ESIA Italy
Annex 8 Landscape Impact Assessment
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1 INTRODUCTION

This Landscape Impact Assessment concerns the onshore section of the TAP pipeline in Italy. The pipeline will transport gas from new sources of supply in the Caspian Sea to western and south-eastern Europe, with landfall in the Municipality of Melendugno, in the province of Lecce, in Apulia region. This Landscape Impact Assessment has been prepared in accordance with the Italian Prime Ministerial Decree of 12/12/2005 "Identification of the documentation necessary for the verification of the environmental and landscape compatibility of the proposed intervention, pursuant to art. 146(3) of the Cultural Heritage and Landscape Code (Italian Legislative Decree no. 42/2004 of 22/01/2004)."

To determine the impact of the proposed intervention on the reference landscape and to provide for impact mitigation measures, based on information obtained from the databases of the local authorities involved and analysis carried out during the preparation of the Environmental and Social Impact Assessment (ESIA), analysis was carried out with a view to characterising the component from a structural and perceptual point of view.

More specifically, by means of inspections, photographic surveys and with the help of CTR and ortho-photography, the areas were characterized in terms of landscape, geomorphology and natural vegetation; an historical analysis was carried out and the existing protection constraints were verified, on the basis of the planning/programming tools in force at different levels in the territory under study.

The results were translated into maps which highlight the constituent elements of the landscape and the perceptual aspects.

Once the above analysis was completed, an analysis of the planned works was performed, considering their morphological, linguistic and dimensional characteristics in relation to the reference context with the aid of 3D photo simulations in order to determine the impact of the project on the landscape. With regard to environmental mitigation, this Landscape Impact Assessment takes into account the existing Preliminary Mitigation Project (see Appendix 1 of this Annex), already submitted to the Superintendence of Architectural Heritage and Landscape of the provinces of Lecce, Brindisi and Taranto.
2  TERRITORIAL OVERVIEW

The proposed pipeline will originate in Greece and will cross Albania and the Adriatic Sea with landfall in southern Italy.

In Italy (also considering the Italian territorial waters) the project essentially consists of a subsea pipeline (offshore) of about 45 km in length with landfall in the province of Lecce, in Apulia Region, and a 8.2 km long onshore pipeline, a Block Valve Station (BVS), and a Pipeline Receiving Terminal (PRT) located in the territory of Melendugno, on the border with the Municipality of Vernole.

The landfall of the pipeline will be on the coast between San Foca and Torre Specchia Ruggeri, in the Municipality of Melendugno. The main onshore components of the project are described below.

The Study Area is defined as the geographic area within which the project could potentially interfere with the morphological, visual and natural components as well as the historical and cultural values of the territory.

Therefore, to exercise greater caution, it was considered appropriate to apply a corridor of 2 km around the Project route and the PRT.

The Study Area, therefore, affects the territory of the Municipality of Melendugno and a small part of the territory of the Municipality of Vernole, in the province of Lecce.
3 LANDSCAPE AND TERRITORIAL PLANNING INSTRUMENTS

The planning instruments reviewed in relation to the Project and described in the present paragraph are:

- Thematic Territorial Urban Planning (PUTT/p);
- Regional Landscape and Territorial Plan (PPTR);
- Provincial Territorial Coordination Plan (PTCP) of the province of Lecce;
- Municipalities Urban Planning of Melendugno (PRG);
- Municipalities Urban Planning of Vernole (PUG).

3.1 Thematic Territorial Urban Planning (PUTT/p)

Landscape and territorial planning at a regional level is to date, governed by the Region Thematic Territorial Urban Planning “Landscape” (PUTT/p), that came into force in 2000 and was prepared pursuant to Law n. 431/1985 and therefore only refers to certain areas of the regional territory. However, it should be noted that this plan will cease to apply upon publication of the new Regional Landscape and Territorial Plan (PPTR) in the Official Bulletin of the Apulia Region, which is currently under approval and analysed below.

The main objective of the Plan is to allow objective assessment of the compatibility of each landscape transformation associated with a development project. For this purpose, areas are categorised by one of 5 landscape values, called Broad Areas (“Ambiti territoriali estesi” - ATE), each referring to specific protection levels:

- Exceptional value “A”, refers to assets of acknowledged uniqueness and/or singleness, also in the absence of existing restrictive regulations, in consideration of which the objectives will be aimed at the preservation and valorisation of the current situation and the recovery of compromised situations (NTA 2.02);

- Significant value “B”, refers to situations of co-existence of more essential assets, also in the absence of existing restrictive regulations, in consideration of which the objectives will be aimed at the preservation and valorisation of the current situation and the recovery of compromised situations through the removal of the detractors or mitigation of the negative effects (NTA 2.02);

- Noticeable value “C”, refers to situations where one essential asset exists, also in the absence of existing restrictive regulations, in consideration of which the objectives will be aimed at the preservation and valorisation of the current situation, if qualified, and transformation if compromised, compatibly with the landscape characterisation (NTA 2.02);

- Low value “D”, whereby, also in the absence of an essential asset, there are restrictions in consideration of which objectives must be set for the valorisation of the relevant aspects protecting panoramic views (NTA 2.02);
• Normal value “E”, whereby it is not possible to declare a significant landscape value, in consideration of which objectives must be set for the valorisation of the characteristics of the site (NTA 2.02).

*Figure 3-1* shows the directions provided by the PUTT/p with regard to the broad area (Ambiti Territoriali Estesi - ATE) for the Study Area of the Project.

*Figure 3-1  ATE PUTT/p Classification*

The figure shows that the work layout involves the following broad areas:

• the pipeline landfall point is in ATE “B” (area crossed by microtunnel);
• the onshore pipeline involves ATE “C” and “D”;
• the PRT site falls in ATE “C”.

*Source: PUTT/p (2006)*
Table 3-1 summarises the total lengths of the sections affecting the ATE.

**Table 3-1  Total Lengths of Pipeline Sections Affecting the ATE**

<table>
<thead>
<tr>
<th>Broad Areas</th>
<th>A (Exceptional)</th>
<th>B (Significant)</th>
<th>C (Noticeable)</th>
<th>D (Relative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipeline length (8.2km of Base Case Route plus 0.6km of microtunnel onshore)</td>
<td>0 m</td>
<td>249 m*</td>
<td>6,705 m</td>
<td>1,871 m</td>
</tr>
</tbody>
</table>

* crossed by microtunnel

Source: PUTT/p

Along with Broad Areas, the PUTT/p identifies Specific Areas (or “Ambiti territoriali distinti” - ATD) characterized by three structural elements of the territory:

- Geology, geomorphology and hydrogeology;
- Flora, cultivation and fauna;
- History of urban development.

The PUTT/p identifies distinct territorial areas, components and groupings, some of which are indicated below by way of example:

- shorelines;
- surface water;
- mountainous areas;
- woodlands;
- areas of biological and natural interest;
- wetlands;
- areas of potential and/or significant presence of wildlife;
- rural buildings and clusters of rural buildings characterized by consolidated traditional farming methods;
- archaeological sites;
- buildings and artefacts of historical and environmental interest;
- panoramic roads and scenic areas.

For each subsystem and its components, the PUTT/p rules identify the characteristics and specify the protection regimes for distinct areas. With reference to the different areas, components and groupings identified, the preservation and valorisation of the landscape/environment will be pursued.
Figure 3-2 below shows all of the components situated in the Study Area; the information contained in Figure 3-2 was obtained from the PUTT/p territorial information system.

Figure 3-2  ATD PUTT/p Classification

Source: PUTT/p (2006)
The pipeline and PRT potentially affect the following ATD:

- **Coastal area within 300 m from the shoreline and dunes, within the Municipality of Melendugno.** According to the NTA 3.07 of PUTT/p, in the coastal area (defined as 100 m from the shoreline, including dunes), projects and interventions are allowed that "involve only the following transformations: [omissis] 3. buried network infrastructure, when geological characteristics of the site exclude works below the profile of the coast and as the position and the pipeline route are not in conflict with the morphology of the area or the coastal profile ("progetti e interventi che [omissis] comportino le sole seguenti trasformazioni: [omissis] 3. infrastrutture a rete completamente interrate qualora le caratteristiche geologiche del sito escludano opere al disotto del profilo del litorale e purche' la posizione, nonche' la disposizione planimetrica del tracciato, non contrastino con la morfologia dei luoghi e con l'andamento del profilo del litorale;"). In the adjacent area (defined as 200 m from the coast), projects are not allowed that involve “5. the elimination of medium and tall tree species and shrubs, with the exception of cultivation methods that ensure the preservation and integration of complex existing natural vegetation; whereas for non-native vegetation cures, required by regulations of woods cleaning, can be taken" ("5. la eliminazione delle essenze a medio ed alto fusto e di quelle arbustive, con esclusione degli interventi colturali atti ad assicurare la conservazione e integrazione dei complessi vegetazionali naturali esistenti; per i complessi vegetazionali non autoctoni possono essere attuate le cure previste dalle prescrizioni di polizia forestale"). **Installation of the pipeline using a microtunnel will avoid any possible interference along this section of coast.**

- **Forest area, within the Municipality of Melendugno.** According to NTA 3.10, projects and interventions are allowed that "involve only the following transformations: [omissis] 3. Above ground network infrastructure and, for those below ground, if location and route layout do not affect the vegetation" ("i progetti e interventi che [omissis] comportino le sole trasformazioni [omissis] 3.infrastrutture a rete fuori terra e, per quelle interrate, se posizione e disposizione planimetrica del tracciato non compromettano la vegetazione"). In the adjacent area (100 m from the forest), projects and interventions are allowed that “involve only the following transformations: [omissis] 2. road and technological infrastructure without important changes to site topography” ("i progetti e interventi che [omissis] prevedano la formazione di: [omissis] 2. infrastruttura viaria carrabile e tecnologica senza significative modificazioni dell'assetto orografico del sito"). **Installation of the pipeline using a microtunnel will avoid any possible interference with the vegetation in this area (PUTT/p).**
Dry stone walls within the Municipality of Melendugno, as per NTA 3.14.4, which refers to points 3.2 of Art. 3.05 and 4.2 of art. 3.10. According to NTA 3.05, in ATE “B”, the chance to realize [omissis] underground pipes [omissis], should be checked by a Landscape Assessment in order to evaluate the impact on the botanical / vegetation system with the definition of any mitigation works. Moreover, according to NTA 3.10, projects and interventions are allowed that “only involve the following transformations: [omissis] above ground network infrastructures and, below ground, if planned location and layout do not compromise the vegetation [omissis] 2. road and technological infrastructure without important changes to site topography” (“negli ambiti territoriali estesi di valore rilevante (“B” art. 2.01), la possibilita' di allocare condotte sotterranee o pensili, ecc., va verificata tramite apposito studio di impatto paesaggistico sul sistema botanico/vegetazionale con definizione delle eventuali opere di mitigazione [omissis] i progetti e interventi che [omissis] prevedano la formazione di: [omissis] infrastrutture a rete fuori terra e, per quelle interrate, se posizione e disposizione planimetrica del tracciato non compromettano la vegetazione. 2. infrastruttura viaria carrabile e tecnologica senza significative modificazioni dell'assetto orografico del sito”). Any land modifications must be authorised in advance by means of a Landscape Permit through the ESIA Procedure. However, during the pipeline construction all possible measures to minimize impact on the environment and the areas crossed by the pipeline (including dry stone walls) will be adopted. Dry stone walls that will be affected during the construction phase will be returned to their pre-existing condition.

