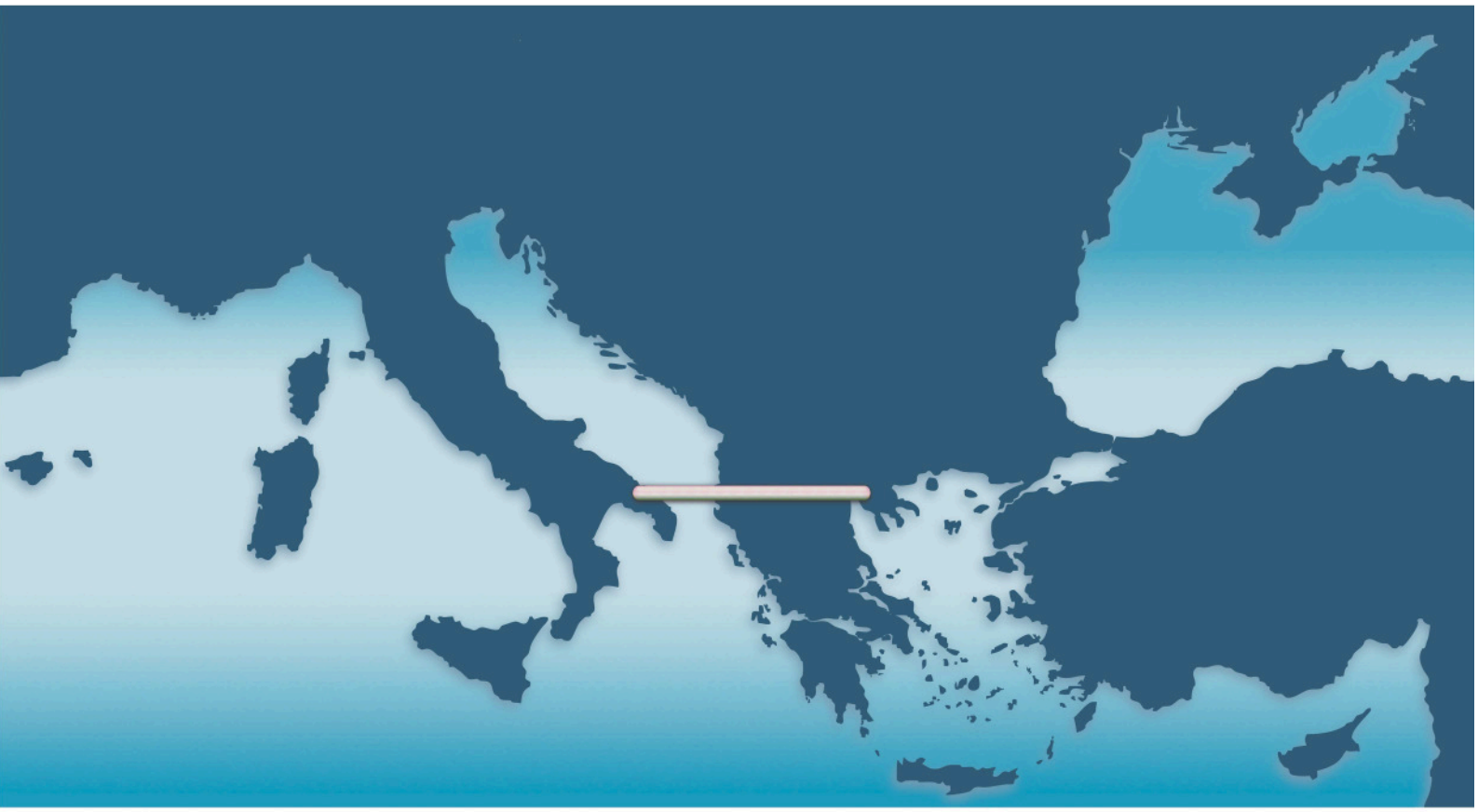
Trans Adriatic Pipeline



Scoping Report for the ESIA (Environmental and Social Impact Assessment) Albania

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Date 04/2011

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ACRONYMS AND ABBREVIATIONS

Alt. 1	Alternative 1
Alt. 2	Alternative 2
Alt. 3	Alternative 3 (EBE)
Alt. 4	Alternative 4
Alt. 5	Alternative 5
Alt. 6	Alternative 6
AOX	Absorbable Organic Halides
ASCIs	Areas of Special Conservation Interest
BAP	Biodiversity Action Plan
BAT	Best Available Technique
BCM	Billion Cubic Meters
BOD	Biological Oxygen Demand
BV(S)	Block Valve (Station)
CEP	Community Engagement Plan
CLO	Community Liaison Officer
COD	Chemical Oxygen Demand
CoNISMa	Consorzio Nazionale Interuniversitario per le Science del Mare
CORINE	Coordination of Information on the Environment
CS	Compressor Station
CSD	Cutter Suction Dredger
DESFA	Hellenic Gas Transmission System Operator
DO	Dissolved Oxygen
EBE	Extended Basic Engineering
EBRD	European Bank for Reconstruction and Development
ENT	E.ON New Build & Technology GmbH
ERM	Environmental Resources Management
ESD	ESIA Scoping Document
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMP FEED	Environmental and Social Management Plan Front End Engineering Design
EU	European Union
GFCM	General Fisheries Commission for the Mediterranean
GIS	Geographic Information System
GPS	Global Positioning System
HSE	Health, Safety and Environment
IBC	International Building Code
ICH	Intangible Cultural Heritage
ILF	ILF Consulting Engineers
INSTAT	Statistical Institute of Albania
IUCN	International Union for Conservation of Nature
Kp	Kilometre Point
MARPOL	International Convention for the Prevention of Pollution From Ships
masl	Meters Above Sea Level
MEFWA	Ministry of Environment, Forest and Water Management
METE	Ministry of Economy, Telecommunications and Energy
NCEAS	National Centre for Ecological Analysis and Synthesis
NGO	Nongovernmental Organisations
PAH	Polycyclic Aromatic Hydrocarbons
PCBs	Polychloro Byphenils
PIG	Pipe Inspection Gauges
QRA	Quantitative Risk Assessment
RAP	Resettlement Action Plan
REAs	Regional Environmental Agencies
ROV	Remotely Operated Vehicle
RoW	Right of Way
SEP	Stakeholder Engagement Plan
SSS	Side Scan Sonar
TAP	Trans Adriatic Pipeline
TAP	Client
TOC	Total Organic Carbon
TOM	Total Organic Matter
TPH	Total Petroleum Hydrocarbons
TSHD	Trailing Suction Hopper Dredger
UXO	Unexploded Ordinance

1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Trans Adriatic Pipeline (TAP) is a proposed pipeline in the Southern Gas Corridor that will bring gas from new sources in the Caspian region to Western and South Eastern Europe.

The 520 km pipeline will connect to existing gas networks and start in Greece, cross Albania and the Adriatic Sea and come ashore in southern Italy, allowing gas to flow directly from the Caspian basin into European markets. TAP's shareholders are Swiss EGL (42.5%), Norwegian Statoil (42.5%) and German E.ON Ruhrgas (15%).

TAP will contribute to the security and diversity of Europe's energy supply by providing the necessary infrastructure to transport gas from the Shah Deniz II field in Azerbaijan via the most direct route to Southern Europe once production begins in early 2017. As more gas becomes available, TAP will have the capacity to cater for an additional 10 bcm per annum of new gas, expanding to 20bcm as required.

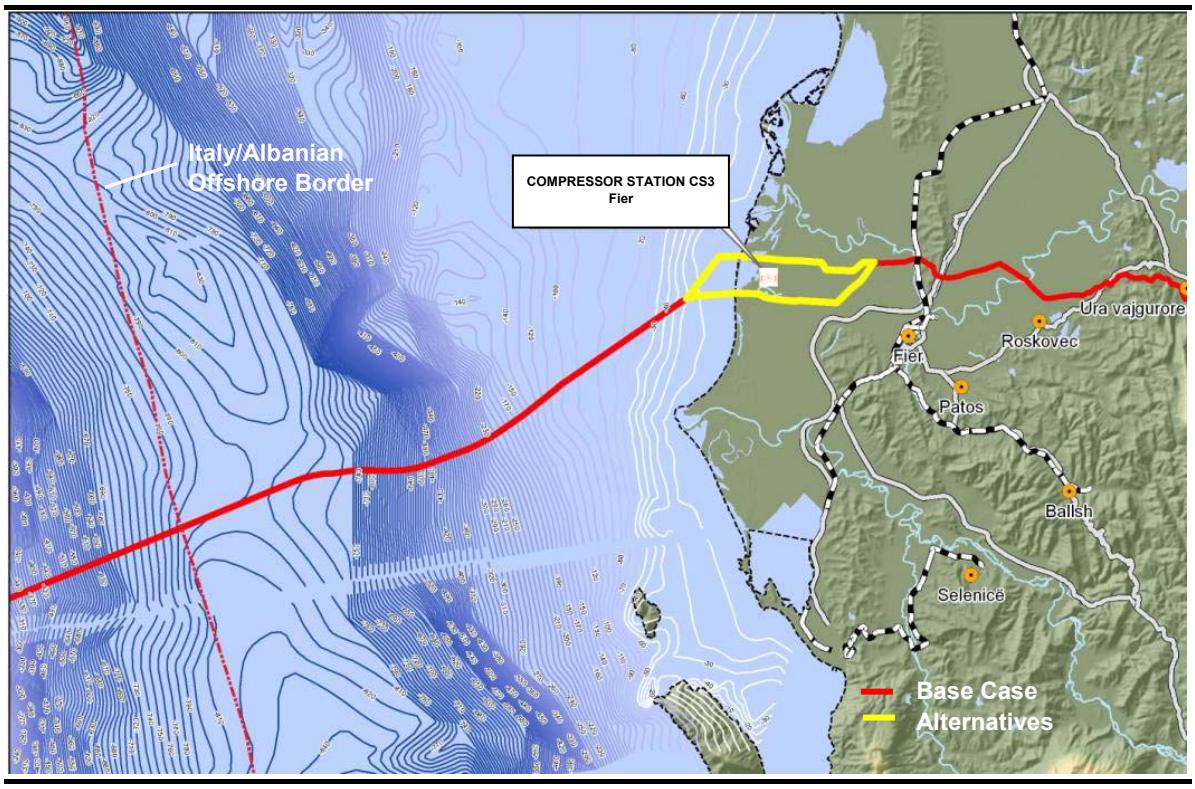
TAP is supported by financially stable/strong shareholders. TAP will require no funding from subsidies or from any of the governments of the host countries. TAP can deliver substantial benefits in terms of significant investment and employment to the countries which it passes through. The European Union recognized the project under the so-called TEN-E (Trans-European Energy Networks) guidelines as a Project of Common Interest for the European Union's overall energy policy objectives.

The pipeline system through Albania would initially consist of an approximately 200 km long onshore pipeline, an approximately 60 km long offshore pipeline and a compressor station near Fier (also referred to as CS3) with a capacity of 10 Billion Cubic Meters (BCM) of natural gas per year (around 1.520.000 cubic metres per hour). In line with international best practice, block valve stations will be installed approximately every 30km of the onshore pipeline to interrupt the gas flow in case of maintenance or emergency. At a later stage a second compressor station (CS2) will be build near Miras, close to the Greek border, to increase the throughput capacity of the pipeline from 10 to 20 BCM per year (from 1.520.000 to 3.040.000 cubic meters per hour).

Figure 1.1 shows the onshore TAP route in Albania whilst *Figure 1.2* shows the offshore section.

Figure 1.1 TAP in Albania (onshore)

Figure 1.2 TAP in Albania (offshore)



The base case route of the TAP in Albania is defined as a 2 km wide corridor at this stage of the project (red line in *Figures 1.1* and *1.2*). The corridor has been selected following an extensive and thorough alternatives route assessment process performed by TAP in 2009/2010 with the aim to select a technically feasible pipeline route with the least environmental, socioeconomic and cultural heritage impacts (please see *Section 3* of main report).

The route refinement process has been completed for most of the base case route with the exception of an approximately 30 km long section between the Albania/Greek border and Vithkuq and the westernmost section of the route between Fier and the coastline (see yellow lines in *Figure 1.1*). Similarly, the exact location of the compressor station near the coast (CS3) and the landfall alternatives are currently still under investigation (see *Section 3* for the location of the options).

1.2 PURPOSE OF THIS REPORT

A project of these characteristics is subject to a process of Environmental Impact Assessment (EIA) according to Albanian Regulations. Furthermore, TAP has voluntarily adopted the most stringent International Practice for this project, in the form of compliance with EBRD (European Bank of Reconstruction and Development) requirements.

One of the requirements of the EIA process (from now on called Environmental and Social Impact Assessment (ESIA) in line with EBRD terminology) is to carry out a Scoping Study. This is a process by which stakeholders are consulted to contribute to the identification of key issues to be investigated as part of the ESIA itself. This Scoping Document is prepared in application of this requirement and the requirements of the EU EIA Directive. The primary output of the scoping process will be the final scope and contents of the full ESIA, taking in account the input from relevant stakeholders, and the specific requirements of the Albanian Authorities and other stakeholders.

1.3 PROJECT DESCRIPTION

1.3.1 Overview

The onshore pipeline will be 48 inches (1.219 m) in diameter whilst the diameter of the offshore pipeline will be reduced to 42 inches (1.067 m). The pipeline will be made of welded steel pipe sections which will be approximately18 m long. The steel pipe sections will be coated outside. Some of the pipeline sections will be additionally coated with reinforced concrete to protect the pipe from external damage. The entire pipeline will be protected against corrosion by a cathodic protection system.

The onshore section of the pipeline will be buried underground for the entire length with a minimum soil cover of 1 m. Greater depth will be required when crossing existing infrastructure. The offshore section will be laid on the seabed

with the exception of the shallow water section (up to 10 m depth) which will be buried at depths exceeding 2 m. At the landfall burial depth is expected to be up to 4 m. The TAP pipeline will be designed for a technical life time of 50 years.

1.3.2 Onshore Pipeline

The onshore TAP project in Albania consists of the following main components; onshore pipeline, 6-7 block valve stations, compressor stations (CS3 and CS2) and associated facilities required during construction (access roads, camps, yards, etc.). TAP will need 7 temporary stock yards for the pipes, 5 temporary storage areas for equipment and 5 worker camps. TAP will upgrade approximately 90km of existing road, establish around 40km of new roads and rehabilitate all roads and land to the pre-project status.

The onshore pipeline will be assembled in a conventional way by a construction spread that follows along the pipeline corridor. The construction strip requires a width of approximately 40 m, as it must provide room for pipeline fabrication, and for simultaneous vehicle movements. TAP aims to reinstate the construction strip to its original condition. The main limitations on land use above the pipeline will be a narrow corridor of maximum 10 m in which the growing of deep routing trees will be restricted, a corridor of maximum 60 m in which the construction of houses will be restricted and a corridor of maximum 200 m in which the establishment of cluster of houses and/or industrial infrastructure is limited. The preferred route was selected to accommodate this criteria and allows sufficient space also for future developments of neighbouring communities.

To enhance pipeline safety, the pipeline will have block valve stations, with which any segment of the line can be isolated for maintenance work or in case of a rupture or leak. The block valves will be unmanned and will cover a total surface area of approximately 500 m^2. The main equipment of such station will be installed underground.

The compressor stations are required to transport the gas by increasing the pressure. The compressor stations will mainly comprise facilities for gas treatment, metering, compression and cooling. The size of the land plot required for the compressor station is estimated to be approximately 100 ha. The surface area required for the buildings of the compressor station is approximately 2 ha. The remaining portion of the 100 ha area will remain empty as the compressor station will be positioned within this plot to ensure sufficient distance from other buildings or infrastructure

During operation the pipeline will be monitored and controlled from a central control room at a location yet to be confirmed. During operation, continuous measurements of pressure and flow rates at inlet and outlet of the pipeline will be performed. If in the unlikely event of a leak is detected, emergency shutdown procedures will be implemented. To allow internal inspection of the pipeline, pigging facilities will be installed.

1.3.3 Offshore Pipeline

The offshore pipeline route is approximately 60 km in length from the Albanian coast to the mid point between Albania and Italy in the Strait of Otranto (Adriatic Sea). The pipeline then continues towards the Italian coast.

The offshore pipeline will be installed using a lay-barge, which is a typical vessel used for pipe laying. Pipe sections are welded together on the barge and the pipeline is laid down to the seabed as the barge moves along the route. Near shore trenching will be completed using dredging techniques. The dredged sediments are temporarily stocked in proximity of the trench and then backfilled once the pipe has been laid in the trench. For shallower water depths the trench may also include a graded rock/gravel armour layer to stabilise the pipeline.

Dredging is also involved in landfall construction, which will typically comprise the trench excavation and cofferdam construction (a cofferdam is an enclosure within a water environment constructed to allow water to be pumped out to create a dry work environment), pulling the pipe into the trench via winches, cofferdam removal and replacement of the excavated soils and backfilling with material such as gravel and rock. Operational activities will be integrated with the onshore section as one single system. The external condition of the sub-sea pipeline, including the condition of the cathodic protection system, will be monitored on a regular basis.

1.4 BASELINE CONDITIONS

1.4.1 Onshore Section

The eastern section route is divided by the Morava Mountains which run on a north-south axis and rise to over 1800 m at their highest point. The coniferous and broadleaved forests of this eastern section are important habitats for large mammals and carnivores. This section of the route is characterised by small settlements, only three have a population of over 400. Forest and shrub are the main habitats within the corridor. This land, along with the land designated for grazing, is used by settlements for livestock and seasonal crop production.

The central section of the route crosses an area characterised by a mountainous reliefs, broken terrain and high contrasts. The main areas of vegetation and floral interest of the route are found in this central part section, including mature or old growth forests, sub alpine natural grasslands and river habitat of the Osumi River. Land use is characterised by forested and mountainous areas with small areas of agricultural land surrounding settlements, a combination of crop production and animal husbandry a high proportion of which is undertaken at a subsistence level. Çorovode is the main town in the area. The rest of the settlements are relatively small with populations typically ranging between 100 – 400 inhabitants.

The western section crosses a range of different geographies from the mountainous area, through foothills and onto the flat coastal plain. There are two main watershed river systems, the Semani-Osumi River and the Vjosa River watershed systems. Natural habitats are more scarce within this section due to greater exploitation (mainly agricultural). The stream/river habitats and wetlands are the ones of high ecological interest. The district of Berat is hilly with a mosaic of seasonal and permanent crop production and grazing. The district of Fier is flatter and more uniformly used for seasonal crop production. The close proximity of the cities of Berat and Fier, in addition to the area of oil extraction in Roskovec commune, results in a more diversified economy than the other sectors.

The route does not pass through any currently protected areas. In the eastern section the closest protected area is the Hotova Fir-Dangelli National Park, approximately 3 km to the south. In the central section, the route passes at 1 km distance to the Bogova Managed Nature Reserve. In the western section the closest site to the route is the Crown Forest of the River Semani Nature Monument which is approximately 3 km to the north of the route.

1.4.2 Offshore Section

Water depth along the proposed route ranges from the coast down to around 800 m. Sediment supply arrives mainly from the materials transported by the rivers, the nearest mouths to the landfall site is the river Semani to the north. Seabed along the proposed route is therefore covered by soft sediments, formed mainly by fine sands and muds. The area is characterised by low seabed species richness, attributable to the significant input of terrigenous sediments discharged by the numerous rivers of the Albanian coast. These conditions also result in the absence of seagrasses.

The fish fauna of the area is composed of both demersal (fish that live near the seabed) and pelagic species (fish usually found inhabiting the water column in the pelagic zone). The most important commercial fish species include European hake, seabass, sardine (pilchard) and seabreams. Three turtle species have been recorded in the Adriatic Sea, namely the loggerhead turtle, the green turtle and the leatherback turtle, the latter being considered as a rare visitor. Concerning the marine mammals, despite the absence of specific studies, five species can be confirmed as inhabitants of Albanian waters: sperm whale, Cuvier's beaked whale, bottlenose, striped and common dolphins.

The off-shore boundary between Albania and Italy on the continental shelf was defined by an Agreement signed in 1992. Fishing and navigation are open to other countries as long as no Fishing Reserve or Economic Exclusion Zones is defined, which is the case between Albania and Italy. The fishery sector in Albania is still a relatively minor sector for the country as a whole. The fishing fleet of Albania is very limited. Fish trade in Albania is mainly concentrated in areas near the four main harbours. The pattern of trading is quite simple due

to the low number of operators. The port of Durres, which is the primary harbour of Albania and is situated approximately 75 km the north of the landfall, hosts the highest number of fishing vessels in Albania. The coast of Fier region has a medium-high potential for tourism development. There are presently very little organized tourism infrastructure.

1.5 POTENTIAL IMPACTS AND MITIGATION MEASURES

The project's environmental and socioeconomic impacts have been identified and preliminarily assessed during the scoping process. The assessment has been based on the project information currently available, the baseline information collected to date and the experience gained in similar projects constructed in similar environmental and socioeconomic contexts. Mitigation and management measures have also been preliminarily identified for each impact. The likelihood, magnitude and significance of the impacts identified during the scoping process will be further assessed in the detailed ESIA.

Major environmental, socioeconomic and cultural heritage impacts have been avoided by means of an extensive route assessment which had the aim of selecting a route with the least impacts.

Construction impacts of a pipeline and associated facilities are typically temporary in nature and localised. The main permanent impacts are related to associated facilities. Construction impacts include temporary noise and air emissions from construction machinery, impacts on land use, loss/disturbance of natural habitats (flora and fauna), landscape and temporary impacts to water quality and aquatic habitats during river crossings and near shore marine works. The magnitude and significance of construction impacts will depend on the local conditions. Typically construction impacts can be managed and mitigated efficiently.

The onshore pipeline will be buried and the land will be re-instated to its pre-construction status. The main limitations on land use above the pipeline will be a narrow corridor of maximum 10 m in which the growing of deep routing trees will be restricted, a corridor of maximum 60 m in which the construction of houses will be restricted and a corridor of maximum 200 m in which the establishment of cluster of houses and/or industrial infrastructure is limited. The preferred route was selected to accommodate this criteria and allows sufficient space also for future developments of neighbouring communities. The operation of the compressor stations will generate air emissions and noise and will have an impact on the landscape. The magnitude and significance of these impacts are comparable to those of small co-generation gas power plants. Best practice and mitigation measures will be adopted to minimise operational impacts. Landscape impacts will be managed through the restoration of the original landscape along the pipeline route and through vegetation screening of the permanent structures where required.

1.6 TERMS OF REFERENCE FOR ESIA

TAP will commission a detailed, integrated Environmental and Social Impact Assessment to be conducted in accordance with Albanian requirements on Environmental Impact Assessment and EBRD Environmental and Social Policy (2008). The main ESIA steps include:

- Update and finalise the technical project description as further engineering details become available;
- Conduct additional consultation and further refine the scope of the ESIA as necessary;
- Collect additional baseline data through desktop research and field studies to complete a comprehensive description of the environmental, social and cultural heritage conditions;
- Assess the impacts
- Develop mitigation and enhancement measures and outline an Environmental and Social Management Plan (ESMP) including an approach for monitoring;
- Report findings in a comprehensive ESIA report which will be submitted to the authorities.

To develop a complete understanding of the existing environmental and social conditions of the project's area of influence and assess the impacts, further desktop and field studies will be carried out. These tasks will be performed by an interdisciplinary team of local Albanian and international qualified specialists.

Field studies will include sampling and analyses of soil samples, surface and groundwater, river sediments, marine sediments, air quality and ambient noise levels. In addition environmental (flora, fauna, habitats, vegetation), socioeconomic (stakeholder engagement, household surveys, etc.) and cultural heritage surveys will be performed. Specific offshore surveys will also be performed.

1.7 STAKEHOLDER ENGAGEMENT

Consultation and engagement with stakeholders is an integral part of the Environmental and Social Impact Assessment (ESIA) process. In line with this, TAP has prepared a Stakeholder Engagement Strategy whose overall aim is to ensure that a consistent, comprehensive, coordinated and culturally appropriate approach is taken for consultation and project disclosure. The approach taken by TAP is in full compliance with Albanian EIA Regulations, EBRD Performance Requirements, as well as relevant policies of the IFC and World Bank. TAP intends to undertake a process of stakeholder engagement through project planning, construction, operation and decommissioning. The plan for this engagement, including identification of stakeholders (i.e. people and organisations who have a role in the project or could be affected by the project or who are interested in the project) and disclosure of information, consultation, and handling of suggestions, comments and concerns, is

documented in the Albania Stakeholder Engagement Plan which will be posted on the Project's webpage. This plan will be updated as required as the project progresses.

The Project's ESIA and Stakeholder Consultation Schedule is reported in *Table 1.1* below.

Table 1.1 ESIA and Stakeholder Consultation Schedule

Activity	*Timing*	
	Start	*Finish*
Scoping Document	November 2010	March 2011
Scoping Disclosure to stakeholders	end of March 2011	April 2011
Ongoing Stakeholder Engagement (including Household Surveys)	April 2011	August 2011
Specialist Field Surveys	April 2011	Mid June 2011
ESIA Report Drafting	May 2011	September 2011
Submission of Draft Final ESIA to Authorities		September 2011
Public Consultation and Disclosure of Draft ESIA	September 2011	November 2011
Authority Review of Draft ESIA	September 2011	June 2012
Final ESIA Production	June 2012	August 2012

1.8 PUBLIC COMMENTS AND SUGGESTIONS

An important objective of the ESIA Scoping disclosure process is to allow stakeholders to provide feedback on the Project. In this regard, TAP has envisaged a process that allows stakeholders to address their comments and suggestions in writing to TAP after the scoping meetings have taken place.

In this regard, TAP would like to invite all stakeholders involved in the scoping process, including local communities and the general public, to submit in writing their comments and suggestion concerning the Albanian section of the Trans Adriatic Pipeline (TAP) until 30th June 2011.

Appendix B presents a standard form to facilitate the submission of comments and suggestions in both English and Albanian. Participants to the scoping meetings as well as the general public interested in the project are invited to submit comment forms either via mail or E-mail to the following address:

Trans Adriatic Pipeline AG – Albania (Branch Office)
Torre Drin, Abdi Toptani Street
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1 INTRODUCTION

1.1 OVERVIEW OF THE PROJECT

The Trans Adriatic Pipeline (TAP) is a proposed pipeline in the Southern Gas Corridor that will bring gas from new sources in the Caspian region to Western and South Eastern Europe.

The 520 km pipeline will connect to existing gas networks and start in Greece, cross Albania and the Adriatic Sea and come ashore in southern Italy, allowing gas to flow directly from the Caspian basin into European markets. TAP's shareholders are Swiss EGL (42.5%), Norwegian Statoil (42.5%) and German E.ON Ruhrgas (15%).

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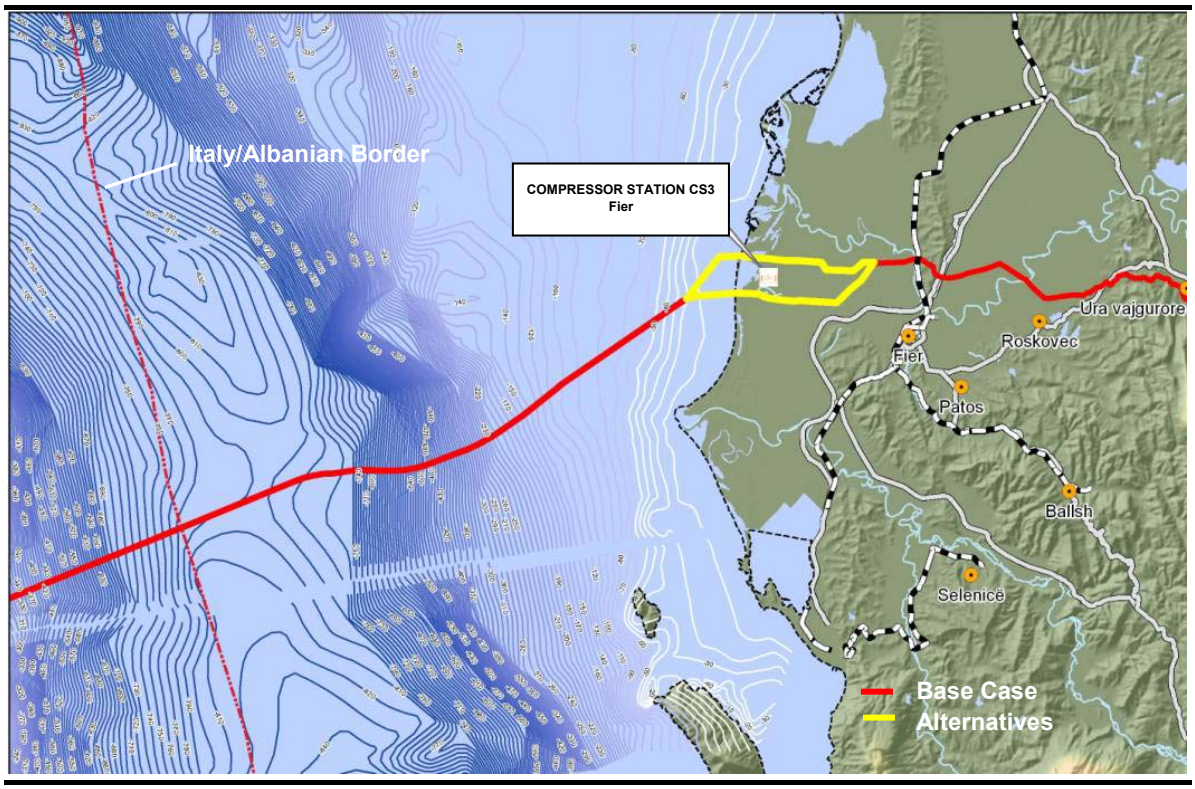


The base case route of the TAP in Albania is defined as a 2 km wide corridor at this stage of the project (red line in *Figures 1.1* and *1.2*). The corridor has been selected following an extensive and thorough alternatives route assessment process performed by TAP in 2009/2010 with the aim to select a technically feasible pipeline route with the least environmental, socioeconomic and cultural heritage impacts (please see *Section 3*). The route refinement process has been completed for most of the base case route with the exception of an approximately 30 km long section between the Albania/Greek border and Vithkuq and the westernmost section of the route between Fier and the coastline (see yellow lines in *Figure 1.1*). Similarly, the exact location of the compressor station near the coast (CS3) and the landfall alternatives are currently still under investigation (see *Section 3* for the location of the options).

This report presents the outcomes of the Environmental and Social Impact Assessment (ESIA) Scoping Process performed for the TAP Project. The overall ESIA process adopted by TAP and details of the scoping approach are presented in the following sections.

For the purpose of this scoping report the project comprises the base case route, the two route alternatives, the landfall options and the optional locations for CS3. Once the route refinement has been completed the detailed ESIA will be performed on the selected options only.

1.2 ESIA PROCESS

1.2.1 Introduction

TAP's overall approach to ESIA will be in compliance with Albanian regulations and will be performed in line with the requirements of the European EU Directive and applicable international standards, as embodied in the European Bank for Reconstruction and Development (EBRD) Performance Requirements (PR1-10) (see *Section 2.2*).

The first step in TAP's ESIA process was to conduct an assessment of the possible route alternatives across Albania. The alternatives assessment commenced in early 2009 and ended in 2010 with the selection of a preferred alternative. The assessment was based on technical, environmental, socioeconomic and cultural heritage criteria with the aim to identify a technically feasible alternative with the least environmental, socioeconomic and cultural heritage impacts. Once the preferred alternative had been identified and validated and endorsed by all stakeholders in late 2010, TAP commenced the Scoping process with the aim to define the required scope of the ESIA. This report presents the findings of this activity.

Since the commencement of the alternatives assessment process TAP has engaged with stakeholders with the aim to seek the views of interested parties so that these can be taken into account in the project design and

implementation. This process continued throughout the scoping process (see *Section 8*) and will continue throughout the Project life cycle.

