TABLE OF CONTENTS

2 PROJECT JUSTIFICATION 3
2.1 Project Background 3
2.2 Project Objectives and Value of Project 3
2.3 Project Alternatives 4
2.3.1 No Project Alternative 4
2.3.2 Onshore Route Alternatives 6
2.3.3 Offshore Route Alternatives 33

LIST OF TABLES

Table 2.3-1 Impact Indicators used for the Appraisal of Route Alternatives 6 and 6A .......... 18
Table 2.3-2 Key Issues Associated with each CS03 Optional Location.............................. 23
Table 2.3-3 Potom Route (August 2012) - Environmental, Socioeconomic and Cultural Heritage Constraints ............................................................................................ 29
Table 2.3-4 Pipeline Base Case (November 2011) - Environmental, Socioeconomic and Cultural Heritage Constraints ................................................................. 31

LIST OF FIGURES

Figure 2.3-1 Strategic Suppliers of Energy ........................................................................ 5
Figure 2.3-2 Strategic Project ............................................................................................ 6
Figure 2.3-3 Project Area with Assessed Route Alternatives between 2003 and 2009 .......... 8
Figure 2.3-4 Hotova Region, Assessed Route Corridors and Challenging Sections ............ 10
Figure 2.3-5 Alternative 3 (South) and Alternative 6 (North) ............................................ 11
Figure 2.3-6 Typical Topography of the Pipeline Corridor ............................................. 13
Figure 2.3-7 Ski Slope in the Area between Korca - Boboshtice - Dardhë ....................... 14
Figure 2.3-8 Area with Tourism Potential at Dardhë (Drenovë Commune) in relation to Alternative 6 ................................................................................................. 15
Figure 2.3-9 Route Alternatives “Korca Loop” .................................................................. 16
Figure 2.3-10 Route Alternative 6 (late 2010) ........................................................... 20
Figure 2.3-11 CS03 Optional Locations ............................................................................ 21
Figure 2.3-12 Shore Approach Route and Landfall Location Alternatives ....................... 22
Figure 2.3-13 Detail of Landfall Location Alternatives 6A to 6D ....................................... 25
Figure 2.3-14 Roskovec-Hoxhara Channel, Contaminated with Crude Oil ....................... 26
Figure 2.3-15 Alternative E / Potom Route ...................................................................... 27
Figure 2.3-16 Detail of Potom Route Survey and Study Area ........................................... 28
Figure 2.3-17 Base Case Route (August 2012) ................................................................ 33
Figure 2.3-18 Macroscopic Offshore Route Alternatives ................................................ 34
Figure 2.3-19 UXO Dumping Areas .................................................................................. 35
Figure 2.3-20 Lay Out of Offshore Route Alternatives Considered ................................... 37
2 PROJECT JUSTIFICATION

2.1 Project Background

Europe currently relies on Russia, Africa and the North Sea for gas supplies through several existing pipelines, Russia being its key provider. However, Europe realises the strategic need to diversify its gas supply and has taken several steps in this direction in the last three years (European Dialogue, 2011).

The Trans Adriatic Pipeline (TAP) is a proposed natural gas pipeline in the so-called Southern Gas Corridor\(^1\) that will bring gas from new reserves in the Caspian region to Southern and Central Europe. The TAP Project supports Europe in achieving its strategic goal of securing further gas supplies and meeting growing energy needs. It will be the shortest gas transit route of all the European pipeline projects currently supported by the EU within the Southern Corridor.

The 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 when production begins in early 2018. As more gas becomes available, the TAP will have the capacity to cater for an additional 10 billion cubic metres per year (bcm/yr) of new gas, expanding to 20 bcm/yr as required.

The TAP Project is supported by financially stable and strong shareholders. TAP AG’s shareholders are Swiss Axpo (42.5%), Norwegian Statoil (42.5%) and German E.ON Ruhrgas (15%). The European Union recognised 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.

2.2 Project Objectives and Value of Project

The TAP offers a new gas transportation route between the Caspian Region and Southern and Central Europe. Following is a list of the key project objectives:

- Support Europe in achieving its strategic goal of securing and diversifying natural gas supplies and boosting its ability to meet growing energy needs;
- Enhance security and diversification of gas supplies for the European markets;
- Open a new Southern Gas Corridor to Europe and market outlet for natural gas from the Caspian Sea and Middle East regions; and
- Connect existing and planned grids for natural gas transport in southeastern Europe with gas systems in Western Europe in the most efficient and economical way.

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\(^1\) Term is used by the European Commission to describe planned infrastructure projects bringing gas from Caspian and Middle Eastern sources to Europe, aimed at improving security of supply.
2.3 Project Alternatives

The route of the TAP in Albania has been selected following an extensive and thorough route alternatives assessment process performed by TAP AG with the aim to select a technically feasible pipeline route with the least environmental, socioeconomic and cultural heritage impacts.

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. This has been an iterative process taking place for 8 years, with increasing intensity and level of detail.

The route refinement process of the base case including micro-reroutings was completed for the on-shore pipeline in November 2011. After that time only local route optimization will be further investigated to basically minimize potential impacts. These optimizations will be related to determining the final pipeline (working strip) location with regard to special points like crossings of roads, rivers and other infrastructure, single old trees or physical structures or cultural heritage sites.

2.3.1 No Project Alternative

A ‘no project alternative’ would mean that none of the consequential benefits caused by the construction and operation of this infrastructure would occur.

The TAP Project is a strategic asset in the Southern Gas Corridor, and a priority energy infrastructure for the EU as defined in the proposal for a regulation on "Guidelines for trans-European energy infrastructure" (adopted on 19 October 2011). In turn the Southern Corridor is identified in the EU “Communication on energy infrastructure priorities for 2020 and beyond" (adopted on 17 November 2010).

The target of these priority projects, as stated in the communication, is to build the infrastructure needed to allow gas from any source to be bought and sold anywhere in the EU, regardless of national boundaries. This would also ensure security of demand by providing for more choice and a bigger market for gas producers to sell their products (Figure 2.3-1).