Watershed within the Municipality of Melendugno, included in the PUTT/p. According to NTA 3.09.4 (which refers to points 4.2 of Art. 3.08) in the adjacent area to watershed (a buffer area of 25 m for each side of the watershed), projects and interventions are allowed that “protect the landscape and environment of the area, involving only the following transformations: [omissis] buried network infrastructure [omissis] “("infrastrutture a rete completamente interrate"). Therefore it is considered that the Project is allowed.

The table below lists the different territorial areas, components and groupings subject to protection by PUTT/p and crossed by the pipeline or adjacent to the PRT
Table 3-2 Constrained areas by PUTT/p and crossed by the pipeline or adjacent to PRT

<table>
<thead>
<tr>
<th>Constrained Area</th>
<th>Kp</th>
<th>Art. of NTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal area within 300 m of the shoreline and dunes</td>
<td>Landfall</td>
<td>3.07</td>
</tr>
<tr>
<td>Forest area</td>
<td>Landfall</td>
<td>3.10</td>
</tr>
<tr>
<td>Dry stone walls</td>
<td>-</td>
<td>3.14</td>
</tr>
<tr>
<td>Watershed</td>
<td>Kp 4.3;6.5 and 7.6</td>
<td>3.09</td>
</tr>
</tbody>
</table>

Source: PUTT/p (2013)

All constraints reported in PUTT/p (NTA 5.07) can be over-ridden in case of “regional/public works and works of public interest (as defined by the legislation in force). This applies only when the proposed works:

- are compatible with the purposes of protection and enhancement of the landscape and environmental resources in the places provided. **During pipeline construction, all possible measures will be adopted to minimise the environmental impact and all elements of environmental value affected by the construction phase will be restored; regarding the PRT area, a draft environmental mitigation assessment has been prepared and presented to the Superintendence for Architectural Heritage and Landscape of the provinces of Brindisi, Lecce and Taranto;**

- are absolutely necessary or in the best interest of the resident population: in accordance with Law n. 239/2004 the transport and distribution of natural gas to the network are of public interest, as well as the energy supply management connected to the energy transport and distribution to the network;

- have no alternative locations”: **as reported in Annex 2 - Alternative Assessment Report, the route is the result of a detailed alternatives assessment.**
The following conclusions can be drawn:

- The PUTT/p is the landscape planning tool currently in force in Apulia region;

- The Project complies with the prescriptions for Broad Areas ("Ambiti territoriali estesi") and for Specific Areas ("Ambiti territoriali distinti") described in the PUTT/p. With reference to the constraints described above and summarized in the table, even if the detailed identification and quantification of potential impacts is provided in the Environmental Impact Assessment Section (Section 8.5.5), it is noted that:
  
  o The pipeline route has been defined to minimize disturbance with constrained areas;
  
  o All possible measures will be adopted during pipeline construction to minimise any impact on the environment (i.e. using the microtunnelling technique);
  
  o Areas crossed by the pipeline, at the end of the construction phase, will be reinstated to their pre-construction condition.

3.2 Region Landscape and Territorial Plan (PPTR)

With resolution no. 1435/2013, the Regional Council adopted the Landscape and Territorial Plan of Apulia Region, currently under approval, including preservation measures (Art. 105 NTA) that must be observed up to the approval of the plan.

The PPTR promotes self-sustainable, durable socio-economic development and the conscious use of the regional territory, including by preserving and restoring the aspects and specific characteristics of the social, cultural and environmental heritage of the territory, recognising the role of biodiversity and identifying new integrated and consistent landscape values that satisfy the criteria of quality and sustainability.

The PPTR regulates the entire territory and includes all of the landscapes of the Apulia Region, not just those that might be considered outstanding, but also degraded landscapes and those with a lower value.

In particular, Title VI Regulation of Landscape Heritage and Additional Contexts of the PPTR defines and regulates three Structures, which are divided into two different Components:

- **Hydrogeomorphological structure**
  
  o Geomorphological components
  
  o Hydrological components

- **Ecosystem and environmental structure**
  
  o Botanical and vegetation components
  
  o Components of protected areas and natural sites

- **Human, historical and cultural structure**
  
  o Cultural components and settlements
  
  o Components of perceptive values
With regard to public works or works of public interest, art. 95 of the PPTR states that "public works or works of public interest can be carried out in derogation from the requirements laid down in Title VI of the rules for landscape heritage and additional contexts, as long as during the landscape permit phase or the investigation of landscape compatibility such works are still compatible with the quality objectives pursuant to art. 37 and that no location and/or design alternatives exist. The Region remains responsible for issuing the derogation."

In accordance with art. 95, in addition to this Landscape Impact Assessment, prepared according to Italian Prime Ministerial Decree of 12/12/2005 "Identification of the documentation necessary for the verification of the environmental and landscape compatibility of the proposed intervention, pursuant to art. 146(3) of the Cultural Heritage and Landscape Code (Italian Legislative Decree no. 42/2004 of 22/01/2004)". the Analysis of Alternatives (Annex 2) is attached to the ESIA, which provides the results of a detailed assessment of alternative routes.

In addition, in order to perform a complete analysis of urban planning instruments, the following paragraph analyses the PPTR constraints applicable to the Project Route, construction sites and the Pipeline Receiving Terminal. The analysis was conducted using an official GIS database, available on the official website of the Territorial Structure Department (http://paesaggio.regione.puglia.it/). For each constraint identified, the definition and related requirements are described as outlined in the NTA (technical rules for implementation) of the Plan in question.

The Landscape and Territorial Quality Objectives of the area defined in the PPTR and the related sub-objectives defined in the Environmental Profile 10/Tavoliere Salentino (Document No. 5 of the PPTR) are provided in Section 3.2.5.0

3.2.1 Hydrogeomorphological Structure

*Figure 3-3* below shows the specific geomorphological components mapped in the Study Area, while the PPTR constraints applicable to the Project Route, construction sites and Pipeline Receiving Terminal are listed below in *Figure 3-3*:

**Dunes** (Art.143(1)(e) of the "Cultural Heritage and Landscape Code")

- **DEFINITION**: areas that can be mapped in relation to the scale of representation of the PPTR, which consist of natural accumulations of material transported by wind, both in active modelling phases and in previous phases, and possibly partially occupied by man-made structures.
- REQUIREMENTS: in these areas, interventions that may be in conflict with the quality objectives and standards of use of art. 37 are not allowed, in particular those involving the "profound transformation of the soil, tillage or movement of land, or any action that disrupts the hydrogeological balance or alters the soil profile; ... [omissis] ... the construction of gas pipelines, power lines, or secondary telephone or electrical lines, with the exception of domestic connections and all network systems if buried under the existing road network."

**Figure 3-3  Geomorphological Components – PPTR**

Source: ERM (August 2013)

PPTR constraints applicable to the Project Route, construction sites and Pipeline Receiving Terminal are listed below in *Figure 3-4*. 
Coastal territories (art. 142(1)(a) of the “Cultural Heritage and Landscape Code”)

- DEFINITION: a strip of land within 300 m of the shoreline, identified on the Regional Technical Map.
- REQUIREMENTS: according to art. 45 and in compliance with the quality objectives and regulations of use indicated in art. 37, in these areas, “b7) the installation of buried network infrastructure and/or infrastructure in the public interest” is allowed “provided that it is demonstrated to be absolutely necessary and cannot be located elsewhere.” As reported in paragraph 4, a landscape permit is required for interventions “c 1) aimed at ensuring the maintenance or restoration of normal environmental conditions for the preservation or recovery of hydrogeomorphological characteristics and natural existing vegetation, reforestation carried out under conditions that meet natural forestry criteria and the landscape characteristics of the area, and forestation works according to the requirements laid down by the State Forest Police.”

Areas subject to hydrogeological constraint (Art.143(1)(e) of the “Cultural Heritage and Landscape Code”)

- DEFINITION: areas protected under Royal Decree (RD) no. 3267/1923, “Reordering and reform of forests and mountain areas”, applying a hydrological constraint to land of any nature and destination which, due to forms of exploitation that are in conflict with the regulations, may suffer deforestation, lose stability or disturb the water regime.
- REQUIREMENTS: these areas are regulated by RD no. 3267/1923. All soil movement and vegetation cutting must be authorised by the Regional Forestry Department.
3.2.2 Ecosystem and Environmental Structure

Figure 3-5 and Figure 3-6 below show the botanical vegetation components mapped in the Study Area, while the PPTR constraints applicable to the Project Route, construction sites and Pipeline Receiving Terminal are listed below:

**Wooded areas** (Article 142(1)(g) of the “Cultural Heritage and Landscape Code”)

- **DEFINITION:** consists of territories covered by forests, woods and scrub, including areas affected or damaged by fire, and those subject to a reforestation constraint.
- **REQUIREMENTS:** according to art. 62, in such areas the "construction of gas pipelines, power lines, secondary telephone or electrical lines,” is not allowed “with the exception of domestic connections and all network systems if buried under the existing road network.”

Notes: RER = Regional Ecological Network
Source: ERM (August 2013)
Pastures and natural grasslands (Article 143(1)(e) of the “Cultural Heritage and Landscape Code”)

- **DEFINITION:** territories covered by natural and semi-natural grasslands used as low-production forage, even if subjected to change of use by tillage, crushing and grinding of bedrock. This includes all secondary grasslands consisting of hemicryptophytes and therophytes throughout the region, on limestone substrates characterized by a great variety of flora, variability of formations and high spatial fragmentation.

- **REQUIREMENTS:** according to art. 66, interventions are not allowed that involve: “a1) the removal of natural grassland, trees or shrubs... [omissis]...”. However, all interventions "carried out in compliance with the landscape heritage without compromising the existing historical, cultural and natural elements," are allowed “guaranteeing high levels of planting and soil permeability and ensuring the preservation of the views and public access to the places from which the views can be enjoyed... [omissis]...”.

Woodland respect zone (Article 143(1)(e) of the “Cultural Heritage and Landscape Code”)

- **DEFINITION:** consists of a preservation strip of 100 metres from the outer perimeter of the wooded area.

- **REQUIREMENTS:** according to art. 63, in such areas the "a1) transformation and removal of trees and shrubs ... [omissis] ... a6) construction of gas pipelines, power lines, or secondary telephone or electrical lines,” is not allowed “with the exception of domestic connections and all network systems if buried under the existing road network.”
Figure 3-5  Botanical and Vegetation Components - PPTR (1 of 2)

Source: ERM (August 2013)
3.2.3 Human, historical and cultural structure

Figure 3-7 below shows the cultural components and settlements mapped in the Study Area, while the PPTR constraints applicable to the Project Route, construction sites and Pipeline Receiving Terminal are listed below:

**Buildings and areas of significant public interest** (Article 136 of the “Cultural Heritage and Landscape Code”)

- **DEFINITION**: areas declared to be of significant public interest pursuant to articles 136 and 157 of the Code.
- **REQUIREMENTS**: the NTA for projects and interventions not subject to art. 95 refer to the quality objectives in the profiles of the related areas (Document no. 5 of the PPTR), as detailed in Section 3.2.5.
Figure 3-8 below shows the perceptual components mapped in the Study Area, while the PPTR constraints applicable to the Project Route, construction sites and Pipeline Receiving Terminal are listed below:

Roads of landscape value (Article 143(1)(e) of the “Cultural Heritage and Landscape Code”)

- DEFINITION: vehicular, rolling stock, cycle, pedestrian and navigable routes from which it is possible to appreciate the diversity, complexity and peculiarities of the landscapes, which cross natural and man-made landscapes of high landscape significance, which skirt around or cross characteristic morphological elements (mountain ranges, ridges, lame (valleys), channels, edges of cliffs or dunes, etc.), and from which it is possible to enjoy panoramic and close-up views of high landscape value.

