black Sea Romanian continental shelf (Constanta county)	Greek Age

Table 10-1 Offshore historical monuments and archaeological sites in Romanian Black Sea

These triggered the execution of field surveys and of the regulatory permitting process required under the national law.

Field Surveys

Geophysical and bathymetric surveys were performed for all offshore project facilities including Ana, Doina, infield facilities and pipelines. The surveys were performed by a specialized contractor, MG3 between September 2016 and November 2016:

The studies had a wider scope to inform the project design and included the location of any wrecks or objects of cultural heritage interest.

Further assessments of the data gathered during the survey concluded that no objects of cultural heritage interest have been identified as result of the geophysical surveys performed for Ana, Doina and the infield facilities.

The geophysical survey of the pipeline route performed in November 2016 located two objects at KP 93.68 and KP 95.20 which were identified at the time as being wrecks.

The first object identified (recorded at the time of the study as “Wreck 1”) was given sonar contact ID ERSC025, and was located at pipeline KP 93.68, and at 216.1 m North of the centre line, and measures 13.0 m length, 5.61 m width and 2.01 m height.

The second object ("Wreck 2" – sonar contact ERSC026) was located at pipeline KP 95.20, and at 161.2m North of the centre line and measures 30.50 m length, 10.49 m width and 4.45 m height.

Location and details of the identified presumed wreck objects are represented in Figures 10-1 and 10-2 below.