On an EU level supplies are diversified along three corridors: the Northern Corridor from Norway, the Eastern Corridor from Russia, the Mediterranean Corridor from Africa and through Liquefied Natural Gas (LNG); however, single source dependency still prevails in some regions. The document “Communication on energy infrastructure priorities for 2020 and beyond" also states that every European region should implement infrastructure allowing physical access to at least two different sources.
In order to achieve these objectives, the following priority corridors have been identified (Figure 2.3-2):

- The Southern Corridor, to further diversify sources at the EU level and to bring gas from the Caspian Basin to the EU;
- Linking the Baltic, Black, Adriatic and Aegean Seas, in particular through the implementation of BEMIP and the North-South Corridor in Central Eastern and Southeastern Europe; and
- The North-South Corridor in Western Europe to remove internal bottlenecks and increase short-term deliverability, thus making full use of possible alternative external supplies, including from Africa, and optimising the existing infrastructure, notably existing LNG plants and storage facilities.

The ‘no project alternative’ would prevent the development of the Southern Corridor and thus reduce energy supply safety for the entire EU. It would also mean no economic opportunities though direct, indirect and induced employment would be generated from the construction and operation of the project. At the national level it would mean that no revenue would be generated by gas transit for the involved countries, or by community investment.
2.3.2 Onshore Route Alternatives

2.3.2.1 Background

A Feasibility Study of the TAP was first performed between 2003 and 2005 with the objective of identifying the most suitable corridor from south-eastern Europe to Italy. At that time, the starting point of the TAP was identified near Thessaloniki in Greece - the eastern most point of the scheme within the Balkan region. The proposed pipeline corridor extended from here across northern Greece and through Albania to the Adriatic coastline. The Albanian 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 Project development phase (July 2006 - April 2007), the landfall on the Albanian Adriatic coast was shifted further northwards to the Hoxhara plain, west of the city of Fier. Accordingly the route corridor branched off from the initially foreseen corridor near Kalivac/Shkoza to the northwest, predominantly adjacent to the course of the Vjosa River. This phase resulted in the confirmation of the route corridor evaluated previously during the feasibility phase.

Whilst technically feasible, this route would run for 27 km through the Hotova Fir-Dangelli National Park\(^1\) (7 km through its core zone) and require the construction of 25 km of new 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 AG reviewed its routing in 2008 and subsequently conducted an Assessment of Alternatives during 2009 and 2010, in line with the Albanian Environmental Impact Assessment legislation (Law 8990, 23/1/2003\(^3\)). The objective of this process was threefold:

- Identify the optimal route in Albania;
- Identify options and measures to avoid and/or minimise residual environmental, socioeconomic and cultural heritage impacts; and
- Engage with relevant stakeholders (national, regional and local authorities and the general public).

Throughout 2009 a total of six alternative corridors were identified in the Hotova Region. Two of the six alternatives were designed to completely bypass the National Park to the north. Another technically feasible route was identified by-passing the core zone of the National Park but still crossing the Sustainable/Traditional Use Zones of the National Park. A summary of the alternatives identified and studied from 2003 to 2009, is shown in Figure 2.3-3, where the magenta line shows the earlier alternatives and the dark yellow the base case in 2009.

---

\(^1\) Also known as the Hotova’s National Park and Bredhi Hotovës National Park and is referred to in the text as ‘National Park’.

\(^2\) EU Habitat Directive (92/43/CEE) Article 6 specifies that to be allowed to impact 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 AG’s Policy on Corporate Social Responsibility contains the commitment that TAP AG 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 Law 8990/2003 requires inclusion 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 not-for profit organisations during the phases of planning, review and implementation of the project”.

Figure 2.3-3  Project Area with Assessed Route Alternatives between 2003 and 2009

Subsequently routes in the Eastern and Western Regions for two of the preselected alternatives from the original six were studied, completing the assessment for the entire onshore section in Albania. The alternatives were assessed by means of a technical, environmental, socioeconomic and cultural heritage appraisal. This activity included baseline characterisation and appraisal of the alternatives, conducted through a combination of desktop studies and field surveys, performed between April 2009 and February 2010.

A similar combination of desk-based studies, field work and stakeholder engagement was used during 2010 and 2011 to identify, compare and select alternatives for the Eastern Region (between the Greek border and the central mountains) and the Western Region (between the city of Fier and the landfall location). Two main alternatives were studied for the Eastern Region and six for the Western Region (see Figure 2.3-9 and Figure 2.3-12 respectively).
2.3.2.2 Methodology

The alternatives were assessed within a 2 km wide corridor (1 km on either side of the central line). This corridor was considered adequate to cover the footprint of each alternative and sufficiently large to represent the environmental, socioeconomic and cultural heritage characteristics of the territory crossed by the alternatives. However, whenever required the teams investigated sites/areas located outside the corridors, especially the socioeconomics and cultural heritage teams. The information gathered and assessed during the desktop and field phase of the alternatives assessment study was managed by means of a Geographic Information System (GIS). Environmental, socioeconomic and cultural heritage aspects and constraints associated with the logistic sites (yards, camp sites, etc.) and access roads proposed were also included in the appraisal.

Once the technical, environmental, socioeconomic and cultural heritage characteristics of each alternative were established, ‘impact indicators’ for each discipline were used to highlight the 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 identification and appraisal of relevant differences and similarities between the alternatives under study. The output of all indicators were then presented as a table or ‘indicator matrix’. The list of indicators selected for the appraisal of the six alternatives identified in the Central Region is presented in Annex 1. Similar tables have been used for the appraisal in the Eastern and Western Regions, fine-tuned, especially in the environmental indicators, to the specific values of each section. Further detail on the findings of the alternatives assessments for the Central, Eastern and Western Regions is given in Section 2.3.2.3.1, Section 2.3.2.3.2 and Section 2.3.2.3.3 respectively.

Preliminary risk assessment of the route alternatives across onshore Albania was also performed with the sole purpose of indicatively verifying the pipeline safety of the routes, as well as a further criterion for comparison. In addition, a cost comparison was carried out. The evaluated costs could not be considered as absolute costs, as the present design stage does not allow precise cost estimation.