Figure 1.3 graphically presents the ESIA process. The scoping phase and ESIA activities are briefly described in *Table 1.1.*

Figure 1.3 Schematics of the ESIA Process

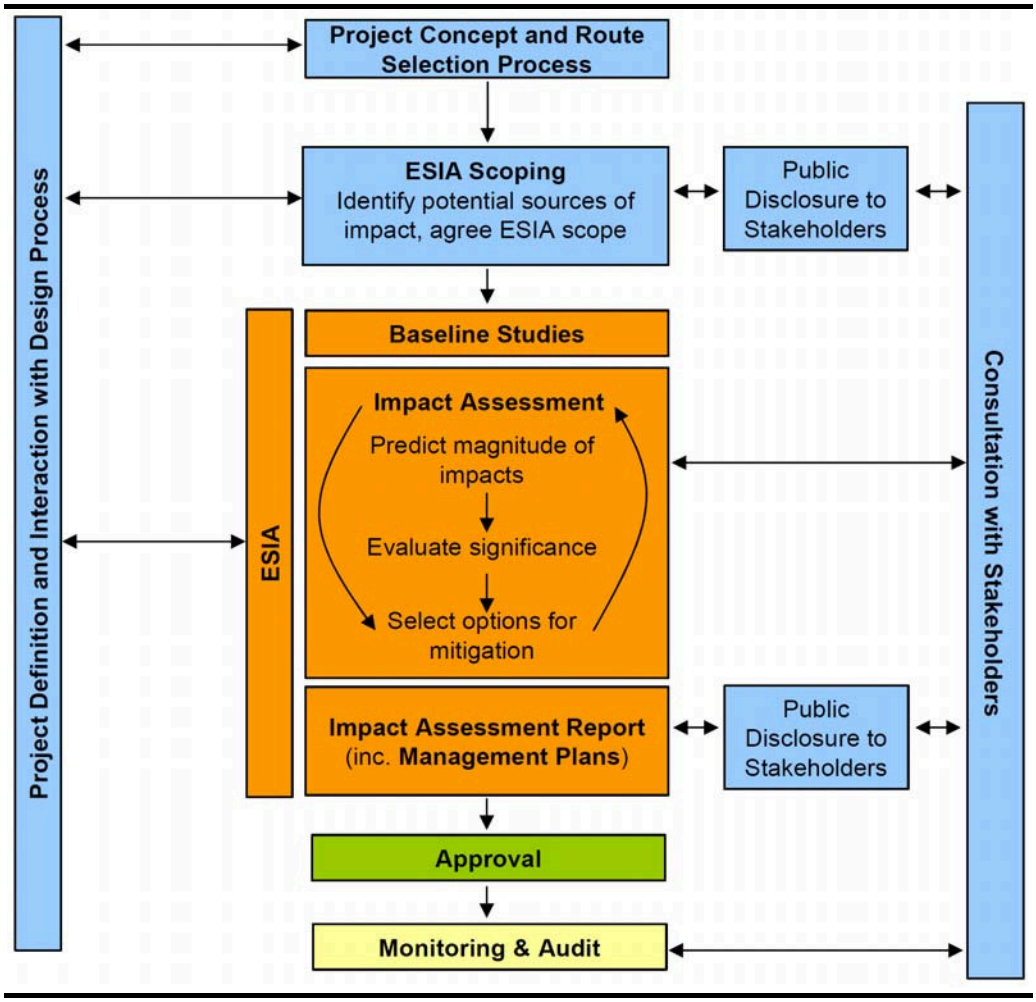


Table 1.1 Summary of the ESIA Process

Step	*Description*
Screening	In the Albanian EIA screening is required to determine the project requires a summary EIA or a detailed EIA (see *Section 2.1*)
Scoping	Scoping identifies the key issues to be addressed in the ESIA. Scoping, as presented in this report, will ensure that the process is focused on the potentially significant environmental and social impacts which may arise from the project. It will take into account the results of consultations undertaken to date on the project. Ultimately scoping defines the scope of work of the ESIA, including stakeholder engagement.
Baseline Studies	For the key issues identified in scoping, available information on the existing environmental and social conditions (also referred to as baseline conditions) will be gathered. This will be supplemented by field studies and surveys where necessary. The future development

Step	*Description*
	of the baseline conditions in the absence of the project will also be considered.
Impact assessment and mitigation measures	This stage is focused on predicting environmental and social changes from the baseline as a result of the project's activities (considering the entire lifecycle of the project). Each impact will then be evaluated to determine its significance for the environment and society. Where necessary measures will be proposed to mitigate significant impacts.
Environmental and social management plans	The various mitigation measures will be presented in an Environmental and Social Management Plan (ESMP), describing how measures will be implemented throughout the different project phases. The ESMP will detail the resources and responsibilities for implementation, the timing and monitoring and audit plans to ensure all the mitigation commitments are met. It will also identify any requirements for training and other capacity building. The ESMP will include a Livelihood Restoration Plan and a Resettlement Action Plan detailing how land acquisition and easment will be managed in accordance with TAP policy and international good practice.
Stakeholder Engagement and Consultation	During the ESIA studies the team will seek the views of interested parties so that these can be taken into account in the assessment and reflected in the proposals for mitigation. Once complete, the ESIA Report will be subject to public disclosure and consultation. Comments will be taken into account in revising the final ESIA Report and ESMP.

1.2.2 Approach to Scoping

Scoping for this project has been approached as a communication, disclosure and consultation process, in which the project proponent, its consultant and different stakeholders exchange information with the aim of mutual understanding and setting up of the ESIA process and subsequent steps as outlined above.

It must be noted that since the early stages of inception and design of the project, up to the present stage, several activities involving communication and information exchange with different stakeholders have already taken place, which are part of the mentioned Scoping process. These activities are further detailed in subsequent sections of this report and will continue throughout the life cycle of the project.

This Scoping Document is part of the formal process of Scoping and its objective is twofold:

a) Serve as a basic documentation for the scoping process, compiling and summarising relevant and available project information at the time of formalising the process. The timing of Scoping must find a balance between having sufficient information as to make it meaningful, and being early enough so that it can influence project design, if necessary.

The Document will be distributed amongst stakeholders so that they can issue informed comments.

b) The primary output of the scoping process will be a final Scoping Report, which will refer and include all the comments made by the different consultees and determine the final scope and contents of the full ESIA itself, taking in account the input from all stakeholders, and the specific requirements of the Albanian Authorities.

1.3 SCOPING REPORT STRUCTURE

The remainder of this report is structured as follows:

Section 2 -Regulations and Guidelines: provides a brief overview of the relevant Albanian and International ESIA regulatory framework and international best practice with regards to scoping;

Section 3 –Description of Selected Options: summarises the alternatives route assessment performed by TAP in order to select the 'base case' route;

Section 4 –Project Description: describes the main components of the project and the main construction, pre-commissioning, operation and decommissioning activities;

Section 5 –Baseline Conditions: provides an overview of the baseline environmental, socioeconomic and cultural heritage characteristics of the Study Area;

Section 6 –Potential Impacts and Mitigation Measures: summarises potential significant environmental, socioeconomic and cultural heritage impacts and provides an indication of potential mitigation and management measures;

Section 7 –Terms of Reference of the ESIA: presents the proposed terms of reference, the structure of the detailed ESIA and a tentative schedule of the ESIA activities;

Section 8 –Stakeholder Engagement: presents the proposals for consultation with identified external stakeholders, including affected communities, who may have an interest in the project during scoping. The section also summarises the consultation activities undertaken earlier in the ESIA process.

Appendix A-Maps: Maps 1-5 represent the main technical, landuse, environmental, socioeconomic and cultural heritage characteristics of the onshore base case route respectively. Map 6 represents the offshore routes and Map 7 represents all the onshore route alternatives.

Appendix B- Comments Form – form to be used to provide comments and feedback on the scoping report.

Appendix C –List of stakeholders

Appendix D- ESIA Action Plan – presents the list of studies (baseline and modeling) to be performed during the ESIA and the timing of the activities.

Appendix E- References

2 REGULATIONS AND GUIDELINES

2.1 ALBANIAN LEGAL FRAMEWORK ON EIA

The legal framework for Environmental Impact Assessment (EIA)[1] procedure in Albania is based on *Law No. 8990 on Environmental Impact Assessment*, approved on January 23, 2003. The complete legal framework is provided in *Table 2.1.*

The procedure for the Environmental Impact Assessment in Albania can be summarised in the following three phases:

- Screening: the applicant shall provide a preliminary description of the project to the Regional Environmental Agencies (REAs), in order to define whether the project requires a summary EIA or a detailed EIA;
- Local Consultation Phase: aimed at the acquisition of the formal "no objection" statement by the local government (Municipalities and Communes). This process includes the following steps:
  - The proponent sends a non technical summary of the EIA and the preliminary authorisation by METE to the local governments
  - The Commune/ Municipality organises a Public Consultation event
  - The Council of the Commune/ Municipality expresses an opinion on the project.
- Approval by the Ministry of Environment, Forests and Water Administration (MEFWA):
  - The application for the EIA permit is submitted to the National Centre for Licensing which forwards the documents to the Directorate of Environmental Permitting and Licensing at MEFWA
  - MEFWA forwards the documents to the REAs who evaluate the documents, perform field surveys and prepare their opinion on the project including specific permitting requirements
  - In consideration of the opinion of the REAs, the MEFWA issues the permit and sends it to the NCL which then transmits it to the applicant.

(1) [1] The Albanian legislation refers to EIA and not ESIA. If references are made to the Albanian procedure the acronym EIA will be used. If references are made to TAP's broader approach the acronym ESIA will be used.

Table 2.1 Albanian Legal Framework on Environmental Impact Assessment

Reference	*Year*
Law no. 8990, dated 23.1.2003 "On environmental impact assessment" as amended by Law no.10050, dated 24.12.2008;	2003
DCoM no. 249 dated 24.4.2003 "On the approval of the documentation for an environmental permit and environmental permit elements";	2003
Order No.6, dated 27.12.2006, "On the approval of methodology for the preliminary environmental impact assessment of an activity"	2006
DCoM no.538, dated 26.05.2009 "On the licenses and permits handled by / or through the National Licensing Centre";	2009
Order of Minister no.429, date 17.11.2009 "On the rules and procedures for environmental permit"	2009
Instruction of Minister no.1, dated 03.03.2009 "For the duties of environmental entities to ensure the public participation and environmental NGO's in the process of environmental impact assessment"	2009
Instruction of Minister No. 2, dated 29.6.2010 "On the necessary documentation to request an environmental permit"	2010

2.2 EBRD PERFORMANCE REQUIREMENTS ON ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

TAP has adopted EBRD Performance Requirements (PRs) as the international reference standard for their social and environmental strategies.

The TAP project should be classified as Category A according to EBRD criteria, and as such a special formalised participatory assessment process is required according to EBRD Standards. The process should include:

- A comprehensive Environmental and Social Impact Assessment in compliance with PR 1 Environmental and Social Appraisal Management and PR 10 Information Disclosure and Stakeholder Engagement[1].
- An examination of the technically and financially feasible alternatives and the rationale for the alternative selection.
- Also addressing PRs 2 and 4 the ESIA should identify the issues related to potential risks related to community health, safety and security, as well as labour and working conditions
- An assessment of involuntary resettlement issues according to PR 5 Land Acquisition, Involuntary Resettlement and Economic Displacement
- The sustainable use of the natural resources and the protection of biodiversity will have to be considered as instructed by PR 6
- An assessment of impacts on cultural heritage according to PR 8 Cultural Heritage.

Also the following PRs can be mentioned at this stage:

[1]EBRD's definition of Stakeholder: Individuals or groups who (i) are affected or likely to be affected (directly or indirectly) by the project ("affected parties"), or (ii) may have an interest in the project ("other interested parties")

PR2 - Labour and Working Conditions: This PR applies more to organizational and operational issues, however in so far as some aspects are an integral part of an ESIA, they will be addressed in all relevant sections of the ESIA, and in particular in the ESMP.

PR3 - Pollution Prevention and Abatement: This PR has and is permeating TAP engineering design, and thus, will be feeding all the ESIA process

With respect to the Albanian requirements for the ESIA, the application of EBRD standards requires the following additional processes:

- *Scoping*: a process by which stakeholders are consulted to contribute to the identification of key issues to be investigated as part of the ESIA. This *Scoping Document* is prepared in application of this requirement.
- *Stakeholder Engagement Plan*: a comprehensive approach to the communication and consultation with the identified stakeholders throughout the whole project lifecycle.
- *Focus on Social Issues*: whereas the Albanian legislation mainly refers to environmental impacts the EBRD approach also focuses on the identification of impacts on the impacted communities and subsequent definition of necessary mitigation measures.

2.3 ESIA RELATED INTERNATIONAL CONVENTIONS/AGREEMENTS

In relation to ESIA process, Albania has ratified both Aarhus and Espoo international conventions (see *Table 2.2)*. Compliance with public participation requirements defined by Aarhus convention will be fully covered by TAP through the compliance with Albanian legislation and EBRD standards.

The approach to compliance with Espoo convention will be defined through collaboration with the three involved States (Albania, Greece and Italy).

Table 2.2 International Conventions and Agreements Signed/Ratified by Albania in Relation to the ESIA Process

Convention name	*Ratified by Albania*
• Espoo Convention (1991): Convention on Environmental Impact Assessment in a Transboundary Context	12/05/2006
• Aarhus Convention (Convention on Access to Information (1998) Public Participation in Decision-making and Access to Justice in Environmental Matters	27/06/2001

3 DESCRIPTION OF SELECTED OPTIONS

3.1 INTRODUCTION

The route of the TAP in Albania has been selected following an extensive and thorough alternatives route assessment process performed by TAP with the aim to select a technically feasible pipeline route with the least environmental, socioeconomic and cultural heritage impacts. As a result of the assessment process, Alternative 6 was selected as the preferred corridor (see *Section 3.2*).

Upon the selection of the preferred route (or 'base case') a process of route refinement commenced with the aim to optimise the route, particularly through those sections which present greater technical, environmental, socioeconomic and cultural heritage challenges. The route refinement process of the base case has been completed for most of the route with the exception of an approximately 30 km long section between the Albania/Greek border and Vithkuq and the westernmost section of the route between Fier and the coastline (see yellow lines in *Figure 1.1*). Similarly, the exact location of the compressor stations CS3 and CS2 and the landfall alternatives are currently still under investigation. Currently there are 4 optional landfall locations still being investigated (Landfalls A – D, see *Figure 3.2*) and three locations for CS3 (Options 3, 5 and 6 – see *Figure 3.1*). Due to the presence of unexploded ordinance dumping grounds and slope instability the southern route of the offshore alternatives was chosen as the base case route. The offshore base case route currently makes landfall at Landfall C, however the refinement of the landfall route is still ongoing and as such the nearshore section may be re-routed once the preferred landfall is selected.

3.2 ONSHORE

3.2.1 Background

A Feasibility Study of the TAP was first performed between 2003 and 2005 with the objective of identifying a best suitable corridor from south-eastern Europe to Italy. The starting point of TAP was identified in Thessaloniki in Greece as the eastern most point within the Balkan region. The landfall of the offshore crossing of the Adriatic Sea was initially foreseen to be north of the city of Vlore.

Based on initial stakeholder consultations during the Basic Engineering Phase (July'06- April'07) the landfall on the Albanian Adriatic coast was shifted further northwards to the Hoxhara plain, west of the city Fier. Accordingly the route corridor branched off from the initially foreseen corridor near Kalivac/Shkoza towards northwest following mainly the Vjosa River (see *Appendix A – Map 7)*. This phase resulted in the confirmation of the route

corridor evaluated previously during the Feasibility phase. This route crossed the Hotova Fir-Dangelli National Park[1].

While technically feasible, this route would run for 27 km through the National Park, 7 km through its core zone, and require the construction of 25 km of new access roads within the National Park.

Following conditions set forth by the Albanian government (CRTRA Decision 1, 14/8/2007) and international best practice[2], TAP reviewed its routing in 2008 and conducted in 2009-2010, in line with the Albanian Environmental Impact Assessment Law (No. 8990, 23/1/2003[3]), an Assessment of Alternatives. The findings of the alternatives assessment study performed between 2008 and 2010 are reported in Alternatives Assessment Albania and its appendices (*ref. 1, Appendix E*).The objective of this process was threefold:

- Identify the optimal route;
- Identify options and measures to avoid and/or minimise residual environmental, social and cultural heritage impacts; and
- Engage with national, regional and local authorities and the populations at large.

Desktop studies started to assess technically feasible alternative route corridors in the Hotova Region (see *Appendix A – Map 7*). The aim of the studies was to identify an alternative route that would avoid the National Park and would have the least environmental, socio-economical and cultural heritage impacts. The limiting factors in identifying technically feasible alternatives in the Hotova Region were the extensive geological instabilities (mainly landslides) and the morphological restrictions (small ridges, narrow valleys, high mountains).

During 2009 a total of 6 alternative corridors were identified in the Hotova Region. Two of the six alternatives (Alternatives 5 and 6) were designed to completely bypass the National Park to the North. Another technically feasible route (Alternative 3) was identified by-passing the core zone of the National Park but still crossing the Sustainable/Traditional Use Zones of the National Park (see *Appendix A – Map 7*).

[1] This park is also known as the Hotova's National Park and Bredhi Hotovës National Park. and is often referred to in the text as 'National Park'

[2] EU Habitat Directive (92/43/CEE) Article 6 specifies that to be allowed to impact on a protected area, a project "must document that the alternative put forward for approval, is the least damaging for habitats, for species and for the integrity of the site etc., regardless of economic considerations, and that no other feasible alternative, exists that would not affect the integrity of the site." In addition, TAP's Policy on Corporate Social Responsibility contains the commitment that TAP will "assure that adverse impacts on people, their rights, livelihoods, culture and environment are avoided or, where avoidance is not possible, minimised, mitigated, offset and/or compensated".

[3] Art. 9 of the Law 8990/2003 requires to include in the Environmental Impact Assessment Report "Procedures and reasons of selection of site where project will be implemented, description of at least two additional options of location of project" as well as "Potential negotiations plan with local government organs, the public and environmental non-for profit organisations during the phases of planning, review and implementation of the project".

Subsequently routes to the east and west of the Hotova Region for Alternative 3 and 6 were studied, completing the assessment for the entire onshore Albania. The alternatives were assessed within a 2 km wide corridor (1km at either side of the central line). The outcomes of the interdisciplinary alternatives assessment study in Albania lead to the identification of two technically feasible route alternatives for which the main environmental, socioeconomic and cultural heritage aspects were identified. The alternatives are (*Appendix A – Map 7*):

- The northern route Alternative 6;
- The southern route Alternative 3.

Environmental, socioeconomic and cultural heritage aspects and constraints associated with the logistic sites (yards, camp sites, etc.) and access roads proposed for Alternative 3 and 6 were also included in the appraisal. The information was drawn from a desk top study performed in a stand alone document called Logistic Study Albania (*Ref. 2 – Appendix E*).

3.2.2 Methodology

The technical, environmental, socioeconomic and cultural heritage baseline characterisation and appraisal of the alternatives was conducted through a combination of desk top studies and field surveys. For each alternative a 2 km wide corridor (1 km either side of the proposed route) was investigated.

Once the technical, environmental, socioeconomic and cultural heritage characteristics of each Alternative were established, 'impact indicators' for each discipline were used to highlight the key potential features of the alternatives that could be related to key potential impacts of a standard gas pipeline project and also on the specificities of the study area (i.e. based on the findings of the desk study and field survey). The use of these indicators ultimately allowed the comparison and the identification of relevant differences and similarities among the Alternatives under study.

3.2.3 Findings of Alternatives Assessment

Of the 6 alternatives, the following 4 were discarded due to the following reasons:

- Alternative 1 was found not to be feasible from a construction perspective as it crosses several active landslides.
- Alternative 2 was found to be unable to avoid impacts on the core zone of the National Park as it would need to be built partly along the borders of the core zone where construction and new access roads would cause irreversible changes to the protected and sensitive landscape and forest habitats.
- Alternative 4 aimed to avoid the core zone and reduce the overall impacts on the National Park while using the most direct connection between the Albanian highlands and the Vjosa Valley. The assessment concluded that

this routing was technically not feasible as it crosses some active landslides and follows for 8 km the bed of the Osumi River.

- Alternative 5 had the objective to provide a routing completely outside the National Park, but field investigations concluded that this route is technically not feasible due to a large number of active landslides and the need to follow the Osumi river in its bed for 8 km.

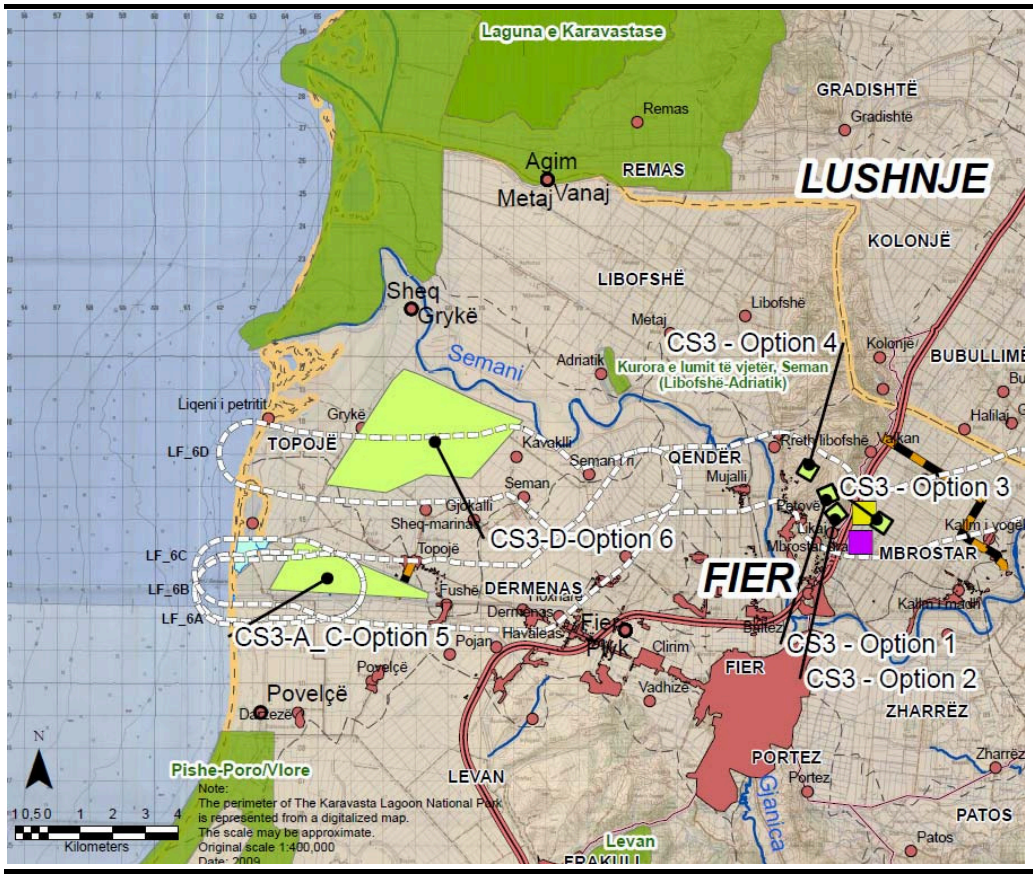
Consequently, only Alternative 3 and 6 were considered as the preferred alternatives and were subject of a more detailed assessment. Both alternatives were found to be technically feasible and face similar challenges in view of safety, social and cultural heritage impacts. Alternative 6 faces fewer challenges in terms of environmental impacts and interferences with official planning zones. On the other hand, the construction of Alternative 3 would not be able to comply with Albanian and EU legislation due to its impacts on the Hotova National Park as it crosses the Park's Sustainable/Traditional Use Zones for 18 km.

As a result of the outcomes of the alternatives assessment, TAP decided to use Alternative 6 as the base case routing for its further planning and approval process in Albania.

3.2.4 Compressor Stations

Six optional locations have been identified for CS3. Of these six, three locations were positioned on the Ardenica hill to ensure the soil's bearing capacity and stability (CS3 Options 1, 2 and 4). Due to technical (extensive earthworks and lack of space), environmental (area of high landscape value) and socioeconomic (permanent crops) aspects the three sites were discarded. Currently three options are still under investigation: CS3 Options 3, 5 and 6 (see *Figure 3.1*).

Figure 3.1 CS3 Optional Locations



3.3 OFFSHORE AND LANDFALL

3.3.1 Introduction

An iterative review process was used for the selection of the offshore route, which can be characterised as a review of one or more potential pipeline corridors. The selection process was primarily performed through the evaluation of constraints, the bathymetry of the area and the desire to establish the shortest possible connection between the starting and the end points (landfalls).

During this process each alternative corridor was reviewed in a series of desktop and site investigations during which the constraints along the routes were identified and evaluated, against the evaluation of options of appropriate design and construction methods. The following aspects have been taken into account for offshore routing:

- Protected Areas
- Marine habitats of high ecological value (e.g. seagrass);
- Archaeological sites;
- Military areas;
- Fishing areas;
- Anchorage areas;
- Geo-hazards (e.g. sub-sea landslides);

- Landfall constraints;
- Touristic areas;
- Existing offshore installations (e.g. platforms, pipelines, sub-sea wells, cables).

3.3.2 Route Selection Process and Results

The offshore route selection process initially led to the identification of three macroscopic route corridors for connection between Albania and Italy. The onshore route selection process in Albania was the main driver for both the landfall and the offshore corridor. Ultimately the location of the onshore route determined the approximate location of the Albanian landfall and thus the offshore corridor.

The next step in the route selection process was analysing the constraints for the selected corridor. The main constraint for the offshore routing was the dumping grounds of unexploded ordinance resulting from the end of 2nd World War which were disposed of on the seabed e.g. torpedoes, sea mines, bombs, etc. (also referred to as UXO) (see *Map 6 - Appendix A*). From an assessment of the constraints it becomes evident that the offshore route needs to go either north or south of the dumping grounds.

Several alternatives were thus generated, both north and south of the dumping grounds. Due to slope stability differences on the Albanian side, expected to be better on the southern route, and the landfall location alternatives in Italy, the southern route was chosen as the preferred corridor by TAP.

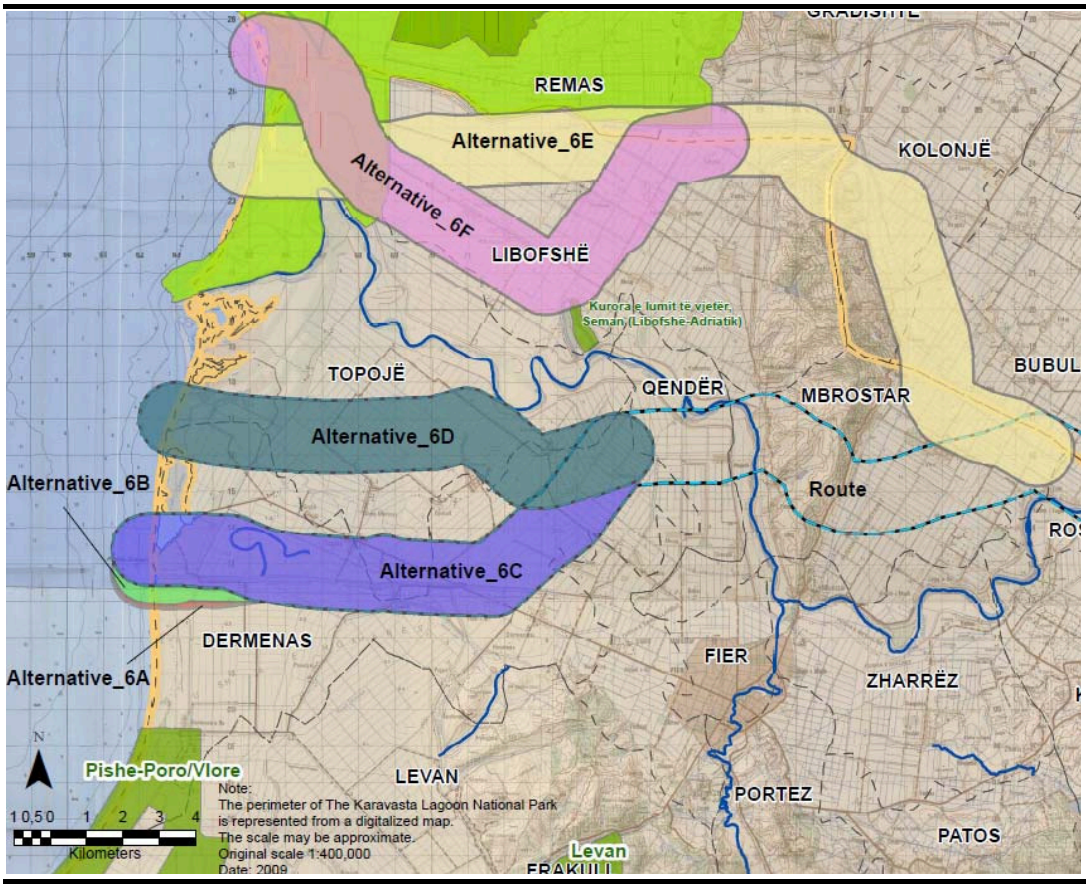
3.3.3 Landfalls

The route selection process in Albania was driven by the technical feasibility of both onshore and offshore sections as well as the shortest and shallowest crossing point of the Adriatic Sea between Albania and Italy. Once the area around Fier was identified a selection of suitable landfall sites was carried out using multi-disciplinary criteria with the aim of avoiding interferences with:

- Protected Areas
- Areas of high ecological value (onshore and offshore);
- Known cultural heritage sites;
- Areas of high archaeological potential;
- Military areas;
- Touristic areas;
- Fishing grounds;
- Areas with known contaminated sediments;
- Villages/towns/settlements.

All landfall alternatives identified and assessed are presented in *Figure 3.2*.

Figure 3.2 Landfall Alternatives



The desk top and field investigations determined that Alternatives F and E fall within the extended boundaries of the Karavasta Lagoon protected area (Ramsar Site) and as such were discarded. Alternatives A, B and C are in proximity of the Hoxara channel which is characterised by oil contamination from the oil fields around Fier. During the field surveys visible signs of contamination were observed on the beaches close to the channel. As a result alternatives A, B, C and D are still under investigation.

4 PROJECT DESCRIPTION

4.1 INTRODUCTION

4.1.1 General Description

The TAP in Albania will consist of an approximately 200 km onshore section from Greece/Albanian border to the Adriatic coast and an approximately 60 km offshore pipeline from the coast to mid Adriatic Sea. The onshore pipeline will be 48 inches (1.219 m) in diameter whilst the diameter of the offshore pipeline will be reduced to 42 inches (1.067 m).

The pipeline will be made of welded steel pipe sections which will range between 8 and 18 m in length. The steel pipe sections will be coated both inside and outside. The internal coating will be an epoxy resin which reduces friction, whilst the external coating will be 3-layer polyethylene to protect the pipeline from corrosion Some of the pipeline sections will be additionally coated with reinforced concrete to protect the pipe from external damages. The entire pipeline will be protected against corrosion by a cathodic protection system.

The onshore section of the pipeline will be buried underground for the entire length. For safety reasons and in order to minimise impacts to existing land uses (e.g. agricultural) the buried pipeline will have a soil cover of minimum 1 m. Greater depth will be required when crossing existing infrastructure (see *Section 4.2.1*). The offshore section will be laid on the seabed with the exception of the shallow water section (between 0 and 10 m depth) which will be buried at depths exceeding 2 m. At the landfall burial depth is expected to be up to 4 m.

The pipeline transportation capacity may be increased from an initial throughput of 10 BCM/year to 20 BCM/year. For the 10 BCM phase only two Compressor Stations (CS1 in Greece and CS3 in Albania) are required. The third Station (CS2) shall be added to increase the throughput from 10 BCM to 20 BCM.

The TAP pipeline will be designed for a technical life time of 50 years. The design life for equipment and piping of the stations is 20 years. The design shall assure that the gas transport system fulfils all safety requirements of the base European Codes and Standards.

The onshore section of the pipeline shall have a design pressure of 95 barg (bars above atmospheric pressure), which shall be sufficient for the TAP capacity base case of 10 BCM/y and potential future extension of the TAP System capacity to 20 BCM/y. The final design pressure will be defined after finalisation of an iterative engineering process considering all relevant parameters.

Compressor stations and block valve stations shall be designed to European codes, except where specific equipment is designed to other standards nominated in the respective functional specifications. Design and construction of civil structures and buildings shall be according to National Codes, the Eurocodes, European Standards and TR1827. Fire design and protection of structures shall be according to the International Building Code (IBC).

Project details will be further developed and defined in the next steps of the design. The following *Sections 4.2* and *4.3* provide information on the construction, pre-commissioning, operation and decommissioning methods that will be used for the onshore and offshore section of the project.

4.1.2 Safety

A preliminary risk assessment of the onshore pipeline route was performed with the aim of verifying the pipeline safety. Approximately 20% of the route crosses populated regions. The preliminary assessment determined that the route was feasible with respect to safety of the pipeline and the nearby population. In a few denser populated sections a potential for route optimisation was identified in order to further reduce proximities to settlements. Furthermore, the most populated sections identified are relatively short, enabling efficient technical risk mitigation to be applied where needed or required.

For the offshore pipeline section a risk assessment has been performed to confirm safe operation in accordance with the safety policy established by TAP. The risk assessment focused on damage to the offshore pipeline by external impacts (anchors, geohazards, etc.) and the resulting risk related to third parties (persons onboard ships operating in the vicinity of the pipeline).

4.2 ONSHORE

4.2.1 Introduction

The onshore TAP project in Albania consists of the following main components:

- Approximately 200 km onshore pipeline;
- 6-7 Block Valve Stations (depending on final layout);
- 2 Compressor Stations CS2 and CS3;
- A 2.5km long tunnel of approximately 4 m in diameter;
- Associated facilities required during construction (access roads, camps, yards, etc.).