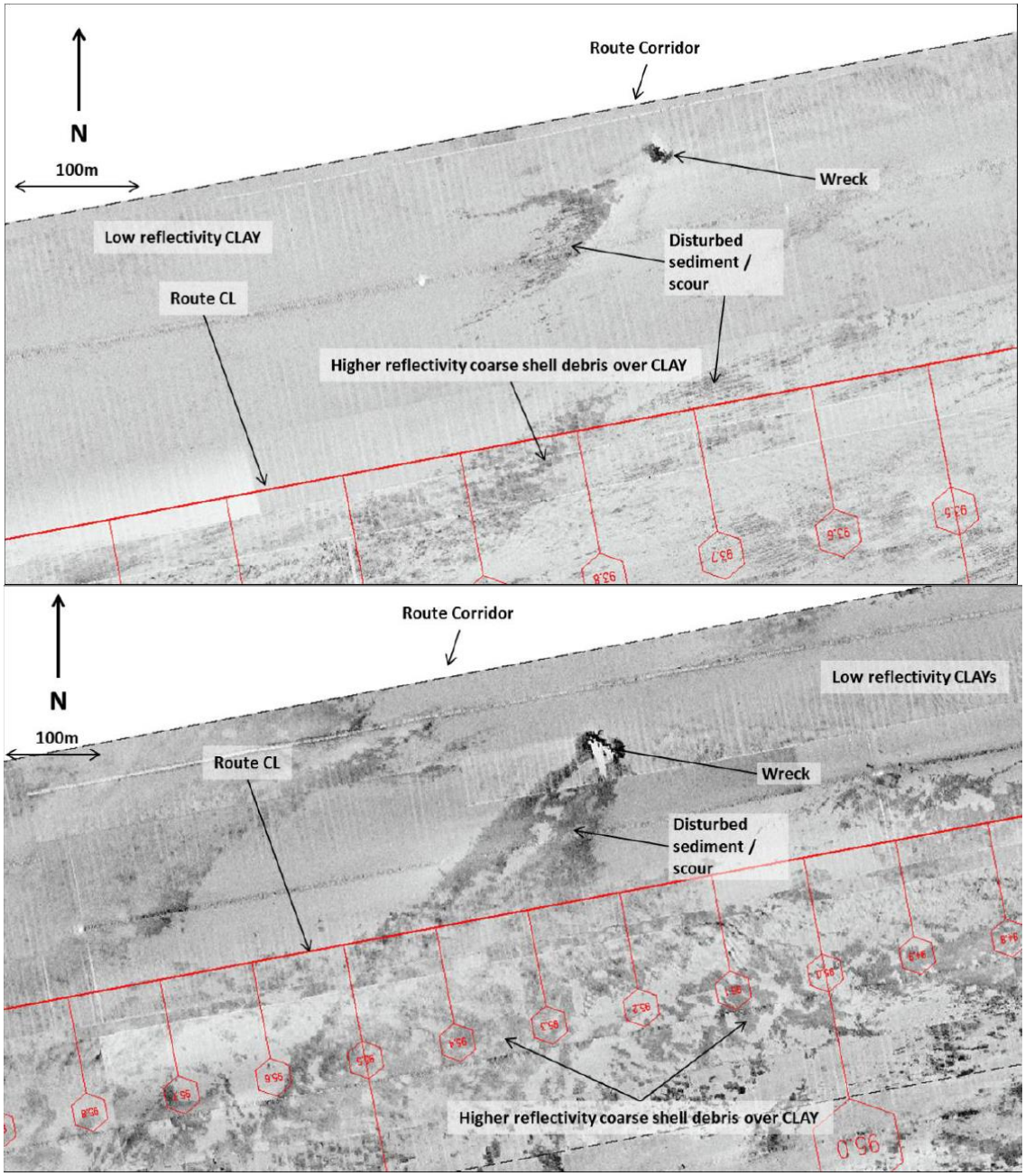


Figure 10-1 Location of presumed wreck objects identified (MG3 Geophysical & Environmental Results Report, 2016)

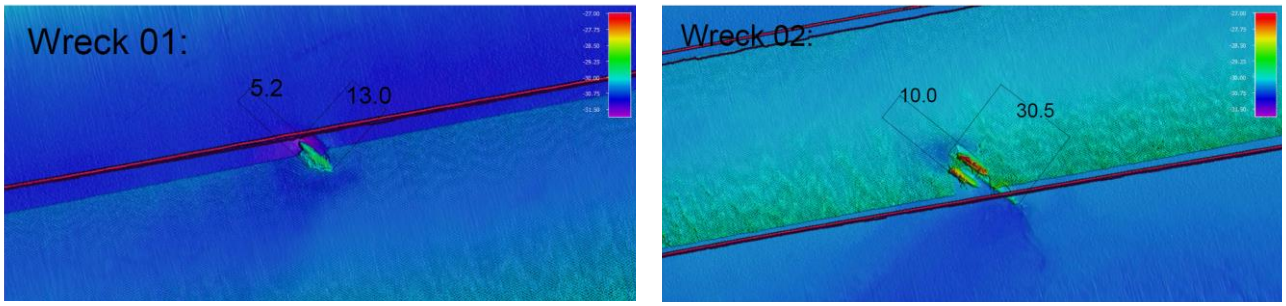


Figure 10-2 Details of presumed wreck objects

The identified presumed wreck objects determined the execution in September 2018 of further surveys by cultural heritage expert from MINAC assisted by specialised diving services provider.

The scope of the surveys was to confirm the nature of the two objects and determine whether these are of cultural heritage relevance.

The first specialized autonomous diving survey at Wreck 01 object location was performed on 20 September 2018. The object was located at a depth of 31 m and identified as a metallic modern structure of unknown origin composed of two elongated barrel-like shaped floating devices connected between them by different metal bars. Dimensions: 14 m length by 10 m wide. Depth: 31m.

The second specialized autonomous diving survey at Wreck 02 object location was performed on 21 September 2018. The object was located at a depth of 32 m and identified as a metallic modern structure of unknown origin composed of one elongated barrel like shaped floating device with different metal bars attached to it.

The survey results were documented by photo and video recording and summarized in an Archaeological Diagnosis Report by MINAC for project permitting purposes. The surveys performed determined that the initial interpretation was incorrect and that the two objects are sunk modern metal objects (parts of military targets or floats) without cultural heritage value.

11.2.2 Onshore Cultural Heritage Baseline

Desktop studies

The basis of the initial desktop study was the List of historical monuments in Romania as per the Government Order No. 2828/2015. The review identified 22 historical monuments in the Corbu Commune area, of which 10 are in Corbu village[6] and 12 are in Vadu village, as summarized in Table 10-2 overleaf.