As a parallel and integral activity in this alternative selection process, a continuous and intense public consultation and stakeholder engagement process took place throughout the entire period between 2006 and 2011. The objectives of the stakeholder engagement activities were to: (1) introduce the Project to potentially affected stakeholders; and (2) gather information pertinent to the route selection process.
The information collected was used to complement and verify information available from a desktop study and included the identification of socioeconomic sensitivities. Four groups of stakeholders were identified: (1) national authorities, (2) regional and district authorities, (3) communal / municipal authorities and (4) village representatives and local residents along the 2 km corridor. No specific stakeholder groups were invited to the public meetings, as the objective of these events was to hold meetings open to all. NGOs have been engaged in meetings held at national and regional levels during ESIA Scoping disclosure.

As a result, these public consultation and stakeholder engagement activities have shaped the scope and results of the alternatives assessment, and it has been used as a vehicle for the stakeholders to influence project design, planning and decisions to the extent practicable.

2.3.2.3 Findings of Alternatives Assessment

2.3.2.3.1 Central Region

As previously mentioned, at the end of 2009, six alternatives had been identified to cross the central mountainous region of Albania. The core, and most challenging part, of this section is the Hotova Region. Figure 2.3-4 shows the location of the six alternatives in the region.

Figure 2.3-4 Hotova Region, Assessed Route Corridors and Challenging Sections

ERM (2010)
These six alternatives were studied following the methodology explained in Section 2.3.2.2 and using the Route Selection Indicators. The summary and end result of the exercise was a selection of two of the alternatives for further study and comparison.

Of the six mentioned alternatives, the following four were discarded because:

- Alternative 1 was found not to be feasible from a construction perspective, as it crosses several active landslides;
- Alternative 2 was found to be incapable of avoiding 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 the bed of the Osumi River for 8 km; and
- Alternative 5 had the objective of providing a routing completely outside the National Park, but field investigations concluded that this route was 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.

Thus, the outcome of the interdisciplinary alternatives assessment lead to the identification of two technically feasible route alternatives for which the main environmental, socioeconomic and cultural heritage aspects were further assessed. The two alternatives (the northern route Alternative 6; and the southern route Alternative 3) are shown in Figure 2.3-5.

**Figure 2.3-5 Alternative 3 (South) and Alternative 6 (North)**

Source: ERM (2010)
The comparison matrix with indicators (refer to Annex 1) was again used, based on detailed information gathered through further field work, desktop studies and public consultation. The full environmental, socioeconomic and cultural comparison matrix is shown in Annex 1 of the ESIA Report.

A summary of the appraisal of both alternatives demonstrates that both were found to be technically feasible, facing similar overall construction challenges. Similarly, no significant differences were found in terms of safety, socioeconomic and cultural heritage impacts. Alternative 6 was found to face fewer challenges in terms of environmental impacts and interference with official planning zones. On the other hand, the construction of Alternative 3 would not 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.

In parallel, stakeholder engagement for the alternatives assessment was undertaken between July and October 2009. The consultation focused on directly and indirectly affected parties including communities within, or in close proximity to, the pipeline corridor, and local, district and regional level authorities. The engagement activities were concentrated within the Hotova Region due to the number of possible route alternatives and the lack of available primary data on the local population. Socioeconomic studies of the eastern and western parts of the central section were planned as a desktop exercise. Additional consultation was conducted along Alternative 6 in the western section, and consisted of commune and district level engagement.

A total of four regional, six district, 30 communal and 68 village authorities were consulted during the mentioned period of 2009. Data and opinions expressed by stakeholders during engagement activities are summarised below:

- **Acceptance of the project:** The majority of stakeholders consulted were positive about the project and about the intention to avoid impacts on the National Park. They believed that the project would bring development and prosperity to the local area;

- **Route preferences:** During the Hotova Region consultation, each village requested that the project be routed through their land, believing that this would bring development in the form of roads and jobs and open up the area to other opportunities;

- **Concerns and expectations:** None of the local residents consulted were concerned at the prospect of the pipeline being laid through their agricultural land as long as it only caused temporary disruption. There is the expectation that the project will provide employment for the local population, both directly and indirectly through support service provision; and

- **Roads upgrading:** Development and upgrade of roads in the study area were seen as the key development need and a possible positive outcome of the project.

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

During the early 2011 round of completion of the alternatives assessment, the Eastern Region, between the Greek border and the mountainous Central Region, was considered. An assessment of the only existing alternative (Alternative 6) of approximately 30 km length was made in detail, including another round of consultation with national and regional authorities. These activities highlighted several important issues regarding this section, facts which had already been identified in earlier phases, mainly between 2009 and 2011. A summary of the most relevant characteristics and considerations of Alternative 6 are given below:

Environmental

- The area of Morava, Korca region close to the border with Greece is included in the Emerald Network and is envisaged to become a protected conservation area, probably IUCN Category V, Protected Landscape. The new protected area will connect the National Park of Drenova and the protected zone of Nikolice in the south. The present corridor crosses this area;

- The reasons behind these future classification include several high-value ecosystems, old growth forests (Natural Monuments) and large fauna habitats, all of these to be affected by the corridor;

- The topography of the area implies significant work along very narrow mountain ridges with associated erosion and landscape effects. An example of the topography of the corridor is shown in Figure 2.3-6;

Figure 2.3-6 Typical Topography of the Pipeline Corridor

Source: Field Survey, ERM (2011)
Socioeconomic

- Both of the available compressor station locations were located relatively near inhabited areas;

- The area of Dardhë in the mountains crossed by the pipeline corridor is a major focus in the development and land planning of the region, as it is considered to have significant tourism attraction potential. Incipient tourist developments already exist in the area, such as the ski slope shown in Figure 2.3-7;

**Figure 2.3-7 Ski Slope in the Area between Korca - Boboshtice - Dardhë**

- The “Study for the Development and Protection of the Dardhë area as a Priority Area for Tourism” defined the spatial limits of an area with potential for tourism, which is shown in Figure 2.3-8; and

- Forests also have an important economic value in the study area, although their uncontrolled exploitation, mainly for heating and household uses, has heavily depleted this resource in the past years.
Figure 2.3-8  Area with Tourism Potential at Dardhë (Drenovë Commune) in relation to Alternative 6

These characteristics of Alternative 6 deemed it necessary to identify and appraise an alternative route for this section of the pipeline. This alternative route identification was linked to a change in the location of the border crossing between Greece and Albania, and a change also of a particular stretch of the route on the Greek side. Both appraisals were undertaken more or less simultaneously to assure that no specific constraints appeared on one side as a result of changes on the other side.