4.2.2 Pipeline Construction

The onshore pipeline will be assembled in a conventional way by a construction spread that follows along the pipeline corridor. First, the top soil is stripped away and stored separately, and then a trench is excavated. Individual 8 to 18 m long joints of pipe are then welded to the pipeline string which is subsequently lowered into the trench. The soil is placed back into the trench and the landscape reinstated while the construction spread moves forward.

In flat soft terrain the average construction progress will be up to 600 m/day, in hilly or mountainous regions the average progress will be between 300 and 450 m/day whilst in difficult sections like steep slopes and rock the average progress could be as low as 50m/day.

For communication and data exchange during operation, a fibre optic cable will be laid alongside the pipeline within the pipeline trench. Specialised techniques will be used for crossing of roads and railways. The crossing of main roads/highways, railways and larger channels may require the use of trenchless methods (e.g. horizontal drilling). Whether performing an open-cut or a trenchless installation, the pipeline shall be installed at least 2-3m below the existing infrastructure to be crossed.

The standard onshore pipeline construction, applicable along most parts of TAP, has the following main elements:

- The working strip requires a width of approximately 40 m. The fertile top soil (typically 0.3-0.5 m thick) will be stripped off over a width approximately 22-24 m. The top soil is temporarily stored on one end of the working strip (see *Figure 4.1*).

- The non-fertile "sub-soil" obtained from the pipeline trench excavation will be stored on the opposite side of the working strip. Fertile top soil must be re-deposited on top of the non fertile soil to assure adequate crop- or vegetation growth.

- The width of the working strip must provide room for pipeline fabrication (pipe stringing and welding, protective coating and quality testing of the fabricated pipeline section, lowering into the trench), and for simultaneous vehicle movements, both to happen in a safe manner.

In areas where there are construction constraints (e.g. environmental or land use constraints) and in general where limited room is available, the working strip may be reduced from 40 m to 30 m (see *Figure 4.2*).

Figure 4.1 Regular Working Strip

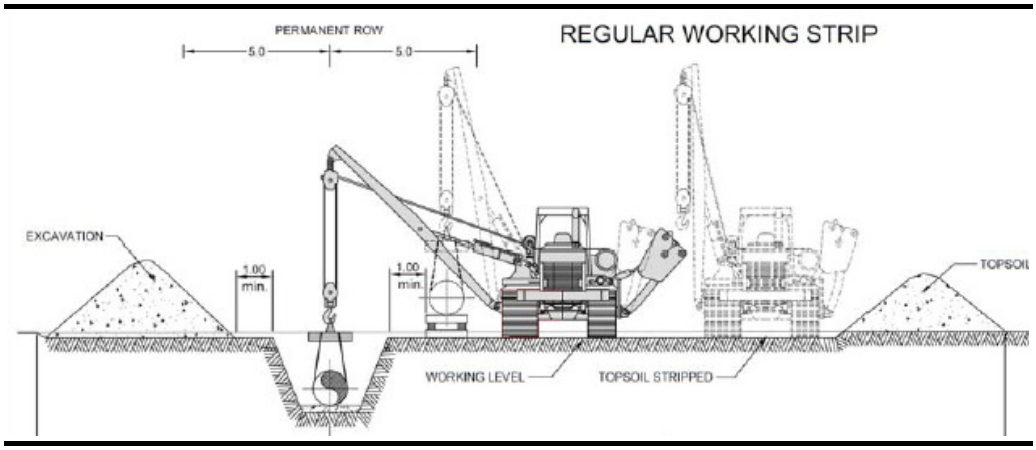
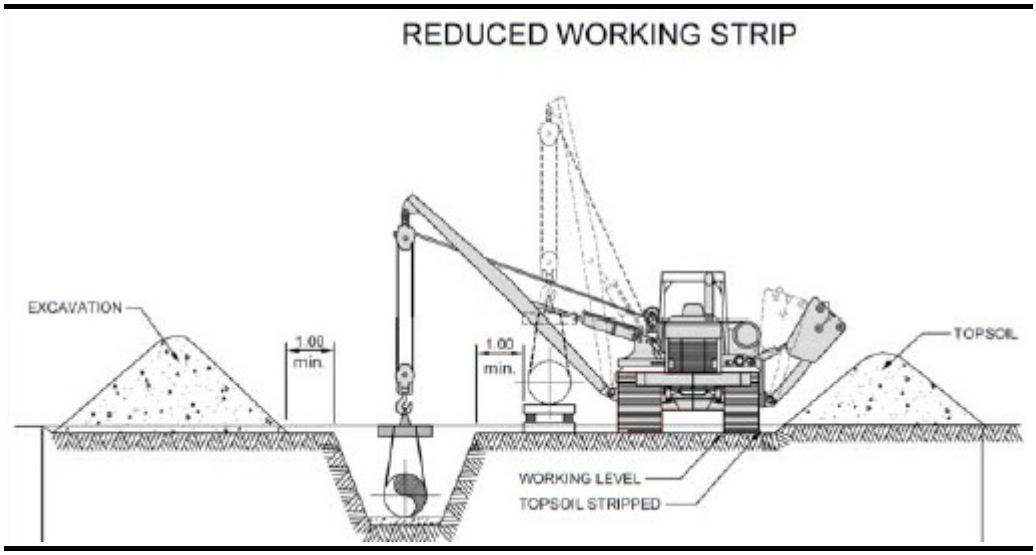


Figure 4.2 Reduced Working Strip



The main limitations on land use above the pipeline will be a narrow corridor of maximum 10 m in which the growing of deep routing trees will be restricted, a corridor of maximum 60 m in which the construction of houses will be restricted and a corridor of maximum 200 m in which the establishment of cluster of houses and/or industrial infrastructure is limited. The preferred route was selected to accommodate this criteria and allows sufficient space also for future developments of neighbouring communities.

The pipeline crosses 1 highway, 7 major roads, 30 secondary roads, 228 carriage ways and tracks and 1 railroad. In addition, it requires 26 river crossings, including 14 major rivers. Where necessary, construction methods that avoid interferences or visible long term impacts will be used in order to minimise impacts on traffic and the environment.

Block Valve Stations

To enhance pipeline safety, the pipeline will have 6 block valve stations. With these valves the operator can isolate any segment of the line for maintenance work or isolate a rupture or leak. The block valves are unmanned and contain a small building with a fence around them to avoid any interference, covering a total surface area of approximately 20x30m. In line with international best practice, these stations will be installed in regular intervals of around 30km and the main equipment of such station will be installed underground.

Compressor Stations CS2 & CS3

The compressor stations are required to transport the gas by increasing the pressure. In the specific case of the compressor station near Fier, the diameter reduction for the offshore section from 48" to 42" (from 1.219 m to 1.067 m) requires an additional pressure increase.

A typical compressor station consist of: 1 – Pipe Inspection Gauges (Pig) traps; 2 – Filters; 3 – Fuel gas heaters; 4 – Turbine-Compressor buildings; 5 – Gas coolers; 6 – Control building and 7 – Maintenance building & Warehouse (see *Figure 4.3*).

Figure 4.3 ***Compressor Station - Typical Layout***

CS3

The compressor station will mainly comprise facilities for gas treatment (filter separators), metering, compression and cooling. The size of the land plot required for the compressor station is estimated to be approximately 100 ha. The surface area required for the buildings of the compressor station is approximately 2 ha. The remaining portion of the 100 ha area will remain empty as the compressor station will be positioned within this plot to ensure sufficient distance from other buildings or infrastructure.

Filter separators will be used to clean the gas from deposits with might occur in the pipeline upstream of the metering runs. After cleaning and metering the gas will be compressed to the required pressure. For the pressure increase the installation of gas turbine driven turbo compressors is planned. For the 10 BCM/y case gas turbines of the 15 MW class will be used. In case of extension to 20 BCM/y, compressors with gas turbines of the 25 MW class will be added. The fuel for the gas turbines is natural gas taken from the gas pipeline. Exhaust gas from each gas turbine will be discharged to the atmosphere via a dedicated stack per gas turbine of approximately 40 m height. A venting stack of approximately 70 m is also envisaged. After compression the gas will be cooled down to 50 °C via air cooled heat exchangers. Filter separators, metering runs and a gas cooler will be installed as free standing facilities, whereas the compressors and gas turbines are installed in buildings. Currently buildings each with two compressors are foreseen. Further additional buildings are required, such as control, electrical, workshop and administration buildings.

Power consumption of the compressor station is approximately 2,000 kW with medium voltage. The electrical connection of the compressor station will be considered in the site selection of the station. Independently from this, each station will be equipped with a diesel engine to provide the power in case of loss of energy from the external source. Currently the installation of a combination of gas turbine and steam turbine driven turbo compressors is under investigation. In this case the lost heat from gas turbine driven compressors will be used to produce steam. This steam will then be used to drive one or more steam turbines connected to a turbo compressor for gas compression. Within this alternative the gas turbine driven compressors will be equipped with a heat recovery boiler. Furthermore a water treatment plant and steam recovery cooler are required.

CS2

The compressor station will mainly comprise facilities for gas treatment (filter separators) and metering. However the size of the plot shall give the opportunity to install also compression and cooling facilities which are required to transport 20 BCM/y gas. Like CS3 the size of the plot of land required by the metering/compressor station is estimated to be approximately 100 ha. The surface area required for the buildings of the compressor station is approximately 2 ha. The remaining portion of the 100 ha area will remain empty.

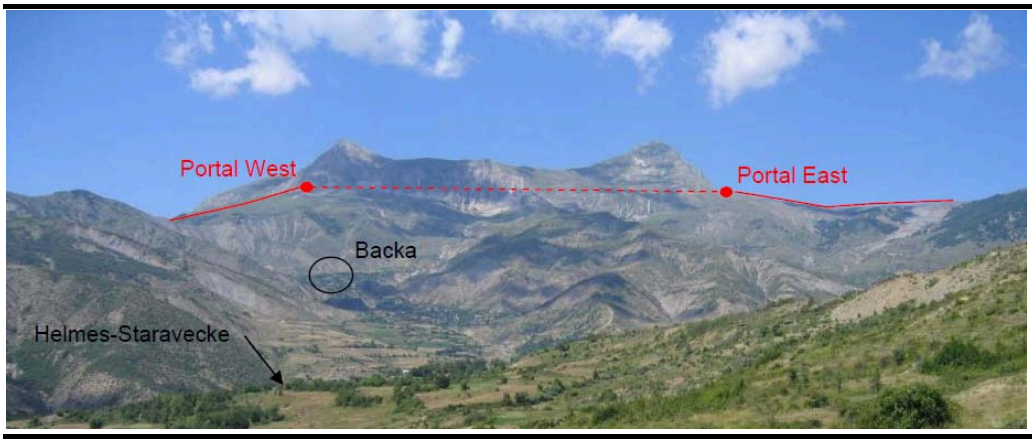
For the 10 BCM/y no compression units are required within this location. In case of extension to 20 BCM/y, compressors with gas turbines of the 25 MW class will be added. In case of this extension the details of fuel, exhausts, heat exchangers, filters, buildings, etc. are the same as those reported for CS3 above.

Tunnel

A 2.5km long tunnel will cross the highest point of the route to avoid pipe laying in horizontal side slopes (see *Figure 4.4* and *Appendix A – Map 1*). The tunnel has a diameter of around 4 m and is only accessible for inspection and maintenance. Due to its remote location, the tunnel will be established with the traditional drill and blast method and is expected to proceed with around 6 m/day, which results in a total construction time of ~24 month incl. the construction of access roads and re-establishment of temporary used areas such as the camp sites and the landfill areas. Due to this long duration, the tunnel construction needs to start one year before the work on the pipeline.

For a tunnel length of 2.5 km a total amount of approximately 31,000 m^3 of rock material will be excavated. The excavated material cannot be recycled and will be disposed at an adequate site as close as possible to the portals to avoid long transport distances.

Figure 4.4 ***Tunnel***



The tunnel will be accessed from the east via existing roads passing through the villages Vithkuq and Stylla. These roads presently used for public transport and logging, will be upgraded and around 7 km of new roads will need to be established on the flat ridges after Stylla to reach the eastern portal of the tunnel. On the west the roads between Corovode and Potom will be upgraded and around 7 km of new roads established to approach the west portal of the tunnel. This road will follow the ridges and also be used as construction corridor of the pipeline. An additional 3km road will connect the two portals and could be used if desired after the end of construction to connect Corovode with Korça.

Associated Facilities

For the storage and handling during construction, TAP will need 7 temporary stock yards for the pipes, 5 storage area for equipment (trucks etc.) and 5 worker camps (see *Appendix A – Map 1).* The selection of the location of associated facilities was conducted on the basis of access to the construction sites and RoW. A desk-top assessment of the environmental, socioeconomic

and cultural heritage impacts of the sites and roads was performed with the aim to minimise interferences.

Pipe yards sizes will range between 15000 m² - 24000 m² with capacities ranging between 1260 – 2772 pipes. Regular pipes of diameter 48" will be stacked in three layers, concrete coated pipes (e.g. for river crossings) will be stacked in two layers maximum.

Workers camps will range between 20000 m² (200 x 100 m) and 50000 m² (200 x 250 m) and will accommodate between 80 and 200 workers. The pipe yards and workers camps are expected to be operating for approximately 1 year during the construction phase.

The main point of entry for the pipes and those equipment that cannot be purchased in Albania will be the port of Durres, the main pipe yard will be situated around 15-20 km south of this town to avoid impacts on tourism and urban populations. In order to transport the 15,000 pipes to the right location, TAP will upgrade approximately 90km of existing road, establish around 40km of new roads and rehabilitate all roads and land to the pre-project status.

4.2.3 Pre-Commissioning

Once the pipeline has been installed a number of activities will be required to ensure that the pipe meets the operational requirements. The primary objective of these activities is to verify that the line has been laid without significant defects and that it is in a suitable condition to be filled and pressurised with the export gas. The pre-commissioning equipment will be used for cleaning, hydrotesting and gauge pigging of the installed pipeline. The equipment will be mainly located at the compressor stations CS2 and CS3 and the block valve stations, so that it can be used to pre-commission the pipeline in sections.

The water required for hydrotesting shall be fresh and clean water which will be drawn from (and discharged to) water sources along the route (rivers, reservoirs, lakes). A detailed concept and assessment for the proposed hydrotesting activities and water resources to be used will be defined in detail in the ESIA based on detailed studies. The maximum length of a test section shall be limited to 10 km horizontal. The length of vertical sections will depend on the final pipe design. Special sections such as main river crossings shall be tested individually.

4.2.4 Operation

Detailed operating procedures for the pipeline system will be developed. These procedures will be in place ahead of pipeline operation. The operating procedures will typically address the following:

- An administration system covering legal considerations, work control and safety;
- Clear and effective emergency procedures and operating instructions;
- Adequate and regular training of all personnel involved in operational and maintenance issues;
- A comprehensive system for monitoring, recording and continually evaluating the condition of the pipeline and auxiliary equipment;
- A system to control all development or work in the vicinity of the pipeline;
- Effective corrosion control and monitoring;
- A system to collect and collate information on third party activities;
- Monitoring of restoration, and the undertaking of remedial work as necessary.

The pipeline will be monitored and controlled from a central control room at a location yet to be confirmed. During operation, leak detection will be by continuous measurements of pressure and flow rates at inlet and outlet of the pipeline. If a leak is detected, emergency shutdown procedures will be implemented. To allow internal inspection, pigging facilities will be installed. The pipeline system has been designed to allow use of instrumented pigs, if necessary.

4.2.5 Decommissioning

The expected service lifetime of the pipeline is 50 years. Decommissioning of the onshore pipeline will be undertaken in accordance with the legislation prevailing at that time, in liaison with the relevant regulatory authorities. The eventual decommissioning requirements will be taken into account in the design stage by ensuring that all possible options will be available. The pipeline will carry only processed gas and therefore it is unlikely that the disposal of spent cleaning fluid will be of concern.

4.3 OFFSHORE

4.3.1 Introduction

The landfall location is the point at which the onshore pipeline is tied-in with the offshore pipeline. The currently preferred landfall location at the Albanian coast is located near the city Fier. From that point, the route is approximately 60 km in length until the mid point between Albania and Italy in the Adriatic Sea (see *Appendix A- Map 6*).

That base case foresees a nearly straight route, crossing the steeper areas of the Strait of Otranto in perpendicular direction, avoiding potential sub-sea landslide areas. The pipeline leaves Albanian territory in the middle of the Strait of Otranto. The pipeline would then continue towards the Italian coast from that point, but that section will be treated in other documents. The route crosses six cables in total, 4 in the Albanian side. A Fibre Optic Cable (FOC)

will be laid in parallel to the offshore pipeline to provide the necessary data communication between the relevant pipeline stations at both sides of the Adriatic Sea.

4.3.2 *Pipeline Construction*

Offshore Section

The offshore pipeline will be installed using a laybarge, which is a typical vessel used for pipe laying. Pipe sections are welded together on the barge and the pipeline is laid down to the seabed as the barge moves along the route. Special measures will need to be employed (i.e. protecting existing elements with concrete mattressing) at crossings such as cables, within the surveyed corridor. The pipe-lay operation will be performed on a 24-hour basis to ensure minimal navigational impact on other users and to maximise efficient use of suitable weather conditions and vessel and equipment time. Notifications will be issued in accordance with statutory procedures to ensure navigational and operational safety. In addition to the installation vessel(s), additional support, supply and guard vessels will be involved in the operation.

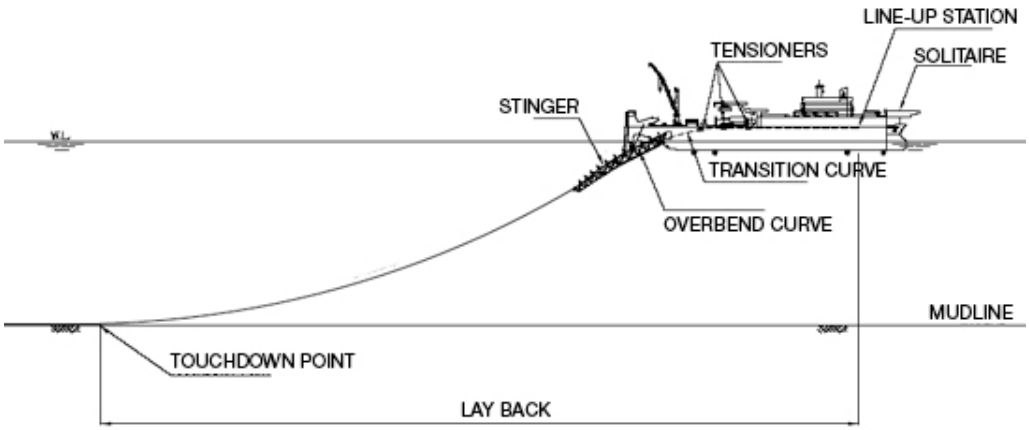
It is likely to be the case that two different lay barges are used – one for the shallow water sections and one for deeper water. *Figure 4.5* shows a standard shallow water laybarge.

Figure 4.5 Standard Shallow Water Pipe Lay Barge

Offshore pipe-laying is accomplished by the sequential alignment, welding and lowering of pipe from the installation vessels. Pipe sections (typically 8 to 18 m long) are transported to the installation vessels pre-coated. Following alignment, the sections are joined together using automatic welding techniques and lowered under tension to the seafloor.

Figure 4.6 presents a schematic drawing of a typical pipe laying method.

Figure 4.6 Typical Pipe Laying Technique



In shallow waters the pipeline will be buried to provide on-bottom stability and as a safety measure to avoid damage and interaction with respect to third parties' infrastructure (for example, trawling gear and anchors) and to minimise the risk of the pipeline "free spanning" over gaps, causing pipeline fatigue.

The pipeline will be buried at depths exceeding 2 m. At the landfall burial depth is expected to be up to 4 m. Currently it is expected that the pipeline will be buried below the seabed for the first 2 km offshore, until reaching a depth of approximately 10 meters below sea level.

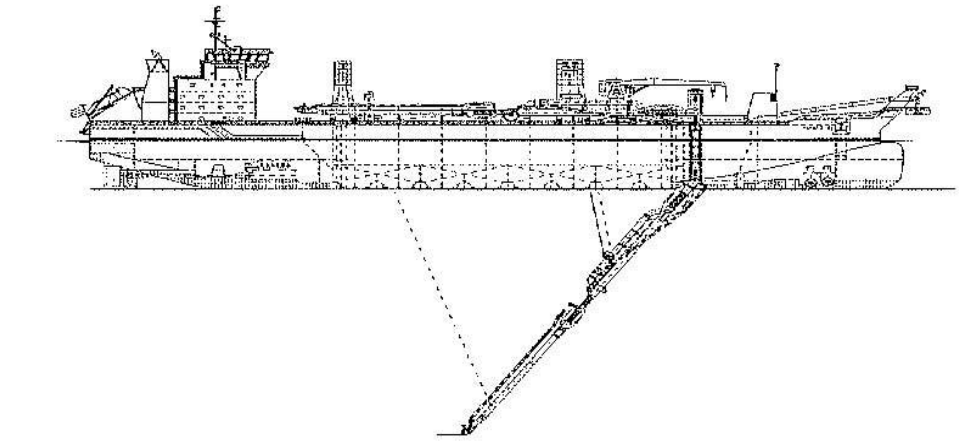
In soft sediments there are two basic methods to bury a pipeline:

- Dredging and backfilling;
- Post-trenching.

<u>Dredging and Backfilling</u>

Near shore trenching will be completed using dredging techniques. *Figure 4.7* below presents a side-on view of typical dredging operations, dredged material is suctioned and stored in compartments on the vessel itself, before being disposed of in a permitted location.

Figure 4.7 Schematics of a Suction Dredging Operation



Dredging vessels can not be used in very shallow water and in these cases a backhoe dredger is used. Backhoe dredgers use a crane-mounted fixed bucket and are designed for use in shallow inland and near-shore waterways. Dredged material is loaded onto an independent barge adjacent to the backhoe. In general, the dredged trench will be backfilled using the previously stockpiled materials. For shallower water depths the trench may also include a graded rock/gravel armour layer to stabilise the pipeline.

Post lay trenching

Post lay trenching is achieved by laying the pipeline onto the seabed and removing the material from beneath it, allowing it to sink into the trench (this second method is known as post-lay burial). Post-lay burial can be achieved using a number of different types of devices, including jetting systems (using high pressure jets of water) and ploughs.

Shore Approach and Landfall

Dredging is also involved in landfall construction. Usually construction design is based on the open cut method, subject to environmental constraints, as this uses proven technology with minimal construction risk. Open cut construction at the landfall site will typically comprise the following:

- Trench excavation and cofferdam construction (a cofferdam is an enclosure within a water environment constructed to allow water to be pumped out to create a dry work environment);
- Pulling the pipe into the trench via winches located onshore or offshore;
- Cofferdam removal and replacement of the excavated soils with reinforced materials to limit erosion; and
- Premature backfilling with material such as gravel and rock in order to provide suitable pipeline mechanical protection and on-bottom stability.

The cofferdam will protect the trench, avoiding the backfilling of the trench with sediments.

4.3.3 Pre-Commissioning

The pre-commissioning equipment is planned to be located at the landfall site in Italy. The first operation will be to flood, clean and gauge the pipeline in one pigging operation starting from Italy and ending in Albania.

Hydrotesting will then immediately follow with pumps located on the same site in Italy. Dewatering of the pipeline will be done by running a pig train from Italy to Albania. Discharge of the untreated seawater (approximately of 170 000 m^3) used for the hydrostatic testing will be in Albania. Drying of the pipeline will most likely be done with dry air.

The aim is to do the pre-commissioning of the pipeline in one continuous operation which is likely to last 1.5 – 2 months.

4.3.4 Operation

The pipeline will be brought into service by the introduction of gas from Albania, only after all control and monitoring systems have been commissioned at both ends of the pipeline. Operational and decommissioning activities were summarised in *Sections 3.2.3-4*.

The external condition of the sub-sea pipeline, including the condition of the cathodic protection system, will be monitored on a regular basis. To allow internal inspection, pigging facilities will be installed. The pipeline system has been designed to allow use of instrumented pigs, if necessary.

4.3.5 Decommissioning

Decommissioning of the offshore pipeline will be undertaken in accordance with the legislation prevailing at that time, in liaison with the relevant regulatory authorities (see *Section 4.2.5*). The potential environmental effects of decommissioning related to the disturbance of the seabed are similar to those described for the construction phase.

5 BASELINE CONDITIONS

5.1 ONSHORE

5.1.1 Introduction

The environmental, socioeconomic and cultural heritage baseline characterisation presented in the following sections has been focussed on a 2 km wide corridor (1 km either side of the proposed centre line) along the entire length of the onshore route. The 2 km wide corridor is also referred to as study area.

To facilitate the description of the baseline characteristics, the route has been subdivided in the following sections:

- Eastern section: section between the Greek/Albanian border and north of the town of Mollas;
- Central section: section between the town of Mollas and the town of Polican;
- Western section: section between the town of Polican and the coastline.

Maps 2-5 in *Appendix A* represent the main landuse, environmental, socioeconomic and cultural heritage characteristics of the onshore base case route respectively.

5.1.2 Environment

Climatic Conditions

Albania has a variety of climatic conditions, being situated in the transition zone between the typical Mediterranean climate in the west and the moderate continental in the east. The average annual temperature is 15° C. Rainy winters (with frequent cyclones) and dry, hot summers are typical of the coastal plain. Inland temperatures are affected more by differences in elevation than by latitude or any other factor. Low winter temperatures in the mountains are caused by the continental air mass that dominates the weather in Eastern Europe and the Balkans.

Annual precipitation ranges from about 1000 mm on the coast, with the higher levels in the north, to more than 2500 mm in the mountains, in some northern areas. Nearly 95 percent of the rain falls in the winter. Summer rainfall is more abundant in the mountainous interior. The south-western part of the country suffers from summer droughts.

Geography

The eastern section is divided by the Morava Mountains which run on a north-south axis and rise to over 1800 m at their highest point. There are large

open valleys formed by large tributaries of the Devollit and Osumi Rivers on either side of the mountains, which drop to around 900 m within the study area. These two rivers form the main watershed river systems within this portion of the route. The Osumi River flows in a southerly and westerly direction whilst the Devolli River watershed collects water from the north and east of the study area and the river flows northwards before heading west towards Albania's Adriatic Sea coast.

The central section crosses an area characterised by a mountainous reliefs and broken terrain, with altitudes varying from 200 masl to above 2000 masl. The highest elevations are found near Ostrovice (2383 masl) and Rungaja Mountains (1945 masl).

The western section crosses a range of different geographies from the mountainous area in the east, through foothills and onto the flat coastal plain in the west. The highest elevations are around 200 m and drop to sea level at the landfall location. There are two main watershed river systems, the Semani-Osumi River (and its tributaries) and the Vjosa River watershed system. Both of these river systems initially cut their way through low hills along narrow valleys which widen gradually before opening out on the flat coastal plane.

Geology

The route crosses a variety of different bedrock units and overlying soft rock deposits. In summary, these units comprise:

- Flysch-dominated bedrock sequences, at the eastern section and central sections.
- Ophiolithes and carbonate-dominated bedrock units, at the eastern-central section;
- Holocene soft rocks, mainly at the western section up to the landfall

There are of 43 known or assumed active faults along the route, the majority on the eastern and western sections.

It is important to note the Mali I Ostrovices, which is a steep and rugged limestone massif, made of rugged rock walls above the more gently inclined Flysch-slopes, and which poses a morphological major constraint due to the steepness and elevation of the slopes. This constraint will be by-passed with a tunnel (see *Section 4.2.2*). The western section (around Fier and the landfall) is characterised by widely spread alluvium, i.e. delta deposits of the rivers Osumit and Vjosa. The area is potentially exposed to flooding, earthquakes and liquefaction areas.

Vegetation and Flora

The forest habitats found in the eastern section of the route include beech forest (*F. sylvatica*), mixed broadleaved forest dominated by oak (*Quercus sp.*) and coniferous forests dominated by pine *(Pinus nigra)* or fir (*Abies alba).* The

areas of transitional woodland-scrub are generally dominated by oriental hornbeam (*Carpinus orientalis)*. The presence of highly valuable old growth forests is expected but present typically in relatively small patches. The upper catchment of the Devolli river is considered of special interest.

The areas of main vegetation and floral interest of the route are found in the central part of the route. These include mature mixed broadleaves (*Quercus* sp.) or old growth forests near Çorovoda city, sub alpine natural grasslands above 1,500 m s.l. with a number of protected species, river habitat of the Osumi river with patches of old growth riparian forest and river habitat near Çorovoda city dominated by *Platanus orientalis*, *Salix alba*.

The forested areas along the western section of the route are at various stages of development. The majority of forests habitats belong to evergreen sclerophyllous scrubs/forests dominated by *Arbutus unedo*. Natural habitats are more scarce within this section due to greater exploitation (mainly agricultural). A water reservoir is present within the 1 km buffer zone and the stream/river habitats and wetlands are of high ecological interest. Before reaching the coast the route passes through coastal saltmarsh and lagoon habitat. The route also crosses a small area of the Marinez oil field close to Jagodine.

Fauna

The coniferous and broadleaved forests of the eastern section are important habitats for large mammals and carnivores. These include species such as the brown bear (*Ursus arctos*) and the wolf (*Canis lupus*) but also a number of birds (woodpeckers, finches, tits, thrushes, tree creepers, nuthatches). Subalpine natural grasslands in the area are also important habitats for a number of mammals (moles, voles and mice) and birds (partridges, larks, buntings, crows, and birds of prey including vultures, eagles and falcons). The only wetland habitats identified in the area is the Gjançi water reservoir, which has a good potential for the presence of otter (*Lutra lutra*).

In the central section of the route two types of habitats are considered of high importance for fauna: old growth forests and wetlands. The route passes through areas of sensitive wetland habitat along the Osumi River north of Corovode. This habitat is suitable for riverine species such as otter. The areas of undisturbed old growth beech and oak forests are of importance for large mammals and a range of specialist forest species. The known bear range in Albania covers the route from the east of the study area up to Corovode.

In the western section the coastal lagoons and salt marshes are important habitats for waterbirds, especially for the wintering bird community composed of waders, ducks, grebes, gulls, terns, divers and birds of prey. Coastal lagoons as well as drainage channels offer breeding and feeding grounds for a number of fish species and amphibians. Other important areas for fauna along the route are sections along the Osumi river between Polican

and Berat which support relatively sensitive riparian habitat suitable for a range of fish species and in places otter.

Protected Areas

Protected areas within the study area are presented in *Map 3* in *Appendix A* and are listed below:

- *Bredhi i Drenoves National Park*: Bredhi i Drenoves National Park lies approximately 3 km north of the Alternative 6 route corridor in the eastern study area. The National Park was first proclaimed in 1966 (The Decision of the Council of Ministers No. 96, date 21.11.1966) (MoEFWA6 2008). The area protected is 1,380 ha in size and supports a range of mountain habitats including coniferous *Pinus nigra* forest and ash (*Fraxinus* sp.) forest as well as mountain streams, upland meadows and pastures. The habitat within the national park is suitable for large mammals such as wolf and bear.

- *Hotova Fir-Dangelli National Park:* the park is located in the central section of the route, approximately 10 km south of the route. The park was first established in 1996 to protect the Hotova Fir forest, one of the best preserved and most continuous Macedonian fir forests (*Abies borisii-regis*) in the country. In 2008 the Hotova National Park was enlarged to a general surface of 34,361 hectares, and renamed to 'Hotova Fir-Dangelli National Park'. With this decision Hotova National Park became the largest protected area in Albania today.

- *Karavasta Lagoon National Park*: the lagoon is located in the western section of the route, approximately 3 km north of the route of proposed Landfall D. The lagoon is the largest in Albania and one of the largest in the Mediterranean Sea. The Keravasta National Park (Divjake-Karavasta National Park) extends beyond the lagoon to the south until the Semani river and to the East to the Gungage village approximately. The lagoon is also designated as a Ramsar site (wetland of international importance).

- *Nature Reserves:* The nature reserves located within the 2 km corridor (1 km either side of the route) include the Bogove Managed Nature Reserve (IUCN Category IV).

- *Nature Monuments:* Although there is a list of Natural Monuments included in the Albanian governmental decision No. 676, 20/12/2002, an official map with the location and perimeter of the sites does not exist. The exact location and distances from the alternative centreline of all of the Natural Monuments within the study area is therefore currently not known. The known natural monuments located within the 2 km corridor (1 km either side of the route) include: St. Peter Forest, Fir of Vishja, Forest of Markeza, Voskop Spring and Symizë. In addition, the only Natural Monument with a defined perimeter is the *Crown Forest of the River Semani*

Nature Monument (Kurora e lumit të vjetër, Seman -Libofshë-Adriatik) which is located approximately 3 km to the north of the route.

- *Protected Landscapes:*
  - *Nikolice Protected Landscape Area*: The Nikolice protected area (IUCN category V) is approximately 4.5 km south of the route in the eastern study area. The area was proclaimed in 1996 (The Decision of the council of Ministers no.102, date 15.01.1996) (MoEFWA 2008). The area protected is 510 ha in size and supports a range of habitats including mature broadleaved mixed *Quercus* sp. woodland with areas of coniferous *Pinus nigra* woodland.