[6] Corbu Village has two areas Lower Corbu (in Romanian: "Corbu de Jos") and Upper Corbu (in Romanian: "Corbu de Sus"). Nonetheless, it is the same village.

No.	Site Code	Name	Administrative Unit	Location	Age
1.	CT-I-s-B-02632	Archaeological site at Corbu, "Capul Midia" point	Corbu village, Corbu Commune	"Capu Midia", at 3.5 km SSE from Corbu Commune, SW area of the peninsula; overlapped by the border police site and by a fishery	
2.	CT-I-m-B-02632.01	Settlement	Corbu village, Corbu Commune	"Capu Midia", at 3.5 km SSE from Corbu Commune, SW area of the peninsula; overlapped by the border police site and by a fishery	century I-IV p. Chr. Roman age
3.	CT-I-m-B-02632.02	Settlement	Corbu village, Corbu Commune	"Capu Midia", at 3.5 km SSE from Corbu Commune, SW area of the peninsula; overlapped by the border police site and by a fishery	century V a. Chr.-century I p. Chr. Latene
4.	CT-I-m-B-02632.03	Settlement	Corbu village, Corbu Commune	"Capu Midia", at 3.5 km SSE from Corbu Commune, SW area of the peninsula; overlapped by the border police site and by a fishery	century VI-V a. Chr. Late Hallstatt
5.	CT-I-s-A-02633	Tumuli assembly	Corbu village, Corbu Commune	In the entire municipality	Antique era
6.	CT-I-s-B-02634	Inhumation necropolis	Corbu de Jos village, Corbu Commune	In the W limit of the cemetery	century VI-V a. Chr. Late Hallstatt
7.	CT-I-s-B-02635	Archaeological site at Corbu de Jos, "Valea Vetrei" point	Corbu de Jos village, Corbu Commune	"Valea Vetrei", between Corbu de Jos and Corbu de Sus	
8.	CT-I-m-B-02635.01	Settlement	Corbu de Jos village, Corbu Commune	"Valea Vetrei", between Corbu de Jos and Corbu de Sus	century I-VI p. Chr. Roman age
9.	CT-I-m-B-02635.02	Settlement	Corbu de Jos village, Corbu Commune	"Valea Vetrei", between Corbu de Jos and Corbu de Sus	century IV a. Chr.-century I p. Chr. Latene

No.	Site Code	Name	Administrative Unit	Location	Age
10.	CT-I-s-B-02636	Rural settlement	Corbu de Jos village, Corbu Commune	1 km NW from the village	century III-IV p. Chr. Roman age
11.	CT-I-s-B-02773	Archaeological site at Vadu, "Ghiaur-Chioi" point	Vadu village, Corbu Commune	"Ghiaur-Chioi", at 2 km N from the Rare Metal Plant, on the promontory	
12.	CT-I-m-B-02773.01	Settlement	Vadu village, Corbu Commune	"Ghiaur-Chioi", at 2 km N from the Rare Metal Plant , on the promontory	century XVI-XVIII Medieval age
13.	CT-I-m-B-02773.02	Necropolis	Vadu village, Corbu Commune	"Ghiaur-Chioi", at 2 km N from the Rare Metal Plant , on the promontory	century XVI-XVIII Medieval age
14.	CT-I-m-B-02773.03	Settlement	Vadu village, Corbu Commune	"Ghiaur-Chioi", at 2 km N from the Rare Metal Plant , on the promontory	century VI-IV a. Chr.
15.	CT-I-m-B-02773.04	Defence elevation	Vadu village, Corbu Commune	"Ghiaur-Chioi", at 2 km N from the Rare Metal Plant , on the promontory	century VI-IV a. Chr.
16.	CT-I-s-B-02774	Karaharman fortress	Vadu village, Corbu Commune	In the yard of the Rare Metal Plant	century XVII-XIX
17.	CT-I-s-B-02775	Rural settlement	Vadu village, Corbu Commune	"Pepiniera" (seminary), at 2 km NW from the village	century II-III p. Chr. Roman age
18.	CT-I-s-B-02776	Vicus Celeris	Vadu village, Corbu Commune	At 1.5 km S from the village	century II-IV p. Chr. Roman age
19.	CT-I-s-B-02777	Settlement	Vadu village, Corbu Commune	On the shore of the Chituc island, at 5 km NW from the village	century II-IV p. Chr. Roman age
20.	CT-I-s-B-02778	Archaeological site at Vadu, "Bardalia" point	Vadu village, Corbu Commune	"Bardalia", at 2 km S from the village, E from the Vadu border police site	