- REQUIREMENTS: all plans, projects and interventions are not allowed that are in conflict with the quality objectives and the standards of use of art. 37 of the NTA of the PPTR.
3.2.4 Other unconstrained areas

*Figure 3-9* shows the Stratified Topographical Context CTS 002022 of Acquarica di Lecce.

CTS are groupings of cultural assets of all kinds and from every era (churches, castles, masserie, Roman villas, historic towns, cemeteries, etc.), both complex and stratified, incorporating elements from the remotest antiquity to the present day, and characterized by a strong, perceptible integration with the surrounding landscape.
The delimitation criteria of the CTS of Acquarica are the flat nature of the territory concerned. The boundaries of the CTS consist of alternating stretches of modern road, dry stone walls, edges of crop fields and stretches of unpaved local roads. The area is characterized by the widespread presence of traditional dry stone conical and square buildings, and by stone walls which adorn the village of Acquarica di Lecce up to the Abbey of San Niceta. Of note is the fortified settlement of archaeological interest, Pozzo Seccato.

The quality objective for these areas consists of enhancing the identity, cultural and settlement heritage through:

- the restoration and valorisation of cultural heritage;
- the restoration and valorisation of the landscape;
- the electronic cataloguing of the cultural heritage inventory;
- determining the limits of historic towns;
- the use of stratified topological contexts;

**Figure 3-9  Stratified Topological Context (CTS) of Acquarica - PPTR3**

Source: PPTR - ERM (2013)
3.2.5 Conclusion

The analysis carried out shows – particularly for areas classified as Dunes, Wooded areas and Woodland respect zones – that according to Title VI of the rules of the PPTR for landscape heritage and additional contexts, the “construction of gas pipelines, power lines, or secondary telephone or electrical lines”, is not allowed “with the exception of domestic connections and all network systems if buried under the existing road network.”

However, pursuant to art. 95 of the NTA of the same PPTR, public works and works of public interest may be carried out in derogation from the requirements laid down in Title VI of the rules for landscape heritage and additional contexts, as long as during the process of obtaining a landscape permit or during the investigation to confirm landscape compatibility, such works are deemed to be:

- a) compatible with the quality objectives;
- b) no location and/or design alternatives exist (art. 37).

With regard to point a), the Landscape and Territorial Quality Objectives of the area defined in the PPTR and the related sub-objectives defined in the Environmental Profile 10/Tavoliere Salentino (Document No. 5 of the PPTR) are shown in the Tables below, together with the associated verification of Project compatibility. As regards point b), however, we confirm that the Project does not have any location and/or design alternatives, as shown in Appendix 2 - Analysis of Alternatives.

Finally, as regards constraints concerning coastal territories, areas with hydrogeological constraints and pastures and natural grasslands, we believe that the project does not conflict with the NTA reported in the PPTR. In relation to constraints concerning buildings and areas of significant public interest, the landscape and territorial quality objectives of the area are set out in the table below.

Table 3-3 Landscape and Territorial Quality Objectives of the Area - Hydrogeomorphological structure and components (Constraints: dunes, coastal territories, hydrogeological constraint)

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Project Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>To ensure the geomorphological balance of drainage basins</td>
<td>Tap AG will present a study to demonstrate the hydrogeological compatibility of the Project</td>
</tr>
<tr>
<td>To design a regional strategy for inter-sectorial water that is integrated and of landscape value</td>
<td>Not applicable</td>
</tr>
<tr>
<td>To ensure the hydrogeomorphological safety of the territory, protecting the specific nature of the natural features</td>
<td>Tap AG will present a study to demonstrate the hydrogeological compatibility of the Project</td>
</tr>
<tr>
<td>To promote and encourage less hydro-dependent agriculture</td>
<td>Not applicable</td>
</tr>
<tr>
<td>To innovate the local water cycle from an ecological perspective</td>
<td>Not applicable</td>
</tr>
<tr>
<td>To redevelop and enhance coastal landscapes</td>
<td>The construction of the microtunnel will ensure that there will be no interference with the coastal landscape.</td>
</tr>
<tr>
<td>The sea as a large public park</td>
<td>As described in Chapter 8 of the ESIA, the public will not be prevented from enjoying the sea during the operating phase of the project</td>
</tr>
</tbody>
</table>
### Table 3-4  Landscape and Territorial Quality Objectives of the Area - Ecosystem and Environmental Structure (Constraints: wooded areas, woodland respect zone, pastures and grasslands)

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Project Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>To improve the environmental quality of the territory</td>
<td>The construction of the microtunnel will ensure that there will be no interference with the wooded areas. The woodland, pasture and grassland respect zones will be restored at the end of the construction phase.</td>
</tr>
<tr>
<td>To increase the connectivity and biodiversity of the regional environmental system</td>
<td>As described in Chapter 8 of the ESIA, in its early stage of operation, the project does not envisage the fragmentation of natural habitats.</td>
</tr>
<tr>
<td>To limit the consumption of agricultural and natural soil for infrastructure and building purposes</td>
<td>During normal operation, agricultural activity will be possible along the gas pipeline route.</td>
</tr>
<tr>
<td>To ensure the geomorphological balance of drainage basins</td>
<td>The project has been optimized in order to not interfere with the Cassano marshland (Palude di Cassano), thus ensuring its geomorphological balance.</td>
</tr>
<tr>
<td>To develop the watercourses as multifunctional ecological corridors</td>
<td>The project does not affect watercourses.</td>
</tr>
<tr>
<td>To redevelop and enhance coastal landscapes</td>
<td>The construction of the microtunnel will ensure that there will be no interference with the coastal landscape. In addition, the project has been optimised so as not to interfere with the Cassano marshland (Palude di Cassano).</td>
</tr>
<tr>
<td>To raise the ecological gradient of the rural ecosystems</td>
<td>During normal operation, agricultural activity will be possible along the gas pipeline route.</td>
</tr>
</tbody>
</table>
### Table 3-5  Landscape and Territorial Quality Objectives of the Area – Anthropic, Cultural and Historical Structure and Components (Buildings and areas of significant public interest)

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Project Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>To redevelop and enhance historical rural landscapes</td>
<td>As detailed in Chapter 8 and in this Annex to the ESIA, once construction activities are complete, restoration activities will take place.</td>
</tr>
<tr>
<td>To enhance the specific characteristics of the historical rural landscapes</td>
<td>As detailed in Chapter 8 and in this Annex to the ESIA, once construction activities are complete, restoration activities will take place.</td>
</tr>
<tr>
<td>To improve the environmental quality of the territory</td>
<td>As detailed in Chapter 8 and in this Annex to the ESIA, once construction activities are complete, restoration activities will take place.</td>
</tr>
<tr>
<td>To enhance the identity, cultural and settlement heritage</td>
<td>As detailed in Chapter 8 and in this Annex to the ESIA, once construction activities are complete, restoration activities will take place.</td>
</tr>
<tr>
<td>To recognize and promote cultural heritage as an integrated territorial system</td>
<td>The route has been optimised in order to avoid interference with widespread buildings and assets.</td>
</tr>
<tr>
<td>To promote the recovery of masserie, rural buildings and artefacts made of dry stone</td>
<td>The route has been optimised in order to avoid interference with widespread buildings and assets. As detailed in Chapter 8 and in this Annex of the ESIA, once construction activities are complete the dry stone artefacts (stone walls) will be restored.</td>
</tr>
<tr>
<td>To redevelop and enhance the coastal landscapes of the Apulia region</td>
<td>During normal operation, agricultural activity will be possible along the route of the pipeline. The BVS will not be visible from panoramic roads and roads of landscape value identified in the PPTR.</td>
</tr>
<tr>
<td>To protect the historical alternation of undeveloped and developed areas along the coast of Puglia</td>
<td>During normal operation, agricultural activity will be possible along the route of the pipeline.</td>
</tr>
<tr>
<td>To redevelop cultural and landscape assets incorporated in recent urbanization as qualification nodes of contemporary cities;</td>
<td>The pipeline will cross an agricultural area; the function of this area will not be compromised during the operating phase of the Project.</td>
</tr>
<tr>
<td>To redevelop degraded landscapes due to contemporary urbanization</td>
<td>Not applicable</td>
</tr>
<tr>
<td>To enhance traditional rural buildings and artefacts, also developing traditional rural holiday accommodation;</td>
<td>Not applicable</td>
</tr>
<tr>
<td>To plan the slow fruition of the landscape</td>
<td>Not applicable</td>
</tr>
<tr>
<td>To intensify coastal tourism, creating synergies with the hinterland</td>
<td>Not applicable</td>
</tr>
<tr>
<td>To define the urban margins and the limits of urbanization</td>
<td>Not applicable</td>
</tr>
<tr>
<td>To contain urban perimeters with regard to new building expansions and promote policies to combat land consumption</td>
<td>The pipeline will cross an agricultural area; the function of this area will not be compromised during the operating phase of the Project.</td>
</tr>
<tr>
<td>To promote the redevelopment, reconstruction, and renovation of existing buildings</td>
<td>Not applicable</td>
</tr>
<tr>
<td>To promote the redevelopment of peripheral urban areas</td>
<td>Not applicable</td>
</tr>
<tr>
<td>To redevelop peri-urban and/or landlocked open spaces</td>
<td>Not applicable</td>
</tr>
<tr>
<td>To enhance the multi-functionality of peri-urban agricultural areas</td>
<td>The pipeline will cross an agricultural area; the function of this area will not be compromised during the operating phase of the Project.</td>
</tr>
<tr>
<td>To protect rural areas and agricultural activities</td>
<td>The pipeline will cross an agricultural area; the function of this area will not be compromised during the operating phase of the Project.</td>
</tr>
<tr>
<td>To ensure the landscape and territorial quality in the redevelopment, reuse and new construction of productive activities and infrastructure</td>
<td>The pipeline will cross an agricultural area; the function of this area will not be compromised during the operating phase of the Project.</td>
</tr>
<tr>
<td>Objectives</td>
<td>Project Compatibility</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>To protect and enhance landscapes and long term territorial figures</td>
<td>The pipeline will be completely buried within the constraint area and once construction activities are complete, the areas crossed will be completely restored.</td>
</tr>
<tr>
<td>To enhance the aesthetic and perceptual structure of the Apulia landscape</td>
<td>The pipeline will be completely buried within the constraint area and once construction activities are complete, the areas crossed will be completely restored. The BVS will not be visible from panoramic roads and roads of landscape value identified in the PPTR.</td>
</tr>
<tr>
<td>To preserve the extended scenery, continuing horizons and panoramic views that characterize the image of the Apulia region</td>
<td>The pipeline will be completely buried within the constraint area and once construction activities are complete, the areas crossed will be completely restored. The BVS will not be visible from panoramic roads and roads of landscape value identified in the PPTR.</td>
</tr>
<tr>
<td>To preserve the scenic spots and panoramic views (visual catchments, visual fulcrums)</td>
<td>The pipeline will be completely buried within the constraint area and once construction activities are complete, the areas crossed will be completely restored. The BVS will not be visible from panoramic roads and roads of landscape value identified in the PPTR.</td>
</tr>
<tr>
<td>To recognize and enhance the cultural heritage as an integrated territorial system</td>
<td>The pipeline will be completely buried within the constraint area and once construction activities are complete, the areas crossed will be completely restored.</td>
</tr>
<tr>
<td>To redevelop and reuse historical infrastructure (roads, railways, trails, tracks, etc.)</td>
<td>The pipeline will be completely buried within the constraint area and once construction activities are complete, the areas crossed will be completely restored.</td>
</tr>
<tr>
<td>To preserve and enhance panoramic roads, railways and paths as well as those of interest in terms of landscape and environment</td>
<td>The pipeline will be completely buried within the constraint area and once construction activities are complete, the areas crossed will be completely restored. The BVS will not be visible from panoramic roads and roads of landscape value identified in the PPTR.</td>
</tr>
<tr>
<td>To recover the monumental perceptibility and accessibility of historic towns</td>
<td>The pipeline will be completely buried within the constraint area and once construction activities are complete, the areas crossed will be completely restored.</td>
</tr>
<tr>
<td>To enhance the aesthetic and perceptual structure of the Apulia landscape</td>
<td>The pipeline will be completely buried within the constraint area and once construction activities are complete, the areas crossed will be completely restored.</td>
</tr>
<tr>
<td>To preserve and develop the historic avenues providing access to the city</td>
<td>Not applicable</td>
</tr>
<tr>
<td>To ensure the landscape and territorial quality in the redevelopment, reuse and new construction of productive activities and infrastructure</td>
<td>The pipeline will be completely buried within the constraint area and once construction activities are complete, the areas crossed will be completely restored.</td>
</tr>
</tbody>
</table>
3.3 Provincial Coordination Territorial Planning (PTCP)

The general objective of the Provincial Coordination Territorial Planning of Lecce is the establishment of a boundaries framework within which the individual Administrations and Institutions may be defined, possibly also through specific agreements, their policies for the improvement of quality and of the physical, social and cultural services in the provincial territory.