After the identification of a potential alternative, named Alternative 6A, a comparative appraisal of both using the same methodology described for the Central Region was undertaken. Figure 2.3-9 shows both alternatives.
The appraisal of these alternatives was made at two different times, due to specific logistical issues. In the first instance a desktop analysis and field work took place in May 2011, from which a preliminary appraisal was carried out. Later in the year, in September, another round of stakeholder engagement and public consultation took place to confirm or contradict the conclusions and findings of the preliminary appraisal.

As a result of the route refinement works in June 2011 it was decided to incorporate Alternative 6A (the “Korca Loop”) into the base case route.

Although described earlier in detail, the main characteristics of Alternative 6 are summarised below:

- The route corridor does not directly cross any protected area. A portion of the Cangonji Managed Nature Reserve falls within the 2 km corridor;
• The route does not cross forested land or natural habitats of interest, except for the one major river crossing. Most of the route passes through flat agricultural land. Here, soon after the construction works, landscape will recover its original character, and since these landscapes already have a high level of anthropogenic activity and often contain linear features, only minor elements such as the pipeline markers will be visible;

• There are six cultural heritage sites within the 500 m corridor of the potential 2011 rerouting, of which one is a potentially important site. Approximately 90% of the area within the corridor of the alternative is deemed as having a high potential for unknown archaeological sites;

• Most of the land use in the area is agricultural, of which a relatively significant percentage is permanent crops (mostly fruit trees). There are 18 settlements within the 2 km corridor; and

• The preferred CS02 site is located more than 1,500 m from the small settlement of Vishocicë.

The methodology used for the appraisal, as mentioned, was the same used for all other route selection activities undertaken so far, with a focus on the relevant indicators. The indicators used and the results of the comparison are given in Table 2.3-1.
Table 2.3-1  Impact Indicators used for the Appraisal of Route Alternatives 6 and 6A

<table>
<thead>
<tr>
<th>Impact Indicator</th>
<th>Units</th>
<th>Relevance to the Appraisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total length and surface clearance (pipeline construction) within existing</td>
<td>km/ha (considering 38 m wide working strip)</td>
<td>Existing protected areas by statutory designation affected (including Emerald sites) constitute areas of high environmental interest (ecological, landscape, flora and fauna species, etc.)</td>
</tr>
<tr>
<td>Protected Areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total length and surface clearance (pipeline construction) within CORINE Biotopes</td>
<td>km/ha (considering 38 m wide working strip)</td>
<td>Second level of designation, constitute areas of high environmental interest (ecological, landscape, flora and fauna species, etc.)</td>
</tr>
<tr>
<td>Number of Natural Monuments within 2 km corridor</td>
<td>Number</td>
<td>Proposed protected points by statutory designation</td>
</tr>
<tr>
<td>Total area of natural habitats crossed (pipeline construction)</td>
<td>Ha (considering 38 m wide working strip)</td>
<td>Natural Habitats (as identified in the CORINE Land Cover database) are an indicator of natural value</td>
</tr>
<tr>
<td>Total forest clearance (pipeline construction)</td>
<td>Ha (considering 38 m wide working strip)</td>
<td>Important as habitat itself and as indicator of fauna</td>
</tr>
<tr>
<td>Total number of major river crossings</td>
<td>Number</td>
<td>Important habitats at river banks</td>
</tr>
<tr>
<td>Ridge modification</td>
<td>km</td>
<td>Highly visible and landscape modification (permanent impact). Indicative of relevant earthworks and potential landfills and restoration difficulties</td>
</tr>
<tr>
<td>Distance to settlements from CS02 preferred location</td>
<td>km</td>
<td>Visibility and noise impacts higher the nearer the locations to settlements</td>
</tr>
<tr>
<td>Archaeological Site or high potential site/location</td>
<td>1 Site = 6 points</td>
<td>Number of archaeological Sites or High Potential location within the 500 m corridor, where a site is defined as any area with known or strongly suspected to have ancient below-ground cultural remains, artifacts, architectural foundations, or soil features (e.g. tomb, buried settlement or fortification, prehistoric camp site or village)</td>
</tr>
<tr>
<td>Important Archaeological Sites</td>
<td>1 Site = 12 points</td>
<td>Important in this context. Means physically substantial that would require considerable time to investigate and/or rescue</td>
</tr>
<tr>
<td>Overall Archaeological Potential of Corridor</td>
<td>Percentage (%)</td>
<td>Percentage of “cultivated land” (Code 211 and 223) within the 500 km corridor from CORINE land cover maps.</td>
</tr>
<tr>
<td>Archaeological Flexibility</td>
<td>Qualitative (High, Medium, Low)</td>
<td>Re-route options due to chance finds during construction are common. If constructability constraints are great due to rough topography and flatter topography offers more opportunity to create minor route variants during construction and therefore more flexibility to respond to archaeological chance finds</td>
</tr>
<tr>
<td>Regional government stakeholders</td>
<td>Number of regions crossed</td>
<td>Population potentially affected by the Project</td>
</tr>
<tr>
<td>Local government stakeholders</td>
<td>Number of municipalities crossed</td>
<td>Population potentially affected by the Project</td>
</tr>
<tr>
<td>Population in settlements within the 2 km corridor</td>
<td>Number of Residents</td>
<td>Population potentially affected by the Project</td>
</tr>
<tr>
<td>Population density within the 2 km corridor</td>
<td>Inhabitants / km²</td>
<td>Population potentially affected by the Project</td>
</tr>
<tr>
<td>Settlements within the corridor routes</td>
<td>Number of settlements</td>
<td>Population potentially affected by the Project</td>
</tr>
<tr>
<td>Area of agricultural lands</td>
<td>Hectares (38 m width working strip)</td>
<td>Land take compensation indicator</td>
</tr>
</tbody>
</table>
After an analysis of both route indicators, the following key conclusions were drawn:

- Route Alternative 6A seems to have a significantly better environmental profile than Alternative 6, due to lower impact to protected areas, flora, fauna, etc.;

- The land use for each alternative is very different: Alternative 6 is mostly forest whereas Alternative 6A is mostly agricultural. There is no clear advantage of either in this sense, and in both cases impacts could, in principle, be managed. However, the impact on tourism clearly differentiates the alternatives, favouring Alternative 6A where tourism potential is less;

- Route Alternative 6A has a higher potential for undiscovered cultural heritage sites than Alternative 6, basically because it has higher potential for open air sites buried under flood plain alluvium which are harder to detect from above-ground reconnaissance. On the other hand, as reroute options due to chance finds during construction are common, flexibility for these reroutes is also an important factor. If constructability constraints are greater due to rougher topography along Alternative 6, which is the case, then the flatter topography of Alternative 6A would offer more opportunity to create minor route variants during construction and therefore more flexibility to respond to archaeological chance finds; and

- The extra length of Alternative 6A is compensated by the lower constructability constraints posed in relation to Alternative 6.