No.	Site Code	Name	Administrative Unit	Location	Age
21.	CT-I-m-B-02778.01	Settlement	Vadu village, Corbu Commune	"Bardalia", at 2 km S from the village, E from the Vadu border police site	century IV-VI p. Chr. Romano-Byzantine era
22.	CT-I-m-B-02778.02	Settlement	Vadu village, Corbu Commune	"Bardalia", at 2 km S from the village, E from the Vadu border police site	century II-IV p. Chr. Roman age

Table 10-2 Onshore historical monuments and archaeological sites in Corbu commune, Constanta County

The List includes a Class A monument (historical monuments of national and universal value) consisting of tumuli (mounds of earth or stones raised over graves) of undetermined number and location, potentially being present on the entire Corbu Commune area.

The remainder are Class B monuments (historical monuments of local value) consisting of remains of settlements of various ages, many of them being Roman in origin.

Based on consultations with the responsible of the cultural heritage authority (Direction for Culture of Constanta County /Directia Judeteana pt. Cultura Constanta), of the listed archaeological sites the following were determined of relevance for the project:

- Code CT-I-s-A-02633 - Tumuli assembly (tumuli potentially present on the entire area of Corbu Commune
- CT-I-s-B-02774 - Karaharman fortress, century XVII-XIX,
- Code CT-I-s-B-02776 - The rural settlement in the Roman era sec. II-IV p. Chr “Vicus Celeris”, and
- Code CT-I-s-B-02778 - The Roman and Roman-Byzantine settlement from Vadu – Bardalia dated century II-IV p. Chr.

This triggered the execution of field surveys and the regulatory permitting process required under the national law.

Field Surveys

Specialised field surveys were performed by MINAC specialists in September - October 2017.

The reconnaissance surveys performed comprised a wider area around the onshore pipeline corridor and GTP site. This allowed a better delimitation of the Vadu-Bardalia (CT-I-s-B-02778) site and also determined that it partially overlaps with the Roman rural settlement Vicus Celeris (CT-I-s-B-02776) concluding the two represent a sole archaeological site – “Vadu-Bardalia”. The site covers an extended area, starting approximately 100 m to the north of the GTP site.

The surveys also resulted in the identification of two new (unknown) archaeological sites as follows:

- a tumulus and flat necropolis were identified adjacently to the Vadu-Bardalia site and approximately 900 m north-west of the project GTP site.
- a new archaeological site of similar age with Karaharman fortress and named "La Magazii" (“At Warehouses”) was identified at approximately 800 m of the pipeline corridor and approximately 1200 m of the GTP site, to the south.

The location of the Cultural Heritage sites (both the known ones and those identified as result of the field surveys) is represented in Figure 10-3 below.