The guiding principles of the PTCP are:

- Extend recognition of citizen rights, the value of participation in the determination and management of every territorial policy;
- Protection of historic heritage;
- Protection of the natural environment.

Based on these principles, the primary objectives established in the scheme of the Territorial Coordination Plan are:

- Development of well-being and of individual and collective incomes;
- Development of productive activities and employment consistent with the promotion of natural beauty;
- Improvement of accessibility and mobility in the Salento area;
- Development of housing in concentrated and scattered contexts;
- Protection and recovery of old centres and of scattered cultural heritage elements;
- Development of eco-friendly tourism.

These objectives are part of a specific project for spatial and settlement organisation of Salento as a park, whereby concentration and scattering are coexistent and integrated.

In particular, PTCP states that all rural buildings (stone wall, pagghiare) shall be protected. In case of damage, dry stone walls are to be restored using available contributions (UE and Regional).

A Cultural Heritage Survey has been performed within the 100 m corridor of the pipeline route and PRT site. Refer to Section 6 for the results of this survey.
3.4 Municipalities Urban Planning

The following Plans are in force within the Study Area:

- Municipalities Urban Planning of Melendugno (Piano Regolatore Generale - PRG), approved by Regional Deliberations n.1691 dated 28 November 2001. The PRG is structured with a Carta dello Stato di Fatto (shows current status) and a Tavola di Zonizzazione (indicates possible future developments).

- Municipalities Urban Planning of Vernole (Piano Urbanistico Generale - PUG), aligned with the principles affixed by the Apulia Region - Department of Parks with the regional Law n. 1 of 13 May 2010 and updated with comments from the public.

The route does not affect any constraints included in the Municipalities Urban Planning of Vernole (PUG) as it is located entirely within the Municipality of Melendugno. With regard to the Municipality of Melendugno, the pipeline route intersects with the following municipal constraints, reported in the Tavola di Zonizzazione (Zoning Table) (see Table 5 attached) and crosses the following areas:

- **Wetland Respect Zone** – the pipeline route crosses this area directly from Kp 0.3 to 0.6. According to NTA III.8.3 and 8.4 any intervention carried out in the areas referred to above and in the associated respect zones must be authorised by the Inspectorate of the Regional Forestry Department.

- **Urban Park area** – according to the NTA III.7.6, only tree preservation and integration activities are allowed. Only storage buildings for maintenance tools and small rest-stop areas are allowed. Currently no development plans for the Urban Park are known. In any case, this area will be avoided using the microtunnel and therefore **any impacts on the existing vegetation will be avoided**.

- **Tourist or leisure facility area** – the route crosses this area directly from Kp 0 to 0.3. The area was destined for leisure purposes / camping, although at the current stage these plans are not confirmed. No prohibitions are reported in the NTA.

- **Sport Facility area** – the route crosses this area directly from Kp 0.6 to 1.1. According to NTA III.7.10, open-air and indoor sport facilities and any buildings for leisure activities (like gyms, cinemas, theatres etc.) are allowed. No prohibitions are reported in the NTA.
The pipeline crosses the following municipality constraints reported in the Tavola dello Stato di Fatto (refer to Urban Land Planning Map in Annex 7):

- **Maquis zone** – According to NTA III.8.4, vegetation clearance and earth movements are prohibited. For this area, any operation must be authorized by the Regional Forestry Department. Moreover, according to NTA III.6, building activities are not allowed in wooded areas (areas affected by "wild, woody tree species, growing in spontaneous clusters or, directly or indirectly, of artificial origin") or Mediterranean scrub areas; in clearings or in all areas that "contain plant communities that cannot evolve into high scrub or tall trees, although they are of great naturalistic or scenic importance", building activities may take place – in compliance with current zoning measures and applicable legislation, including approved laws dictated by PUTT/P – subject to authorisation from the Inspectorate of the Regional Forestry Department. Each project must be approved by the Regional Forestry Department. In this area, a microtunnel will be constructed to avoid any impact on the existing vegetation;

- **Woodland zone** – According to NTA III.8.4, vegetation clearance and earth movements are prohibited. Any operation in this area must be authorized by the Regional Forestry Department. **The microtunnel will allow the avoidance of any impacts on the existing vegetation in this area.**

With reference to the crossing areas described above and summarized in Table 3-6, it is noted that:

- The definition of the route has been conducted in order to minimize the interference with constrained areas (i.e. microtunnel and re-routing);
- During pipeline construction all possible measures aimed at minimizing the impact on the environment will be adopted (see Section 8);
- The areas crossed by the pipeline will be returned to their pre-construction conditions at the end of the construction phase (see Section 8).

### Table 3-6 Constrained Areas by PRG of Melendugno and Crossed by the Pipeline or Adjacent to the PRT

<table>
<thead>
<tr>
<th>Constrained Area</th>
<th>Kp</th>
<th>Art. of NTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetland Respect Zone</td>
<td>Kp 0.3 to 0.6</td>
<td>III.8.3 and 8.4</td>
</tr>
<tr>
<td>Urban Park</td>
<td>Landfall</td>
<td>III.7.6</td>
</tr>
<tr>
<td>Tourist or leisure facility</td>
<td>Kp 0 to 0.3</td>
<td>III.5.11</td>
</tr>
<tr>
<td>Sport Facility</td>
<td>Kp 0.6 to 1.1</td>
<td>III.7.10</td>
</tr>
<tr>
<td>Maquis</td>
<td>Landfall</td>
<td>III.8.4 and III.6 – E</td>
</tr>
<tr>
<td>Woodland</td>
<td>Landfall</td>
<td>III.8.4</td>
</tr>
</tbody>
</table>

*Source: PRG of Melendugno*
4 LANDSCAPE AND TERRITORIAL CONSTRAINTS

The landscape and territorial constraints of the Study Area have been identified in this section by analysing the following sources:

- the website of the SITAP (the Territorial Environmental Landscape Information System of the Ministry of Cultural Heritage and Activities, http://www.bap.beniculturali.it/sitap);
- Regional landscape plans, Thematic Territorial Urban Planning (PUTT/p) and Regional Landscape and Territorial Plan (PPTR);
- Provincial Territorial Coordination Plan (PTCP) of the province of Lecce;
- Municipalities Urban Planning of Melendugno (PRG);

All constraints considered are listed in Table 4-1 together with an indication of the current legislation.

Table 4-1 Landscape and Territorial Constraints

<table>
<thead>
<tr>
<th>Constraint Name</th>
<th>Current measures</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landscape and Environmental Heritage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal areas (within 300 m from the shoreline)</td>
<td>Legislative Decree no. 42/2004, as amended, art.142(1)(a) - (pursuant to Law 431/85)</td>
<td>PTCP, PUTT/p, PRG, SITAP</td>
</tr>
<tr>
<td>Territories bordering on lakes (within 300 m from the water’s edge)</td>
<td>Legislative Decree no. 42/2004, as amended, art.142(1)(b) - (pursuant to Law 431/85)</td>
<td>PTCP, PUTT/p, PRG, SITAP</td>
</tr>
<tr>
<td>Rivers, streams and watercourses (150 m area)</td>
<td>Legislative Decree no. 42/2004, as amended, art.142(1)(c) - (pursuant to Law 431/85)</td>
<td>PTCP, PUTT/p, PRG, SITAP</td>
</tr>
<tr>
<td>Woods</td>
<td>Legislative Decree no. 42/2004, as amended, art.142(1)(g) - (pursuant to Law 431/85)</td>
<td>PTCP, PUTT/p, SITAP</td>
</tr>
<tr>
<td>Individual elements of beauty</td>
<td>Legislative Decree no. 42/2004, as amended, art.136(1)(a) and (b) - (pursuant to Law 1497/39)</td>
<td>PTCP, PUTT/p, SITAP</td>
</tr>
<tr>
<td>Areas of scenic beauty</td>
<td>Legislative Decree no. 42/2004, as amended, art.136(1)(c) and (d) - (pursuant to Law 1497/39)</td>
<td>PTCP, PUTT/p, SITAP</td>
</tr>
</tbody>
</table>

Protected Areas

| Special Protection Areas (SPA)              |                                                                                  |                                      |
| Parks and national and regional reserves    | Legislative Decree no. 42/2004, as amended, art.142(1)(f) - (pursuant to Law 431/85) | PTCP, PUTT/p, SITAP                 |
| Cultural Heritage                           |                                                                                  |                                      |
| Historical and Archaeological Heritage      | Legislative Decree No. 42/2004, as amended, art.10 - (pursuant to Law 1497/39) | PTCP, PUTT/p, SITAP                 |
The constraints investigated within the Study Area are analysed below (for cartographic details, see Appendix 1 of this Annex).

4.1 Landscape and Environmental Heritage

In the Study Area, the following protected assets according to Italian Legislative Decree no. 42/2004 were examined:

Coastal areas (300 m from the shoreline)

The coastal areas of the Municipality of Melendugno are included in the PUTT/p and are constrained pursuant to Legislative Decree no. 42/2004 (Article 142(1)(a)). In line with the NTA of the PUTT/p, the network infrastructure must preserve the morphological and lithological characteristics of the area (NTA, Art. 3.07). Furthermore, as established by Legislative Decree no. 42/2004, all changes to the territory must receive prior authorisation from the Competent Authority by means of a Landscape Permit.

Rivers, Streams and Watercourses

The Study Area includes 2 watercourses that are subject to protection under Legislative Decree no. 42/2004 (Article 142(1)(c)). One is a small ditch that originates in the Palude di Cassano (or Palude di San Basilio) and flows into the sea after about 800 metres, and the other is located immediately north of the village of San Foca. They are located over 500 m and 300 m, respectively, from the pipeline.

Wooded areas

The wooded areas of the Municipality of Melendugno are included in the PUTT/p and are constrained pursuant to Legislative Decree no. 42/2004 (Article 142(1)(g)). In line with the NTA of the PUTT/p, network infrastructure is allowed provided that it preserves the characteristics of the flora (NTA, Art. 3.10). Furthermore, as established by Legislative Decree no. 42/2004, all changes to the territory must receive prior authorisation from the Competent Authority by means of a Landscape Permit.

Individual elements of beauty

According to Legislative Decree no. 42/2004 (Art. 136(1)(a) and (b)) the following are considered “individual elements of beauty”:

- buildings of remarkable natural beauty, geological singularity or historical memory, including monumental trees;
- villas, gardens and parks distinguished by their uncommon beauty.