    Proposed sites based on the Biodiversity Strategy Action Plan (BSAP):

  - *Cangonji – Drenova's Fir –Nikolice – Gramoz Landscape Protected Area (also known as Morava):* The BSAP sets out its vision for a national network of protected areas and plans for an enlarged landscape protected area which incorporated the Nikolice Protected Landscape Area, the Bredhi i Drenoves National Park, the Canjonji Managed Reserve and a number of Nature Monuments. In addition the site would also be part of a transboundary protected area with Greece.

  - Protected Landscape of the Mountain massifs that include Ostrovica mountain, Vithkuqi and Rungaja

- *Emerald Network Sites:* The Emerald network is a Pan European system of protected areas designed to fulfil some of the requirements established in the Bern Convention. In non-EU countries, such as Albania, the designation of Emerald Sites is done at the national level and directly submitted to the Council of Europe for acceptance. In the EU countries, the sites are designated and submitted to the Council of Europe through the Natura 2000 network (i.e. the Natura 2000 network constitute the protected areas designed in the EU countries to be included in the Emerald Network). Albania already has several Emerald sites but is working on the designation and establishment of Emerald sites. In 2009 (Council of Europe) a list of 25 Proposed Emerald Sites was published (all Emerald Sites are by definition considered as Areas of Special Conservation Interest (ASCIs) throughout the country.

The route does not pass through any currently protected areas. In the eastern section the two closest protected areas to the route are the Bredhi i Drenoves National Park (approximately 3 km to the north of the proposed route) and the Nikolice landscape protected area (approximately 4.5 km to the south). Four National Monuments are located within the 2 km wide corridor along the route: St. Peter Forest, Fir of Vishja, Forest of Markeza and Voskop Spring. In addition the route crosses the proposed Cangonji – Drenova's Fir –Nikolice – Gramoz Landscape Protected Area (also known as Morava). This area has been proposed as a protected area at national level but also as part of the Emerald European network. The Albanian Ministry of the Environment

clarified that routing a pipeline through this area does not conflict with their conservation strategy for this region and could be accommodated in the management plan of a landscape protected area.

In the central section the route crosses the Vithkuq proposed Landscape Protected Area. Currently there is no detailed information available on the status of the proposed landscape protected area, its potential relevance to the Emerald network or on the specific location and borders of the area (only the BSAP 2000 provides a rough reference map). Further north, the route passes close to the Bogova Managed Nature Reserve part of which falls within the 2 km wide corridor. One Natural Monument has been identified within the corridor, a forest area called Symizë, close to Backe.

In the western section the closest site to the route is the Crown Forest of the River Semani Nature Monument (*Kurora e lumit të vjetër, Seman (Libofshë-Adriatik*) which is approximately 3 km to the north of the route. The extended perimeter of the Karavasta lagoon National Park is located approximately 3 km to the north of the proposed Landfall D (still under investigation – see *Section 3.3.3*).

Other Areas of Ecological Interest

A number of CORINE Biotopes have been identified within the study area. CORINE biotopes are areas that have been identified as 'major nature sites' across Europe by the European Environment Agency and include sensitive or rare habitats. These areas, however, do not have any protection status (neither national nor international) but are considered an important reference to identify sites of regional environmental interest.

The CORINE Biotopes crossed by the proposed route are:

- The Cangonj – Bredhi Drenoves – Nikolice CORINE Biotope;
- The Vithkuq-Ostrovice Biotope;
- The Grykederdhja Semanit-Pishe Poro (Fier) Biotope.

Landscape

The eastern section (especially to the east of the village of Floq) is characterised by high landscape values. The route crosses areas that include a combination of natural environments and traditional land uses such as pastures, agricultural lands, etc. The central section of the route crosses sparsely vegetated upland landscapes around Ostrovice Mountain. It then continues west through upland scrub and sparsely vegetated hilly landscapes with occasional areas of wooded landscapes to Corovode. Here it descends into the open Osumi river valley which it follows north through the valley and along ridges on its western side to Polican. The western section of the route passes through several areas planted with olive groves, some of which, mainly around Berat, are ancient trees, likely to be over 100 years old. Most of the

ground crossed is relatively flat and there are no sections of the route which have a gradient of over 30°.

5.1.3 Socio Economic

Introduction

Albania is composed of 12 regional administrative divisions (*Qarku* or *Prefekturë)*, which are divided into 36 districts (*Rrethe*), each of which has a capital city. Regions are subdivided in local government units which are municipalities and communes. The route crosses three Regions: Korça, Berat, Fier and 23 municipalities/communes.

The Albanian economy is heavily reliant on agriculture, which in 2008 accounted for an estimated 21% of GDP (at current prices). The farming sector has been dominated by small private holdings since the collapse of the communist state in 1991, when the collective farms were disbanded. Agriculture remains thus the most important sector of employment in Albania accounting for almost 60% of total employment in the country. In recent years an increase in small businesses, mainly in construction and manufacturing, has created many new jobs. The public sector also remains an important employer in terms of number of employees.

Socioeconomic Context

The eastern section of the route is characterised by large areas of high altitude forests areas and pockets of lowland areas used for seasonal crop production. There are 11 settlements within the 2 km wide corridor for a total of 5,465 inhabitants. These settlements range in population from 80 inhabitants (Sinice, Miras Commune) to 2,387 inhabitants (Miras, Miras Commune). The settlements of Cete and Miras, closest to the Greek border, and Kamenice are the only settlements with a population of over 400. Almost 90% of the population living within the study area is concentrated in these three settlements. Forest and shrub land is the main land use within the 2 km corridor and represents 70% of all land use. This land, along with the land designated for grazing, is used by settlements for livestock. Seasonal crop production is the second largest land use accounting for 28% of land within the corridor. Permanent crop production is only found in the commune of Mollaj and accounts for 1% of all land use. It is considered likely that the economy of the area around Miras is more diversified.

In the central section of the route the land use is characterised by forested and mountainous areas with small areas of agricultural land surrounding settlements. Çorovode is the main town in the area with a population of 8,907. The rest of the settlements are relatively small with 5,033 people distributed in 15 settlements. The dominant economic activity of the mountainous rural settlements is agricultural production consisting of a combination of crop production and animal husbandry; a high proportion which is undertaken at a subsistence level.

The western section of the route crosses the district of Berat which is hilly with a mosaic of seasonal and permanent crop production and grazing. The route also crosses the district of Fier which is flatter and more uniformly used for seasonal crop production. The route crosses an area of oil extraction between the communes of Roskovec and Mbrostar. The main livelihood for almost half of all communes is seasonal and permanent crop production. 29% of communes are reliant on a mix of crop production and animal husbandry. The close proximity of the cities of Berat and Fier, in addition to the area of oil extraction in Roskovec commune, results in 24% of communes having a diversified economy.

5.1.4 Cultural Heritage

Areas of cultural heritage interest found along the route include the:

- Devolli river valley near Miras;
- Area around Vithkuq village;
- Area between Floq, Kamenicë, Pulahë and Bellovodë;
- Villages of Osojë, Jaupas, Vojakë, Mbrakull, Shën Tod, Peshtan, Vodicë, Berat, Lapardha, Zharrëz, Mbrostar, Petovë, and Topojë;
- Eastern portion of the coastal plain.

The heritage sites identified are of the Prehistoric, Late Roman, Classical, Late Classical and Medieval periods. The most common types of sites found are burial mounds, open air sites, hilltop fortifications, historic architecture, churches/monasteries, bridges and Hellenistic fortifications and structures.

5.2 OFFSHORE

5.2.1 Environment

Bathymetry and Water Movement

Water depth along the proposed route ranges from the intertidal down to around 800 m. The continental shelf extends along 25 km of the proposed route from the Albanian coast, reaching a depth of around 200 m.

Currents in the Adriatic Sea are characterised by the presence of a large counter clockwise current gyre in its centre. This large gyre sometimes breaks into two smaller gyres. In both scenarios, the general current flow is northwards along the eastern shores of the Adriatic Sea (Eastern – South Adriatic Current), which correspond to the study area, and southward along the western shores. The gyres and the coastal currents are stronger in the summer and fall (Poulain, 2001). Tides in the area have a maximum variation of around 45 to 50 cm.

Seabed Sediment

In general terms the Adriatic Sea is a Molasse basin, which is fed by sediments from the surrounding land masses. Sediment supply arrives mainly from the materials transported by the rivers in the area. The nearest river mouths to the landfall site are the river Semani to the north, and the river Vjose to the south.

The seasonality of discharge of sediments is influenced by the Mediterranean conditions, with high floods during the winter (November - April) and low water levels from June to August. The seabed along the proposed route is therefore covered by soft sediments, formed mainly by fine sands and muds. Near the coast some belts of coarse sands and gravel can also be found.

Sediments in proximity of the Hoxhara channel are expected to be contaminated by hydrocarbons from the extensive oil contamination deriving from the oil fields around Fier. During the field surveys along the beaches near the Hoxhara channel visible signs of oil contamination were observed. The extent of the contamination is currently unknown.

Benthic Habitats and Biological Communities

A marine environmental survey was performed in 2006 along the offshore base case route (Ref.3, *Appendix E*). The survey focussed mainly on the nearshore section of the route making landfall at Landfall A (see *Figure 3.2*) and included the following activities:

- Video/photographic surveys to determine presence/absence of sea grasses along the route;
- Seabed sediment sampling to collect benthic organisms that live within the top layers of the soft sediment.

The area is characterised by low species richness, attributable to the significant input of terrigenous sediments discharged by the numerous rivers of the Albanian coast.

This continuous discharge of fine and fluid sediments together with a certain quantity of organic matter originate an environment characterised by soil instability and turbidity. These conditions result in the absence of marine phanerogams, such as *Posidonia oceanica* but also more tolerant species as *Cymodocea nodosa* and *Zostera spp*.

Depths down to 14 meters along the route are dominated by the biological community of Fine Well-Sorted Sands (SFBC) (Pérès & Picard, 1964), which is formed mainly by bivalve boring molluscs such as *Acanthocardia paucicostata, Tellina donacina* and *T. nitida,* gastropods as *Natica ebrea* and the annelid *Arenicola marina*. This biological community is tolerant to salinity changes and is typical of estuaries.

Within this biological community the depth interval between 6 and 14 m revealed the increasing presence of species very tolerant to periodic burial by sediment deposition phenomena. The species included, among others the bivalves *Nucula nucleus* and *N. sulcata,* the gasteropod molluscs *Natica filosa* and *Nassarius pygmaeus*, the scaphopod *Antalis inaequicoasttus*, the polychaete annelids *Heteromastus filiformis* and *Cirratulus cirratus*, the Decapod crustaceans *Alpheus glaber* and *Jaxea nocturna,* the stomatopod *Squilla mantis* and the echinoderms *Amphiura chiajei* and *Brissopsis lyrifera*.

In addition some belts of the biological community of Coarse Sands and Fine Gravels Stirred up by Waves (SGBV) (Pérès & Picard, 1964) were found in depths below 14 m.

In depths between 15 and 75 m appears the biological community of Coastal Terrigenous Muds (VTC) (Pérès & Picard, 1964). Among the zoobenthic species observed characterising the biological community are the annelid *Sternapsis scutata* and the mollusc *Turritella communis.*

Further offshore, down to approximately 170 m deep an extensive area characterised by the abundant presence of *Neopycnodonte cochlear* dead shells can be observed. The presence of this bivalve suggests the probable pre-existence inshore of richer and more diversified benthic communities than those currently observed, evidently subjected over time to a phenomenon of gradual burial due to the high rate of sedimentation of fine material carried by the numerous water courses present along the coast.

Deeper waters in the area are less know, however, two marine surveys conducted in the region by an Italian research institue, the CoNISMa (Consorzio Nazionale Interuniversitario per le Scienze del Mare) showed that in the batial zone (200 – 1000 m) the species diversity and abundance reduces significantly when compared to those of the circalittoral area (40 – 200 m).

Plankton

The existing data on phyto and zoo plankton within the project area are limited. In the samples collected in October 2000 by CoNISMa, copepods were the predominant group, followed in terms of number of individuals by Chaetognatha, Ostracoda, Appendicularia, eggs of invertebrates, Doliolida, Cladocera and other taxa.

Ichtyofauna

The ichthyofauna of the area is rich in both demersal (fish that live near the seabed) and pelagic species (fish usually found inhabiting the water column).

Sea turtles and Marine Mammals

Three turtle species have been recorded in the Adriatic Sea, namely the loggerhead turtle (*Caretta caretta*), the green turtle (*Chelonia mydas*) and the

leatherback turtle (*Dermochelys coriacea*), the latter being considered as a rare visitor.

Concerning the marine mammals, despite the absence of specific studies, five species can be confirmed as inhabitants of Albanian waters: *Physeter macrocephalus* (sperm whale), *Ziphius cavirostris* (Cuvier's beaked wahle) *Tursiops truncatus* (bottlenose dolphin), *Sternella coeruleoalba* (striped dolphin) and *Delphinus delphis* (common dolphin)

5.2.2 *Socio Economic*

Introduction

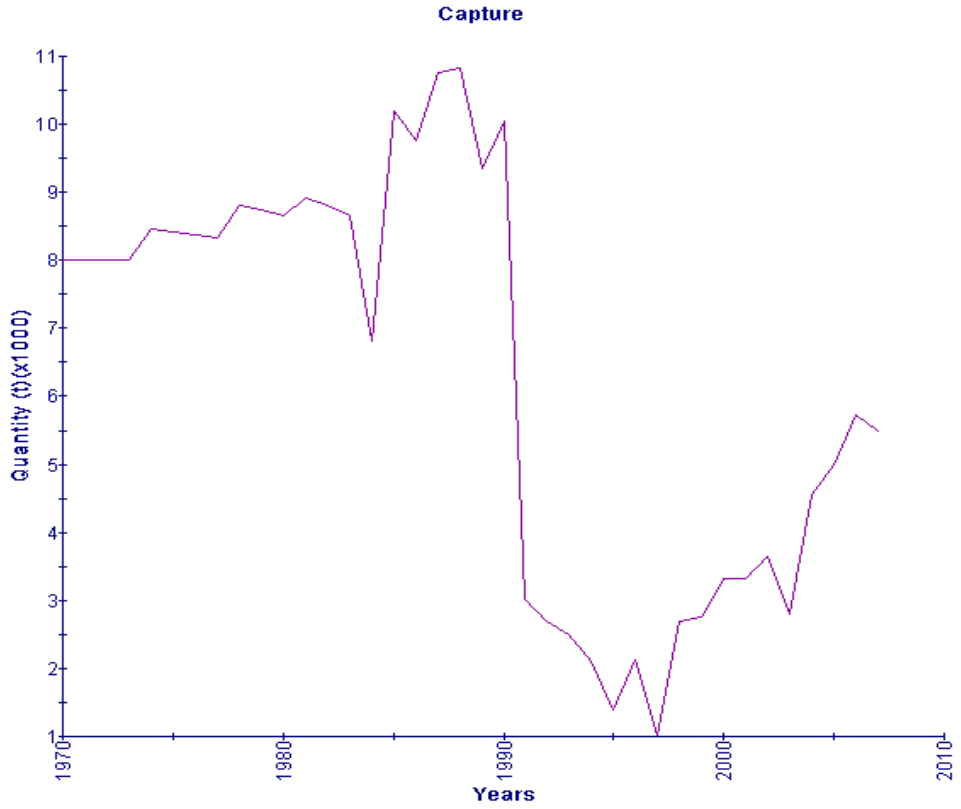
Albania has a 300 km coastline along the Adriatic and Ionic Seas. The off-shore boundary between Albania and Italy on the continental shelf was defined by an Agreement signed on the 18th December 1992. Fishing and navigation are open to other countries as long as no Fishing Reserve or Economic Exclusion Zones is defined. No Fishing Reserve nor Economic Exclusion Zone exists between Albania and Italy.

Fisheries

Fishing within territorial waters (12 nautical miles) in the Mediterranean is reserved to national vessels. Outside the territorial waters no such limitation exists. The number of employees in the fishery sector in Albania was estimated to be 5,200 in 2002 (FAO data).

The fishery sector in Albania reached the highest levels of productivity in the late 1980s up to 1990. An abrupt drop of productivity marked the '90s, corresponding with the drastic changes in the country and the start of the transition to a market economy. Towards the end of the decade the production started to grow again. The capture productivity trend (fish catches landed in Albania), is shown in *Figure 5.1.*

Figure 5.1 Fishery Production by Capture in Albania between 1970 and 2007



Source: FAO - Fisheries and Aquaculture Information and Statistics Service

The marine catch is approximately a half of the total production, according to FAO figures of 2002, the remainder being fresh water catch and aquaculture. According to the same source, imported fish quantities in Albania are largely higher than the in-country production with 15,000 t imported against 3,500 t produced in 2003.

In terms of types of fish caught the following information area is available:

- **Marine demersal fisheries***:* Trawlers and smaller vessels using long-lines and gill nets currently exploit the marine demersal resources. In general, the vessels are old and their condition is poor. Fish caught by larger vessels are boxed and iced at sea. Few vessels are equipped with modern aides to fishing, such as echo sounders or global position recorders. The hake (*Merluccius merluccius*) is one of the main commercial and heavily exploited demersal fish species in the Adriatic.

- **Small pelagic fisheries***:* In the past, Albanian vessels caught sardines, and to a lesser extent anchovy using small purse seines. Currently this fishery is largely underexploited and modernising the fleet is a priority.
  The anchovy production in the Adriatic is presently dominated by Italian landings around 90%, with the small pelagic fleets from Slovenia, Croatia and Albania concentrating mainly on sardines.

Fishing Fleet of Albania

The distribution of the fishing fleet of Albania is in the major ports of Durres and Vlore. The port of Durres hosts the highest number of trawlers in Albania, with 98 registered vessels against 45 in Vlore[1].

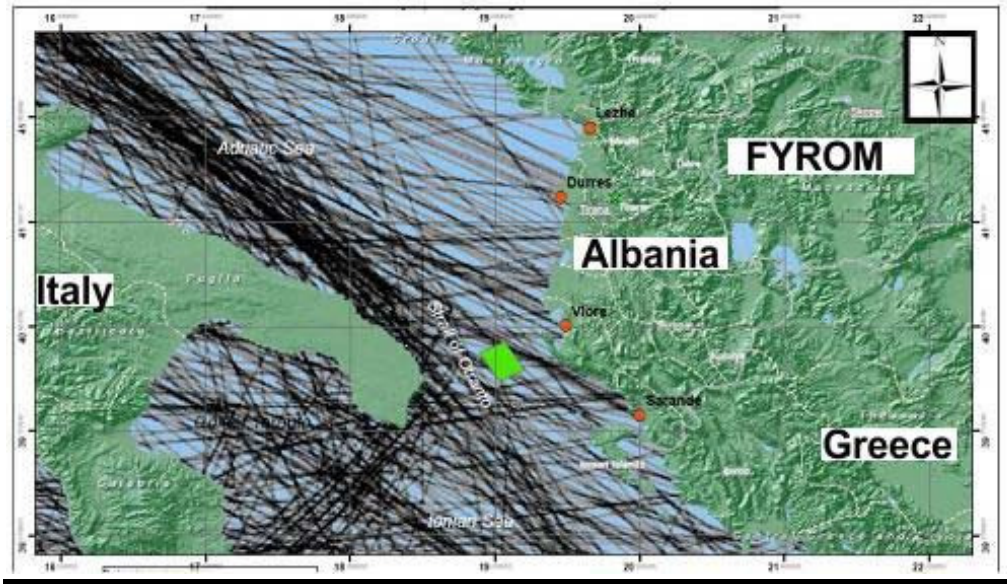
Tourism

Figures on travellers and reasons for travel provided by the national statistics institute (Instat, Albania in Figures 2007) show that tourism is increasing. The majority of visitors are of Albanian nationality but the number of international visitors is also growing at a significant rate. The coast of Fier region has a medium-high potential for tourism development. There are presently very few marinas and touristic port structures along the coast.

Navigation and Maritime Transport

The whole of the Adriatic Sea is a public shipping zone where shipping traffic is intense. *Figure 5.2* provides and indication of the areas where shipping traffic concentrates represented by a higher density of black lines.

Figure 5.2 Shipping Lanes in the Adriatic and Ionian Sea



Source: National Centre for Ecological Analysis and Synthesis, NCEAS

Durres is the primary harbour of Albania and is situated to the north. Durres provides linkages with the Italian ports of Ancona, Bari, Brindisi and Trieste. Vlore, the closest port to the south, provides linkage with the Italian ports of Bari and Brindisi.

Ferries to the Albanian ports generally arrive in the morning and depart in the afternoon. Between August and September, and the Christmas season are peak periods for ferry traffic. Both freight and ferry traffic is scheduled to

(1) [1] : Ministry of Environment Forests and Water Administration, 2008

operate all year round, although it can be disrupted over the winter months, particularly in November and December due to bad weather.

5.2.3 Cultural Heritage

Marine Archaeology

Linking the western Balkans and the East with Western Europe, Albanian waters were busy with shipping since ancient and mediaeval times. The likelihood of archaeological findings of those ages is higher in areas close to the coast than in off-shore areas, since ships usually stayed near the shore to maintain visual contact with land.

Given the available information on neighbouring regions specially Vlore south of the immediate area of influence, the presence of marine archaeological remains of the Greek, Roman and Illiryan periods, as well as remains of the 1st and 2nd World Wars can not be discarded. There is no specific published information about the likelihood of the presence of these remains in the area.

6.1 INTRODUCTION

Tables 6.1 – 6.8 present a list of the main potential environmental, socioeconomics and cultural heritage impacts for the onshore section (*Table 6.1 – 6.6*) and offshore section (*Table 6.7* and *6.8*) of the TAP in Albania. The tables present the following information:

- **Impact Area**: list of impact areas intended as the environmental, socioeconomic and cultural heritage component potentially affected by the project's activities;

- **Potential Impacts of Significance**: list of types of impact or sources of impacts that could occur from the project on the basis of information currently available (project and baseline). The magnitude and significance of the impacts will need to be ascertained during the detailed impact assessment;

- **Area of Influence**: the geographical area which could be potentially affected by the impact. The definition of the area of influence is to be intended as indicative. The extent of the area of influence will need to be ascertained during the detailed impact assessment;

- **Mitigation Options**: list of types of mitigation and control measures that may be considered where significant impacts are identified during the assessment.

With regards to the Area of Influence the following criteria has been adopted:

- **Local –** impacts that affect local environmental, socioeconomic or cultural heritage resources or are restricted to a single habitat/biotope, a single (local) administrative area or a single community. Although considered local, the geographical extent of each impact within this category can be variable, depending on the impact type and location. Local impacts may be restricted to the Right of Way (RoW, 10-20 m wide), the working strip (approximately 40 m wide) and areas directly affected by associated facilities (e.g. access roads, workers camps and pipe yards), however there will be local impacts that extend beyond but are still within the local context (e.g. within hundreds of meters or kilometric distances from the RoW). Orders of magnitude of distances for each local impact are presented in the following tables.

- **Regional/Provincial –** impacts that affect regional environmental, socioeconomic or cultural heritage resources or are felt at a regional scale as determined by habitat type, administrative boundaries or community.

Tentatively the geographical extent of regional impacts will be up to tens of kilometres.

- **National –** impacts that affect national environmental, socioeconomic or cultural heritage resources or affect an area that is nationally protected/ important. Tentatively the geographical extent of national impacts will be up to hundreds of kilometres.

- **Trans-boundary/International/Global –** impacts that are experienced in one country (or several countries) as a result of activities in another, which could reach to planetary level in some occasions (e.g. global warming).

Construction, pre-commissioning, operational and decommissioning impacts are organised according to the following impact areas:

- Displacement of Land Uses, Property and People;
- Resources and Waste;
- Geology, Soils and Contaminated land;
- The Water Environment;
- Air Quality and Climatic factors;
- Noise and Vibration;
- Biodiversity and Nature Conservation;
- Landscape and Visual Impacts;
- Socio-Economic Impacts;
- Community Health and Safety;
- Working Conditions;
- Archaeology and Built Heritage.

6.2 ONSHORE

6.2.1 Construction

Table 6.1 Potential Environmental Impacts and Mitigation Measures Related to Onshore Construction and Pre-Commissioning

Impact Area	Potential Impact/Source	Area of Influence	Potential preventive/mitigation measures
Resources and waste	• Use of large quantities of construction material • Disposal of construction waste • Transportation of construction material and waste • Consumption of fuel by vehicles and machinery • Sewage (black and grey water) management and disposal • Use of water for construction activities, camps, yards • Use of water for pre-commissioning (hydrotesting)	• Local to Regional, depending on impact and specific location of waste disposal sites and origin of construction material and fuel	• Materials to be sourced and disposed of with sustainable procurement principles and from as close as possible to the project so as to minimise impacts of production and transport. • Identify beneficial uses or opportunities for recycling construction spoil and other wastes wherever possible. • Waste management plan and system to be implemented • Environmental and social management plan • Evaluation/assessment of water sources for hydrotesting so as to minimise impacts to other water users and aquatic habitats
Geology, Soils and Contaminated land	• Excavation works during construction including off-site quarrying where needed (compressor stations, block valve stations, landfall site and tunnel) • Clearance of working strip, logistic sites (yards, camp sites) and access roads will affect top soil with the risk of resource loss • Physical damage through soil compaction and accidental contamination should also be considered (see also resources and waste). • Contaminated sediments from past activities	• Local, within working strip (40 m) and the footprint of associated facilities (compressor and block valve stations) • Impacts from contaminated sediments will be Local or Regional depending on the location of the waste disposal sites	• Construction site management plan • Preservation of topsoil • Reinstatement of topsoil following completion of construction activities • Oil & Chemicals Spill Contingency Prevention & Planning • Detailed route investigations to avoid contaminated areas

Impact Area	Potential Impact/Source	Area of Influence	Potential preventive/mitigation measures
Water Environment	• Impacts to aquatic habitats, water quality & river morphology from river crossings of the right of way and access roads	• Impacts to river morphology will be local and typically within the working strip (40 m). Impacts to water quality will depend on the river/channel to be crossed but could be up to hundreds of meters upstream of the crossing (e.g. in tidal rivers/channels) and between hundreds of meters and a kilometre downstream. Same would apply to river crossings of new access roads.	• Minimise number of river crossings • Select crossing locations in order to minimise impacts to riparian vegetation and to the river channel and habitat • Select working window to minimise impacts on aquatic species (winter) • Monitoring of water quality – Environmental Monitoring Plan • Reinstate channel, banks and riparian vegetation to pre-construction status • Audit management and reinstatement • Alternative construction techniques to open cut trenching and backfilling (e.g. Horizontal Directional Drilling)
	• Sediment plumes from working strip, yards, camps and access roads due to rainwater runoff	• Local, specific distances depend on local conditions. Could be up to a kilometre downstream of the discharge location	• Management of working strip, access roads, yards and camps to minimise sediment runoff into water courses (silt fences, silt traps, vegetation of stockpiles and of marginal areas, etc.) • Monitoring of water courses/water bodies - Environmental Monitoring Plan
	• Oil & chemical contamination from machinery on working strip, yards, camps and access roads	• Local, typically within working strip (40 m). Specific distances depend on local conditions. Could be up to a kilometre downstream of the accidental release.	• Fuelling/bunkering procedure for machinery, generators, etc. • Bunded or contained oil/fuel storages • Oil & Chemicals Spill Contingency Prevention & Planning • Chemical handling procedures • Oil & Chemical spill response kit on sites • HSE Training of all on-site personnel on environmental awareness (including managing erosion and siltation on site and waste management) and oil & chemical spill prevention and response. This mitigation measure is valid for all impacts.
	• Generation of waste water and solid waste (from camps, working strip)	• Local, specific distances depend on local conditions. Could be up to a kilometre downstream of the discharge location	• Treatment of waste water prior to discharge in any water body • Locate yards and camps away from water courses/water bodies • Waste management plan

Impact Area	Potential Impact/Source	Area of Influence	Potential preventive/mitigation measures
	• Impacts from discharge of aqueous effluents derived from the tunnel construction (e.g. slurry from tunnel boring activities – depending on method selected) and hydrotesting	• Local, between hundreds of meters and a kilometre downstream. Specific distances depend on local conditions.	• Management of aqueous effluents on site (on-site collection and treatment of effluents prior to discharge into water courses and water bodies). • Waste management plan • Monitoring of water courses/water bodies - Environmental Monitoring Plan • Evaluation/assessment of water sources and discharge locations
Air Quality and Climatic factors	• Impacts from dust generated from earth movements, excavation, vehicles movement, stockpiles, unpaved surfaces, etc. along the working strip, access roads, yards and camps. Receptors will include residential population, workers, fauna and flora species, cultural, historic, water quality, etc.	• Local, typically vicinity of working strip of pipeline (within 100 m) and associated facilities (new roads, yards, camps). Specific distances depend on local conditions and could be up to hundreds of metres in certain unfavourable meteorological situations	• Good construction site management practices such as covering of loose materials, vehicle speed limits, watering dusty surfaces in dry weather, sheeting of trucks, etc. • Environmental and social management plan
	• Impacts from emissions to the atmosphere from machinery and vehicles (i.e. generators, excavators, bulldozers, side booms, trucks, cars, compressors for hydrotesting etc.). Receptors will include residential population, workers, fauna and flora species, water quality, etc.	• Local, typically vicinity of working strip of pipeline (within 100 m) and up to hundreds of meters. Specific distances depend on local conditions. • Global - Greenhouse gases (e.g. CO_2)	• Maintenance of equipment and vehicles • Routing of construction traffic away from sensitive areas • Training of operators and drivers • Avoiding construction traffic from crossing densely populated areas or historic centres • Traffic management plan • Use of low sulphur fuels if available • Modelling of pollutant dispersion from main emission sources (generators, compressors) • Monitoring of main emission sources (generators, compressors) - Environmental Monitoring Plan • Environmental and social management plan.

Impact Area	Potential Impact/Source	Area of Influence	Potential preventive/mitigation measures
Noise and Vibration	• Impacts from noise and vibration from machinery, construction vehicles, blasting of rocks (if required) and compressors for hydrotesting. Noise receptors will include residential population (and sensitive receptors like schools and hospitals), workers, fauna, cultural/historical buildings, etc.)	• Local, specific distances depend on local conditions and source: o Machinery and construction vehicles. Typically between working strip (40 m) and up to hundreds of meters. o Blasting. Up to 10 km	• Good construction site management • Limiting working hours close to sensitive receptors • Using specific mitigation on noisy equipment (acoustic shielding) • Locating noisy equipment (e.g. generators, compressors) away from noise sensitive receptors • Speed limits for vehicles • Adequate Personal Protective Equipment (PPE) for workers • Modelling of main noise emission sources (generators, compressors) • Monitoring of main emission sources (generators, compressors) - Environmental Monitoring Plan • Environmental and social management plan.
Biodiversity and Natural Habitats	• Impacts from habitat loss. The impacts will be both temporary and long term/permanent. Temporary impacts will arise from the working strip, camps and yards which will be reinstated to pre-construction conditions once construction is completed.	• Local, working strip (40 m) and footprint of associated facilities	• Route and associated infrastructure location selection • Alternative construction techniques to open cut trenching and backfilling (e.g. Horizontal Directional Drilling) • Minimise footprint wherever possible (e.g. narrower working strip) • Restore pre-construction conditions as far as possible (e.g. re-vegetation of working strip) - Vegetation/Landscape Restoration Plan.