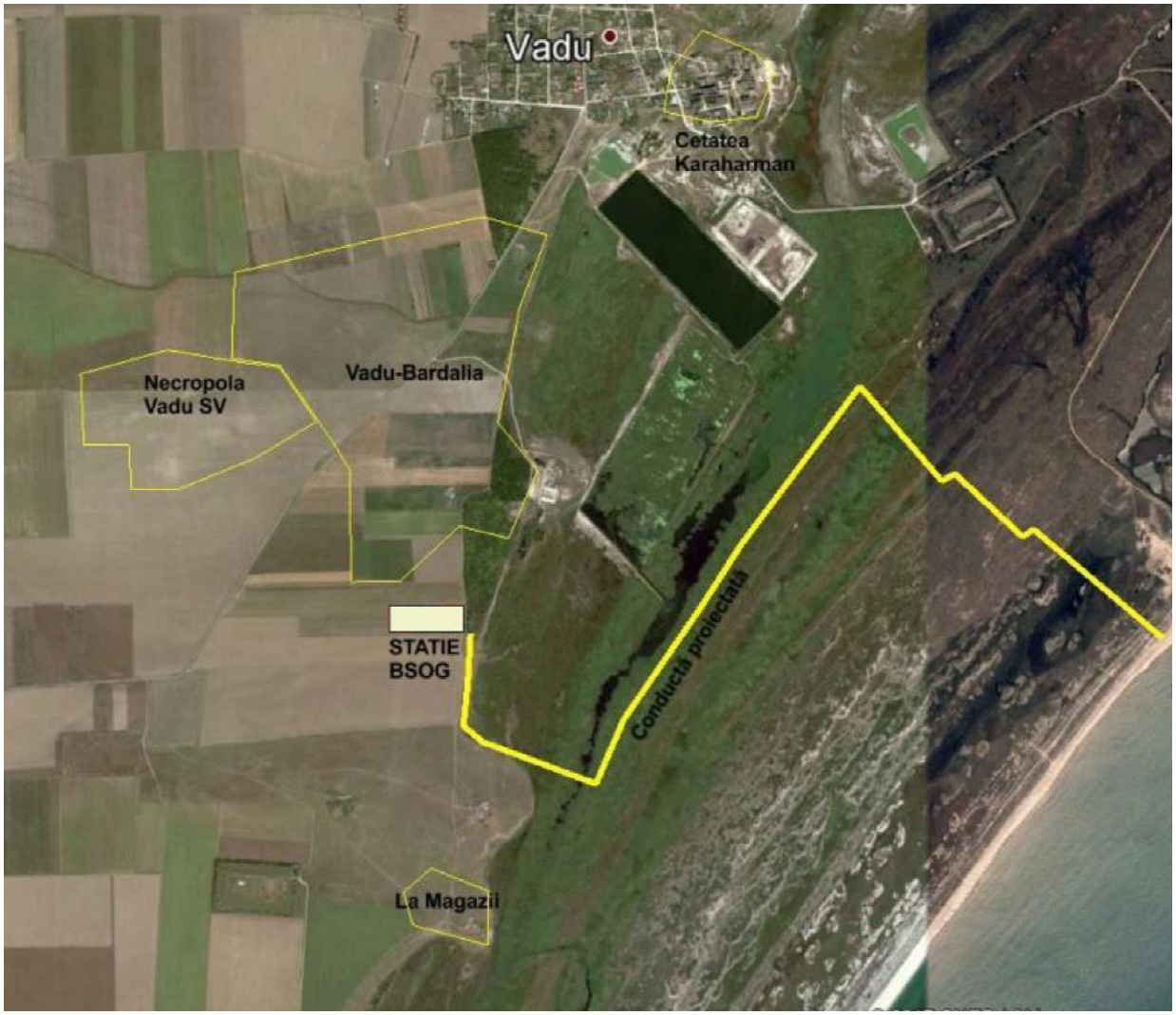


Figure 10-3 Cultural Heritage sites in the study area (Archaeological Diagnosis Report, MINAC 2017)

Based on the observations made in the frame of the reconnaissance surveys at the Project sites the eastern area of the GTP site was determined of archaeological potential and subject of further intrusive archaeological investigations. The survey consisted in 11 archaeological excavation trenches performed by MINAC specialists at intervals of 30 – 50 m.

The majority of the trenches resulted in no archaeological findings.

Two of the trenches determined the presence on the eastern area of the GTP site of an unpaved antic road (*via terrena*), delimited by ditches with an approximate north-south orientation. Given the intensive agricultural ploughing of the area, the exact delimitation of the actual road could not be established. According to the Archaeological Diagnosis Report (MINAC, 2017) summarizing the findings, the antic road was likely connected to the Roman-age Vadu-Bardalia archaeological site located to the north of the GTP site.

The archaeological material recovered during the archaeological survey was rare and it consisted of ceramic fragments dated II-IV p. Chr. centuries the time period. A silver ring likely from the Ottoman period was found in the topsoil at the archaeological digging area.