On the basis of the information provided by Regional Law no. 14/2007 (as amended by Law no. 12/2013 concerning "the protection of the Apulian landscape and monumental olive trees") and the regional list of Monumental Olive Trees (promulgated by Regional Law no. 357/2013), no monumental olive trees have been identified along the route of the pipeline.
In July 2013, TAP conducted field works in order to assess the potential of the project to interfere with the surrounding area. The analysis revealed that, during the construction activities, the project will interfere with:

- about 120 dry stone walls. During the field activities (July 2013), a team of archaeologists mapped out and surveyed the dry stone walls inside the 30 metre corridor of the Project Route (*Appendix 5 of Annex 7*).

- olive trees of various sizes, about 1,900 olive trees with a diameter of greater than 30 cm were identified inside the areas where construction operations are to take place, about 1,650 of which with a diameter between 30 cm and 70 cm, about 200 with a diameter between 70 cm and 100 cm and about 50 cm with a diameter of greater than 100 cm. In this regard it is noted that the final list of monumental olive trees, approved by Resolution No. 357 of the Regional Council of 7 March 2013, does not identify any monumental olive trees within areas affected by the construction operations.

- n. 5 wells.
Elements of scenic beauty

Pursuant to Italian Legislative Decree no. 42/2004 (Art. 136(1)(c) and (d)) the following are considered to be “of significant public interest”:

- groups of buildings that together form a characteristic structure of aesthetic and traditional value, including towns and historical villages;
- elements of scenic beauty, including scenic views and belvederes that are accessible to the public, from where it is possible to enjoy the view of these elements of beauty.

In the Study Area, the following areas of significant public interest, according to Legislative Decree no. 42/2004, were identified:

- The "Coastal area and part of the Municipality of Melendugno, characterized by green areas and the presence of ancient monumental ruins", established by Ministerial Decree of 12/01/1970 and recognized by Legislative Decree no. 42/2004. It is considered an area of high public interest, therefore any changes to the territory must receive prior authorisation from the Competent Authority by means of a Landscape Permit;
- Groups of buildings that make up a characteristic structure of aesthetic and traditional value, consisting of the "Coastal area of Salento in the Municipalities of Lecce - Vernole - Melendugno and Otranto" (Art. 136(1)(c) and already constrained by Law no. 1497/39 and the subsequent Ministerial Decree of 01/08/1985), which is considered to be of high public interest, therefore any changes to the territory must receive prior authorisation from Competent Authority by means of a Landscape Permit;
4.2 Protected Areas

There are no marine or terrestrial protected areas along the route of the pipeline. Near the Study Area, the following areas have been researched:

- Sites of Community Importance (SCI), defined by Directive 92/43/EEC of 21 May 1992 as sites that contribute significantly to the maintenance or restoration of a natural habitat type (listed in Annex I of the Directive) or species (given in Appendix II) at a favourable conservation status;
- Special Protection Areas (SPAs), defined by Directive 74/409/EEC of 2 April 1979 as the most suitable territories in number and size for the conservation of the species listed in Annex I of the Directive;
- Important Bird Areas (IBA), or key sites for the conservation of birds, because they 1) host a significant number of birds of one or more globally threatened species; 2) are home to a significant population of species whose distribution is wholly or largely limited to a particular biome; and 3) are home to a particularly large number of migratory species.

The Sites of Community Importance, identified near the Study Area by Regional Law no. 3310 of 23/07/1996 and reported in the official list included in Ministerial Decree no. 157 of 21/07/2005, are listed in the following Table.

<table>
<thead>
<tr>
<th>Site</th>
<th>Code</th>
<th>Name</th>
<th>Distance (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCI</td>
<td>IT9150032</td>
<td>Le Cesine</td>
<td>2.3</td>
</tr>
<tr>
<td>SCI</td>
<td>IT9150022</td>
<td>Palude dei Tamari</td>
<td>2.8</td>
</tr>
<tr>
<td>SPA</td>
<td>IT9150014</td>
<td>Le Cesine</td>
<td>3.2</td>
</tr>
<tr>
<td>SCI</td>
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<td>Torre dell’Orso</td>
<td>5.0</td>
</tr>
<tr>
<td>SCI</td>
<td>IT9150011</td>
<td>Alimini</td>
<td>7.3</td>
</tr>
<tr>
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<td>IT9150033</td>
<td>Specchia dell’Alto</td>
<td>8.8</td>
</tr>
<tr>
<td>SCI</td>
<td>IT9150025</td>
<td>Torre Veneri</td>
<td>10.7</td>
</tr>
<tr>
<td>SCI</td>
<td>IT9150030</td>
<td>Bosco La Lizza e Macchia del Pagliarone</td>
<td>12.8</td>
</tr>
<tr>
<td>SCI</td>
<td>IT9150003</td>
<td>Aquatina di Frigole</td>
<td>16.6</td>
</tr>
<tr>
<td>SCI</td>
<td>IT9150029</td>
<td>Bosco di Cervalora</td>
<td>17.3</td>
</tr>
</tbody>
</table>

The SCI area closest to construction site is the State Nature Reserve “Le Cesine” located in the territory of Vernole. The SPA area closest to the construction site is the low-lying coastal wetland known as the “Palude dei Tamari” located in the territory of Melendugno.
4.3 Cultural Heritage

Pursuant to Legislative Decree no. 42/2004 (Art. 10), all property and assets of artistic, historical, archaeological or ethno-anthropological interest belonging to the State, the Regions, other local authorities, all other public bodies and institutions, and non-profit organizations, are considered to be “Cultural Heritage”.

In the Study Area, several archaeological sites were identified; a more detailed description of such assets is provided in Section 6.8 and Section 8.8 of the Environmental and Social Impact Study.

The main cultural assets identified are as follows:

- Masseria San Basilio, a fortified farm dating back to the sixteenth and seventeenth century with a two-storey tower, which represents the original core of the building complex, separated by a cornice structure and external stairs. It is located 330 metres south of the pipeline route, at Kp 0.0;
- Masseria Incioli (sixteenth to eighteenth century), located approximately 900 m south of the pipeline route along the road that connects S. Foca to Melendugno; it is an interesting example of a fortified farm characterized by robust foundations with a square tower.
- The remains of a rustic villa, a rural settlement of the Hellenistic-Roman era which can be classified as a medium-sized villa. It is located 200 m south of the pipeline route, at Kp 4.3;
- the chapel of San Niceta, the only surviving witness of the ancient great abbey of the same name, which according to historical sources was founded in 1167. The chapel, with its rectangular foundations and square presbytery, was given its structure during its restoration in the fifteenth century. It is located 200 metres south of the pipeline route, at Kp 4.5;
- the “Gurgulante” dolmen dating back to the Bronze Age is located on a plot of land of the same name near the road from Melendugno to Calimera, about 500 m southeast of the PRT site.
4.4 Conclusion

In summary, part of the project site (which does not include the route of the gas pipeline from Kp 6.4 to Kp 8.2 and the PRT site) is included in areas of scenic interest constrained by the following articles of Legislative Decree no. 42/2004:

- *Coastal areas up to 300 m from the shore line* (Art. 142(1)(a)), will be crossed by the microtunnel, therefore there will be no interference;
- *Wooded areas* (Art. 142(1)(g)), will be crossed by the microtunnel, therefore there will be no interference;
- *Areas of significant public interest* (Art. 136(1)(c) and (d)) consisting of the coast of Salento within the Municipalities of Lecce - Vernole - Melendugno and Otranto affected by the pipeline landfall, the BVS and by part of the gas pipeline route from Kp 0.0 to Kp 1.2;
- *Areas of significant public interest* (Art. 136(1)(c) and (d)), consisting of the coastal areas and part of the Municipality of Melendugno affected by the pipeline landfall, the BVS and the route of the pipeline up until Kp 6.4.
5 HISTORICAL FRAMEWORK

From the Bronze Age, between the fourth and second century BC, the settlements of Valesio, San Pancrazio Salentino, Lecce, Rudiae, Cavallino and Roca were powerful examples of messapico settlements characterised by the construction of large walls encompassing a vast territory for agricultural, military and religious purposes. Around these settlements, there was a dense presence of farms, often arranged along radial lines, moving from the city out towards the surrounding territory.

This settlement, which gradually became linked with the Greek settlement of Taranto, had a Roman structure. The mesh of centuriation, probably created under Gracchi rule, is still fairly well preserved around Lecce, Soleto and Vaste. The Saracen invasions of the ninth century helped to deconstruct the agricultural landscape of Salento in the Late Antiquity and guide the population’s settlement choices towards sites located in the interior. However, the most radical changes to the character of the settlement took place in the final phase of Byzantine domination and the Norman Conquest. This history is reflected in the landscape with the creation of numerous hamlets, low-rank, open settlements – i.e. without fortifications – with a strong rural vocation, often established in continuity with Roman or Byzantine sites, through the creation of Latin-rite churches and Benedictine monasteries. Between the twelfth and fifteenth centuries, the area witnessed the phenomena of concentration of the sparse population in hamlets across larger sites, generally located in the interior, and coastal towns were often abandoned. The wars and famines of the mid fourteenth century contributed to the intensification of these phenomena, as well as the disintegration of the agricultural landscape and the abandonment of many small villages.

However, the administrative, political, religious and economic hegemony of Lecce on the surrounding area, which dates back to the establishment of the Norman county, remained throughout the Spanish Viceroyalty up until the unification of Italy.

In the late nineteenth and early twentieth centuries, some manufacturing activities were performed, related to the processing of agricultural products (with the consequent construction of mills and crushers throughout the countryside), from which the cultivation of tobacco emerged. The socio-productive panorama of the plains is characterized by a fragility of the credit system, the accumulation of savings and financial assets that were not directed at production, a persistent lack of infrastructure, exports linked to the production of wine and oil, and products subject to difficult market conditions, which in just a few years significantly transformed the agricultural landscape. With regard to the infrastructure networks that cross and organise the territory, the dominance of the city over the countryside has been facilitated by the complex road network in the Salento peninsula.
6 SITE CONDITION

6.1 Geomorphological structure

The Salento Plateau affected by the project is typically flat, without any significant morphological forms, and is characterised by: the massive accumulations of red earth, the intense human agricultural settlements and the presence of wooded areas and wetlands towards the coastline. The calcareous soil, frequently exposed, is characterized by the widespread presence of karst formations such as dolines and sinkholes (locally known as "vore"), and rainwater absorption points that draw the water underground, substantially feeding the underground aquifers.

The morphology of this area is the result of the continuous modelling action carried out by exogenous agents, both in relation to the repeated sea level fluctuations that occurred from the Middle to Upper Pleistocene epoch and the erosive action of watercourses, which are currently poorly fed.

6.2 Rural Landscape

The rural landscape of Salento Plateau is characterized by intense human agricultural settlements in the area and the presence of extensive coastal wetlands, especially on the Adriatic coast. The extremely flat territory is characterized by a varied patchwork of vineyards, olive groves, arable crops, horticultural crops and grassland.

This stretch of the Adriatic coast is characterised by the significant presence of diverse natural features. It is also characterised by large sections of forest and shrubs punctuated by coastal lakes and extensive grasslands. There are very few settlements in this area and, as a result, the rural landscape relates to the silvo-pastoral, semi-natural system. This mixture of crops, forests and pastures consists of olive groves/woodland, arable land/pasture, arable land/olive groves alternating with pastures, and arable land/forest.