As a result of these conclusions the Project selected Route Alternative 6A as the base case option, subject to the results of stakeholder engagement and public consultation which took place in September 2011. This included a comprehensive consultation exercise involving meetings with all levels of authorities and general public along the route. Results of these activities did not contradict any of the main conclusions of the preliminary appraisal, suggesting however ways to improve the social acceptability of Alternative 6A by means of partial reroutings and other measures.

In November 2011 a focused analysis of the consolidated Project footprint at that time (updated pipeline route, compressor station locations, access roads to be constructed or upgraded, location of pipeyards and base camps, ridge modification, river crossings, etc) against the different GIS layers, was performed in order to identify any new key findings.
The focused, key findings study included:

(1) Socioeconomic analysis in a buffer area of 60 m (30 m each side of the centreline) for individual buildings, and 200 m (100 m to each side of the centreline) for clusters of buildings.

(2) Cultural heritage analysis in a buffer area of 50 m (25 m each side of the centreline)

(3) Environmental analysis in a buffer area of 500 m (250 m each side of the centreline), although variable depending on the finding.

Subsequently, a series of minor changes were proposed to optimize the Project footprint, avoiding existing sensitivities.

2.3.2.3.3 Western Region

The geographical scope of the alternatives appraisals conducted up until 2009 in the Western Region of the route included up to the west of the city of Fier. In any case, both Alternatives 3 and 6 described above, joined at a common point there. West of that point a significant number of routes, landfall locations and the compressor station CS03 were available from a preliminary feasibility standpoint.

A general view of Alternative 6 in late 2010, with the Western Region alternatives shown in yellow, is presented in Figure 2.3-10.

Figure 2.3-10 Route Alternative 6 (late 2010)

Source: ERM (2010)

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1 The socioeconomic buffers were determined in accordance with safety zones set out in Albanian Law 9946. Since the key findings study was conducted these buffers have been revised to reflect the requirement of temporary Albanian Minister Order 666 to develop gas systems in Albania in accordance with Greek design and safety standards; in this instance, specifically Greek Technical Regulation 4303 on Safety Zones. Therefore in the main ESIA the distance for individual buildings has been reduced to 40 m (20 m either side of the centreline) and the distance for clusters of buildings has been increased to 400 m (200 either side of the centreline).
During late 2010 and 2011 an alternatives appraisal took place, using a similar general methodology as for the route appraisal in the Central Region of the route.

A particularity of this Western Region was the location of the landfall and its link with the offshore route selection, described later in this Section. Obviously the location of the landfall and the offshore route starting point needed to be the same. The onshore route selection process in Albania was to be the main driver for the landfall and, as a consequence, of the starting point for the offshore corridor.

A total of six pipeline route alternatives and landfall locations and six CS03 locations were identified from technical and logistical standpoints, as shown in Figure 2.3-11 and Figure 2.3-12, respectively.

**Figure 2.3-11 CS03 Optional Locations**

Source: ERM (2011)
As previously mentioned the approach to the route, landfall and CS location appraisal was similar in concept to the one followed for the Central Region of the pipeline route. Desktop studies and field investigations, as well as stakeholder engagement was carried out in early 2011, with the aim of selecting the most appropriate route, landfall and CS03 location. With respect to stakeholder engagement, the western section was partially included in previous rounds of stakeholder engagement during 2009 and 2010 and complemented with the new alternatives during 2011.

With regard to the compressor station location, of the 6 initially considered, 3 locations were positioned on the Ardenicë hill to ensure the soil’s bearing capacity and stability (CS03 Options 1, 2 and 4, see Figure 2.3-11) Option 3 is located on the flat area of Semani river floodplain and both Options 5 and 6 are located closer to the coast.

The key issues associated with each option are shown in Table 2.3-2:
Table 2.3-2  Key Issues Associated with each CS03 Optional Location

<table>
<thead>
<tr>
<th>Option</th>
<th>Environmental Issues</th>
<th>Socio-Economic Issues</th>
<th>Cultural Heritage Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1</td>
<td>Close to the Petova water reservoir. Almost natural eutrophic lake with high value as ecosystem</td>
<td>Proximity to a water reservoir, Proximity to single houses (less than 300 m), Agricultural land use</td>
<td>Indications of cultural heritage constraints in the form of surface pottery of the Roman and Hellenistic Periods</td>
</tr>
<tr>
<td>Option 2</td>
<td>Area of valuable landscape (Ardenicë Hill)</td>
<td>Area of valuable landscape (Ardenicë Hill), Agricultural land use</td>
<td>Indications of cultural heritage constraints in the form of surface pottery of the Roman and Hellenistic Periods</td>
</tr>
<tr>
<td>Option 3</td>
<td>Flat floodplain area, Privately owned, Agricultural land use</td>
<td></td>
<td>No evident constraints</td>
</tr>
<tr>
<td>Option 4</td>
<td>Area of valuable landscape (Ardenicë Hill)</td>
<td>Area of valuable landscape (Ardenicë Hill), Proximity to isolated existing buildings, Agricultural land use</td>
<td>Indications of cultural heritage constraints in the form of surface pottery of the Roman and Hellenistic Periods</td>
</tr>
<tr>
<td>Option 5</td>
<td>On coastal area (1 km from the shoreline), Possible interference with future tourism development</td>
<td></td>
<td>No evident constraints</td>
</tr>
<tr>
<td>Option 6</td>
<td>On coastal area (2 km from the shoreline), Possible interference with future tourism development</td>
<td></td>
<td>No evident constraints</td>
</tr>
</tbody>
</table>

ERM (2011)

As a summary of the above mentioned comparison of CS03 optional locations, and due to technical (extensive earthworks and lack of space), environmental (area of high landscape value) and socioeconomic (permanent crops) aspects, options 1, 2 and 4 were discarded. Of the three remaining options, 6 had been selected against 5 only on the grounds of its link to the preferred shore approach route, which is described below. Option 3 is considered only as a fall back in case Option 6 is found to be unfeasible due to geotechnical constraints.
With respect to the pipeline routes in their approach to shore and the landfall locations, 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, as explained later in the description of the offshore route selection. 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; and
- Villages/towns/settlements.