Impact Area	Potential Impact/Source	Area of Influence	Potential preventive/mitigation measures
	• Impacts to fauna and flora species of nature conservation interest from the project's activities (e.g. noise, aqueous discharges, sediments plumes, uptake of water for hydrotesting, greater human pressure to previously inaccessible areas) during construction and pre-commissioning works with particular reference to sensitive areas such as nesting places, old growth forests, wetlands, rivers, riparian vegetation and areas identified as rich in endemic and protected species.	• Local, specific distances depend on source of impact and local conditions. Typically immediate vicinity of working strip of pipeline (40 m) and associated facilities (new roads, yards, camps). Specific distances depend on local conditions and could be up to hundreds of metres in certain unfavourable conditions. Impacts to water quality and aquatic habitats could be up to a kilometre depending on the impact and the conditions.	• As above for water quality, air quality noise & vibration impacts • Management of dust, air emissions, aqueous discharges and waste to minimise impacts on flora, fauna and ecosystems (e.g. locating fixed machinery as far as possible from sensitive habitats) • Restrict construction during certain periods/seasons at certain areas • Monitor impacts on flora and fauna at sensitive locations - Environmental Monitoring Plan • Environmental and Social Management Plan • Biodiversity Action Plan (BAP) to be designed for the life of the project. Action Plans for specific important species (e.g. bear) and habitats/environments should be developed. • Relocate endemic/rare plant species to suitable nearby habitats
Landscape and Visual Impacts	• Temporary and permanent landscape and visual impacts from land take and above-ground structures. The impacts will be temporary for the working strip, camps and yards which will be reinstated to pre-construction conditions once construction is completed. Sections with potentially significant landscape impacts include mountain ridges or elevated terrain and old growth and mature forests.	• Local, specific distances depend on local conditions. Up to 10 km in certain circumstances (Regional)	• Minimise footprint wherever possible (e.g. narrower working strip) • Restore pre-construction conditions as far as possible (e.g. re-vegetation of working strip) - Vegetation/Landscape Restoration Plan. • Visual mitigation measures where deemed necessary (compressor stations) • Location of new roads, temporary accesses and camps away from sensitive landscape locations

Table 6.2 Potential Socioeconomic Impacts and Mitigation Measures related to Onshore Construction and Pre-Commissioning

Impact Area	Potential Impact/Source	Area of Influence	Potential preventive/mitigation measures
Displacement of Existing Land Uses, Property and People	• Temporary impacts on land uses. Temporary impacts will arise from the working strip which will be re-instated following the completion of the construction activities returning the land to its original use. Impacts on annual crops will also be temporary along the working strip along which annual crops can be grown once re-instated.	• Local, working strip of pipeline (40 m) and associated facilities (new roads, yards, camps) and areas to be occupied by compressor stations, block valve stations and associated permanent facilities.	• Implement a Resettlement Action Plan (RAP) to set out how resettlement for permanent and temporary acquisition of land will be managed and mitigated in line with TAP's Strategy for the Acquisition of Land and Easement. • Implement a land restoration plans to ensure previous use and users returning on completion of construction.
Socio-Economic Impacts	• Increased government revenues (e.g. permit & construction fees and levies)	• Local, Regional and National,	• Early engagement with national government stakeholders
	• Impacts to local livelihoods and loss of household income as a result of construction works (e.g. temporary and long term occupation of agricultural land). • Site clearing and opening of access roads in mountainous areas could affect the collection of forest products and animal grazing.	• Local, working strip of pipeline (40 m) and associated facilities (new roads, yards, camps) and areas to be occupied by compressor stations, block valve stations and associated permanent facilities. Land plots and areas affected by decreased accessibility due to the presence of construction sites.	• Ensure that the Resettlement Action Plan (RAP) includes a strategy for land acquisition based on compensation for loss of livelihoods (i.e. Livelihoods Restoration Plan) as stated in TAP's Strategy for the Acquisition of Land and Easement. • Community Engagement Plan (CEP) as part of TAP stakeholder engagement strategy. • Engage a team of Community Liaison Officers (CLOs) to manage and monitor TAP's community relations.
	• Economic benefits to households and to the local economy as a result of direct/indirect job creation during construction works. • Benefit to the local community and economy as a result of local procurement of materials for construction and other services to supply the project.	• Local and Regional (communes and districts) benefitting from employment and procurement opportunities.	• Develop an Employment and Procurement Strategy to ensure maximisation of opportunities for local people and businesses. • Maximise local employment during construction and provide a fair and transparent recruitment process and to enhance local skills base through training provided by TAP • As far as possible, procure goods from local suppliers through sub-contracts to local firms (subject to availability, quality and cost) and purchasing of goods from local retailers (TBC).

Impact Area	Potential Impact/Source	Area of Influence	Potential preventive/mitigation measures
	• The presence of workers on the site during construction works could have an impact on social infrastructures (water, electricity, roads, health centres) • While there might be a temporary pressure on these infrastructures in the short term, there may be also a positive impact on infrastructure development in the medium to long term.	• Local, typically vicinity of working strip of pipeline (40 m) and associated facilities (new roads, yards, camps) and areas around compressor stations, bock valve stations and associated facilities.	• Ensure provision of social infrastructure to workforce. • Facilitate access of local communities to new infrastructures, in particular new access roads.
	• The presence of workers on the site and the money they earn and spend may cause changes to local customs and norms. • Impacts on local livelihoods (e.g. farming and herding) from project construction could also impact on social institutions and cohesion of the local community since livelihoods and social institutions are often closely bound with each other.	• Local, typically vicinity of working strip of pipeline (40 m) and associated facilities (new roads, yards, camps) and areas around compressor stations, bock valve stations and associated facilities	• Implementation of a Community Engagement Plan (CEP) as part of TAP stakeholder engagement strategy. • Engage a team of Community Liaison Officers (CLOs) to manage and monitor the satisfactory implementation on effectiveness of all community relation procedures. • Develop a Workers Code of Conduct that will include disciplinary measures for those that break the Code requirements.
Community Health and Safety	• Safety risks for communities as a result of construction works. • Increased traffic loads on roads adjacent to the project	• Local, communities currently using and living along the roads to be transited by the project's vehicles, including mountain roads. Communities along transportation routes	• Develop a community Safety Management Plan to address safety risks for communities, including traffic related risks. • Provide traffic awareness training at local schools and at community level to raise the awareness of communities regarding avoidance of road related accidents.
	• The project has the potential to impact on neighbouring communities through changes in noise and air quality, water quality, water resources, visual impact and changes in accessibility (see above), but also by causing severance between people's homes and places they want to visit or go to work to (such as agricultural land and grazing areas).	• Local, communities located in the vicinity of construction sites (up to 10 km in certain circumstances)	• Impacts of severance will be mitigated by provision of replacement crossing points.

Impact Area	Potential Impact/Source	Area of Influence	Potential preventive/mitigation measures
	• Potential increase of local incidence of introduced diseases and pressures on local services (health, leisure, police, etc) from the project's workforce.	• Local and Regional, communities near workers camps.	• Apply strict worker management policies and prevention measures • Provide medical assistance for all workforce to avoid burdens are not placed on local services to the detriment of the local community. • Develop Code of Conduct for workers to abide.
	• Location of workforce in camps near local communities could result in disruption and nuisance.	• Local, communities inhabiting the vicinity (up to 1 km) of worker camps.	• Avoid location work camps close to local communities • Careful attention will be given to the final location and services provided to its workforce. TAP's will ensure access to facilities and services to reduce pressures on local community facilities (i.e. hospitals, transport, etc.).
Working Conditions	• Risk of injuries for workforce as a result of major excavations, tunnelling and working in the vicinity of active roads	• Local, communities located in the vicinity of construction sites (up to 200m).	• Develop a HSE management systems for the project in accordance with international good practice. The HSE plan will identify risks to worker health and safety and describe the HSE management System. • Good site management practise (training and qualification of staff, appropriate work standards) will be implemented to reduce health and safety risks.

Table 6.3 Potential Cultural Heritage Impacts and Mitigation Measures related to Onshore Construction and Pre-Commissioning

Impact Area	Potential Impact/Source	Area of influence	Potential preventive/mitigation measures
Archaeology (known and potential) and Built Heritage including "intangible cultural heritage" (ICH)	• Ground disturbing construction activities including permanent and temporary occupations (i.e. working strip, compressor stations, pipe yards, workforce camps, tunnel portals, landfills/land takes and accesses).	• Local, working strip of pipeline (40 m) and associated facilities (new roads, yards, camps) and areas to be occupied by compressor stations, block valve stations and associated permanent facilities.	• Cultural Heritage Management Plan (including ICH): • Detailed reconnaissance survey of known monuments, ICH and archaeological sites. • Implementation of archaeological monitoring and a "chance finds" procedure with special focus on high potential archaeological areas. • Avoidance of certain and likely impacts by project redesign for archaeological site, monuments and ICH. • Use of low special impact construction techniques where complete avoidance (e.g. re-routing) is not feasible. • Removal of resources by rescue excavations and associated studies. • ESMP within the ESIA to outline the Cultural Heritage Management Plan.

6.2.2 Operation

Table 6.4 Potential Environmental Impacts and Mitigation Measures related to Onshore Operation

Impact Area	Potential Impact/Source	Area of influence	Potential preventive/mitigation measures
Resources and waste	• Waste and wastewater generated by stations during maintenance. This includes waste generated by pigging operations (tailings, sludge).	• Local, specific distances depend on local conditions	• Waste management plan
Air Quality and Climatic factors	• Impacts from air emissions from the compressor station (turbines) • Non-routine events such as emergency venting (and depressurisations for maintenance) at the compressor station or pipe failure have a higher potential to reduce air quality.	• Local, specific distances depend on local conditions, typically hundreds of meters, but could be up to a kilometre in certain unfavourable meteorological conditions. • Greenhouse gases, Global	• Maintenance and monitoring • Air quality monitoring • Location of compressor station away from sensitive receivers • Adoption of Best Available Techniques (BAT) for the abatement of air pollutants
Noise and Vibration	• Impacts from noise emissions during the normal operation of the compressor stations (e.g. compressors, turbine engines). Non-routine events such as emergency venting. Noise receptors will include residential population (and sensitive receptors like schools and hospitals), workers, fauna, cultural/historical buildings, etc.	• Local, specific distances depend on source of impact, local conditions, and location of sensitive receptors. • Compressor noise from 200 m to more than a kilometre in certain unfavourable meteorological conditions.. Over a kilometre for noise generated during emergency venting (typically for short periods of time).	• Maintenance and monitoring • Noise emission monitoring • Location of compressor station away from sensitive receivers • Modelling of main noise emission sources (generators, compressors) • Monitoring of main emission sources (generators, compressors) - Environmental Monitoring Plan • Using specific mitigation on noisy equipment (acoustic shielding) • Locating noisy equipment (compressors) away from noise sensitive receptors

Impact Area	Potential Impact/Source	Area of influence	Potential preventive/mitigation measures
Biodiversity and Nature Conservation	• Impact to fauna from the noise emissions from the compressor stations • Impacts to flora and fauna from the routine maintenance/clearance of the inner safety corridor (maximum 10 m wide) where no deep routed vegetation will be allowed to avoid interference with pipeline.	• Local, RoW (20 m) from 200 m to more than a kilometre in certain unfavourable meteorological conditions in the surroundings of the compressor stations.	• Noise emissions, as above • Restore pre-construction conditions as far as possible (e.g. re-vegetation of working strip) and maintain vegetation - Vegetation/Landscape Restoration Plan. • Monitor impacts on flora and fauna at sensitive locations • Environmental and Social Management Plan • Biodiversity Action Plan (BAP) to be designed for the life of the project. Action Plans for specific important species (e.g. bear) and habitats/environments to be developed.
Landscape and Visual Impacts	• Impacts to landscape due to permanent land take for the compressor stations and block valve stations. • Impacts to landscape from routine maintenance of the RoW.	• Local, RoW (20 m) and accesses for maintenance clearance, other specific distances in terms of the permanent structures (block valve and compressor stations) depend on local conditions	• See above • The Vegetation/Landscape Restoration Plan should pose special attention to areas with high visibility or where special re-vegetation techniques should be established (e.g. slope stabilisation techniques on mountain slopes).

Table 6.5 Potential Socioeconomic Impacts and Mitigation Measures related to Onshore Operation

Impact Area	Potential Impact/Source	Area of Influence	Potential preventive/mitigation measures
Displacement of Existing Land Uses, Property and People	• Permanent land acquisition/easement during operation • Permanent changes to land uses in particular agricultural land for permanent crop production (e.g. olive trees, fruit orchards, vineyards).	• Local, RoW (20 m) and areas to be occupied by compressor stations and other permanent infrastructures.	• Develop a Resettlement/Livelihood Restoration Action Plan setting out how resettlement for permanent and temporary acquisition/easement of land will be managed and mitigated during operation and decommissioning. • Implement a land restoration plans to ensure previous use and users returning after decommissioning of the project. • Develop a Community Engagement Plan (CEP) as part of TAP stakeholder engagement strategy. • Engage a team of Community Liaison Officers (CLOs) to manage and monitor TAP's community relations and restoration plans

Impact Area	Potential Impact/Source	Area of Influence	Potential preventive/mitigation measures
Socio-Economic Impacts	• Increased government revenues as a result of tariffs on gas transport.	National, Regional	
	• Economic benefits to households and to the local economy as a result of direct/indirect job creation during operation (e.g. compressors stations).	• Local and regional (provincial, communes and districts) benefitting from employment and procurement opportunities.	• Develop an Employment and Procurement Strategy to ensure maximisation of opportunities for local people and businesses. • Maximise local employment during operation and provide a fair and transparent recruitment process and to enhance local skills base through training provided by TAP • As far as possible, procure goods from local suppliers through sub-contracts to local firms (subject to availability, quality and cost) and purchasing of goods from local retailers.
	• Land use restriction for safety reasons (built permanent and semi permanent , such as greenhouses, infrastructures)	• To assure the integrity of the pipeline, the construction of houses will be restricted in a corridor of maximum 60 m and the establishment of cluster of houses and/or industrial infrastructure in a corridor of maximum 200 m	• The preferred route was selected to accommodate the safety criteria (see area of influence) and allows sufficient space also for future developments of neighbouring communities
Community Health and Safety	• Safety risks for communities as a result of project operation activities, in particular those related to traffic operations.	• Local, communities currently using and living along the roads to be transited by the project vehicles, including mountain roads. Communities along transportation routes	• Develop a Community Safety Management Plan to address safety risks for communities, including traffic related risks.

Impact Area	Potential Impact/Source	Area of Influence	Potential preventive/mitigation measures
	• The project has the potential to impact on neighbouring communities through changes in noise and air quality, visual impact and changes in accessibility (see above), but also by causing severance between people's homes and places they want to visit or go to work to (such as agricultural land and grazing areas).	• Local, communities	• Impacts of severance will be mitigated by provision of replacement crossing points.
Working Conditions	• Risk of injuries for workforce as a result of routine project operation activities like maintenance	• Local, communities currently using and living along the roads to be transited by the project vehicles, including mountain roads.	• Develop a HSE management systems for the project in accordance with international good practice. The HSE plan will identify risks to worker health and safety and describe the HSE management System. • Good site management practice (training and qualification of staff, appropriate work standards) will be implemented to reduce health and safety risks.

Table 6.6 Potential Cultural Heritage Impacts and Mitigation Measures related to Onshore Operation and Decommissioning

Impact Area	Potential Impact/Source	Area of influence	Potential preventive/mitigation measures
Archaeology (known and potential) and Built Heritage including "intangible cultural heritage" (ICH)	• No specific impacts or risks are expected during the operation (land take and earth works limited to construction phase) • Ground disturbing removal and restoration activities during decommissioning	• Local, RoW (20 m) footprint of associated decommissioning activities	• Cultural Heritage Management Plan (including ICH)

Table 6.7 Potential Environmental, Socioeconomic and Cultural Heritage Impacts and Mitigation Measures related to Offshore Construction

Impact Area	Potential Impact/Source	Area of influence	Potential preventive/mitigation measures
Resources and waste	• Consumption of fuel by vessels and machinery • Sewage (black and grey water) management and disposal. • Solid waste production and disposal.	• Local to National, depending on impact and specific location of waste disposal and origin of construction material and fuel, for example	• Operation under international standards (MARPOL) • Maintenance and monitoring • Waste management plans
Seabed	• Temporary and permanent alteration of the seabed in areas where trenching or other intervention works may be required.	• Local, footprint of intervention works, typically up to 40 m.	• Routing of the pipeline. • Design and construction management to minimise alteration
Water Quality	• Sediment plumes (potentially including contaminants) causing smothering or other detrimental effects to benthos and fish. • Vessel operations wastewater discharges • Disposal of the water from hydro-testing • Potential oil spills and leaks form machinery and vessels.	• Local, specific distances depend on local conditions. Typically hundreds of meters but could be up to several kilometres as a result of certain unfavourable metocean conditions (e.g. strong currents)	• Operation under international standards (MARPOL) • Bunkering procedures • Oil & Chemicals Spill Contingency Prevention & Planning • Design and construction management • Technical solutions to minimise sediment plumes e.g. closed buckets for backhoe dredgers, silt screens (if necessary) • Use of untreated water for hydro-testing • Use of diffusers for hydro-testing discharge
Air Quality and Climatic factors	• Exhaust fumes from vessel and machinery.	• Local, specific distances depend on local conditions, typically hundreds of meters, but could be up to a kilometre in certain unfavourable meteorological conditions. • Greenhouse gases, Global	• Maintenance and monitoring

Impact Area	Potential Impact/Source	Area of influence	Potential preventive/mitigation measures

Biodiversity and Nature Conservation	• Direct effects on coastal/benthic/intertidal communities/habitats along the pipeline route and landfall during construction (e.g. dredging, trenching, pipe lay, excavation, use of barges and anchors).
	• Indirect effects of suspended sediments (smothering, reduced penetration of light) and hydro-testing/wastewater discharges
	• Disturbance to coastal fauna (birds)
	• Subsea noise generation.
	• Accidental releases of chemicals, fuel
	• Alien invasive species from construction vessels (e.g. introduced through the release of ballast water)
		• Local, footprint of intervention works , other specific distances depend on source of impacts and local conditions:
		  • Suspended sediment plume, discharge of hydrotest water: Typically, tens to hundreds of meters. In certain temporary unfavourable metocean conditions, could reach up to several kilometres;
		  • Underwater noise effects on fauna. Variable distance depending on sources (e.g. type of vessel/activity), species and location. Typically, tens to hundreds of meters, but in certain temporary unfavourable conditions, could reach up to several kilometres for some especially sensitive species.
			• Avoidance of sensitive marine habitats (e.g. local re-routes)
			• Oil & Chemicals Spill Contingency Prevention & Planning
			• Design and construction management
			• Technical solutions to minimise sediment plumes e.g. closed buckets for backhoe dredgers, silt screens (if necessary)
			• Use of untreated water for hydro-testing
			• Use of diffusers for hydro-testing discharge
			• Evaluation/assessment of hydrotest water discharge location
			• Seasonal timing of works.
			• Operation under international standards (MARPOL)

Socio-Economic and community Health and Safety Impacts	• Increased government revenues as a result of tariffs on transport. • Temporary disruption to vessel traffic. • Temporary limiting access to commercial fishermen. • Potential risk of collision with other sea users, or interference with other users which can involve safety issues. • Temporary disruption of tourism activities • Indirect effects from construction activities (see onshore)	• Local to National, depending on origin of potentially impacted element	• Where feasible minimise impacts to fishing/shipping areas through local re-routing • Information to authorities/fishermen/mariners. Navigational warnings • Lights, radio communications and other safety devices. • Stakeholders engagement, potential compensation.

Impact Area	Potential Impact/Source	Area of influence	Potential preventive/mitigation measures
Archaeology and Built Heritage	• Direct physical damage, e.g. from pipe laying, excavation, anchoring or dredging; • Indirect effects (e.g. through rock placement or dredging respectively), leading to deterioration, loss, or loss of access to, cultural heritage.	• Local, footprint of intervention, other specific distances depend on local conditions, typically not more than hundreds of meters	• Cultural Heritage Management Plan (including ICH): • Detailed route survey • Implementation of archaeological monitoring and a "chance finds" procedure • Use of low special impact construction techniques where complete avoidance (e.g. re-routing) is not feasible. • Removal of resources by rescue excavations and associated studies. • ESMP within the ESIA to outline the Cultural Heritage Management Plan.

Table 6.8 Potential Environmental, Socioeconomic and Cultural Heritage Impacts and Mitigation Measures Related to Offshore Operation

Impact Area	Potential Impact/Source	Area of influence	Potential preventive/mitigation measures
Resources and waste, water quality	• Solid waste production and disposal (pipeline maintenance activities).	• Local to National, depending on impact and specific location of waste disposal	• Maintenance and monitoring • Waste management plans
Biodiversity and Nature Conservation	• Modification of hydrodynamics, with subsequent effects on seabed features and distribution and abundance of organisms, • Introduction of permanent artificial substrate (e.g. pipeline, seabed tie-in facilities, rock armour, concrete mattresing) on the seabed, leading to colonisation by epifauna (including the potential for invasive species).	• Local, specific distances depend on local conditions, typically within tens of metres from pipeline	• Maintenance and monitoring • Waste management plans
Socio-Economic and community Health and Safety Impacts	• Interaction with fishing gear and risk to fishing vessels if pipeline becomes exposed or spans develop in the pipeline; • Vessel anchor impact, emergency anchoring or dragged anchoring in the vicinity of the pipeline.	• Local to National or International depending on origin of fishing vessel	• Monitoring/surveillance of pipe • Agreements for proven damage compensation

Impact Area	Potential Impact/Source	Area of influence	Potential preventive/mitigation measures
Pipeline integrity/Geohazards	• Seismic activity, faults, slope instability, which constitute a menace for the pipeline integrity.	• Local or Regional, depending on the extent of the event	• Safety design studies. • Route refining (during routing phase)
Archaeology and Built Heritage	• Modification of hydrodynamics, with subsequent effects on seabed features scouring, exposure and deterioration of archaeological resources such as wrecks.	• Local, specific distances depend on local conditions, , typically not more than hundreds of metres	• Routing, salvage

6.4 MAIN FINDINGS OF PRELIMINARY ASSESSMENT

The preliminary assessment presented in the tables above has been based on the project information currently available, the baseline information collected to date and the experience gained in similar projects constructed in similar environmental and socioeconomic contexts.

The likelihood, magnitude and significance of the impacts will be further assessed in the detailed ESIA. However the preliminary assessment highlights that construction impacts of a pipeline and associated facilities are typically temporary in nature and localised. These include temporary noise and air emissions from construction machinery, impacts on land use, loss/disturbance of natural habitats (flora and fauna), landscape and temporary impacts to water quality and aquatic habitats during river crossings and near shore marine works. The magnitude and significance of construction impacts will depend on the local conditions. Typically construction impacts can be managed and mitigated efficiently.

The onshore pipeline will be buried and the land will be re-instated to its pre-construction status. The main limitations on land use above the pipeline will be a narrow corridor of maximum 10 m in which the growing of deep routing trees will be restricted, a corridor of maximum 60 m in which the construction of houses will be restricted and a corridor of maximum 200 m in which the establishment of cluster of houses and/or industrial infrastructure is limited. The preferred route was selected to accommodate this criteria and allows sufficient space also for future developments of neighbouring communities. The operation of the compressor stations will generate air emissions and noise and will have an impact on the landscape. The magnitude and significance of these impacts are comparable to those of small co-generation gas power plants. Best practice and mitigation measures will be adopted to minimise operational impacts. Landscape impacts will be managed through the restoration of the original landscape along the pipeline route and through vegetation screening of the permanent structures where required.

7 TERMS OF REFERENCE FOR ESIA

7.1 INTRODUCTION

A key outcome of the scoping process is the definition of the Terms of Reference (or ToR) of the detailed ESIA study. The findings of the ESIA study will presented in an ESIA report (or EIA report in line with Albanian Regulations) which will be prepared in compliance with National Albanian standards and regulations as well as international standards. As for all previous ESIA steps performed by TAP (Alternative Routes Assessment and Scoping) TAP has selected the more stringent EBRD standards as the international standards benchmark for the ESIA report.

The following sections present the Terms of Reference of the detailed ESIA which will be performed for TAP. The section is structured as follows:

- Overview of activities to complete the ESIA process;
- Specialist studies;
- Stakeholder engagement;
- Outline structure for the final ESIA report; and
- Provisional schedule for the ESIA process.

7.2 ESIA OBJECTIVES

TAP recognises that comprehensive planning and management of environmental and socio-economic issues are essential to the execution of any successful project and, therefore, intends to fully integrate environmental and socio-economic considerations into the life cycle of the proposed Project.

To support this, TAP will commission a detailed, integrated Environmental and Social Impact Assessment (hereafter referred as an ESIA) to be conducted in accordance with the following Albanian requirements:

- Law No. 8990 on Environmental Impact Assessment (January 23, 2003)

In addition, the ESIA will be prepared in line with the EBRD's Environmental and Social Policy (2008) including Performance Requirements (PR).

The purpose of the ESIA is to assess the potential impacts of the project and project-related activities on the environment (including biophysical and socio-economic resources) and, where applicable, to design mitigation or enhancement measures to avoid, remove or reduce negative impacts to the environment.

7.3 ESIA STEPS

Following on from the scoping phase of the project, the ESIA will:

- Update and finalise the technical project description as further engineering details become available, working closely with project engineers to confirm details such as the final layout of associated facilities (in particular compressor stations and block valve stations), final locations and layout of temporary infrastructures (pipe yards and worker camps), and construction and operation plans;
- Conduct additional consultation and further refine the scope of the ESIA as necessary;
- Collect additional baseline data through desktop research and field studies to complete a comprehensive description of the environmental, social and cultural heritage conditions;
- Develop mitigation and enhancement measures and outline an Environmental and Social Management Plan (ESMP) including an approach for monitoring;
- Report findings in a comprehensive ESIA report.

7.4 SPECIALIST STUDIES

To develop a complete understanding of the existing environmental, social and cultural heritage conditions (resources and receptors) in the project area of influence, further desktop, bibliographic and field studies will be carried out as summarised *Appendix D.* Any modeling studies required for the assessment of impacts in the ESIA and an outline of an approximate timeframe of the activities is also reported in *Appendix D*.

7.4.1 Desktop Studies

Desktop studies will include additional research to identify existing documentation that contains information relevant to key resources present in the project environment. Potential sources include publicly available literature with relevance to the project site and general area.

Finally, project engineering studies will be reviewed for quantitative information on environmental elements. Studies that may provide useful data would include geotechnical investigations, bathymetric and seabed investigations, process and operations water source investigations, surface water drainage studies, air emission studies and any other studies of relevance.

7.4.2 Field Studies

Planned Studies

Primary data will be collected by field studies carried out by environmental, socio-economic and cultural heritage specialists. Specialist with qualifications in the particular resource area and knowledgeable of the local conditions will

be used. International specialists will be used to provide technical guidance and quality assurance.

Determination of Seasonal Variations

For the TAP project primary sampling will be conducted between spring and summer. Within this timeframe, for any particular resource, selection of the specific sampling period will consider:

- when sampling will be most representative of the existing conditions;
- when 'worst case' conditions exist (e.g. when noise levels are the lowest, when traffic levels are the heaviest); and
- if seasonal variations would have significant effect on determination of potential impacts and significance

Where relevant and necessary, specific autumn surveys will also be conducted and incorporated in the final version of the ESIA

The specialists will adopt scientifically accredited and recognised sampling methodologies.

7.5 STAKEHOLDER ENGAGEMENT

Having completed initial scoping consultation and disclosure, the subsequent steps will be undertaken:

- Baseline consultation;
- ESIA report disclosure and consultation.

7.5.1 Baseline Consultation

Engagement activities carried out later on in the ESIA Study stage include consultations designed to inform local stakeholders about project design, to obtain their key concerns and high level issues and to inform the development of mitigation for the project. This consultation will enable the ESIA team to refine the ESIA analysis by generating additional feedback on the ESIA approach, key issues and analysis of potential impacts (such as assessment of their relative significance).

Consultation will be carried out with local community leaders and small groups of key stakeholders in the communities, the land of which is located within the 2 km study corridor. These will be undertaken alongside the social baseline study that will be carried out to better understand these stakeholders.

7.5.2 *ESIA Report Disclosure and Consultation*

The draft ESIA will be publicly disclosed and comments and suggestions will be collected from stakeholders and the public. The disclosure and consultation will be organised at national, regional and local level under the supervision of the Ministry of Environment Forests and Water Administration and the Regional Environmental Agencies. All administrative levels from the region to the communes and village representatives will be invited to engage as well as the local communities, NGOs and other interested parties.

The notification of the public hearings will be announced through media and the hearings will be open to the public. After 30 days from notification and disclosure of the ESIA report, TAP will hold Public Hearings (dates and locations will be identified and disclosed).

Comments and suggestions of the public hearings will be considered and the ESIA report finalised accordingly.

7.6 *STRUCTURE OF THE ESIA REPORT*

An outline of the proposed contents of the ESIA report is provided in *Table 7.1*. The content may altered during the evolution of the project or based on the findings of on-going consultation, however it is anticipated that the contents of the ESIA report will accord broadly within the suggested framework.

Table 7.1 Proposed EIA Report Structure

Chapter Number	*Contents Heading*	*Explanatory Note*
Front Piece		Title page, acknowledgements, authors and contributors, table of contents (including lists of figures, tables, and maps)
Executive Summary		Summary of the entire ESIA report.
1	Introduction	This *Chapter* will outline the development and structure of the ESIA report including the background, scope, terms of reference and declaration.
2	Project Justification	This *Chapter* will include discussion of the Project background, objectives, need for the project, value of the project, envisioned sustainability, alternatives considered (including no project alternative), development options considered and site selection.
3	Legislative and Policy Framework	This *Chapter* will outline the policy, legal and institutional framework within which the ESIA has been conducted. National regulations will be summarised along with relevant international agreements and conventions to which Albania is party, as well as applicable international best practice guidelines and project standards.
4	Project Description	This *Chapter* will provide a concise description of the project and its geographical and temporal context. It will include a site description, an overview of the Pipeline Project design and details of project inputs and outputs.

Chapter Number	*Contents Heading*	*Explanatory Note*
4	Description of the Environment	This *Chapter* will summarise the available baseline data on the environmental and social resources and receptors within the Project Study Area. It will be based on both primary and secondary data sources and will consider changes in the baseline condition without the development in place.
5	Consultations and Disclosure	This *Chapter* will present the results of consultation undertaken as part of the ESIA, plus plans for future consultation. It will identify key project stakeholders and present their feedback on the TAP Project.
6	Associated and Potential Impacts	This *Chapter* will summarise the predicted positive and negative impacts of the Project. Cumulative impacts will be assessed as appropriate.
7	Mitigation and Residual Impacts	This *Chapter* will outline general and specific mitigation measures to reduce, remove or avoid negative impacts to environmental and social receptors. Any residual impacts (post mitigation) will be outlined.
8	Environmental and Social Management Plan (ESMP)	The ESMP will draw together the possible mitigation measures; group them logically into components with common themes; define the specific actions required and timetable for implementation; identify training needs, institutional roles and responsibilities for implementation; and estimate the costs of the measures.
9	Conclusion	This *Chapter* will summarise conclusions that are made based on the assessment as well as outline any further recommendations.
Bibliography and References		All references made in the report and documents drawn upon during the course of the assessment
Annexes		These will include technical annexes with details of specific technical surveys, the bibliography and list of acronyms.

7.7 PROVISIONAL ESIA SCHEDULE

A provisional schedule for the ESIA is provided in *Table 7.2* below.

Table 7.2 ESIA and Stakeholder Consultation Schedule

Activity	*Timing*	
	Start	***Finish***
Scoping Document	November 2010	March 2011
Scoping Disclosure to stakeholders	end of March 2011	April 2011
Ongoing Stakeholder Engagement (including Household Surveys)	April 2011	August 2011
Specialist Field Surveys	April 2011	Mid June 2011
ESIA Report Drafting	May 2011	September 2011
Submission of Draft Final ESIA to Authorities		September 2011
Public Consultation and Disclosure of Draft ESIA	September 2011	November 2011
Authority Review of Draft ESIA	September 2011	June 2012
Final ESIA Production	June 2012	August 2012

8 STAKEHOLDER ENGAGEMENT

8.1 INTRODUCTION

TAP considers consultation and engagement with stakeholders an integral part of the Environmental and Social Impact Assessment (ESIA) process. In line with the development of the Albanian section of the proposed *Trans-Adriatic Pipeline,* TAP has developed a Stakeholder Engagement Strategy the overall aim of which is to ensure that a consistent, comprehensive, coordinated and culturally appropriate approach is taken for stakeholder consultation and disclosure. The approach taken by TAP is in full compliance with Albanian EIA Regulations, EBRD Performance Requirements, as well as relevant policies of the IFC and World Bank.

TAP intends to undertake a process of stakeholder engagement through project planning, construction, operation and decommissioning phases. The plan for this engagement, including identification of stakeholders (i.e. people and organisations who have a role in the project or could be affected by the project activities or who are interested in the project) and disclosure of information, consultation, and handling of suggestions, comments and concerns, is documented in the Albania Stakeholder Engagement Plan. This plan will be updated as required as the project progresses.

In *Section 8.2* an overview of stakeholder engagement phases planned throughout the project is presented. The engagement activities planned during the scoping phase are further detailed in *Section 8.3*

8.2 STAKEHOLDER ENGAGEMENT PHASES FOR TAP PROJECT

8.2.1 Overview

To fulfil the objectives of stakeholder engagement, the TAP Project has developed a plan for engagement with stakeholders through Project life-cycle. The plan lays out a process for consultation and disclosure through five stages, each having slightly different objectives. These stages are described in *Table 8.1.*

Table 8.1 ESIA Stakeholder Engagement Phases

Phase	Objective	Status
Alternatives Assessment	The overall objective of stakeholder engagement during the pipeline route selection process was to identify environmental, social and cultural heritage sensitivities that should be taken into account in selecting the preferred route.	*Completed*
Scoping	The aim of this engagement during the scoping phase is to provide further detail on the project and an opportunity for stakeholders to provide feedback on the scope, approach and key issues that will be addressed during the ESIA as well as the plans for future engagement activities.	*On-going*
ESIA Study	Stakeholder engagement during the ESIA Phase will have two objectives: maintain the relationships developed during the previous stages; and ensure all stakeholder issues have been identified and taken on board by the Project. TAP will revisit national and regional authorities and engage with affected communities along the chosen pipeline route. All stakeholders will be provided with a project update and an opportunity to comment, express any concerns and discuss issues	*Planned*
ESIA Disclosure	Stakeholders will be presented with the draft ESIA report at the end of the ESIA process and invited to comment on the document. Information on the project impacts will be presented along with the mitigation measures designed to minimise or enhance them.	*Planned*
Project execution (construction, operation and decommissioning)	TAP will continue to engage with stakeholders throughout the project lifecycle. The methodology for this will be developed and finalised using the information compiled during the ESIA process.	*Planned*

8.2.2 Pre-scoping Consultation

Stakeholder engagement to support route selection for the TAP Project was undertaken between May 2009 and March 2010 and included series of consultation meetings along the pipeline route in July and October 2009. The overall objectives of stakeholder engagement during the alternative route selection process were to: i) introduce the proposed project to potentially affected stakeholders; and ii) gather information pertinent to the route selection process.