The stones and wells are characteristic elements of the agricultural landscape of the plains: the habit of arranging stones in “Specchie” or mounds derives from the need to prepare the land for cultivation, and they are used to mark the boundary between neighbouring estates. These rocks are also used to build small dry stone walls which surround olive groves and vineyards, employing methods used in ancient Roman times. The wells are indispensable for the supply of water for vegetable gardens and suburban gardens.

Another characteristic element of the landscape is the “Pagghiare”, or characteristic rural buildings located on agricultural land. They were built according to ancient traditions in two different types of structures:

- quadrangular base with a truncated pyramid section;
- circular base with a conical section.
They represent an important socio-cultural indicator and can be considered monuments of rural society, on a par with the natural landscape. Some of these structures are very old, dating back to the seventeenth century.

The fortified *masseria* (farm), around which the productive activities were organised. Throughout the entire Salento peninsula, the greatest concentration can be found in the area between San Cataldo and Vernole-Melendugno, on the Adriatic coast.

Another element that characterises the suburban agricultural landscape is the garden, which combines olive trees, fruit trees, vines and vegetable patches, with a well and often a residence with an adjoining courtyard and chapels, a sign of a deeply suburban space modified by the presence of man and the nucleus of the sixteenth century villas that currently dot the contemporary landscape of the Lecce countryside.

6.2.1 The Lecce countryside and the system of suburban villas

From a geomorphological perspective, the "Cupa" area is a large karst depression in a well-defined geographical area, with Lecce at its centre, and from which numerous towns and villages stem.

Few traces remain today of the ancient beauty of these areas, however the appeal of this countryside remains intact, as well as the subtle charm of the objects that inhabitants created with their own hands, for work or for pleasure.

Due to the special beauty of the countryside and the scenery, since the fifteenth century, the area has been chosen as an ideal holiday location by the aristocracy, where they built numerous villas.

The municipalities of the Cupa valley, with their relative altitudes, are: Lecce (49 m), Surbo (40 m), Campi Salentino (33 m), Squinzano (48 m), Trepuzzi (55 m), Novoli (37 m), Carmiano (31 m), Arnesano (32 m), Monteroni di Lecce (35 m), San Pietro di Lama (43 m), Lequile (38 m), San Cesario di Lecce (42 m), San Donato di Lecce (79 m), Cavallino (38 m), Lizzanello(42 m), and Vernole (38 m).

On the Adriatic coast between San Cataldo and Vernole-Melendugno, there is a widespread presence of fortified masserie linked to large ecclesiastical property. These structures also served as an organic coastal defence.

From the coastal hinterland to the first urban centres gravitating around Lecce, the agricultural landscape is dominated by the presence of low and high density olive groves, sometimes grown in monocultures, with a large network of dry stone walls and numerous stone shelters (pagghiare).
6.3 Coastal Landscape

The coastline of the reference landscape is slightly uneven but mostly linear, with a low, sandy morphology or with soft rock and cliff sections. Between Torre San Gennaro and Torre Specchia Ruggeri, there is a long stretch of sandy shore line with shallow beaches, bordered by intermittent dunes of up to 10 m high, behind which the vast wetlands extend, now largely reclaimed.

This stretch of coast is occasionally interspersed with small rocky stretches, both high and low, in most cases surrounded by sandy material at the base. To the south of Torre Specchia Ruggeri, a mainly rocky and indented coast line dominates the landscape, increasing in height as it proceeds towards the south.

Despite the high level of urbanization, the Adriatic coast of the Salento plateau is still characterised by a high number of natural features of importance outside the region. The typical Salento coastal system consists of sequential formations of beach, dunes covered with scrub or pine forest, and wetlands behind the dunes, fed by a line of outcrops of karst springs and water from the surrounding countryside. This system has a high ecological value as it allows the development of important elements of biodiversity. The presence of wetlands behind the dune area as a place where rainwater can filter into the system can also help to mitigate the serious problem of saline contamination of the Salento aquifer.

Over the years, a lack of proper planning has produced an uncontrolled urbanization model, with settlements and urban areas located close to the beach areas.

In the absence of any morphological references, the only visual points of reference are given by anthropic elements such as church spires, domes and towers that appear above the olive trees or that stand out on the edge of small depressions (visual reference point of Lecce and the initial radial rim of the Cupa valley). The landscape perceived from the dense road network is characterised by a patchwork of vineyards, olive groves, arable land, horticultural crops and grassland; it varies subtly according to the main crops grown, with an increase of agricultural plots and a greater concentration of historical anthropic signs. The coast is never monotonous, but is constantly varied with irregular contours.

The Adriatic coast, north of Otranto, is mostly low-lying and is characterised by the presence of basins behind the dunes and dune formations. From Alimini to Casalabate, the coast remains low-lying, except in the vicinity of San Foca where stretches of sandy beaches alternate with rocky beaches; here the coastline is heavily affected by the silting phenomenon, therefore it has been subjected to numerous different remediation efforts.
The wetland known as “Le Cesine”, a WWF oasis considered to be of international interest in terms of its flora and fauna, is one of the last stretches of marshland between Brindisi and Otranto, and is an extremely composite area with different natural habitats. It consists of vast expanses of reeds, a number of channels, bog and marshland, and two basins, Pantano Grande and Salapi. The other environments that characterize the reserve are a pine forest, Mediterranean scrub, holm-oak forest and crops.

Continuing in the direction of the Otranto promontory, the beautiful coast road more or less follows the edge of the cliff, descending to the sea at certain points and penetrating the karst land in others. The coast begins to change appearance and the white sands give way to a rocky coastline that is a prelude to the imposing cliffs that dominate the lower side of the Adriatic coast of Salento. The road crosses San Foca, a small fishing town, Roca Vecchia, an archaeological centre and seaside resort, Torre dell’Orso, a picturesque town nestled at the top of a wide inlet and, just a few kilometres north of the Alimini lakes, it reaches the Frassanito Reserve which extends for about thirty acres and is characterised by high dunes that form the backdrop to a long beach, covered with thick junipers. Some sections have been reforested with the Aleppo pine, while a very limited number of wetlands still have a flora that is typical of such environments.

6.4 Analysis of Study Area and Analysis of Site

The Study Area, as shown in Figure 6-1 extends for 2 km (1 km on either side) around the pipeline and the PRT and includes mostly agricultural areas (79.8% of land in the Study Area) and forested and semi natural areas (14.1% of land). Urban land use is limited to 2.6% and industrial, commercial and productive land use amounts to 1.3%. This information is derived from the CORINE\(^1\) Land Cover database (level3), GIS data on land use features, together with field observations (see Table 6-1).

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\(^1\) Coordinate Information on the Environment
<table>
<thead>
<tr>
<th>Macro category</th>
<th>Detailed category</th>
<th>Area (Ha)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial Surfaces (115.2 ha – 6.1%)</td>
<td>Continuous urban area</td>
<td>13.5</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>Discontinuous urban area</td>
<td>34.79</td>
<td>1.86</td>
</tr>
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<td></td>
<td>Industrial or commercial settlements</td>
<td>24.7</td>
<td>1.32</td>
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<tr>
<td></td>
<td>Road and rail networks and associated land</td>
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<td>1.16</td>
</tr>
<tr>
<td></td>
<td>Mineral extraction sites</td>
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<td>0.01</td>
</tr>
<tr>
<td></td>
<td>Dump sites</td>
<td>1.17</td>
<td>0.06</td>
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<td></td>
<td>Construction sites</td>
<td>15.8</td>
<td>0.84</td>
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<td></td>
<td>Green urban areas</td>
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<td>0.01</td>
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<td></td>
<td>Sport and leisure facilities</td>
<td>1.4</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>Graveyards</td>
<td>1.8</td>
<td>0.10</td>
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<td>Non-irrigated arable land</td>
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<td></td>
<td>Vineyards</td>
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<td></td>
<td>Fruit trees and berry plantations</td>
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<td>Olive groves</td>
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<td></td>
<td>Pastures</td>
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<tr>
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<td>Annual crops associated with permanent crops</td>
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<td>Forest and Semi-Natural Areas (264.2 ha – 14.1%)</td>
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<td></td>
<td>Coniferous forest</td>
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</tr>
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<td>Natural grasslands</td>
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<td></td>
<td>Moors and heathland</td>
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<td>Sclerophyllous vegetation</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>1,874.4</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Carta Uso del Suolo Regione Puglia, Manuale di foto interpretazione, vers.1.0
The nearest main roads in the Study Area are the following:

- SP 145 (San Foca-Melendugno), that runs in an east-west direction, located south of the pipeline route;
- SP 366 (San Cataldo-Otranto), which crosses the Study Area near the landfall;
- SP 2 (Vernole-Melendugno), which is located about 1.5 km north-east of the PRT site;
- SP 29 (Sternatia-Calimera-Melendugno) localized about 0.5 km south of the PRT Site.

Other minor communal and country roads cross the Study Area, the latter sometimes quite narrow and bounded by stone walls. The following paragraphs show the landscape characteristics of the coastal territory (the landfall) and the agricultural plain area (the pipeline and the PRT).

The landscape characteristics of the coastal territory (pipeline landfall and BVS), and the agricultural plain area (pipeline route and PRT) are analysed separately below.
The coastal territory

The coast is mostly rocky (Figure 6-2), with long sandy beaches towards San Foca (Figure 6-3), to the south, and small beaches toward the north.

Figure 6-2 Rocky Coast south of Torre Specchia Ruggeri

Source: ERM field visit (April 2013)
Immediately behind the coast, there is a dune and a territorial strip covered with Mediterranean scrub and wooded areas that constitute visual barriers. The following figures show the dune, the Mediterranean scrub and the wooded area.
Figure 6-4  Dune covered with Mediterranean scrub

Source: ERM field visit (April 2013)
Figure 6-5  The Mediterranean scrub at the edge of SP 366 and the wooded area in the background

Source: ERM field visit (April 2013)
Figure 6-6 The Mediterranean scrub and wooded area in the background, seen from the west

Source: ERM field visit (April 2013)

In Figure 6-7 the olive grove is visible, located to the west of the aforementioned Mediterranean scrub. The work site (hydrotesting area) will be located inside this olive grove area.
Another valuable environmental element, which has great ecological value because it allows development of important elements of biodiversity, present in the Study Area, is the San Basilio marshland (Palude di San Basilio, shown in the following figure) located just beyond the wooded areas that delimit the coastal strip at a distance of over 100 meters north of the gas pipeline. Near the San Basilio marshland, the intervisible area of the project site (hydrotesting) turns out to be larger than the rest of the Study Area.
In the area of the coastal territory described above, of environmental value characterized by high level natural features, the urban area of San Foca (Figure 6-9) can be seen. San Foca is situated about 600 meters south of the gas pipeline landing point. There are also elements of historical and cultural significance such as the Masserie, which are more common in the Adriatic strip between S. Cataldo and Vernole-Melendugno than in the entire Salento area. Figure 6-10 shows the Masseria San Basilio, situated at about 300 meters south of the gas pipeline.
Figure 6-9 The urban area of San Foca

Source: ERM field visit (April 2013)
Figure 6-10 Masseria San Basilio

Source: ERM field visit (April 2013)
The agricultural plain area

Beyond the territorial strip along the coast, most of the territory included in the Study Area is primarily used for agriculture, and cultivated almost entirely in olive groves. The olive groves are delimited by dry stone walls (Figure 6-11) and olive trees with trunks measuring over 100 cm in diameter can often be found within these groves (Figure 6-12).

Figure 6-11 Olive groves delimited by dry walls by the pipeline route

Source: ERM field visit (April 2013)
As already indicated, olive trees of various sizes were identified during the site survey in July 2013. In particular, around 1,900 olive trees with a diameter greater than 30 cm have been identified inside the areas where construction operations are to take place, about 1,650 of which with a diameter between 30 cm and 70 cm, about 200 with a diameter between 70 cm and 100 cm and about 50 cm with a diameter greater than 100 cm.