Of these 6 preliminarily identified, the desk top study findings and the observations made during the environmental field survey (15th and 16th February 2011) determined that landfall location alternatives 6F and 6E fall within the extended boundaries of the Karavasta Lagoon protected area (Ramsar Site), and as such were discarded. Therefore, the environmental, socioeconomic and cultural appraisal focused on the remaining 4 landfall location alternatives, 6A to 6D.

It must be remembered that these landfall location alternatives share a common route until a point where they separate in two main alternatives, one combining 6A to 6C (southern options) and one called 6D (northern option).

Figure 2.3-13 shows the four landfall location alternatives (labelled LF-6A to LF-6D). The CS03 optional locations 3, 5 and 6 are also shown using green polygons.
Figure 2.3-13 Detail of Landfall Location Alternatives 6A to 6D

The four landfall alternatives could be considered very similar in environmental, socioeconomic and cultural heritage terms. In environmental terms, besides the habitats situated along the coastal belt (salt marshes, lagoons, Mediterranean pine forests, downstream of drainage channels), common to all alternatives, other types of natural habitats are quite scarce, fragmented and degraded, the territory dominated by a mosaic of agricultural land. In socioeconomic terms, agricultural land use is predominant and development plans for the area focus on the potential for tourism in the coastal area. The entire coastal area between the Semani River and River Vjose is meant to be devoted to tourism development. No significant cultural heritage issues make the alternatives different, nor does a technical-construction standpoint.
The only significant difference is that the southern landfall options are located in the vicinity of the Roskovec - Hoxhara channel. During the field survey, it was observed that the Roskovec - Hoxhara channel is heavily polluted with crude oil. The crude oil pollution originates from the Marinez oil field located approximately 25 km inland. Figure 2.3-14 shows a view of the channel with evident signs of pollution. For this reason, northern Landfall Route Alternative 6D and associated CS03 Option 6 were selected as the base case at that time.

**Figure 2.3-14 Roskovec-Hoxhara Channel, Contaminated with Crude Oil**

![Roskovec-Hoxhara Channel, Contaminated with Crude Oil](Source: Field Survey, ERM (2011))

The different meetings with regional and communal authorities and other stakeholders undertaken in the western area in the framework of the alternative selection did not identify or raise particular concerns or issues which had not been already taken into account in the appraisal.

### 2.3.2.3.4 Central Region - Potom Route

Sections 2.3.2.3.1 to 2.3.2.3.3 detail the findings of alternative assessments undertaken along the pipeline route until late 2011. As a result of these assessments the route was consolidated in November 2011 into route Alternative 6A (dated 25-11-2011) and at that time was considered the ‘base case’ for the TAP Project.

Since the pipeline route was consolidated in November 2011, further technical studies\(^1\) were conducted on the base case. Subsequent to these studies, TAP AG investigated the feasibility of alternatives to the tunnel section of the route (approximately ‘Kilometre point’ or ‘Kp’ 78.5 to 81\(^2\)), with suitable options for respective road access.

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\(^1\) These investigations include more detailed studies on geotechnical conditions and constructability of an alternative solution on slopes and mountain ridges that might be used for such an alternative route.

\(^2\) Base case route dated 25-11-2011.
The proposed investigated tunnel, approximately 2.5 km long, lies at the highest point of the November 2011 base case route, 18 km east of Corovode in the Ostrovice Mountains (2,350 m asl). This feature was developed during route selection and refinement in response to difficult terrain and geotechnical conditions in the area.

As a technically feasible alternative to the tunnel section, route Alternative E was identified in the Potom area. This alternative consists of diverting the pipeline route directly south along a ridge at approximately Kp 76, south of the settlement of Helmesi before heading northwest up the Stravecke River valley, past the settlement of Potom, to re-join the November 2011 base case route – as shown in Figure 2.3-15. Alternative E is also referred to as the ‘Potom Route’.

**Figure 2.3-15 Alternative E / Potom Route**

At the end of July 2012, a field survey of the Potom route and one access road (Access Road Nr 7) was undertaken in order to allow a comparison of this proposed alternative with the November 2011 base case – refer to Figure 2.3-16. Once the field survey was complete a preliminary identification and analysis of impacts that may be considered ‘red flags’ was completed to complement the detailed comparison of the two alternatives being considered. This report also

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1 In this report a ‘red flag’ is a potential impact that is deemed significant based on professional experience, July 2012 survey results and the location of the identified impact to the route where specific construction restrictions and mitigation, and avoidance measures need to be considered in the final design of the pipeline, and prior to construction.
provided preliminary information on mitigation measures associated with the identified red flags, and potential construction restrictions to help facilitate future decision making.

The comparison matrix presented in the report used quantitative indicators covering the disciplines of interest for the route comparison, as used in previous alternative appraisals for the Central, Eastern and Western Regions, helping to identify the main similarities and differences between the two options. The report also drew on information gathered during the 2009 ‘optioneering’ phase of the Project (see Section 2.3.2.3.1) where Alternative 5 shared the same alignment as the first six kilometres of the Potom Route (Kp 76 to 85).