Engagement with local authorities and potentially affected communities served to gather information on social, environmental and cultural heritage sensitivities. Any key concerns or high level issues that communities had regarding each of the route were identified at this early stage. Moreover, when presenting the proposed project to stakeholders, the team was also able to gain an understanding of how the local population viewed the project, whether they had any preferences in route and if there are any major impacts or constraints.

After completion of the route refinement process, *Alternative 6* was considered the preferred route - a summary of the appraisal is provided in *Section 3* of this report. A public disclosure program was carried out at national, regional and local level during June and July 2010 to inform government stakeholders and

NGOs about the results of the route selection process and the location of the proposed route corridor. The public disclosure activities included meetings with ministries in Tirana as well as meetings in the capital cities of Korça, Berat and Fier regions. A fourth meeting was organised in Çorovoda (Berat) to facilitate the participation of the heads of all communes concerned.

Issues identified during these consultations are summarised in *Table 8.2* below.

Table 8.2 Summary of Disclosure Issues

Issue	Comments
Quality of the assessment	The quality of the work was appreciated and participants generally had no objections to the reasoning for selecting *Alternative 6*.
Early engagement	The strategy for early stakeholder engagement was considered highly positive since it set the framework for the next phases of the project.
In favour of the proposed project	The stakeholders met were generally in favour of the project and expressed hope that the construction activities would commence promptly.
Alternative energy source	The TAP project was seen as an opportunity for supplying an alternative and sustainable source of energy to the country, thus contributing to its development. At present the main energy sources are hydropower, fuel oil and wood. However, TAP informed stakeholders that off takes of gas in Albania were not presently conceived within the project plan

With the aim of learning more about planned developments (power, mining, urban, etc.) along the preferred route and identifying potential constraints to the final location of the Compressor Stations and the landfall (see *Section 3*), TAP re-engaged with some of the national and regional government stakeholders to gather baseline data key for the assessment.

The meetings took place in last week of January 2011. Meetings were held with National Government Ministries in Tirana and Regional Government Authorities, Regional Councils, Regional Environmental Agencies (REAs) and Forestry Directorates in Korça and Fier.

8.3 SCOPING PHASE STAKEHOLDER ENGAGEMENT

8.3.1 Objectives

The objective of engagement during the scoping phase is to provide further detail on the project and an opportunity for stakeholders to provide feedback on the scope, approach and key issues that will be addressed during the ESIA study phase as well as the plans for future engagement activities.

The main emphasis of the scoping phase engagement is to present the project to government agencies, NGOs and other key groups as well as to community leaders. These organisations are listed in *Table 8.3* below. Information will also be disseminated to local communities and to the general public and channels will be opened to receive their feedback.

Table 8.3 Key Stakeholder Groups for ESIA Phase Engagement

Stakeholder Group	Stakeholder
National Government Stakeholders	Ministry of Environment, Forest and Water Administration Ministry of Agriculture, Food and Consumer Protection Ministry of Economy, Trade and Energy (METE) National Licensing Centre (QKL) Albanian National Agency of Natural Resources (AKBN) Ministry of Tourism, Culture and Sports Ministry of Public Works, Transport and Telecommunication (MPTT) Ministry of Defence Ministry of Interior Albanian Energy Regulator (ERE) Central Immovable Property Registration Office (IPRO)
NGOs and Other interested parties	NGOs (including regional/local) Community Groups Community Based Organizations (CBOs) Academic and Research Organisations International Development Agencies Media *Others tbd*
Regional Government Stakeholder	Regional Government (Korça, Berat and Fier Prefectures) Heads of Regions Regional Councils Regional Environmental Agencies (REAs) Regional Road Directorates Regional Forests Directorates Regional Immovable Property Registration Office (IPROs)
Local stakeholders	29 Heads of Communes/Municipalities 62 Heads of Villages General Public

The complete list of stakeholder groups, individual organisations and communities is presented in *Appendix C*.

8.3.2 Stakeholder Engagement Activities

Overview

Stakeholder meetings are planned in Tirana as well as in the regions to facilitate the participation of all concerned stakeholders, in particular heads of villages travelling from remote areas. The schedule for these meetings is shown in *Table 8.4.*

Specific activities to disclose information and seek comments from different stakeholder groups are summarised in the subsequent sections.

Table 8.4 Scoping Meetings

	Type of Engagement	Venue
11-15th April 2011	• One to one meetings with National Government stakeholders • Scoping Meeting with NGOs and other interested parties	Tirana
26-29th April 2011	• 4 regional scoping meetings (Regional and Communal Authorities and Heads of Villages and local NGOs)	Korça, Berat, Çorovoda and Fier

Engagement with National Government Stakeholders

National government agencies have expressed a preference for one to one meetings with the TAP Project to discuss the project and the scoping report. Consequently it is planned to send this document (ESIA Scoping Document, ESD) in Albanian to national government stakeholders, with a covering letter inviting them to a one to one meeting with TAP. The letter will also advise them of the Project and the ESIA study.

Both the letter and the ESD will be sent 15 days before the date of each of the proposed one to one meeting.

Engagement with NGOs and Other Organisations

The ESD will be sent to NGOs, including regional NGOs, and other interested parties accompanied by a letter inviting them to participate in a scoping meeting in Tirana. Both the ESD and the letter will be sent 15 days in advance of the scoping meeting to allow an in-depth review of the document during the meeting.

At the scoping meeting, it is planned to provide a presentation of the project and of the scoping report prior to opening the meeting to questions and comments. Participants will be able to pose the questions or raise the issues as well as to submit follow -up questions and comments during the meeting through comments sheets or subsequently send them by post or through the Project web site.

Engagement with Regional, Communal Authorities and Heads of Villages

Regional, communal and village level government stakeholders will be invited together to participate in one of the four scoping meetings to be organised by TAP. In preparation for the meetings, TAP will send the ESD in Albanian to all of them, with a covering letter inviting them to the scoping meeting in their respective regions. The letter will also advise them of the Project and the ESIA study.

Both the letter and the ESD will be sent 15 days before the date of the relevant scoping meeting.

Engagement with Local Communities

TAP/ENT is committed to continue engaging and consulting with affected communities along the chosen pipeline route to ensure that the project is fully explained to local communities and that their concerns and views on the Project are heard and taken into account.

During scoping, the main channel of communication will be the Heads of Villages. Heads of Villages will participate to the regional scoping meetings representing their constituencies and as such will have a role to play in further disseminating information on the project and in making accessible the copies of the ESD for the individual stakeholders.

For this purpose a shorter leaflet and accompanying poster with information about the ESIA Scoping Process and the feedback mechanism will be distributed to all Villages Heads during the regional scoping meetings for onwards distribution to communities (see above). Villages Heads will officially be asked to put up the poster and the leaflets in an accessible place in each village or town (i.e. communal premises, school building). In addition a daily notice will be broadcasted in local radio stations the week before and after the regional meetings to make sure all community members and other interested parties locally are informed about the Project and the ESIA Scoping process as well as the mechanism to provide comments on the Project.

Further consultation will be carried out with local community members including vulnerable populations and gender groups during the ESIA study phase. Moreover, all communities will be invited to participate in open public hearings during disclosure of the final ESIA report when information on the project impacts will be presented along with the mitigation measures designed to avoid or minimise them.

General Public

A notice will be written for national newspapers to ensure that interested parties and the general public outside the direct area are informed about the Project and the ESIA Scoping process.

The ESD will also be placed on the Project website with an email address for submitting the comments.

8.4 GRIEVANCE MECHANISM

In accordance with international best practice, a process has been set up through which any person or organisation can contact the project to ask a question or raise a concern. This process will be detailed in the project Environmental and Social Management Plan (ESMP) and will accord with EBRD standards. It will be open and accessible to all, designed to suit the varying cultural needs of all potential stakeholders, and will deal with grievances in a fair and transparent manner. All grievances will be recorded and responded to promptly before being closed.

The grievance mechanism is part of TAP's broader process of stakeholder engagement and quality and compliance assurance. While TAP is committed to avoid grievances through its dedication to a good overall stakeholder engagement process, the Project is aware that grievance and complains will occur and need to be addressed in good faith and through a transparent and impartial process.

Details on the grievance process, including grievance forms, are available on the Project website. They will also be conveyed to Villages Heads during the scoping engagement.

8.5 RESOURCES AND RESPONSIBILITIES

Stakeholder engagement is an integrated element of TAP's core business activities and is managed with the same principles as all other business functions: with clearly defined objectives and targets, professional, dedicated staff, established timelines and budgets, responsibility, accountability and oversight. TAP recognizes the importance of dedicating appropriate resources to the engagement process and establishing clear lines of responsibility.

8.6 PUBLIC COMMENTS AND SUGGESTIONS

An important objective of the ESIA Scoping disclosure process is to allow stakeholders to provide feedback on the Project. In this regard, TAP has envisaged a process that allows stakeholders to address their comments and suggestions in writing to TAP after the scoping meetings have taken place.

In this regard, TAP would like to invite all stakeholders involved in the scoping process, including local communities and the general public, to submit in writing their comments and suggestion concerning the Albanian section of the Trans Adriatic Pipeline (TAP) until 30th June 2011.

Appendix B presents a standard form to facilitate the submission of comments and suggestions in both English and Albanian. Participants to the scoping

meetings as well as the general public interested in the project are invited to submit comment forms either via mail or E-mail to the following address:

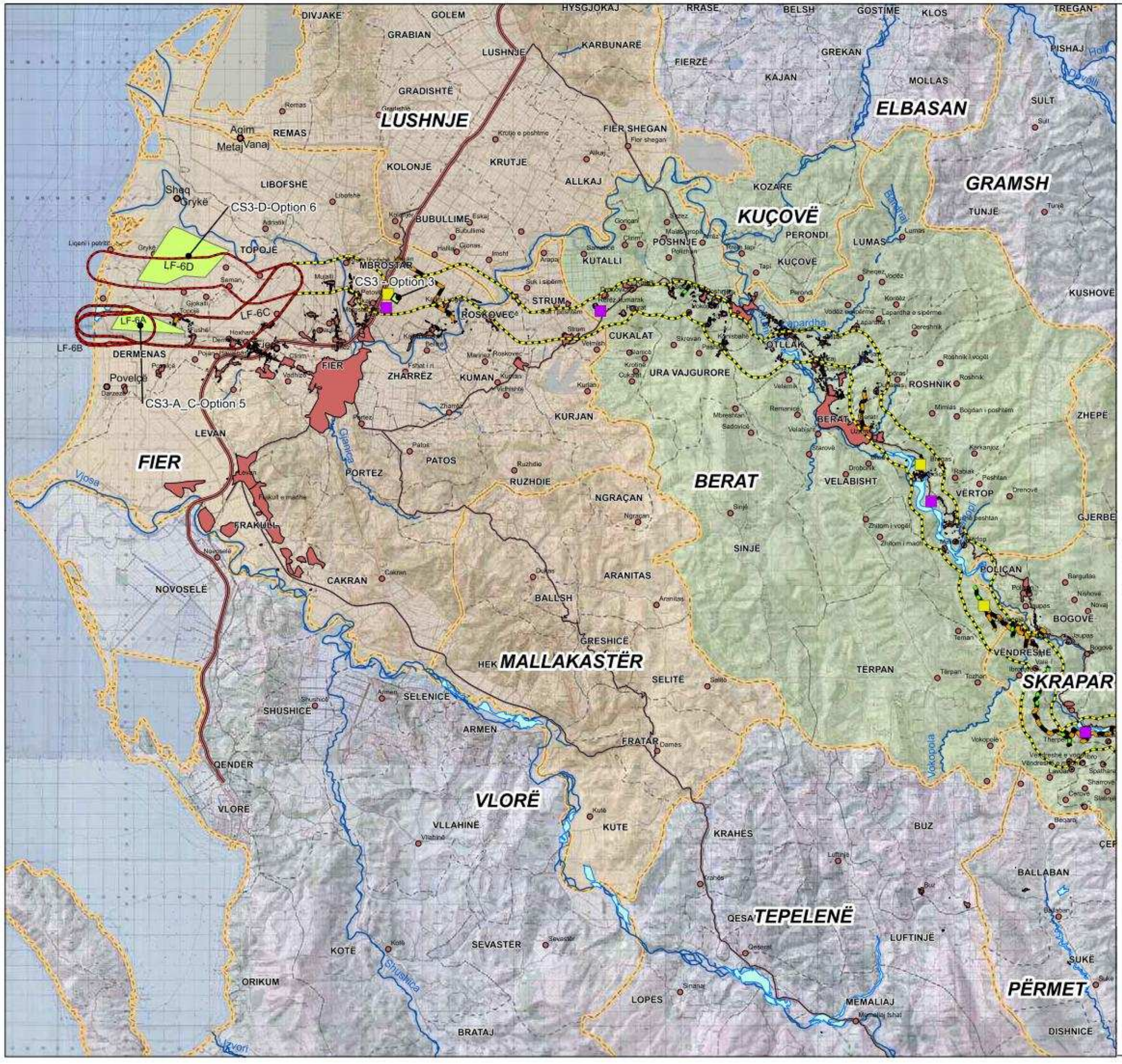
Trans Adriatic Pipeline AG – Albania (Branch Office)
Torre Drin, Abdi Toptani Street
Phone: + 355 44 308 770
Fax: + 355 42 265 685
Tirana, Albania

www.trans-adriatic-pipeline.com
esia-comments@tap-ag.com

Trans Adriatic Pipeline

Appendix A
Maps

(TAP-FEED-AL-EIA-REP-7028)



Legend

- Corridor_Landfall alternatives
- Corridor (2 km)

Logistic

- Camp sites
- Yards
- Compressor Station location options

Access Roads

- New Roads
- Upgraded Roads

Admnistrative Boundaries

Regions

- BERAT
- FIER
- Districts
- Communes
- Settlements

Roads

- RD-1 Highway, National Road
- RD-2 Main Road

Main Hydrology

- River
- Wetlands

REFERENCE DRAWINGS:

DOCUMENT TITLE:	DOC. NO.:
ESIA Scoping Report Albania	TAP-FEED-AL-EIA-REP.7028

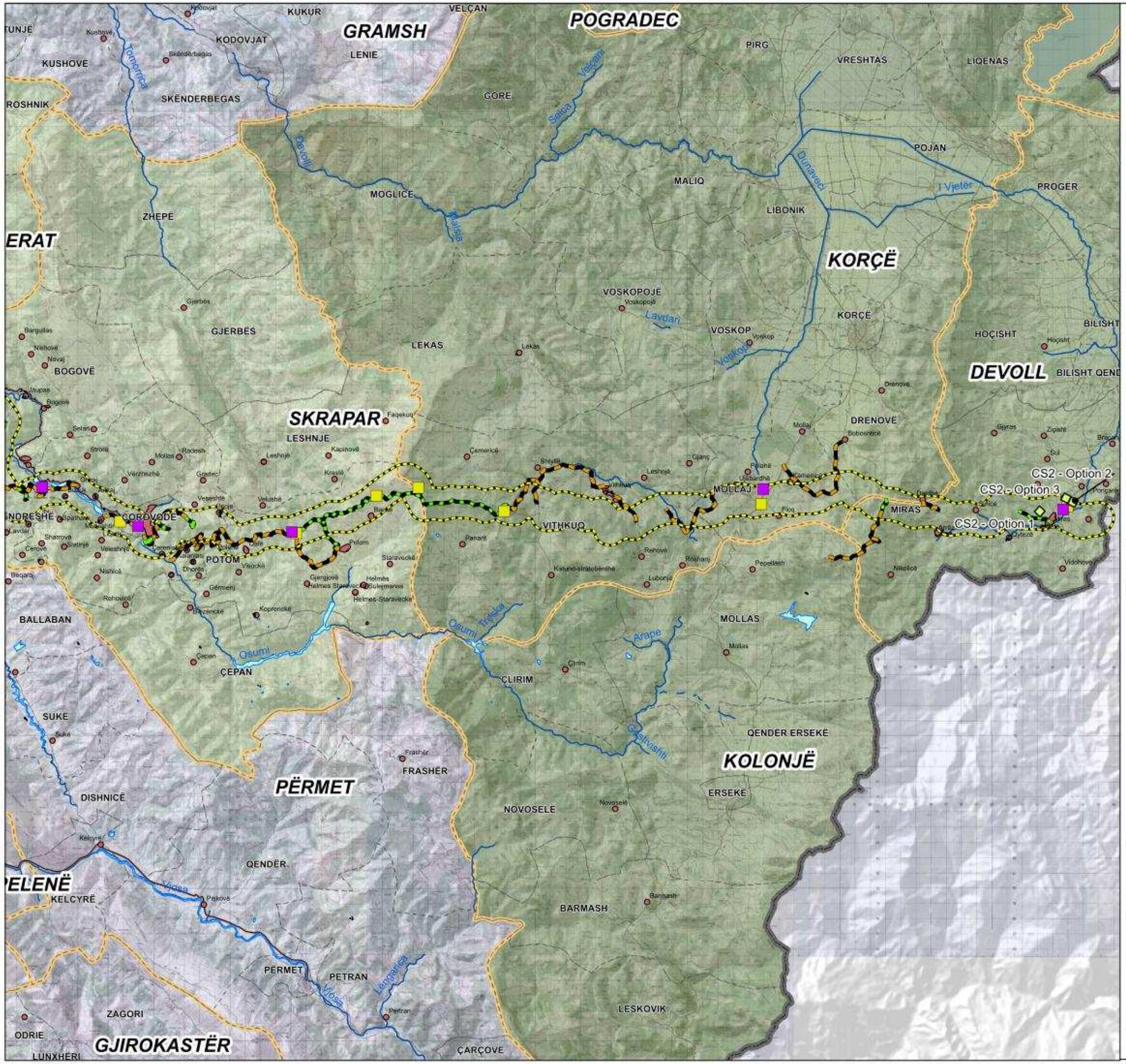
REV	DATE	ISSUE, SCOPE OF REVISION	PREP.	CHECK	APPR.
3	30/03/2011	IFA	MCP	MTV	ASM

CLIENT: Trans Adriatic Pipeline

PROJECT:
Trans Adriatic Pipeline (TAP)
Front End Engineering Design (FEED)

DRAWING TITLE:
Technical Map

SCALE:	PROJECT:	DRAWING NO:	SHEET OF
1:250.000	0092333	1	1 / 2



Legend

- Corridor (2 km)

Logistic

- Camp sites
- Yards
- Compressor Station location options

Access Roads

- New Roads
- Upgraded Roads

Admnistrative Boundaries

Regions

- BERAT
- KORÇË
- Districts
- Communes
- Settlements
- Greek Border

Roads

- RD-1 Highway, National Road
- RD-2 Main Road

Main Hydrology

- River
- Wetlands

REFERENCE DRAWINGS:

DOCUMENT TITLE:	DOC. NO.:
ESIA Scoping Report Albania	TAP-FEED-AL-EIA-REP-7025

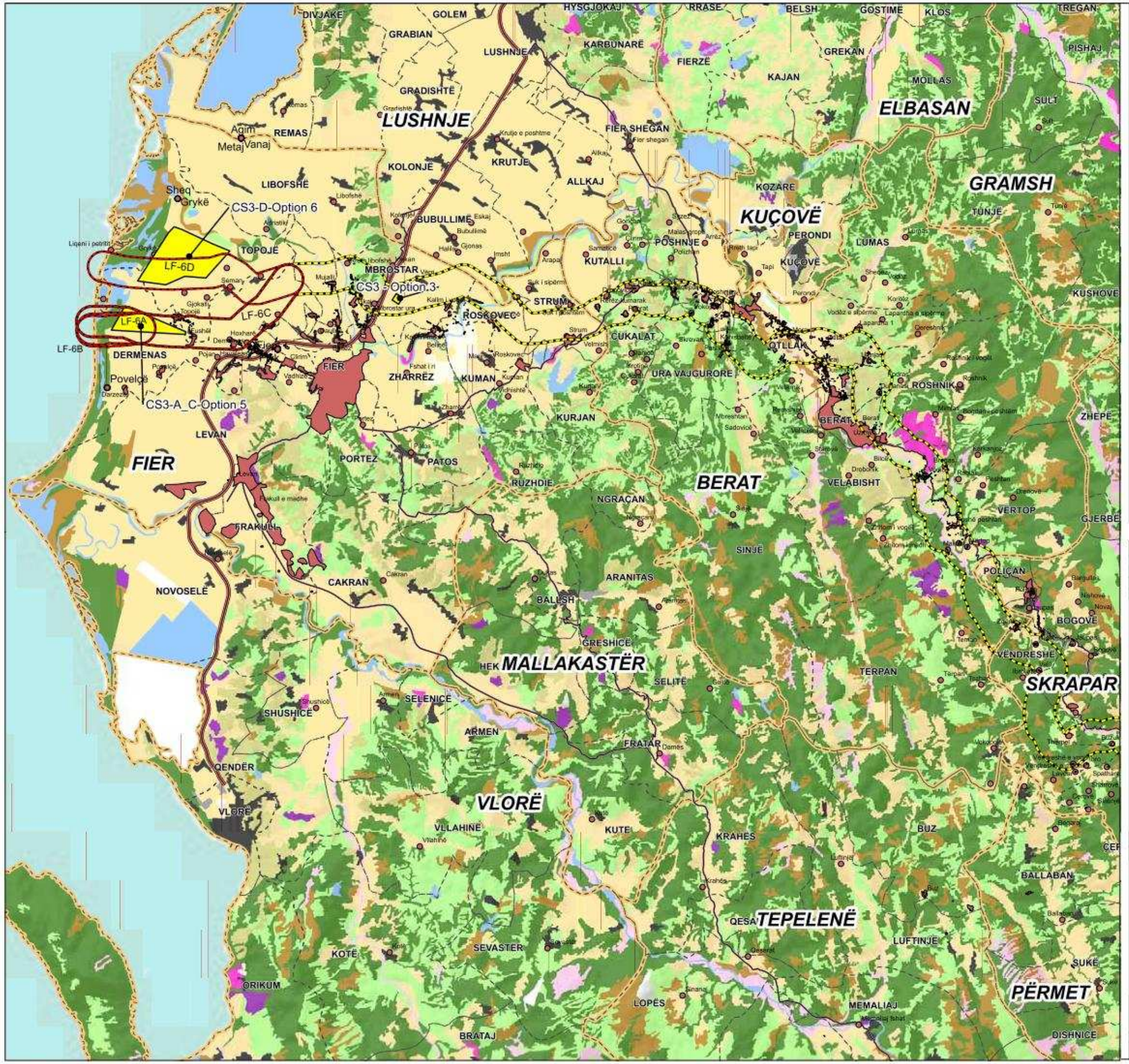
REV	DATE	ISSUE, SCOPE OF REVISION	PREP.	CHECK	APPR.
3	30/03/2011	IFA	MCP	MTV	ASM

CLIENT: Trans Adriatic Pipeline

PROJECT:
Trans Adriatic Pipeline (TAP)
Front End Engineering Design (FEED)

DRAWING TITLE:
Technical Map

SCALE:	PROJECT:	DRAWING NO:	SHEET OF
1:250.000	0092333	1	2 / 2



REFERENCE DRAWINGS:

DOCUMENT TITLE:	DOC. NO.:
ESIA Scoping Report Albania	TAP-FEED-AL-EIA-REP.7028

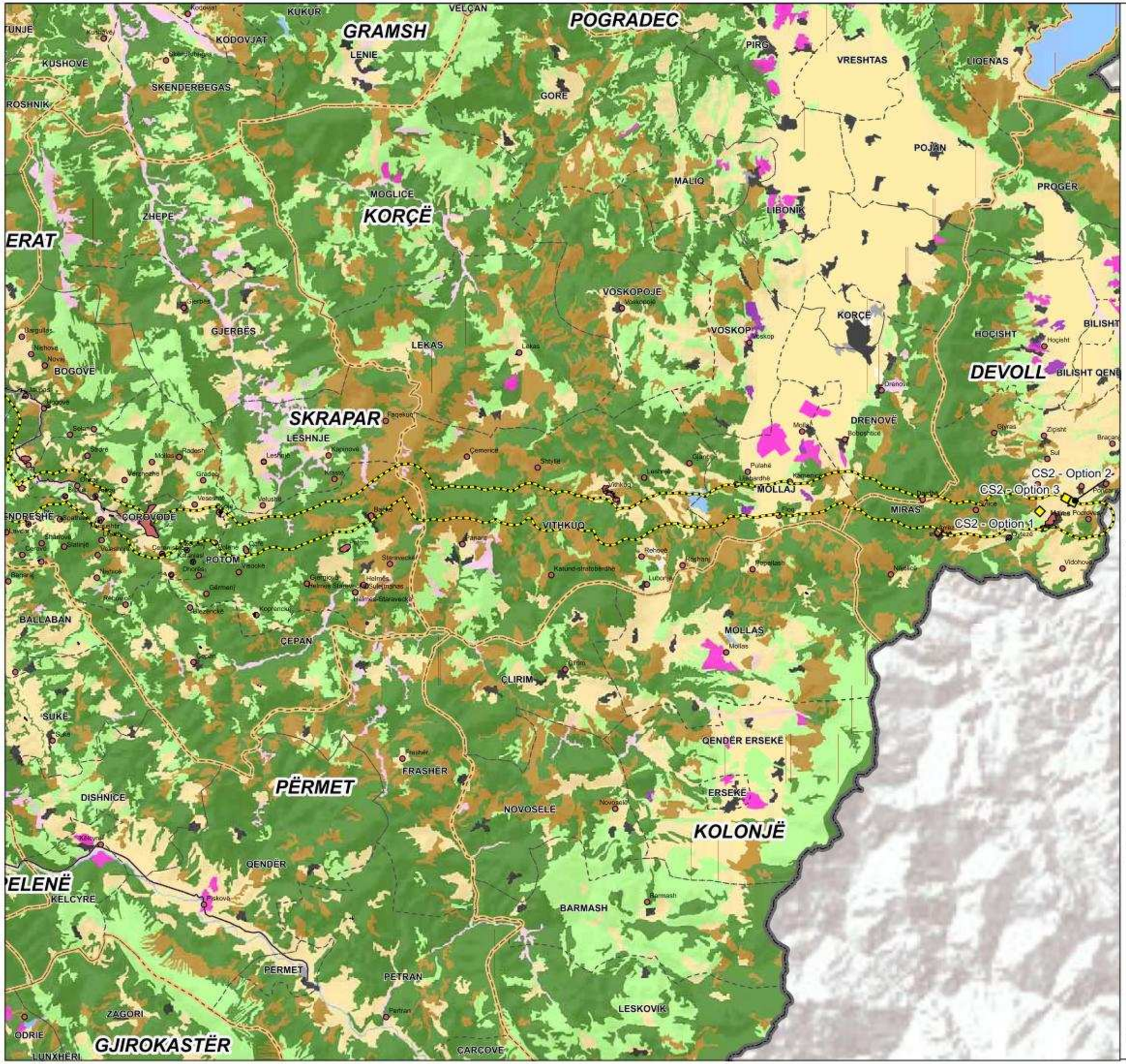
REV	DATE	ISSUE, SCOPE OF REVISION	PREP.	CHECK	APPR.
3	30/03/2011	IFA	MCP	MTV	ASM

CLIENT: Trans Adriatic Pipeline

PROJECT:
Trans Adriatic Pipeline (TAP)
Front End Engineering Design (FEED)

DRAWING TITLE:
Land Use Baseline - Onshore

SCALE:	PROJECT:	DRAWING NO:	SHEET OF
1:250.000	0092333	2	1 / 2



Legend

- Corridor (2 km)

Logistic
- Camp sites
- Yards
- Compressor Station location options

Access Roads
- New Roads
- Upgraded Roads

Admnistrative Boundaries
- Communes
- Districts
- Settlements
- Greek Border

Roads
- RD-1 Highway, National Road
- RD-2 Main Road

Land Use
- Urban fabric
- Industrial or commercial units
- Mineral extraction sites
- Vineyards
- Olive growes
- Pastures
- Fruit trees and berry plantations
- Herbaceous cultivation areas
- Forest
- Bare rock
- Transitional woodland-shrub
- Wetlands, salines and water bodies

REFERENCE DRAWINGS:

DOCUMENT TITLE:	DOC. NO.:
ESIA Scoping Report Albania	TAP-FEED-AL-EIA-REP.7028

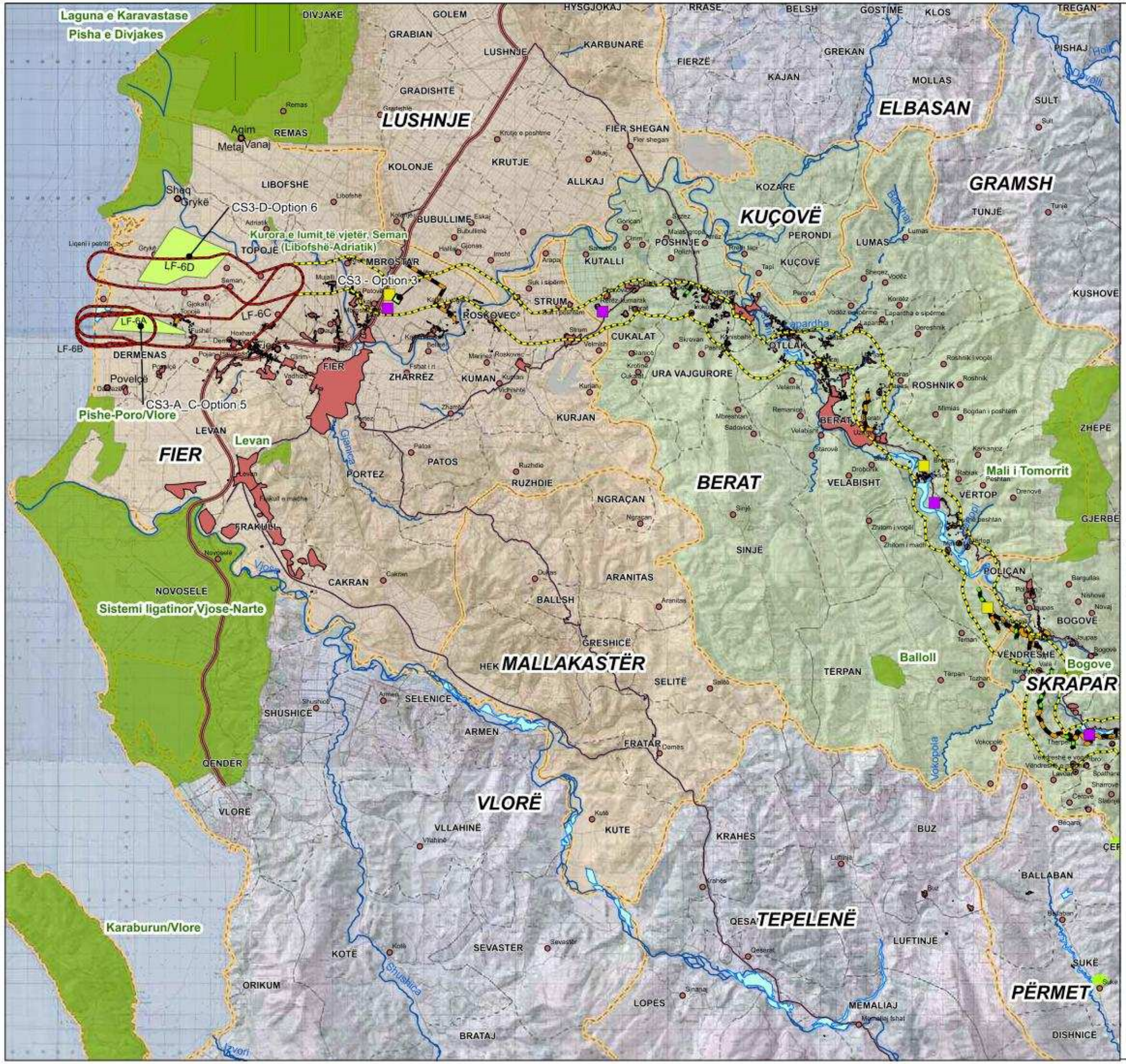
REV	DATE	ISSUE, SCOPE OF REVISION	PREP.	CHECK	APPR.
3	30/03/2011	IFA	MCP	MTV	ASM