The agrarian landscape is characterized by the presence of elements of historical-cultural interest, such as Masserie (Figure 6-13) and Pagghiare (Figure 6-14 and Figure 6-15).
Figure 6-13  Masseria Incioli on SP 145

Source: ERM (April 2013)
Figure 6-14  Barn (Pagghiara) near the PRT

Source: ERM field visit (April 2013)
Other elements of historical and cultural interest present in the agricultural plain are: the area of the rustic villa, a rural settlement from the ancient Greek-Roman era, near Casa Fanfula; the Chapel of San Niceta (Figure 6-16), a 12th century church, near the cemetery of Melendugno. These elements are situated about 200 meters south of the pipeline route.
To the south of the San Niceta Chapel, about 500 from the route, the northeast part of the urban centre of Melendugno (Figure 6-17) is located.
Figure 6-17  Northeast part of Melendugno seen from Provincial Road n. 145

Source: ERM field visit (April 2013)
In the agricultural plain, the elements making up the landscape of environmental value are as follows: the wooded area situated near Casa Monaco (Figure 6-18), the sinkholes in the Study Area and wooded area along with the watershed situated in the vicinity of the PRT area (Figure 6-19).

**Figure 6-18  Wooded area near Casa Monaco**

*Source: ERM field visit (April 2013)*
Figure 6-19  Wooded area and watershed east of the PRT

Source: ERM field visit (April 2013)

*Figure 6-20* shows the PRT site, a vast unirrigated cultivated field where there are a Pagghiara and a sinkhole. The site is delimited almost exclusively by olive groves, with farm roads, except for the southernmost part bordering on the planted areas and the Masseria Capitano (*Figure 6-21*), and therefore the visibility of the project site is fairly limited.
Figure 6-20  PRT Site

Source: ERM field visit (April 2013)
Figure 6-21  Masseria Capitano situated near the PRT Site

Source: ERM field visit (April 2013)

It is important to note the presence of Dolmen Gurgulante, an element of historical-cultural interest, located over 500 meters southeast of the PRT site.
Figure 6-22  Dolmen Gurgulante situated over 500 meters to the southeast of the PRT Site

Source: ERM field visit (April 2013)
7 PROJECT DESCRIPTION

The pipeline system in Italy will basically be composed of the following main installations, listed from the Adriatic Sea median line to the PRT (Figure 3 in Appendix 2 to Annex 7):

- A sub-sea 36” pipeline, approximately 45 km long, from the Adriatic Sea median line to the Italian landfall (maximum design pressure 145 bar-g (bar above atmospheric pressure));
- A landfall microtunnel, approximately 1,485 m long;
- A buried cross-country 36” pipeline (onshore) approximately 8,2 km long (maximum design pressure 145 bar-g, operating pressure at the PRT 75 bar-g);
- A landfall block valve station (BVS) at Kp 0.1;
- The Pipeline Receiving Terminal (PRT) (Kp 8.2 from landfall);
- Associated facilities required during construction (access roads, construction, pipe yards, etc.).

Box 7-1 The kilometre point: Kp

To allow an easy identification of the onshore pipeline components, their location is defined in this ESIA by their kilometre point (Kp), where Kp 0 is the tie-in between the onshore and the offshore pipeline at the starting point of the onshore microtunnel. So Kp represents the pipeline length in kilometres from the onshore microtunnel starting point.

7.1 Onshore Section

The onshore section of the pipeline (about 8.2 km long, stretching from the landfall point to the PRT) runs in an east-west direction across the Salento Peninsula, entirely within the Municipality of Melendugno (Province of Lecce), with a diameter of 36”. The location of the underground onshore pipeline is shown in Table 3 of Annex 7.

The onshore section of the pipeline originates north of San Foca, in San Basilio, which corresponds to the landfall point of the offshore section coming from Albania, in an area cultivated with olive trees where the work site for the construction of the landfall microtunnel and the completion of hydrotesting activities in the pre-commissioning phase, is expected to be located, with a surface area of 26,000 m².

The pipeline will be buried at a minimum of 1.5 m in the standard stretches, according to the Decree 17/04/2008, however this value may be increased as necessary and where conditions require, for example, in sensitive areas from an environmental point of view, or where the work on the pipes requires additional protection.
7.2 **Block Valve Station**

A Block Valve Station (BVS) will be installed close to the pipeline landfall in order to enable the isolation of the offshore pipeline from the onshore part for maintenance and safety purposes.

The Block Valve Station will be located at Kp 0.100, immediately after the exit of the onshore microtunnel in an area cultivated with olive trees, where the construction site for microtunnel will be located.

The BVS will be automated and will include a small electrical substation. It will consist of a total surface area of about 13 x 14 m surrounded by a fence to prevent any intrusion.

**Figure 7-1**  Example of a Block Valve Station - 3D Model

Source: Saipem (June 2013)
7.3 Pipeline Receiving Terminal

The Pipeline Receiving Terminal (PRT) will be located within the municipality of Melendugno, near the border of the municipality of Vernole, about 8.2 km inland from the seashore (Figure 7-2).

The PRT will constitute the connection with the Italian national grid owned and operated by Snam Rete Gas S.p.A (SRG).

**Figure 7-2 PRT 3D Model – North View**

![PRT 3D Model – North View](image)

Source: TAP AG (May 2013)

The PRT work site will also be the main construction site for all construction activities of the onshore section and will cover an area of about 12 hectares.

The Pipeline Receiving Terminal controls the flow of gas released into the SRG grid and ensures that the pressure between the TAP and the SRG grid is protected.

The depressurization of the equipment – which may be required as the result of an emergency or to shut off the PRT – will be carried out by means of two dedicated cold vents installed inside the fenced area of the Terminal.

7.3.1 PRT site and Architectural Project

The PRT will be constructed in a large non-irrigated arable field in which a pagghiara is located. It is bordered almost exclusively by olive groves with their surrounding stone walls and farm roads, except for the southern part where the terminal borders areas of arable land.

In general, the lack of elevated points in the Study Area limits the visibility of the PRT.

The existing pagghiara will be retained and will become the focal point of the external courtyard of the main building of the PRT.
The new buildings will be covered with materials normally used for rural architecture, such as natural rough-cut stone and hydraulic lime render.

The boundaries of the property will be marked by dry stone walls and protected by metal security fencing, which will blend into the surrounding environment with the help of climbing plants planted at its base.

In order to reduce the visual impact of the site, the buildings and structures will be as small as possible and a “green roof” will be installed on the office buildings.

The building heights will not exceed 6 m, with the exception of the boiler room, which will be 8 m high, and the cold vents, which will be 10 m high.

In general, the colours of the buildings and facilities will match the natural colours of the surrounding landscape, with the use of browns and greens for exposed installations.

7.3.1.1 Visual impact

To verify the potential visual impact of the PRT structures, a specific study was carried out (see Appendix 1 to this Annex) in which the visibility of the works site from up to 1 km away was evaluated.

The study found that the morphology of the territory – which is essentially flat – and the presence of olive groves limit the visibility of the planned structures from the view identified as “1 bis”, located about 300 metres to the east of the PRT, and the view identified as “3 bis”, located about 150 m south-west of the PRT (see the photo simulations in Appendix 1 to this Annex).

7.4 Mitigation Measures

The mitigation measures that will be applied to the entire length of the route include, where possible, the restoration of soil cover with what was originally removed.

In particular, before construction work is complete, a general recovery of the working strip will be carried out. This phase consists of the levelling of the area affected by the works and the reconfiguration of pre-existing slopes, restoring the original morphology of the ground, and re-activating ditches and channels, as well as of pre-existing flow lines. During ground levelling, particular care will be taken to avoid leaving holes or depressions that could create problems for subsequent farming activities.

Considering the morphology of the territory crossed by the pipeline, where possible the morphological restoration works (in the case of demolition) will essentially consist of the reconstruction of the structures involved in the work plan, returning them to their original state.

To complete the construction work, all the necessary environmental rehabilitation work must be completed. The purpose of this work is to restore the natural balance that previously existed in the area.
“Although construction activities do not interfere with any tree included in the regional list of “monumental olive trees” (approved by the Regional Council with resolution n. 357 of 7 March 2013), there are olive trees of significant age and size along the working strip. TAP AG commits to restore the condition of the land to the ante-operam status through the reinstatement of the olive groves. Upon request of the landowner, and in agreement with the relevant authorities, alternative compensation measures could apply.

For the olive trees that will be transplanted (Figure 8 of Appendix 3 to Annex 7) the following actions will be taken, with the agreement of the owners:

- pruning (reduction of approximately 50% of the foliage);
- disinfection of cut areas with fungicides;
- wrapping of trunks, if necessary with burlap or other similar material;
- finish the surface with grass turf installed with a digging machine; the grass turf will be held in place with a wire net and anti-algae tarp.

Once construction work is complete, the olive trees will be replanted in their original positions, with possible small variations due to the need to avoid deep excavations directly over the pipeline.

In terms of the dry stone walls, those that will be removed during the construction phase will then be re-installed during the restoration process in accordance with their original size and using original stone materials that were duly set aside before the installation work of the pipeline (Figure 10 in Appendix 3 of Annex 5).

With regard to the presence of other structures of scenic interest, the actual interference will be considered on a case by case basis and any need for restoration will be discussed with the authorities/owners.

In terms of the road crossings, once the pipeline is installed, the trench will be refilled and compacted in layers, according to current specifications provisioned by relevant regulations. The road surface will then be restored over the compacted trench. The final choice of crossing methods will be made in consultation with the competent road management authorities.

In order to ensure the perfect reinstatement of the area, before any construction work is begun, topographic and photographic records will be made of the existing conditions of the terrain through which the pipeline and access roads will run. These records will be used as the standard against which the quality of the restoration work will be judged once the construction work is complete.

Construction work will be carried out taking into account the importance of the tourist season, taking care not to interfere with it. To do this, the work in the coastal area will be interrupted during the summer.
A suitable lighting scheme will be formulated for the construction phase in order to reduce the impacts related to the lighting of the construction sites during night time. The lighting of the construction sites will be in compliance with the main recommendations stated in Regional Law No. 15/2005 "Urgent measures for the containment of light pollution and saving energy", art. 5.

Generally, a reduction of obtrusive light is possible through the following solutions (Institute of Lighting Engineers, 2005):

- Do not "over" light. There are published standards for most lighting tasks, adherence to which will help minimise upward reflected light.
- Dim or switch off lights when the task is finished. Generally a lower level of lighting is sufficient to ensure adequate safety and security levels.
- Use specifically designed lighting equipment that minimises the upward diffusion of light.
- Keep glare to a minimum by ensuring that the main beam angle of all light directed towards any potential observer is not more than 70°.