**Figure 2.3-16  Detail of Potom Route Survey and Study Area**

![Map of Potom Route Survey and Study Area](Image)

*Source: ERM (2012)*

A summary of the main environmental, socioeconomic and cultural heritage constraints associated with the Potom Route are reported in Table 2.3-3 and the tunnel section of the November 2011 base case are reported in Table 2.3-4. The tables only report significant or potentially significant environmental, socioeconomic and cultural heritage constraints.
### Table 2.3-3 Potom Route (August 2012) - Environmental, Socioeconomic and Cultural Heritage Constraints

<table>
<thead>
<tr>
<th>Main Constraint</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental (Biological)</strong></td>
<td>The following elements are considered to be of high environmental and landscape value:</td>
</tr>
<tr>
<td>• Passes through a high quality beech forest with high biodiversity value</td>
<td>• Beech forests are considered very important in this section by providing high quality climax habitats for flora and fauna species. In this section, the forest is still primarily with stands of multiple ages and remaining mature trees 150+ years old. ‘High Forest’ is still present between Kp. 76.8 and Kp. 77.7. This section of forest particularly has been identified as important for key fauna species and evidence of brown bear, wolf,rosalia long-horn beetle and woodpecker species were observed during the survey. The forest is also largely undisturbed with no grazing pressure or much evidence of cutting and it forms part of an important wildlife corridor for large mammal species.</td>
</tr>
<tr>
<td>• Presence of EU habitat with high biodiversity value</td>
<td>• This forest is also important for providing additional protection from landslides. Existing evidence of landslides at Kp.77.4 and Kp 78.65 shows the instability of soils and steepness of slopes in the area.</td>
</tr>
<tr>
<td>• Forest providing slope stabilisation</td>
<td>• Presence of glades of un-grazed mountain hay meadows along the ridge line at Kp 77.23 and Kp 77.6 with large diversity of invertebrates.</td>
</tr>
<tr>
<td>• Forest of Lirza Nature Monument</td>
<td>• Presence of Beech Forest and glades (Kp 77.9 – 78.7). Some ‘High Forest’ trees present and forest quality still high while glades are largely un-grazed and with large invertebrate diversity, including the European priority species Rosalia long-horn beetle</td>
</tr>
<tr>
<td>• Wildlife corridor for large carnivores</td>
<td>• Presence of Forest of Lirza Nature Monument located approximately 500 m from the pipeline centreline. Current status and perimeter of designated forest is unknown. Includes a freshwater spring, monument (see cultural heritage) as well as a grazed hay meadow. Beech Forest still of high quality even if historically managed and the area supports key species such as brown bear.</td>
</tr>
<tr>
<td><strong>Environmental (Physical)</strong></td>
<td>The following elements are considered to be of high environmental and landscape value:</td>
</tr>
<tr>
<td>• Landslides, steep slopes and narrow sections</td>
<td>• Potential landslide in Kp 77.4 located about 50 m from centre line, and landslide in Kp 78.65 located about 75 m from centre line. Both landslides are high sensitive to erosion due to unstable soil conditions.</td>
</tr>
<tr>
<td>• Pipeline works visible from Potom</td>
<td>• Both steep slopes along section Kp 82.5 – 83.5 are about 30° inclination. The slopes are high sensitive to erosion due to unstable soil conditions.</td>
</tr>
<tr>
<td>• Crossings of the Staravecke River and its tributaries with high risk of erosion</td>
<td>• Section Kp 82.5 – 83.5 is visible from Potom village, affecting the visual amenity.</td>
</tr>
<tr>
<td></td>
<td>• The Staravecke River flows all year around, even during the dry season. This river is important for local biodiversity. The river crossing area is high sensitive to erosion due to unstable soil conditions.</td>
</tr>
<tr>
<td>Main Constraint</td>
<td>Considerations</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------</td>
</tr>
</tbody>
</table>
| **Socioeconomic** | • The population along the route are heavily dependent on herding as a key livelihood activity. Thus, part of the land is used for animal feed cultivation and grazing.  
• Two cemeteries have been identified: Potom cemetery, approx. 20 m from the route and Helmesi cemetery approx. 30 m from the route.  
• Cluster of houses have a min distance of 40 m from the route.  
• The main water reserve of Staravack village (artificial lake) is located at approx. 150 m from the route.  
• Forest areas are used once a year to collect wood for personal use (1 week in October). |
| **Cultural Heritage** | • Presence of cultural heritage sites in the vicinity of the Potom Route  
• The Potom Route is located approximately 500 m southeast of the Lirza Memorial monument and as such, should have no direct impact on the monument. However, the Potom Route will be visible from the monument and as a result may impact the ambiance or aesthetic of the monument’s setting.  
• The Helmesi Village Cemetery is located within 2 km of the Potom Route. The Potom Route passes within 25-30 metres (m) of the Helmesi Village cemetery. The close proximity of the Potom Route may impact the site through direct physical impacts to archaeological resources; impacts to the commemorative and aesthetic value of the grave monuments in the cemetery; and or the cultural/religious significance of the cemetery as an intangible cultural heritage site.  
• At Kp 85.1 the Potom Route passes within 15-20 m of a historic bridge pier and within 50 m of the ruins of a historic, small stone building. Construction activities could have physical impacts on the bridge pier, in the form of direct physical impacts and vibrations associated with construction activities and vehicular traffic. This feature is potentially historic and suggests a high probability of encountering additional ruins or other archaeological features associated with a historic bridge in the immediate area. |
Table 2.3-4 Pipeline Base Case (November 2011) - Environmental, Socioeconomic and Cultural Heritage Constraints

<table>
<thead>
<tr>
<th>Main Constraints</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental</strong></td>
<td>The following elements are considered to be of high environmental and landscape value:</td>
</tr>
<tr>
<td>• Crossing of the Vithkuq-Ostrovice CORINE biotope.</td>
<td>• The pipeline corridor (including tunnel) and Access Road 7 pass directly through the Vithkuq-Ostrovice CORINE biotope. In this zone the biotope includes Ostrovice Mountain, and hay meadows which are EU habitats and support, invertebrates large mammal species including potentially Balkan chamois.</td>
</tr>
<tr>
<td>• Presence of EU habitat</td>
<td>• The area provides an important bio-corridor for regional movements of large carnivore species (such as brown bear and wolf) and ungulates.</td>
</tr>
<tr>
<td>• Presence of species of high conservation value</td>
<td>• Forest of Symize Nature Monument passed directly through by the pipe corridor between Kp 81.6. And Kp 83.3The forest size is around 30 hectares and is of high conservation value in providing connecting habitat in the region and a bio-corridor for species.</td>
</tr>
<tr>
<td>• Forest of Symize Nature Monument.</td>
<td>• Minor streams, creeks, and wet meadows crossed by the Access Road 6 (Kp 82.3-Kp 82.7) form important habitats for threatened species such as the Yellow-bellied toad (<em>Bombina variegata</em>), Stream frog (<em>Rana graeca</em>) and are present in this area.</td>
</tr>
<tr>
<td>• Presence of steep slopes with the potential for landsliding</td>
<td>• Mountain hay meadow providing habitat for invertebrates, brown bear and wolf.</td>
</tr>
<tr>
<td><strong>Socioeconomic and Cultural Heritage</strong></td>
<td>• Access Road 6 passes directly through Forest of Symize Nature Monument (Kp 81.7 – Kp 82.3) as described above.</td>
</tr>
<tr>
<td>• Presence of Monument and small cemetery</td>
<td>• Steep section of slope on road between Kp 83.1 – Kp 83.4. This section is likely to need considerable stabilisation works and is very exposed to erosion and potential landsliding.</td>
</tr>
</tbody>
</table>