CLIENT: Trans Adriatic Pipeline

PROJECT:
Trans Adriatic Pipeline (TAP)
Front End Engineering Design (FEED)

DRAWING TITLE:
Land Use Baseline - Onshore

SCALE:	PROJECT:	DRAWING NO:	SHEET OF
1:250.000	0092333	2	2 / 2



Legend

- Corridor_Landfall alternatives
- Corridor (2 km)

Logistic

- Camp sites
- Yards
- Compressor Station location options

Access Roads

- New Roads
- Upgraded Roads

Admnistrative Boundaries

Regions

- BERAT
- FIER
- Communes
- Districts
- Settlements

Roads

- RD-1 Highway, National Road
- RD-2 Main Road

Main Hydrology

- River
- Wetlands

Protected Area

- Protected Area
- Natural Monument

Note:
The perimeter of The Karavasta Lagoon National Park is represented from a digitalized map.
The scale may be approximate.
Original scale 1:400,000.
Date: 2009

REFERENCE DRAWINGS:

DOCUMENT TITLE:	DOC. NO.:
ESIA Scoping Report Albania	TAP-FEED-AL-EIA-REP.7028

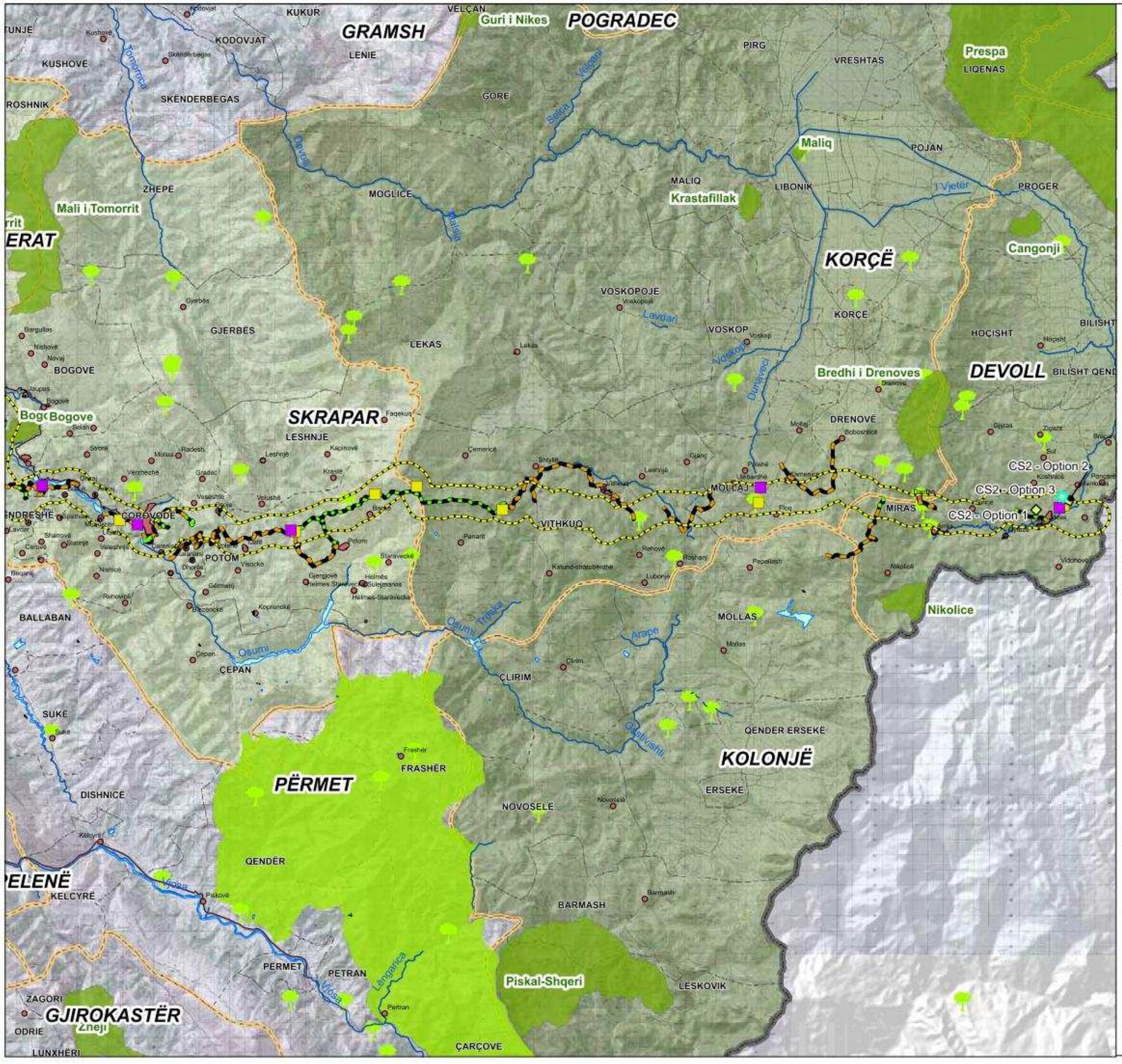
REV	DATE	ISSUE, SCOPE OF REVISION	PREP.	CHECK	APPR.
3	30/03/2011	IFA	MCP	MTV	ASM

CLIENT: Trans Adriatic Pipeline

PROJECT:
Trans Adriatic Pipeline (TAP)
Front End Engineering Design (FEED)

DRAWING TITLE:
Environmental Baseline - Onshore

SCALE:	PROJECT:	DRAWING NO:	SHEET OF
1:250.000	0092333	3	1 / 2



Legend

Corridor (2 km)

Logistic

- Camp sites
- Yards
- Compressor Station location options

Access Roads

- New Roads
- Upgraded Roads

Admnistrative Boundaries

Regions

- BERAT
- KORÇË
- Communes
- Districts
- Settlements
- Greek Border

Roads

- RD-1 Highway, National Road
- RD-2 Main Road

Main Hydrology

- River
- Wetlands

Protected Area

- Protected Area
- Natural Monument
- HOTOVA FIR DANGELY "NATIONAL PARK"

Note:
The perimeter of The Karavasta Lagoon National Park is represented from a digitalized map.
The scale may be approximate.
Original scale 1:400,000.
Date: 2009

REFERENCE DRAWINGS:

DOCUMENT TITLE:	DOC. NO.:
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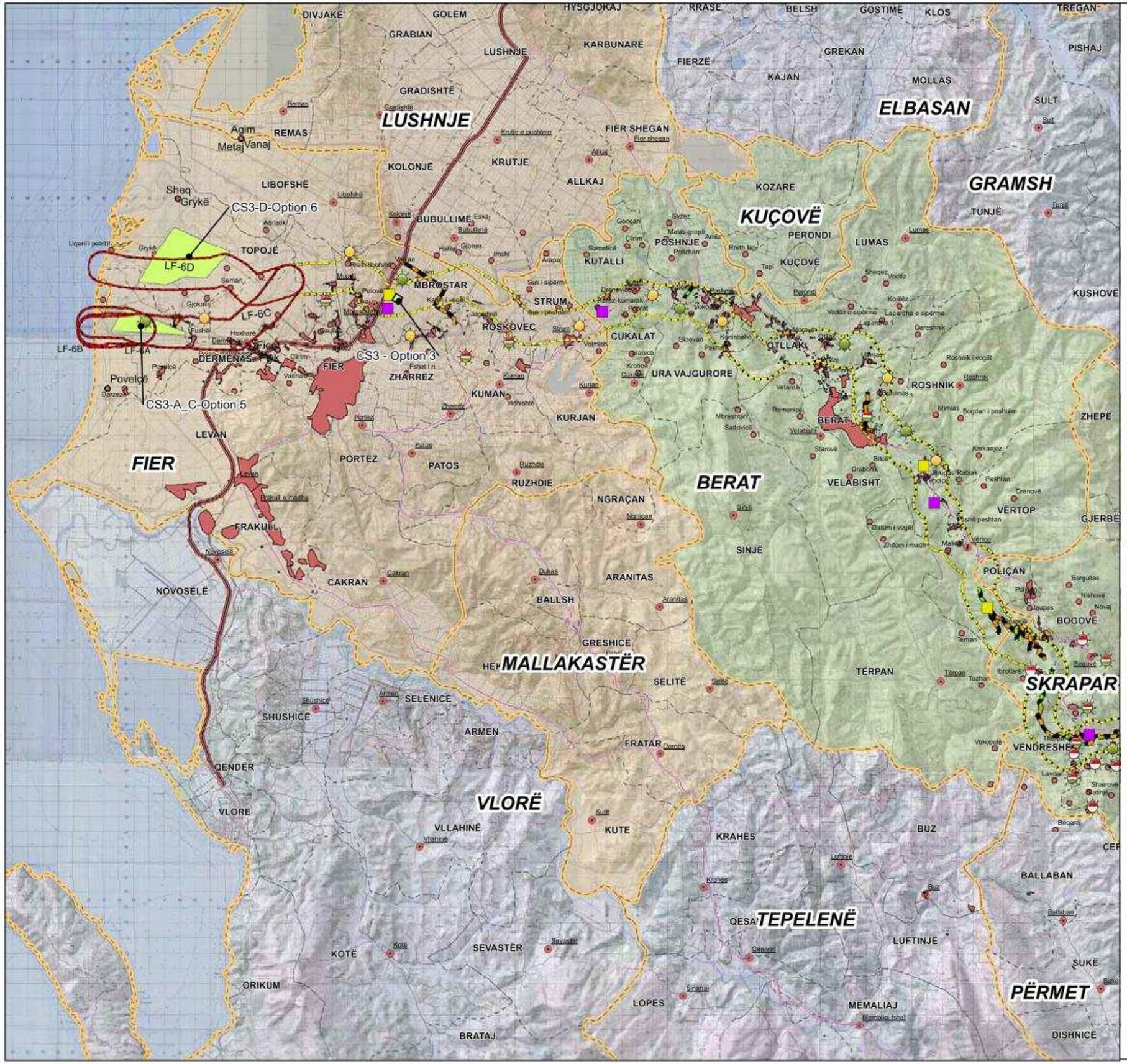
3	30/03/2011	IFA	MCP	MTV	ASM

CLIENT: Trans Adriatic Pipeline

PROJECT:
Trans Adriatic Pipeline (TAP)
Front End Engineering Design (FEED)

DRAWING TITLE:
Environmental Baseline - Onshore

SCALE:	PROJECT:	DRAWING NO:	SHEET OF
1:250.000	0092333	3	2 / 2



Legend

- Corridor_Landfall alternatives
- Corridor (2 km)

Logistic

- Camp sites
- Yards
- Compressor Station location options

Access Roads

- New Roads
- Upgraded Roads

Admnistrative Boundaries

Regions

- BERAT
- FIER
- Communes
- Districts
- Capital
- Settlements

Roads

- RD-1 Highway, National Road
- RD-2 Main Road

Social

- Mixed agriculture
- Crop production
- Animal husbandry
- Subsistance
- Industrial
- Diversified economy

REFERENCE DRAWINGS:

DOCUMENT TITLE:	DOC. NO.:
ESIA Scoping Report Albania	TAP-FEED-AL-EIA-REP.7028

REV	DATE	ISSUE, SCOPE OF REVISION	PREP.	CHECK	APPR.
3	30/03/2011	IFA	MCP	MTV	ASM

CLIENT: Trans Adriatic Pipeline

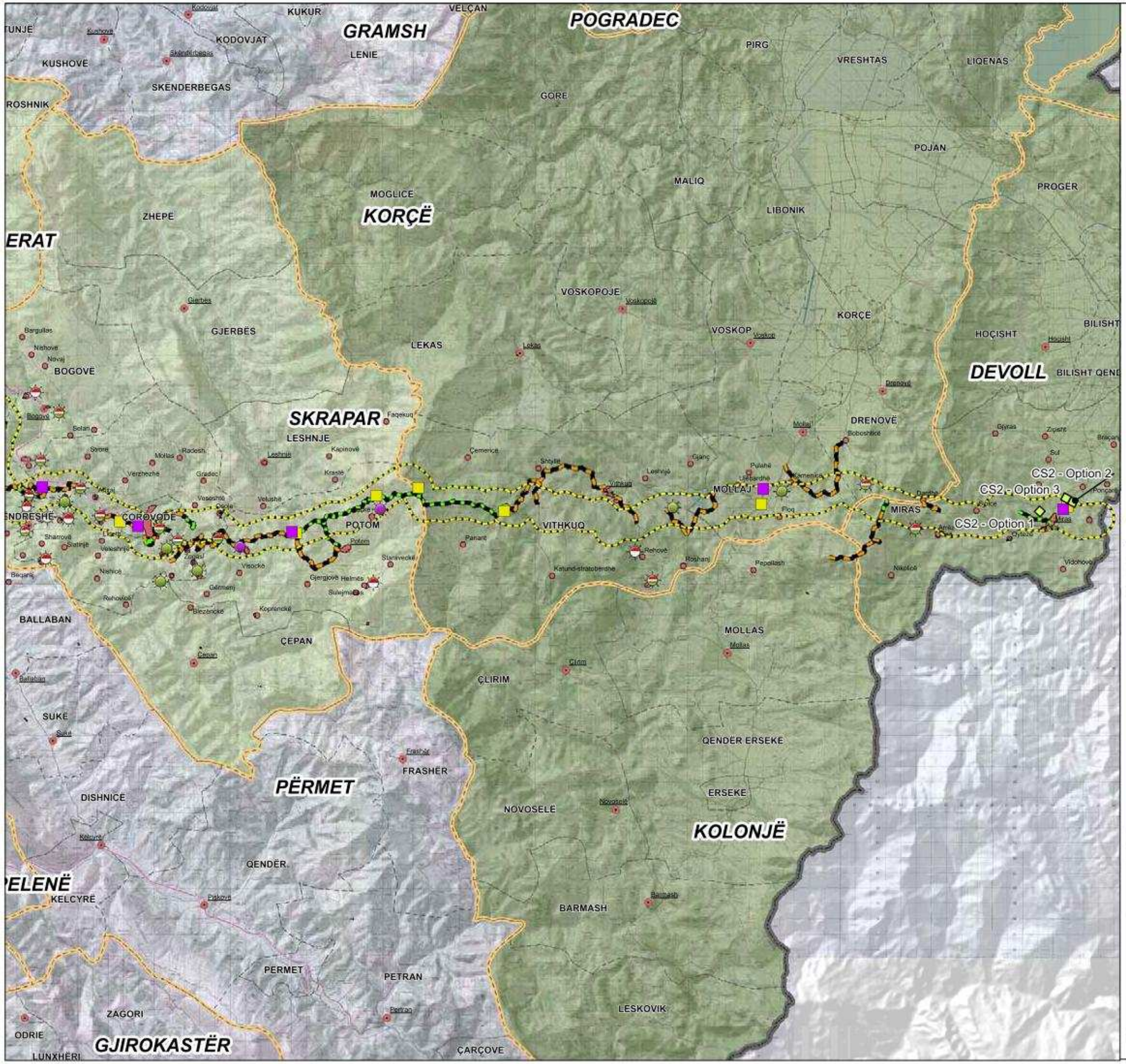
PROJECT:

Trans Adriatic Pipeline (TAP)
Front End Engineering Design (FEED)

DRAWING TITLE:

Socio Economic Baseline - Onshore

SCALE:	PROJECT:	DRAWING NO.	SHEET OF
1:250.000	0092333	4	1 / 2



Legend

- Corridor (2 km)

Logistic

- Camp sites
- Yards
- Compressor Station location options

Access Roads

- New Roads
- Upgraded Roads

Admnistrative Boundaries

Regions

- BERAT
- KORÇË
- Communes
- Districts
- Greek Border
- Capital
- Settlements

Roads

- RD-1 Highway, National Road
- RD-2 Main Road

Social

- Mixed agriculture
- Crop production
- Animal husbandry
- Subsistance
- Industrial
- Diversified economy

REFERENCE DRAWINGS:

DOCUMENT TITLE:	DOC. NO.:
ESIA Scoping Report Albania	TAP-FEED-AL-EIA-REP.7028

REV	DATE	ISSUE, SCOPE OF REVISION	PREP.	CHECK	APPR.
3	30/03/2011	IFA	MCP	MTV	ASM

CLIENT: Trans Adriatic Pipeline

PROJECT:

Trans Adriatic Pipeline (TAP)
Front End Engineering Design (FEED)

DRAWING TITLE:

Socio Economic Baseline - Onshore

SCALE:	PROJECT:	DRAWING NO:	SHEET OF
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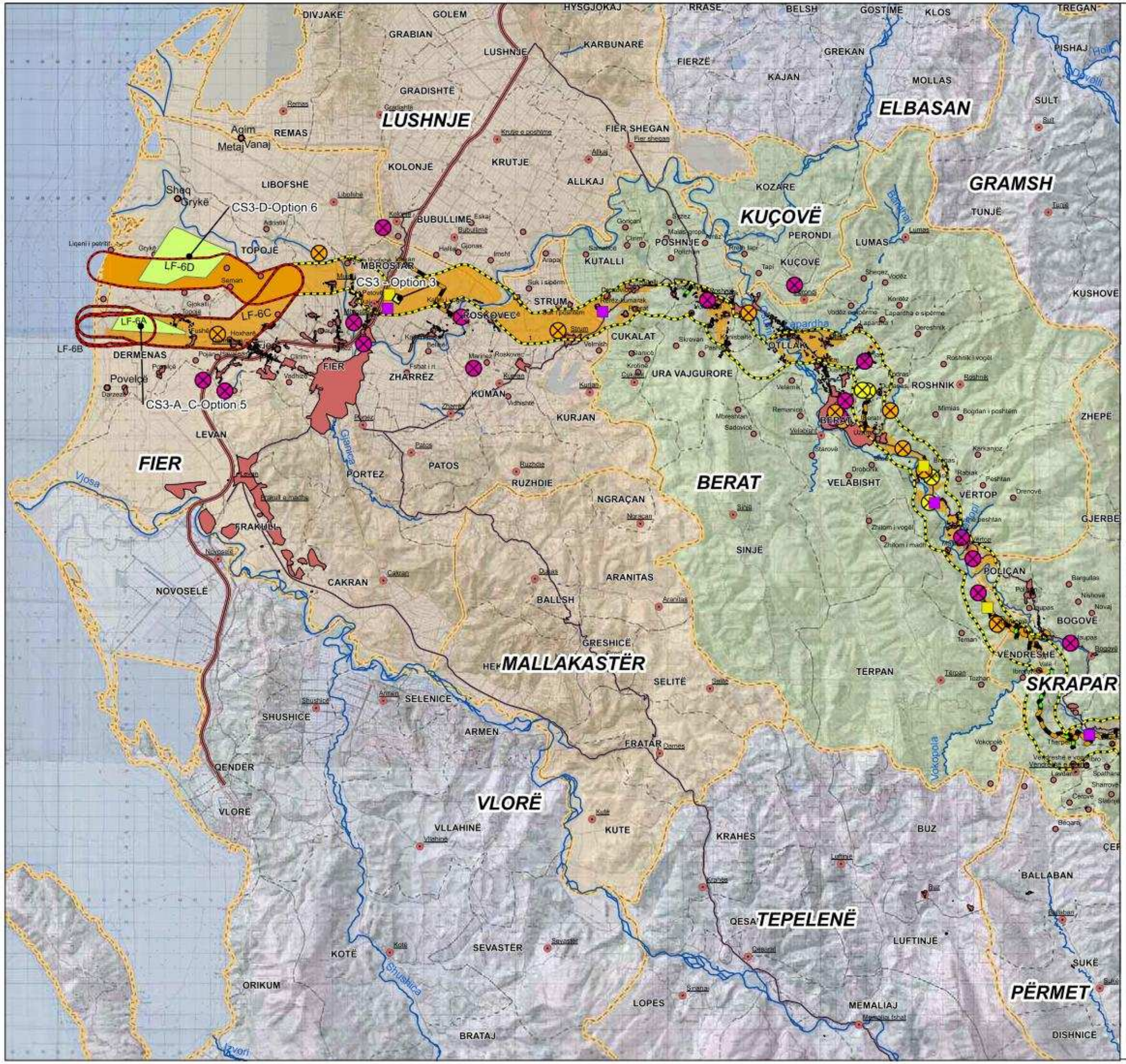


Legend

- Corridor_Landfall alternatives
- Corridor (2 km)

Logistic

- Camp sites
- Yards
- Compressor Station location options

Access Roads

- New Roads
- Upgraded Roads

Admnistrative Boundaries

Regions

- BERAT
- FIER
- Districts
- Communes
- Settlements
- Kapital

Roads

- RD-1 Highway, National Road
- RD-2 Main Road

Main Hydrology

- River

C.H. Sites importance

- High importance
- Moderate importance
- Low importance

Archeological Potential

- High Archeological Potential

REFERENCE DRAWINGS:

DOCUMENT TITLE:	DOC. NO.:
ESIA Scoping Report Albania	TAP-FEED-AL-EIA-REP.7028

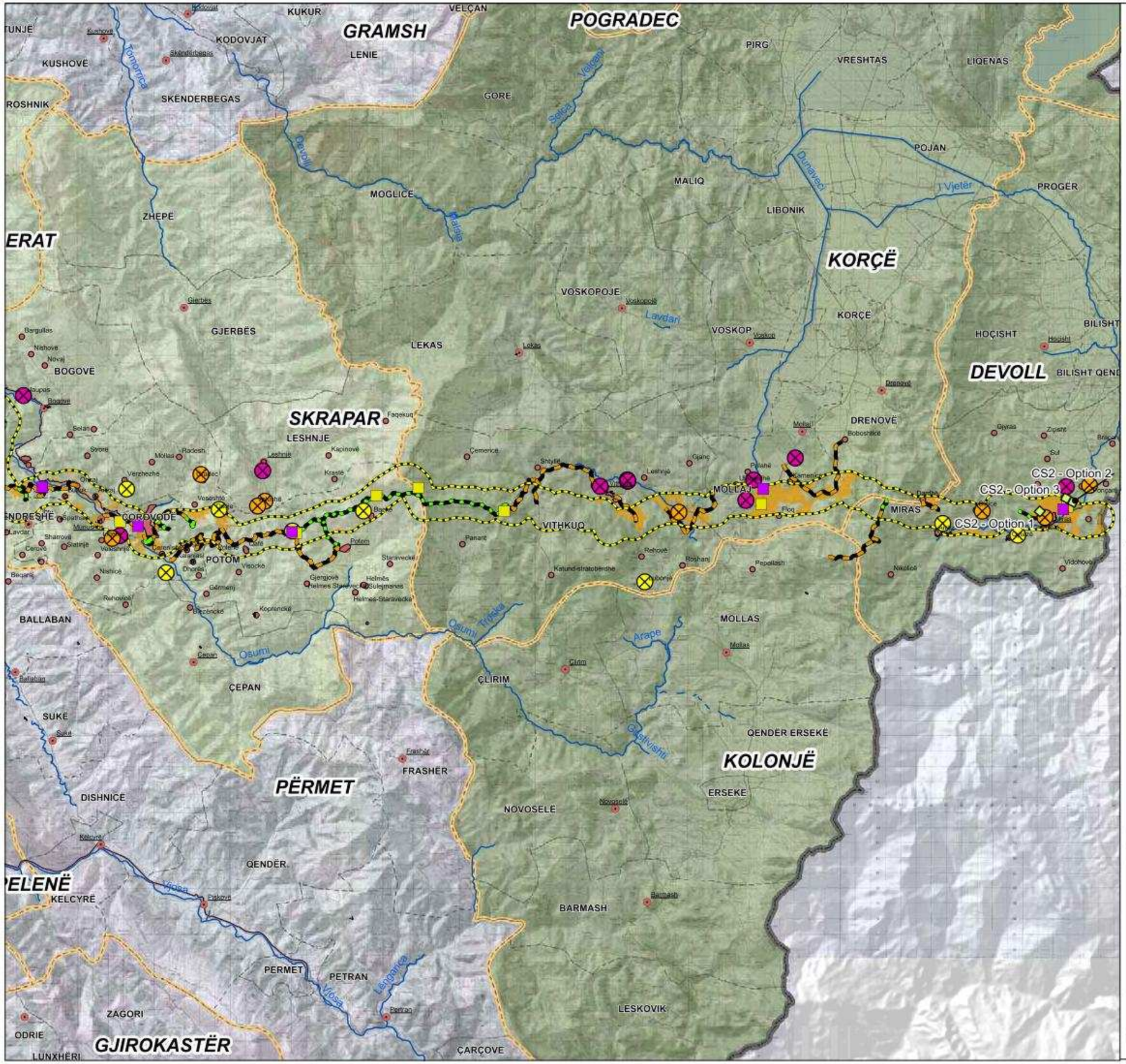
REV	DATE	ISSUE, SCOPE OF REVISION	PREP.	CHECK	APPR.
3	30/03/2011	IFA	MCP	MTV	ASM

CLIENT: Trans Adriatic Pipeline

PROJECT:
Trans Adriatic Pipeline (TAP)
Front End Engineering Design (FEED)

DRAWING TITLE:
Cultural Heritage Baseline - Onshore

SCALE:	PROJECT:	DRAWING NO:	SHEET OF
1:250.000	0092333	5	1 / 2



Legend

- Corridor (2 km)

Logistic

- Camp sites
- Yards
- Compressor Station location options

Access Roads

- New Roads
- Upgraded Roads

Admnistrative Boundaries

Regions

- BERAT
- KORÇË
- Districts
- Communes
- Greek Border
- Settlements
- Kapital

Roads

- RD-1 Highway, National Road
- RD-2 Main Road

Main Hydrology

- River

C.H. Sites importance

- High importance
- Moderate importance
- Low importance

Archeological Potential

- High Archeological Potential

REFERENCE DRAWINGS:

DOCUMENT TITLE:	DOC. NO.:
ESIA Scoping Report Albania	TAP-FEED-AL-EIA-REP.7028

REV	DATE	ISSUE, SCOPE OF REVISION	PREP.	CHECK	APPR.
3	30/03/2011	IFA	MCP	MTV	ASM

CLIENT: Trans Adriatic Pipeline

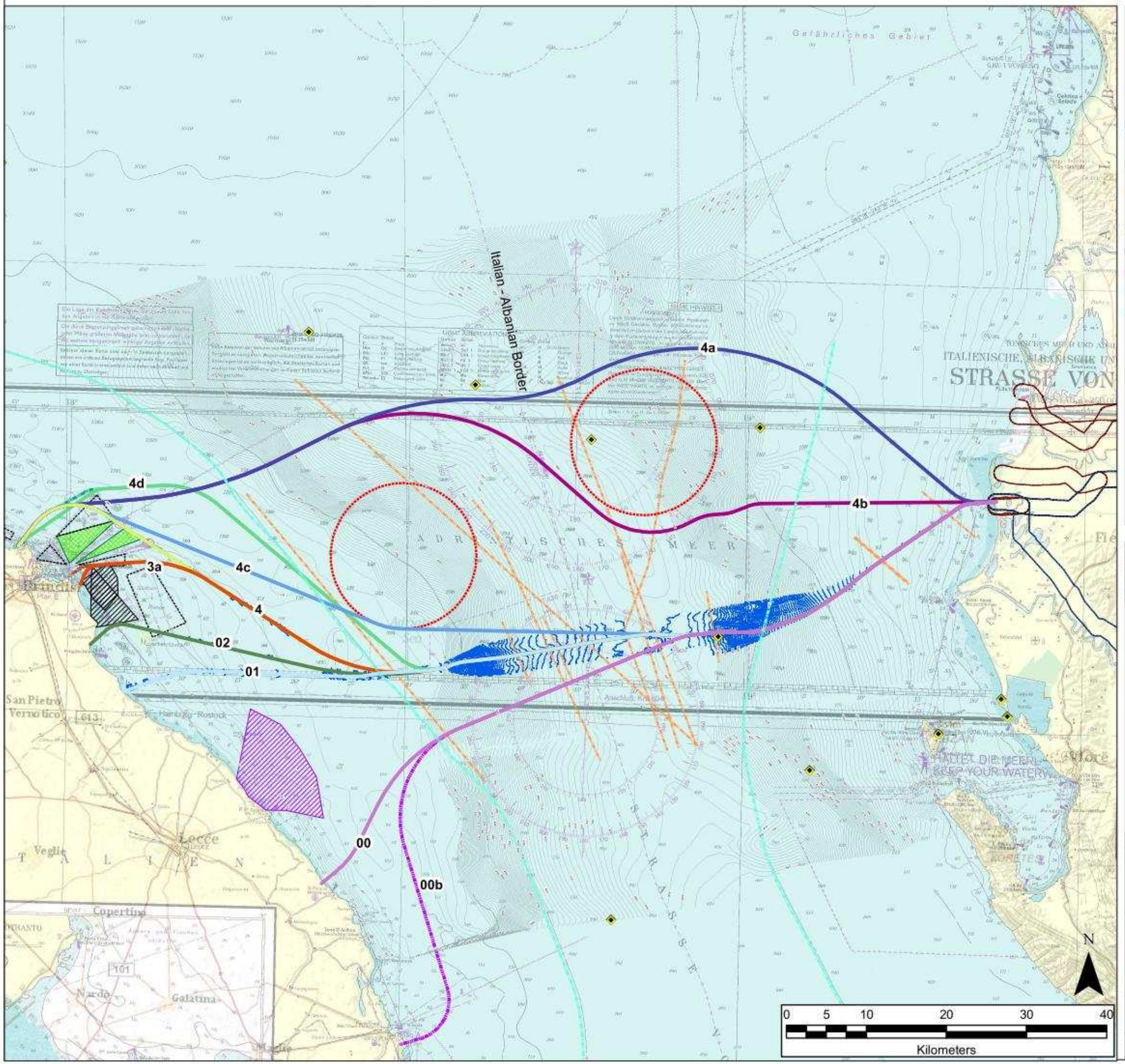
PROJECT:

Trans Adriatic Pipeline (TAP)
Front End Engineering Design (FEED)

DRAWING TITLE:

Cultural Heritage Baseline - Onshore

SCALE:	PROJECT:	DRAWING NO:	SHEET OF
1:250.000	0092333	5	2 / 2



Legend

- Albanian alternatives
- Base case
- Route 00a
- Route 00b
- Route 01_1.2
- Route 01 Windfarm
- Route 02
- Route 03a
- Route 03b
- Route 04
- Route 04a
- Route 04b
- Route 04c
- Route 04d
- Route 04d Option
- Anchorage forbidden
- Cargo Area
- Explosive Dumping Ground
- Fishing Area
- Military Area
- Trafic Zone Area
- Wellheads
- Cable
- 12 Miles line
- Detailed bathymetry (10m)
- Bathymetry

REFERENCE DRAWINGS:

DOCUMENT TITLE:	DOC. NO.:
ESIA Scoping Report Albania	TAP-FEED-AL-EIA-REP-7026

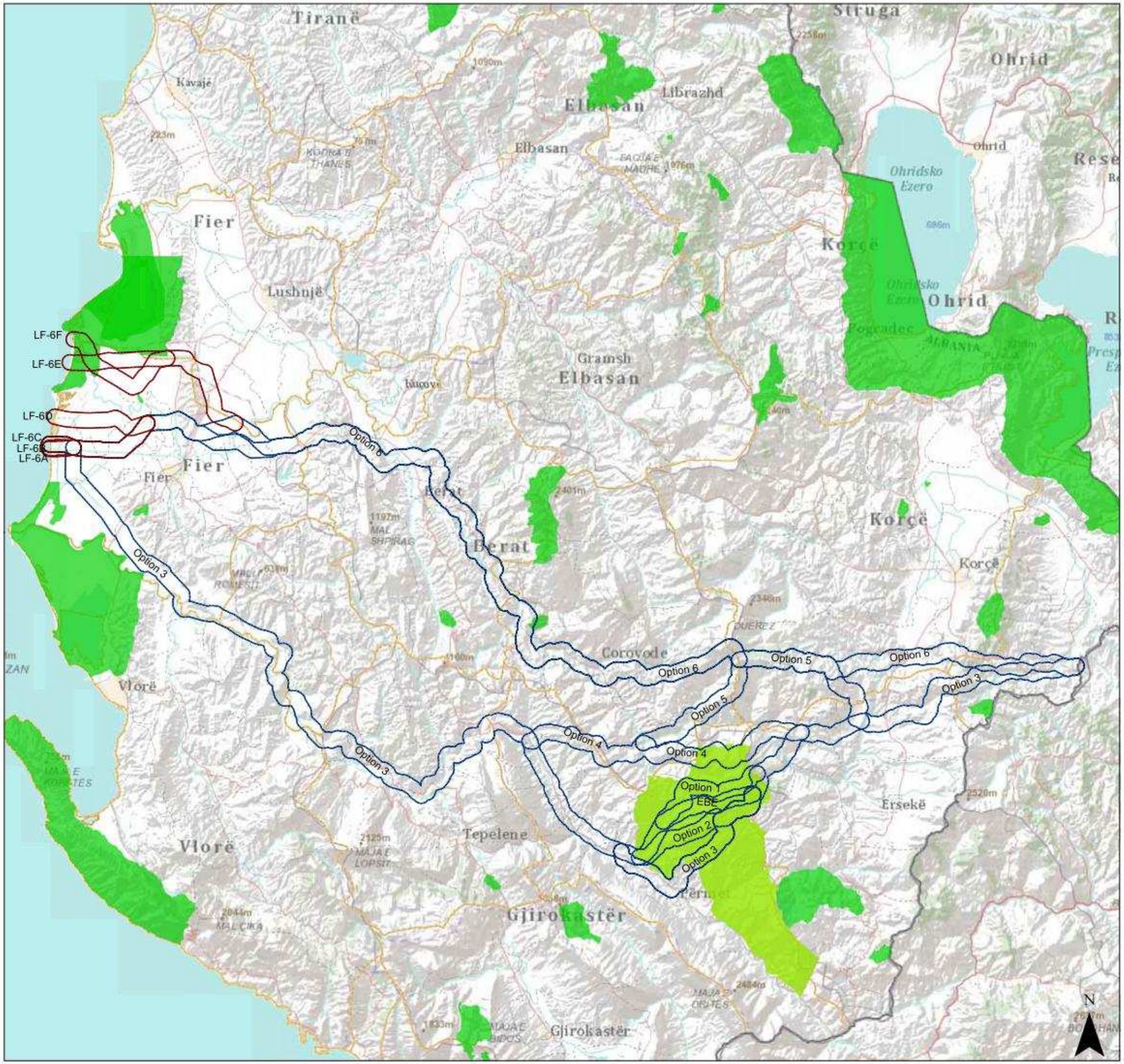
REV	DATE	ISSUE, SCOPE OF REVISION	PREP.	CHECK	APPR.
2	30/03/2011	IFA	MRU	MTV	ASM