11.3 Cultural Heritage Assessment and Clearance

11.3.1 Offshore Cultural Heritage Assessment and Clearance

Cultural Heritage research and field investigations of the study area were performed including geophysical and bathymetry surveys, specialist data interpretation followed by specialist autonomous diving checks of the identified anomaly areas and of the objects of potential archaeological interest.

The results of the investigations were summarized in an Archaeological Diagnostic Report (MINAC, December 2018) and conclude that no elements of historical or archaeological interest have been identified in the study area and recommends the construction permitting of the offshore project components.

Based on the above, cultural heritage clearance was obtained for the offshore components of the project. The project footprint was removed from the classified archaeological site CT-I-s-A-02561 (the Romanian continental shelf of the Black Sea) and removed from the historical monument listing in December 2018 based on an Archaeological Discharge Certificate issued by the Direction of Culture of Constanta County and by the Minister of Culture Order (No. 4009 of 21.12.2018).

11.3.2 Onshore Cultural Heritage Assessment and Clearance

The onshore project components are located in an area with confirmed archaeological sites of Roman and Ottoman ages.

While Cultural Heritage research and field investigations performed along the pipeline corridor did not result in findings of archaeological interest, archaeological material was recovered and an unpaved antic road (*via terrena*) was identified at the eastern part of the GTP site.

The outcome of the investigations and assessment performed were summarized in two Archaeological Diagnosis Reports (MINAC, 2017) completed for each the GTP site and the onshore pipeline corridor.

The reports recommend the construction permitting of the onshore project components, subject to specialized archaeological supervision during the earth moving stage of the construction and execution of an intrusive archaeological research at a specified area of the GTP site, prior to construction initiation.

Based on the above, cultural heritage clearance was obtained for the GTP site based on an Archaeological Discharge Certificate issued by the Direction for Culture of Constanta County in March 2018. The Cultural Heritage authority consents for construction were obtained for both the onshore pipeline and the GTP.

11.4 Mitigation Measures

Pre-construction Investigation

An intrusive investigation will be performed at the eastern area of the GTP site before initiation of the construction activities.

The investigations will be performed by authority-approved Cultural Heritage specialists.

Based on the GTP site Archaeological Diagnosis Report (MINAC, 2017), the archaeological investigation will be performed within an area delineated by the following coordinates:

X (north)	Y (east)
796814.882	332234.518
796855.323	332237.192

796884.034	332337.107
796842.712	332335.107

Table 10-3 Delineation of GTP site area subject to pre-construction intrusive archaeological investigation (coordinates provided in STEREO 70 system).

The investigation will be performed in line with applicable regulatory requirements and international best practice based on a program agreed with the territorial Cultural Heritage authority.

Upon completion, the investigation report will be submitted to the territorial Cultural Heritage authority.

Archaeological Supervision

Specialized archaeological supervision will be ensured for the entire period of earth moving works execution during the construction of the GTP and the onshore pipeline.

The archaeological supervision will be ensured by specialist archaeologists, based on contractual agreement with an approved specialized institution (museum).

Upon completion of the archaeological supervision works, the report completed by the archaeological supervision specialists will be submitted to the territorial Cultural Heritage authority.

Cultural Heritage Management and Chance Finds Procedure

A Cultural Heritage Management Plan will be developed as part of the E&S Management System. The Plan will detail how the project manages and mitigates the Cultural Heritage as the project execution progresses, detailing a clear agreed framework for mitigation implementation. The plan will detail the roles and responsibilities of individuals responsible for dealing with known sites and unexpected discoveries during and after construction of the scheme, including clear reporting structures and example scenarios.

A clear and detailed Chance Finds Procedure will be developed in conjunction with the authorities, in line with the regulatory provisions and implemented for the project. It will detail the roles and responsibilities of individuals responsible for dealing with unexpected discoveries during construction of the scheme, including clear reporting structures and example scenarios. This will allow implementation of appropriate responses in the event of such discoveries, to the benefit of the Cultural Heritage. In relation to these documents, the legal requirements relevant for these activities and actions will be observed.

APPENDIX A Drill Cuttings Disposal - Best Practicable Environmental Option

APPENDIX B Assessment of Effects on Critical and Natural Habitat and Priority Biodiversity Features