| A Monument and small cemetery are present on the route. |
Key sensitivities identified along the proposed Potom Route include areas of beech forest (*F. sylvatica*), Alpine hay meadows and the associated flora and fauna (including large mammals, such as brown bears), and alignment of the proposed route near the village cemeteries of Potom and Helmesi. Although the implementation of the Project will affect these sensitive areas, the impacts can be appropriately managed through the construction and operation phases of the Project (further details on the impact assessment and proposed mitigation measures are given in Section 8 and Section 9 respectively).

After due consideration of the technical aspects and sustainability of both alternatives, as well as implications on Project scheduling, route Alternative E / Potom Route was integrated into the base case route\(^1\). The selection of this alternative also required alterations to other Project components for this section of pipeline, including some changes to the network of access roads and the relocation of a pipe yard and construction camp near the settlement of Potom.

The decision to incorporate the Potom route into the base case was motivated by the following:

- The tunnel alternative would produce an irreversible impact to the environment in the form of a tunnel, whilst any impact caused during construction of the Potom alternative will be reinstated and only the maintenance road will remain;

- In accordance with the tunnel feasibility study, the soil excavated for the tunnel (approx. 120,000 m\(^3\)) would have to be disposed of within the vicinity of the construction site, especially at the western portal. Whereas only a small quantity of the excavated soil for the Potom route will need to be disposed of, as most of the soil will be used for refilling, widening of the working strip and for road construction;

- Construction of the tunnel portals, tunnel and pipeline construction in the tunnel would need approx. 36 months, in addition to the continuous logistical traffic (trucks and cars). The Potom route effective construction time is estimated to be approx. 10-15 months; and

- Operation of the tunnel alternative would require continuous use of diesel generators to provide power for the safety systems installed in the tunnel. Fuel will therefore have to be transported to the site, with an associated increase in local air and noise emissions. The buried pipeline along the Potom route would only require standard service checks.

\(^1\) Subsequently referred to as ‘August 2012 base case’ route – see Section 2.3.2.4..
2.3.2.4 Preferred Consolidated Route

As a result of the aforementioned alternative assessments, and at the time of writing this report, consolidated route August 2012 (see Figure 2.3-17) is considered the ‘base case’ for the TAP Project. As described in the previous sub-sections, this route contains the Korca loop in the east, the Potom route in the central region and landfall Alternative 6D at the Adriatic coast in the west.

This ESIA assesses the August 2012 base case route; the specific environmental, socioeconomic and cultural heritage characteristics of the route are presented in Section 6 and the assessment of potential impacts of the TAP Project on the receiving environment along the route is presented in Section 8.

Figure 2.3-17 Base Case Route (August 2012)

Source: ERM (2012)

2.3.3 Offshore Route Alternatives

The route selection process in Albania was driven by the combined feasibility of both onshore and offshore sections. In what refers to the offshore section, the main driver for route selection was the desire to establish the shortest and shallowest possible connection between Albania and Italy, provided that such route was feasible from all standpoints (technical, socioeconomic, environmental, etc).
The onshore-offshore relation in terms of route selection in Albania was driven by the landfall location, which had to be convenient for both onshore and offshore parts of the route, and also compatible with the Italian side of the offshore route and the location of the Italian landfall.

These inter-relations have determined a route selection process performed in parallel to the onshore route selection, and using a somewhat similar tiered approach than in the onshore sections, but with the particular circumstances of the marine environment.

The offshore route selection process initially led to the identification of three macroscopic route corridors for connection between Albania and Italy. These are shown in Figure 2.3-18.

**Figure 2.3-18 Macroscopic Offshore Route Alternatives**

![Map of offshore route alternatives](source: ERM (2011))

Both the location of the Albanian and Italian landfalls at the time, as well as the mentioned depth of water and length of route variables resulted in a primary selection of the northern corridor (red in Figure 2.3-18). Later developments, especially in Italy, have in fact resulted on a base case route which in fact combines the red corridor in Albania, but crosses towards the black central corridor.
In parallel to the landfall location-selection process, the high seas, or mid water offshore route selection was primarily performed through, apart from the mentioned depth of water and length of route variables, by the evaluation of constraints, the such as: 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).

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, with the information available at the time, on an iteration process, and against the evaluation of options of appropriate design and construction methods.

One main constraint to offshore routing was the dumping grounds of unexploded ordinance (UXO) disposed of on the seabed at the end of World War II. In Figure 2.3-19, the black dotted military areas are the dumping grounds for the mentioned UXO, while the red dotted areas are military exercise areas as informed by the respective national authorities. Another key constraint was slope stability on the Albanian slope between the continental shelf and the abyssal plain.

**Figure 2.3-19 UXO Dumping Areas**
With all these variables, several potentially feasible alternatives were generated, linking the optional Albanian and Italian landfalls and through the existing corridors between the UXO dumping areas and the geophysical characteristics of the continental slopes. The full array of potential offshore routes considered and investigated to different levels of detail is shown in Figure 2.3-20.
Figure 2.3-20  Lay Out of Offshore Route Alternatives Considered

Coordinate System: WGS 1984 UTM Zone 34N
Source Reference Map: © ESRI Basemaps
With reference to the Albanian section of the offshore route, there are three main alternatives, stemming from the currently selected landfall location, northern, central and southern. At the time of drafting this report, the southern route is the selected base case, selection driven mainly by the location of the Italian landfall and the known geophysical characteristics of the Albanian continental slope. This base case route will be further confirmed and refined after the detailed route survey which is programmed to take place in late 2012 / early 2013.