CLIENT: Trans Adriatic Pipeline

PROJECT:
Trans Adriatic Pipeline (TAP)
Front End Engineering Design (FEED)

DRAWING TITLE:
TAP Alternative Routes Offshore

SCALE:	PROJECT:	DRAWING NO:	SHEET OF
1:475,000	0092333	6	1 / 1



Legend

- Corridor_Landfall alternatives
- Corridor
- PROTECTED AREA
- HOTOVA FIR DANGELY "NATIONAL PARK"
- Greek Border
- Communes
- Districts

(*) The perimeter of this area is represented from a digitalized map.
The scale may be approximate.
Original scale 1:400,000
Date: 2009

REFERENCE DRAWINGS:

DOCUMENT TITLE:	DOC. NO.:
ESIA Scoping Report Albania	TAP-FEED-AL-EIA-REP.7028

REV	DATE	ISSUE, SCOPE OF REVISION	PREP.	CHECK	APPR.
3	30/03/2011	IFA	MRU	MTV	ASM

CLIENT: Trans Adriatic Pipeline

PROJECT:
Trans Adriatic Pipeline (TAP)
Front End Engineering Design (FEED)

DRAWING TITLE:
TAP Alternative Onshore Routes in Albania

SCALE:	PROJECT:	DRAWING NO:	SHEET OF
1:500,000	0092333	7	1 / 1

Trans Adriatic Pipeline

Appendix B
Comments Form

(TAP-FEED-AL-EIA-REP-7028)

Public Comments & Suggestions Form

Concerning the Trans Adriatic Pipeline (TAP) ESIA Scoping Document

Reference No.	
Received on	
Received by	

Full Name, Surname

_____

Contact information (*please fill in how you want to be contacted*):

Post Address _____

_____

_____

Telephone _____

E-Mail _____

Preferred contact Language Albanian ☐ English ☐

Please note here your suggestions and comments concerning the Albanian section of the Trans Adriatic Pipeline (TAP) Project

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Please send this form back to:

Trans Adriatic Pipeline AG – Albania (Branch Office)
Torre Drin, Abdi Toptani Street
Phone: + 355 44 308 770
Fax: + 355 42 265 685
Tirana, Albania
www.trans-adriatic-pipeline.com
esia-comments@tap-ag.com

Trans Adriatic Pipeline

Appendix C
Stakeholders List

(TAP-FEED-AL-EIA-REP-7028)

CONTENTS

1 NATIONAL GOVERNMENT STAKEHDOLERS

Institutions	Department
Ministry of Environment, Forest and Water Administration	▪ General Policy Directorate ▪ Department of Forests and Pastures ▪ Department of Environmental Protection ▪ Directorate of Biodiversity ▪ Fishery Directorate
Ministry of Economy, Trade and Energy	▪ General Policy Directorate ▪ Department of International Business ▪ Department of Licensing and Concessions ▪ Directorate of Strategic Planning ▪ Department of Business Development ▪ Department of Energy Policy
AKBN - Albanian National Agency of Natural Resources	▪ Hydropower Sector ▪ Hydrocarbon Sector
Albanian Geological Survey	▪ Director
ERE	▪ Director for Licensing
Ministry of Tourism, Culture and Sports	▪ Directorate of Tourism ▪ Directorate of Culture Heritage
Archaeological Service Agency	▪ Directorate of Archaeology
National Council for Archaeology	▪ Director
Ministry of Public Works, Transport and Telecommunication	▪ Directorate of Policy and Planning for Transport ▪ Directorate of Road Transport Policies ▪ Directorate of General Construction and Housing Policy ▪ Directorate for Water and Waste Water ▪ General Directorate of Maritime
National Agency for Territorial Planning	▪ General Director ▪ Deputy General Director
Albanian Development Fund	▪ Department of Infrastructure ▪ Department of Regional Development
Ministry of Defence	▪ General Secretary ▪ Logistics Department ▪ Albanian Joint Forces ▪ Navy
Ministry of Agriculture, Food and Consumer Protection	▪ General Secretary ▪ General Directorate of Policies (GDoP) ▪ General Directorate of Resources management
Central Immovable Property Registration Office	▪ Director
Inter- institutional structure of the Control of the Marine Space (QNOD)	▪ Representatives from member Ministries

Region	District	Commune/ Municipality	Settlements (Villages and towns) Within the 2 km corridor
KORÇË	DEVOLL	Miras	Çetë Maja e Pocroves Miras Sinicë
	KORÇË	Drenovë	Dardhë
		Mollaj	Kamenicë Ujëbardhë
		Vithkuq	(none)
BERAT	BERAT	Berat	Berat Uznovë
		Cukalat	(none)
		Kutalli	Drenovicë Kutalli Pobrat Protoduar Rërëz-kumarak Sqepur
		Otllak	Moravë Otllak Ullinjas
		Poshnjë	Çiflik Poshnjë
		Roshnik	(none)
		Tërpan	(none)
		Ura Vajgurore	Guri i bardhë Konisbaltë Ura vajgurore Vokopolë
		Velabisht	Duhanas Malinat
		Vërtop	Bregas Fushë peshtan Mbrakull Vërtop Vodicë

Region	District	Commune/ Municipality	Settlements (Villages and towns) Within the 2 km corridor
BERAT	SKRAPAR	Bogove	Ustië
			Valë
		Çorovoda	Çorovoda
		Poliçan	Zgërbonjë
		Potom	Backë
			Qafë
		Qendër	Arizaj
			Buzuk
			Çerenishte
			Munushtir
			Orizaj
			Osoje
			Polenë
		Vendreshe	Therpel
			Vëndreshë e vogël
FIER	FIER	Dermenas	Dermenas
			Hamil
			Hoxharë
			Sulaj
		Kurjan	(none)
		Libofshë	Rreth libofshë
		Mbrostar	Kallm i vogël
			Mbrostar ura
			Petovë
			Verri
		Qendër	Mujalli
		Roskovec	(none)
		Strum	Strum
		Topoje	Fushë
			Kavaklli
			Seman
			Seman i ri
			Topojë
	LUSHNJE	Bubullimë	(none)

Table 2.1 List of Participants for Regional Consultation Meetings

Authority
Region
Regional Authority (Prefect)
Head of Regional Council
Regional Environmental Agency
Regional Roads Directorate
District Forestry Directorate
District Immovable Property Registration Office
Municipality/Commune
Mayor/ Head of the Commune
Urban Planning Department
Local Community
Head of Villages within 2 km corridor of baseline + northern landfall alternative
NGOs/Civil Society
Local NGOs
Other interested parties
Off-shore Authorities
Harbour Master Vlore
Coastal Guard
Coastal Police
Customs Agencies

Note: Public Meetings and Focus Groups Discussions will be carried out in addition

Table 3.1 List of NGOs in Tirana

	Name of the Organisation
1.	Sustainable Economic Development Agency *Agjensia e Zhvillimit Ekonomik te Qendrueshem*
2.	Albanian Society for the Protection of Birds and Mammals (ASPBM) *Shoqata per Ruajtjen e Shpendeve dhe Kafsheve te Egra (Gjitareve) te Shqiperise*
3.	ASET - Economic Social Forum *ASET - Forumi Shqiptar Social Ekonomik*
4.	Association for Development of Environmental Policies -- G & G Group *Shoqata për "Zhvillim të Politikave Mjedisore - G & G group"*
5.	Association for Evaluation of Environment, Energy, Nature *Shoqata për Vlerësim Mjedisi, Energji, Natyrë- Menvgroup*
6.	Association for Protection of Water Fauna *Shoqata e Mbrojtjes së Gjallesave Ujore të Shqipërisë*
7.	Association of Conservation and Protection of Natural Environment in Albania *Shoqata e Ruajtjes dhe e Mbrojtjes se Mjedisit Natyror ne Shqiperi*
8.	Center of Study and Consulting in Sustainable Use and Management of Natural Resources *Qendra e Studimeve dhe Konsultimeve per Perdorimin e Qendrueshem te Burimeve Natyrore*
9.	Co-PLAN
10.	EDEN - Environmental Centre for Development, Education and Networking
11.	Eko-Movement Group *Qendra e Grupimit "Ekolëvizja"*
12.	Environmental and Social Protection and development 'Iliria' *Shoqata 'Mbrojtja dhe zhvillimi mjedisor e social ILIRIA'*
13.	Environmental Women Association *Gruaja Ambjentaliste Shqiptare*
14.	Albanian Civil Society Foundation *Fondacioni Shqiptar i Shoqerise Civile-FSHSHC*
15.	For New Environmental Policies *Per politikat e reja Ambjentale*
16.	Forest Progress NGO *OJF 'Progresi Pyjor'*
17.	ICAA - International Centre for Albanian Archaeology *Qendra Nderkombetare per Arkeologjine Shqiptare*
18.	Institute for Environmental Policy *Instituti i Politikave Mjedisore*
19.	Institute of Environmental Studies *Instituti i Studimeve Ambjentale* *ARHUS*
20.	Institute of Nature Conservation in Albania *Instituti per Ruajtjen e Natyres ne Shqiperi*
21.	Institute of Environmental Studies *Instituti i Studimeve Ambjentale*
22.	Institute for the Study of Nature and Environmental Education in Albania *Instituti Për Studimin e Natyrës dhe Edukimin ambjental ne Shqiperi*
23.	Kadmi and Harmonia
24.	Junior environmental club *Klubi Fëmijënor i Mjedisit, Tiranë*
25.	Klubi Mjedisor "Perla" *Environmental Club "Perla"*

	Name of the Organisation
26.	Youth Environmental Club "PNL" *Klubi Rinor Mjedisor "PNL*
27.	Albanian Students Environmental Club *Klubi Studentor Ambjentalist Shqiptar*
28.	National Association of Cooperatives of Albania *Bashkimi i Kooperimeve Agrare te Shqiperise*
29.	National Environmental Movement Center *Qendra Kombëtare e Lëvizjes Ambientaliste*
30.	National Resource Centre for Training and Technical Assistance *Qendra Kombetare Burimore e Trajnimit dhe Asistences Teknike (ANTTARC)*
31.	Eco-counseling Center *Qendra për Eko-këshillime*
32.	Centre for Environmental Research and Development *Qendra Shqiptare për Studime dhe Zhvillime Mjedisore*
33.	SEDA www.seda.org.al
34.	"The new Ecolog" Association *Shoqata "Ekologu i Ri"*
35.	Association "Lawyers for Environmental Protection" *Shoqata "Juristët për Mbrojtjen e mjedisit"*
36.	Association of Municipalities of Albania *Shoqata e Bashkive te Shqiperise*
37.	Agriculture Organic Association *Shoqata e Bujqësisë Organike*
38.	Hygienist Association of Albania *Shoqata e Higjienistëve të Shqipërisë*
39.	Albanian Ecological Association of Engineering *Shoqata e Inxhinierisë Ekologjike Shqiptare*
40.	Association of Communes *Shoqata e Komunave te Shqiperise*
41.	Association for the Preservation of Birds and Wildlife of Albania *Shoqata për Ruajtjen e Shpendëve dhe Kafshëve te egera te Shqiperise*
42.	Social Science Association "Environment and Health" *Shoqata Shkencore Shoqerore "Mjedisi dhe Shendeti"*
43.	Stimulating Program for Social Alternatives *Programi i Alternativave Social Stimuluese*
44.	URI - Urban Research Institute *Instituti i Kerkimeve Urbane*
45.	Zyra Per Mbrojtjen e Qytetareve Citizens Advocacy Office
46.	Albanian Fund for Monuments Fondi Shqiptar per Monumentet
47.	Albanian Heritage Center Qendra/Forumi per Mbrojtjen e Trashegimise

Table 3.2 Regional NGO

Name	Region
Association for the Protection of Environment and Nature *Shoqata Per Mbrojtjen e Mjedisit Natyror*	Berat
Regional Development Agency *Agjensia Rajonale e Zhvillimit*	Berat
Protection of social rights of Kucove *Mbrojtja e te Drejtave Sociale Kucove*	Berat
Ecologic club of Fier *Klubi ekologjik I Fierit*	Fier
Ecological Club *Klubi Ekologjik, Fier*	Fier
Regional Development Agency *Agjencia Rajonale e Zhvillimit*	Fier
Fishermen Association	Vlore
Korca, Rural, Agroturizmi	Korçë
Tourism and Environment *Turizmi dhe Mjedisi*	Korçë
Transborder Wildlife *Natyra Ndërkufitare*	Korçë
D.R.K.K. Archaeology Sector Archaeology Museum Muzeumi Arkeologjik	Korçë
Kamenica Museum *Muzeu Kamenices*	Korçë
Environmental association of Morava *Shoqata mjedisore e Moraves*	Korçë
Environmental association of Morava *Shoqata mjedisore e Moraves*	Korçë
Association of private forests and pasture *Shoqata e pyjeve dhe kullotave private*	Korçë
Agro-tourism association *Shoqata e agroturizmit*	Korçë
Youth Environmental Club "Perla" *Klubi Rinor Mjedisor "Perla"*	Korçë
Amaro Drom	Skrapar

Table 3.3 Universities and Research Centres

	Name of the Organisation	Purpose
1.	Tirana State University School of Agriculture and Environment School of Forestal Sciences School of Biotechnologies	Informant on Agriculture, Environment, Forestry issues
2.	University of Mining	Informant on geological issues
3.	Research Center for Flora and Fauna of Albania (RCFFA) University of Tirana *Qendra Kerkimore per Floren dhe Faunen e Shqiperise (QKFFSH)*	Public research centre on flora and fauna in the Country

Table 3.4 List of Other Interested Parties

	Name of the Organisation	Purpose
1.	EBRD - European Bank for Reconstruction and Development	Strengthen state institutions; invest in infrastructure, including upgrading of national, regional and local road transport networks; further strengthen the banking system; support SMEs / MSEs
2.	GIZ - German Cooperation Company	German cooperation company. Has projects with national coverage on water supply and treatment, energy, vocational training.
3.	REC - Regional Environmental Centre	International Network active in the field of Environment - Agriculture - Forestry
4.	Swiss Cooperation Office Albania	Considers Albania as a priority country Works in various regions of Albania including Fier, Korçe amd Berat.
5.	Tirana Chamber of Commerce	Tirana Chamber of Commerce
6.	UNDP United Nations Development Programme	Supports projects for the identification a prioritization of contamination hotspots in Albania. Informant on soil contaminated areas.
7.	USAID - United States Agency for International Development (USAID)	Coordinates local development projects in various cities including Fier and Korçe
8.	WB - World Bank	Supports projects in the infrastructure sector. Supports participatory forest and pasture management planning and investment in 240 rural communes through the National Resource Development Project (NRDP)

Trans Adriatic Pipeline

Appendix D
ESIA Action Plan

(TAP-FEED-AL-EIA-REP-7028)

Table 1.1 Environmental Desk-top, Field and Modeling Activities – Onshore

Resource	Approach	Parameters	Period
Surface and Ground Water	*Desk:* • Bibliographical/desk based literature review • Remote sensing interpretation using aerial photographs or satellite imagery. *Field study:* (i) Sampling and analysis of selected main crossings of permanent rivers, streams, creeks, channels. (ii) Collect groundwater samples from selected existing wells within 500 m from the selected route *Output:* • Mapping of air quality sensitive receivers (the scale of cartography will range from 1:5,000 – 1: 50,000) • Characterisation of baseline water quality at survey locations	(i) Surface Water: The following data will be collected: River morphology and channel descriptions Water Quality – physico-chemical parameters Sediment Quality (for potentially contaminated rivers only). - physico-chemical and biological parameters (ii) For groundwater: physico-chemical parameters	Timing of field surveys: April – mid May

Resource	Approach	Parameters	Period
Vegetation & Flora	*Desk:* • Bibliographical search; and • Remote sensing analysis: *Field study:* A team of ecologists and flora experts will conduct a survey of the terrestrial environment to describe the existing habitat type and identify flora species of interest. Surveys will be performed only for areas of ecological and conservational interest. Specific field surveys will also have be conducted for the Appropriate Assessment on Natura 2000. *Output:* • Flora species list and distribution • Vegetation map: the scale of cartography will range from 1:5,000 – 1: 50,000. • Characterisation of vegetation and flora at survey locations	• Vegetation and flora surveys will focus on species of conservation interest and priority habitats • Endangered and other endemic/important species under Albanian, EU and Council of Europe	Timing of field surveys: late Aril – early July

Resource	Approach	Parameters	Period
Fauna & Habitats	*Desk:* • Bibliographical search; and • Remote sensing analysis: *Field study:* A team of ecologists and fauna experts will conduct a survey of the terrestrial environment to describe the existing habitat type and identify fauna species of interest. Surveys will be performed only for areas of ecological and conservational interest. Aspects to be identified: • Habitat types • Fauna species list and distribution • Sensitive habitats Specific field surveys will also have be conducted for the detailed assessment of protected areas. *Output:* • Fauna species list and distribution • Habitat Map: the scale of cartography will range from 1:5,000 – 1: 50,000. • Characterisation of fauna and habitats at survey locations	Vertebrates, particularly focusing on species of interest, including: • Priority fauna species (Bear, wolf, Otter) • Nesting Birds • Fish • Amphibians, reptiles, small mammal Macroinvertebrates	Timing of field surveys: middle April – Late September • Priority fauna species (Bear, wolf, Otter): Mid April, and August-October • Nesting Birds: April- May • Fish: April and August • Amphibians, reptiles, small mammals: Mid April and Aug-September • Macroinvertebrates: April – early May

Resource	Approach	Parameters	Period
Air	*Desk:* • Bibliographical and desk based literature review *Field Study:* • Air quality data will be recorded only for the compressor stations • A specialist will conduct a study to determine the status of local air quality using existing monitoring data or by conducting measurements. Measurements will be conducted using an air quality monitoring station. • Air quality sampling, using diffusion tubes, at villages near proposed Compressor Stations locations over a minimum of four weeks. *Output:* • Mapping of air quality sensitive receivers (the scale of cartography will range from 1:5,000 – 1: 50,000) • Characterisation of baseline air quality at proposed compressor station site • Modeling of emission dispersion from compressor operation only.	Parameters to be measured will include: • Oxides of nitrogen (NO_x) • Sulphur dioxide (SO_2) • Hydrocarbons (VOC_s). • Carbon Monoxide (CO)	• Timing of field surveys: April – end of May • Timing of Modeling: June

Resource	Approach	Parameters	Period
Noise & Vibration	*Desk:* • Bibliographical and desk based literature review. *Field Study:* • Noise data will be recorded only for the compressor stations • A specialist will conduct a study of ambient noise levels. The study will identify locations of sensitive receptors. Both short term and long term measurements are to be collected. Measurements are to be taken continuously during the day and the night time (24 hours) at villages near proposed Compressor Stations locations. • Moreover, hourly measurements at villages close to the selected pipeline route other project features (accesses, pipe yards, etc.) that may be impacted temporarily by construction activities. *Output:* • Mapping of noise sensitive receivers (the scale of cartography will range from 1:5,000 – 1: 50,000) • Characterisation of baseline noise levels at proposed compressor station site • Modeling of noise emissions at sensitive receivers close to compressor stations.	• Acoustical measurements using a Type I or Type II integrating sound level meter monitoring the slow response, A-weighted, equivalent sound pressure level (Leq) at selected location	• Timing of field surveys: April – end of May • Timing of Modeling: June
Light Pollution	• Identify sources of light emissions, potential sensitive receptors and view points	• Light emissions and potential sensitive receivers	N/A

Resource	Approach	Parameters	Period
Soil	*Desk:* • Bibliographical/desk based literature review, including project information • Remote sensing interpretation using Soil maps (1:50,000 or similar) and aerial photographs or satellite imagery. *Output* • Geological/hydro geological cartography to 1: 50,000 scale along the selected corridor and other project features (accesses, pipe yards etc.).	*Desk:* • Bibliographical/desk based literature review, including project information • Remote sensing interpretation using aerial photographs or satellite imagery. *Field study;* • The soil specialist will undertake study of: – soil physico-chemical characteristics; – existing soil contamination; – Economic value of soil types Investigation will include analysis of soil samples of upper layers of soil at locations with agricultural land use and areas of potential soil contamination. The soil specialist will also conduct visual assessment of soils for fertility parameters.	• Timing of field surveys: April – mid May

Resource	Approach	Parameters	Period
Landscape	*Desk:* • GIS desk top analysis to assess landscape quality width. Special attention will be given to: – Compressor and block valve stations locations – Areas of high landscape value (mountain areas, forested areas, etc.) • 3D simulations on the Compressor Stations to include: – View sheds analyses – 3D simulation *Field* Visual assessment during corridor survey *Output.* • Mapping of landscape quality (the scale of cartography will range from 1:5,000 – 1: 50,000) • Characterisation of landscape within areas of high landscape value • 3D Model of compressor station	• Location of visual sensitive receivers • Characterisation of landscape where permanent structures will be located	• Timing of field surveys: April – end of May • Timing of Modeling: June

Table 1.2 Cultural Heritage Desk-top and Field Survey Activities – Albania Onshore

Resource	Approach	Parameters	Period
Cultural Heritage Resources	*Desk:* • Bibliographic search • Identification/mapping of areas of high archaeological potential *Field :* • Initial field reconnaissance • Detailed Field survey • Fieldwork will not cover all areas of the project area with equal attention but will focus on area shown by the predictive model and density of know sites to have the highest archaeological potential. *Output.* • Characterisation of CH elements • The scale of cartography will range from 1:5,000 – 1: 50,000.	• Monuments, buildings and above ground structures of cultural interest • Intangible Cultural Heritage (ICH) • Archaeological sites	• Timing of field surveys: April – June

Table 1.3 Socioeconomic Desk-top and Field Survey Activities – Albania Onshore

Resource	Approach	Parameters	Period
Traffic and Transport	*Desk:* • Desk based review of existing information on regional transport network, including rural roads • Description of the current status of vehicle traffic on the roads affected by the project and assessment of the integrity of Project transportation routes. *Field:* • The social experts deployed in the field will identify major junctions and key areas where project traffic could become an issue related to the following: – community health and safety – congestion and flow – impacts to cultural heritage • The field study will be based on both interviews and observations (including traffic counts) *Output.* • Municipal and Village profiles • Findings report on traffic flow on roads and at major junctions.	• Traffic characterisation: current usage patterns and volumes • Structural properties (load limits, traffic volume limits) • Functionality (condition of road surface) • Transportation practices • Access routes	• Timing of field surveys: April – June

Resource	Approach	Parameters	Period
Demographics and Population	*Desk:* • Bibliographical and desk based literature review. • Review of official INSTAT data. • GIS / Cartography desk top analysis to assess settlement size and distribution, • Review of data gaps and updating information as appropriate. *Field :* • A team of social specialists will conduct a survey to determine the general socioeconomic characteristics of the study area including demographics and population trends. • As part of the survey, TAP will undertake a Household Survey to collect qualitative data including data on population and demographics. *Output.* • Commune and Village profiles • Sample quantitative assessment of key population characteristics	• Settlement patterns and mapping • Population size of settlements within 2 km corridor and area around installations. • population trends • in and out migration • Gender and age structure • Religious and ethnic diversity, including minorities • Vulnerable Groups (i.e. women, elderly, etc) • Education and literacy levels	• Timing of field surveys: April – June

Resource	Approach	Parameters	Period
Land Use and Development	*Desk:* • Bibliographic search • GIS desk top analysis of land use (CORINE, Land Sat images) *Field:* • The teams of social specialists deployed in the field will ground truth GIS based information on land uses. • The teams will assess community dependency on natural resources, including water and land, through results of focus groups and interviews with key informants, including heads of municipalities and villages. • If a household survey is undertaken it will include questions on land ownership patterns and tenure structure and availability of alternative land. *Output:* • Conduct a qualitative and quantitative survey of the land tenure system and land use patterns in the 2 km survey corridor through household surveys • Mapping of land use scale of cartography outputs will range between 1: 5,000 and 1:50,000	• Land use • Land ownership and tenure • Traditional land titles • Spatial planning and development • Use and dependency on natural resources, including land for agriculture and pasture.	• Timing of field surveys: April – June

Resource	Approach	Parameters	Period
Socio-Cultural Institutions and Government Administration	*Desk:* • Review of existing desk based (secondary) information on the structure of socio-cultural institutions and administrations *Field:* • As part of the overall socioeconomic survey and stakeholder engagement activities the field teams will assess the presence and structure of social institutions through interviews and focus groups. *Output:* Profile of administrative and community institutions	• Government structures • Presence and role of other institutions (NGOs/CBOs) • Social organisations and institutions • Social networks, power hierarchies and support structures • Role of women • Leadership patterns • Safety, security, law and order	Timing of field surveys: April – June

Resource	Approach	Parameters	Period
Livelihoods and Micro-Economy	*Desk:* • Review of existing desk based information on the local economy and livelihoods including unemployment and employment structures *Field:* • The social teams deployed in the field will assess the means of livelihood and income for all communities within the 2 km corridor and areas around installations. The assessment will be done through qualitative methodologies (focus groups and interviews with key informants). • Quantitative data will be collected if a household survey is undertaken. • Information on alternative livelihood options due to economic resettlement will be investigated. *Output:* • Municipal and Village profiles • Qualitative assessment of household livelihoods and income • Qualitative assessment of employment structure • Qualitative assessment of alternative livelihoods	• livelihood and economic profile • Economic importance of key sectors: tourism, logging, agriculture etc • Income distribution • Occupation and employment structure including proponent's employment plan • Vulnerability and subsistence economy • Opportunities for alternative livelihood activities	• Timing of field surveys: April – June

Resource	Approach	Parameters	Period
Social Infrastructure	*Desk:* • Review of existing desk based information on infrastructures *Field:* • The field survey teams will visit all settlements within the 2 km corridor and the areas around installations to assess the situation vis a vis social infrastructure and to collect relevant data to develop the municipal and village profiles. • The teams will use a combination of observation techniques and interviews with key informants to locate infrastructures and areas of interest. *Output:* • Municipal and Village profiles • List of sites of cultural and religious significance (*see* Cultural heritage survey) • Mapping of sites. Scale of cartography outputs will range between 1: 5,000 and 1:50,000	• Settlements • Key man made features • Economic, culture and historical sites • Recreational facilities (nature and location) • Cultural and religious facilities/ sites (nature and location) • Cultural traditions • Sites of cultural and religious significance • Education and health resources (nature and location) • Utilities (i.e. water, electricity, telecommunications, etc)	• Timing of field surveys: April – June

Resource	Approach	Parameters	Period
Community Health	*Desk:* • Review of existing desk based information on the health status and resources of local communities *Field:* • The social teams deployed in the field will assess the health status and health resources available to communities located within the 2 km corridor and areas around installations. • The assessment will be done through a combination of qualitative methodologies (focus groups and interviews with key informants like doctors and nurses) and quantitative methods (if a household survey is undertaken). *Output:* • Health Profile of the Villages and Municipality • Review of health care resources • High level health capacity review	• Community health status • Health determinants • Community health needs and concerns of host communities • Health Care resources	• Timing of field surveys: April – June

Table 1.4 Desk-top and Field Survey Activities – Albania Offshore

Resource	Approach	Parameters	Period
Wind, Waves, Currents and Tides	*Desk:* • Desk based, bibliographic search. *Output:* • Characterisation of marine habitat within the area of influence.	• Meteocean parameters	• N/A
Sediments and Water Quality	*Desk:* • Desk based, bibliographic search *Field:* • Water and sediment sampling for physico-chemical and biological parameters. *Output:* • Characterisation of water quality and seabed sediments within area of influence • Modeling of sediments dispersion during dredging and backfilling of the nearshore section to determine impacts to water quality and habitats	• Water Quality physico-chemical and biological parameters • Sediment Quality physico-chemical and biological parameters	Timing of field surveys: • April – mid May for water quality and sediments • April – early May for macrobenthos Timing for modeling: June
Habitats	*Desk:* • Desk based, bibliographic search *Field:* • Benthos through sediments sampling - see above • Seagrasses and other habitats of interest will be surveyed by means of Remotely Operated Vehicle (ROV) during the marine surveys *Output:* • Characterisation of marine habitat within the area of influence.	• Benthic macrofauna (see *Appendix A*) • Seagrasses (e.g. *P. oceanica, C. nodosa*, etc.) • Habitats and species of conservation interest: • Presence of Mediterranean sensitive habitats (ASPIM).	• Timing of field surveys: April – mid May
Marine Mammals, marine Turtles and Marine Birds	*Desk:* • Desk based bibliographic research study of the presence of marine mammals, turtles and birds in the area of influence of the project, including migration patterns and presence of	• List and distribution of marine mammal, turtle and marine birds species present or potentially present in the study area. • Breeding, feeding, nursing or nesting grounds of species of conservation interest	N/A

Resource	Approach	Parameters	Period
	endangered species. • Determine exposure of species present to disturbance during marine construction works *Output:* • Characterisation of marine habitat within the area of influence.		
Fish and other Commercially Interesting Species	*Desk:* • Desk based bibliographic research to determine the species, reproductive seasons. and location, migration patterns etc (see below for the socio economic side of fisheries) • Determine exposure of species present to disturbance during marine construction works *Output:* • Characterisation of fisheries resources within the area of influence. • Potential for a stock assessment based on normal off takes if the area is found to be a breeding area for fish	• List and distribution of fish species of conservational interest or commercial interest • Spawning, rearing grounds of species of conservation and/or commercial value	N/A
Marine Cultural Heritage	*Desk:* • Bibliographic search on existing data on marine archaeological finds in and around the study area *Field :* • Side Scan Sonar (SSS) • Video/ROV survey • Multibeam echosounder survey • Magnetometric survey *Output:* • Determine presence or potential presence of archaeological sites/findings within the area of influence	• Archaeological sites/findings • Intangible Cultural Heritage (ICH)	• Timing of field surveys: April – May

Resource	Approach	Parameters	Period
Socio Economics	*Desk:* • The study will include both desktop research, including remote sensing analysis, and primary data collection (interviews, observation, focus groups, household survey). • GIS desk top analysis of costal area *Field:* – *Fisheries: I*nterviews with fisheries authorities and fishermen organisations to gather updated data on fleet and fisheries organisation, fishing methods, areas, seasons, captures, revenues, etc. The specialist will also visit all landing sites within the area of influence of the project. – *Tourism*: Interviews with tourism authorities and organisations to gather updated data on tourism development plans, etc. – *Shipping and navigation, other uses of the sea& infrastructures:* Interviews with relevant authorities and organisations to gather updated data *Output:* • Characterisation of fisheries, shipping and tourism resources within the area of influence.	• livelihood and economic profile of coastal communities • Economic importance of fisheries and tourism sector • Income distribution • Occupation and employment structure including proponent's employment plan • Opportunities for alternative livelihood activities • Dependency on fisheries and tourism livelihood • Coastal land use	• Timing of field surveys: April – June

Trans Adriatic Pipeline

Appendix E
References

(TAP-FEED-AL-EIA-REP-7028)

1 REFERENCES

Ref.	*Doc Number*	*Title*
1	TAP-FEED-AL-EIA-REP -7001	Alternatives Assessment Albania
2	TAP-FEED-AL-PLN-REP-1519	Logistic Study Albania
3	No Reference	Biocenotic Characterisation of the Marine Corridors Affected by he Construction of the Trans Adriatic Italy Albania Gas Pipeline