In terms of the operating phase, for the Pipeline Receiving Terminal (PRT) structures a draft environmental mitigation plan has been drawn up which has initially been submitted to the Superintendence for Architectural and Landscape Heritage of the provinces of Lecce, Brindisi and Taranto (see Appendix 1 to this Annex). The proposed works include a series of mitigation measures, listed here below, that will not entail making evident changes to the consolidated landscape and its perception and that will reduce the visual impacts both at a height and on ground level:

**Reduction of daytime and night-time overhead visual impacts:**

- *colour and material camouflage of the areas not paved or covered by vegetation.* The area around the two cold vent stacks, equivalent to 60% of the entire work site, is identified as a "sterile area". For technical and safety reasons, no trees or shrubs may be planted in this area within a radius of 90 m from each vent stack. As this concerns an area of almost 7 hectares, the measures proposed to mitigate the overhead view found was to deposit on it a layer of assorted crushed stone taken from quarries in the area, distributing it in a non-uniform way so as to create an irregular pattern, using various colours resembling those of the tuff topsoils present in the province of Lecce.
• reduction of light pollution created by artificial light and assessment and control of light indices towards the outside environment. The work site currently presents virtually no night-time light pollution at all. The construction of the PRT includes the installation of a lighting system that ensures an excellent level of security and constant control of the operating area. With a view to attenuating and limiting the amount of pollution, the project adopts lighting with an indirect downward beam and low-energy consumption for the roads. For the pathways, the proposal consists of hooded side lighting that serves the specific purpose of marking the way; again to mitigate the visual impact, pole lighting is only used in areas where strictly necessary while, in the remaining areas, the lights will be applied directly to the buildings.

• elimination of reflective surfaces. In order to reduce the impacts on the overhead views, “green roofs” will be installed so as to mitigate the effects of these horizontal surfaces. They will be applied exclusively in the office area, while the remaining stone surfaces will be of a colour similar to green so that they fit well into the overhead setting. These solutions will be adopted instead of installing photovoltaic panels, as laid down by the legislation in force.

• colour camouflage of road surfaces. The internal road surfaces, even if limited to the areas adjacent to the administrative buildings and the plant area, were mitigated using asphalt of colours resembling those of the tuff topsoils typical of the province of Lecce. For the external road surfaces (security boundary road) use will be made of stabilized stone, duly steamrolled, so as to reproduce the type of farm roads already present all over the surrounding countryside.

• irregular, natural planting. In order to make the works appear as natural as possible, new groves will be planted with a density of 110/120 trees per hectare with an irregular layout. In the area to the north, along the incoming route of the underground pipeline, the trees will be planted in such a way as to be compatible with the pipeline itself.

Reduction of planimetric and altimetric visual impacts (daytime and night-time):

• reduction in the height of the new constructions. Following the topographical survey that was conducted to determine the morphology of the ground, the actual impacts of the constructions were analysed and assessed in relation to the existing surroundings. The lie of the land, which slopes slight downwards from North to South, with a difference in level of about 4 m, enabled the buildings to be positioned below the level of the horizon, by taking advantage of this slope. In addition, for the technical facilities (fire protection water storage tank), the part protruding above ground will be camouflaged by a soil embankment on which grass will be sown and shrubs planted.
mitigation of critical views with shielding vegetation. The critical views were analysed (see Appendix 1 of this Annex) in order to estimate the actual impacts of the constructions and to orient the choice of the most appropriate mitigation measures. Both for the view identified as "1 bis" and that identified as "3 bis" below, the same mitigation measures were taken, using shielding trees (for the former view point) or multi-level terraces with shielding plants (for the second critical view point). The photo simulations shown below enabled a comparison to be made between the places as they appear today and how they will appear following the mitigation measures using natural elements (olive trees) characteristic of the existing countryside. The site has a fair basic visual absorption capacity due to the presence of eucalyptus woodland. The olive trees completed the shielding effect, thus almost entirely cancelling out the impact of the new constructions.

blending of the site boundaries into the surrounding environment. With a view to making the works fit well into the environment, the decision was made to use a dry stone wall as the site boundary for the PRT so as to create a philological link between the recognized and culturally rooted landscape and the new constructions built to the greatest possible degree in respect of the traditional construction technique.

blending of the new security fences into their natural surroundings. The terminal project includes a second, internal type of fencing characterized by a higher level of security and protection. The proposal made to reduce its visual impacts was to turn it into a natural barrier by planting climbing plants at its base.

use of finishing materials of the surfaces typical of rural architecture. Materials normally used in rural architecture will be adopted in the constructions that are to house the administrative offices and technical and security rooms. To be more specific, projecting walls will be covered with natural rough-cut stone while rendered walls will be finished with hydraulic lime render as it is a natural material that ensures a high degree of breathability and strength and a limited need for maintenance.

colour camouflage of the technological elements of the plant (horizontal pipes, cold vent stacks, safety valves, etc.). In the PRT area, behind the "boiler house", there will be an area with overhead gas pipes and their safety valves. Also in this case, the aim of the mitigation measures is to minimize the visual impacts of the pipes, and colours resembling those of the surrounding vegetation will be chosen in order to obtain a camouflaging effect and a limited impact.

use of native tree and shrub species. For all the mitigation measures in which tree and/or shrub species are to be used, these species will be chosen from the native ones listed in the analytical documents in Appendix 1 to this Annex. Naturally, the choice of the species will depend upon the use. Tall trees, such as eucalyptus, will be used as natural shielding barriers; medium-height species, such as olive trees, will be used both as natural shielding barriers and to reduce the overhead visual impacts by planting the trees in an irregular layout.
• **assessment and reduction of the light impact.** The light impacts on the ground level views were also assessed. The measures described in the "Reduction of the light impact" section above are also valid for this case.

**Preservation of existing elements:**

• **conservation of the "pagghiara" inside the intervention area.** The mitigation measures also include works to protect and recover constructions that, in accordance with the Technical Rules for Implementation of the PUTT/P in force in Puglia, are considered "widespread assets of the area" (art. 3.14). In this specific case, the "pagghiara" (conical-shaped dry-stone shelter often made by the farmer himself using the stones on his land) will be recovered with a view to conserving one of the most important elements of the farming culture of Salento.

• **recovery of existing farm roads.** Closely linked to the previous operation is the recovery of the existing roads, which is also aimed at conserving the traces of the traditional rural civilization.

• **protection of existing vegetation.** The works for the construction of the PRT and those for the construction of the underground pipeline also involve small areas with olive groves. The principle of conservation and protection will also be adopted to safeguard the tree species by removing the trees situated on the work site and replanting them in an alternative location.
8 LANDSCAPE IMPACT ASSESSMENT

8.1 References and Methodology

To assess the potential impact of the Project on the surrounding landscape, the planned works have been analysed with respect to the morphology and the landscape characterizing the Study Area.

The activities to characterise the landscape and the work sites were focused on the useful analyses of landscape/territorial data and therefore aimed at identifying the potential Project interferences.

More specifically, based on the analysis that allowed to understand the dynamics that drove the current structure of the landscape, the following constitutive and representative elements of the landscape were identified and mapped: elements of environmental value such as areas with important natural features, wetlands, dunes, watershed lines, sinkholes, forests etc.; elements of historical and cultural value such as items and areas of archaeological interest, masserie and lodges; pagghiare, buildings for worship, and dolmens; elements that characterise the agricultural landscape, such as dry stone walls, olive groves; and elements of anthropic pressure, such as urban areas and transport systems.

The purpose of this analysis is to identify the elements that characterise the territory and the landscape, which may constitute driving factors in the project choices, and which may help to determine the impact of the proposed transformations on the landscape.

The visual conditions were then examined. Basically, elements of meaning for the landscape that contribute to the perception of the territory/landscape by its potential user (resident, user of the mobility system, etc.) were identified, as well as areas of intervisibility.

Lastly, the significance of the impact on the landscape was evaluated by means of two distinct phases: the identification of the landscape value of the area, defined as the Landscape Sensitivity of the Study Area and the subsequent evaluation of the degree of incidence of the Project, defined as the Magnitude of the Impacts. The landscape impact level is determined by combining the results of the Landscape Sensitivity of the Study Area with the Impact Magnitude.

The landscape sensitivity assessment was carried out by processing and aggregating the intrinsic and specific values of a number of basic landscape patterns that describe the elements of the landscape, grouped into 3 main components:

- **Morphologic and Structural component** - the landscape sensitivity assessment is carried out elaborating and aggregating intrinsic and specific values of the following basic landscape patterns: morphology, natural features and level of protection;
• **Visual component** – this takes into account the landscape perception of panoramic values and significant views. The characterizing elements of this component are the scenic viewpoints identified, known and used by tourists or local residents as privileged observation points for panoramic observation, the landscape peculiarity and the negative effects caused by human activities;

• **Symbolic component** - the landscape symbolic value, as perceived by local communities. The characterizing elements of this component are land use and historical and cultural values.

**Table 8-1 Summary of the Elements considered for the Landscape Sensitivity Assessment**

<table>
<thead>
<tr>
<th>Component</th>
<th>Landscape aspects</th>
<th>Evaluation criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphological and Structural</td>
<td></td>
<td><strong>Morphology</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Definition of the of the main soil characteristics that define the boundaries of the landscape and the evaluation of situations of potential stability/instability of the physical components and man-made structures.</td>
</tr>
<tr>
<td></td>
<td>Natural features</td>
<td><strong>Preservation</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Proximity to a theoretical ecosystem model (the presence of areas of natural interest), in which the effects of human activities are absent or irrelevant. The level of integrity of the places and their consequent vulnerability/fragility is assessed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The higher the degree of protection and the number of constraints involved, the greater the landscape value of the territory considered in protection terms.</td>
</tr>
<tr>
<td>Panoramic views</td>
<td></td>
<td><strong>Visual</strong></td>
</tr>
<tr>
<td></td>
<td>Panoramic views</td>
<td>The existence of special characteristics that provide a broader, more complete view of the surrounding landscape.</td>
</tr>
<tr>
<td></td>
<td>Landscape peculiarity</td>
<td>Evaluation of the rarity of landscape elements in the area and of their reputation from an artistic, historical or literary perspective (tourist attractions).</td>
</tr>
<tr>
<td></td>
<td>Negative effects caused by human activities</td>
<td>Elements which degrade landscape value since they are incongruous</td>
</tr>
</tbody>
</table>
In order to define the landscape state, a value (score) is assigned to each landscape feature; the sum of these scores defines the overall landscape value of the considered area.

The following classification was applied for the synthetic assessment of landscape sensitivity:

- **1 = Very low** landscape sensitivity;
- **2 = Low** landscape sensitivity;
- **3 = Medium** landscape sensitivity;
- **4 = High** landscape sensitivity;
- **5 = Very high** landscape sensitivity.

The criteria used to evaluate the impact magnitude on the landscape are reported in *Table 8-2* and described in the following sections.

**Table 8-2  Landscape Sensitivity Assessment – Synthesis of the Considered Elements**

<table>
<thead>
<tr>
<th>Components</th>
<th>Landscape features</th>
<th>Evaluation criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphological and</td>
<td>Morphology</td>
<td>Visible peculiar landform elements</td>
</tr>
<tr>
<td>structural</td>
<td>Natural features</td>
<td>Visible landscape system of natural interest (presence of ecological network or significant natural areas)</td>
</tr>
<tr>
<td>Protection</td>
<td>Scenic viewpoints</td>
<td>Visibility of a wide landscape area/inclusion in scenic views</td>
</tr>
<tr>
<td>Visual</td>
<td>Landscape peculiarity</td>
<td>Rarity of landscape elements and notoriety for artistic, historical or literary reasons (tourist attraction)</td>
</tr>
<tr>
<td>Anthropic detractors</td>
<td></td>
<td>Elements which degrade landscape value since they are incongruous</td>
</tr>
<tr>
<td>Symbolic</td>
<td>Land use</td>
<td>Sign of human presence in the territory</td>
</tr>
<tr>
<td></td>
<td>Historical and cultural values</td>
<td>Presence of visible settlement elements of historical interest and visible signs of the cultural elements of the landscape</td>
</tr>
</tbody>
</table>

*Source: ERM (2013)*
In order to define the impacts, a value (score) is assigned to each landscape component. The sum of these scores defines the impact magnitude on the landscape.

The following classification was applied for the synthetic assessment of the impact magnitude:

- 1 = **Very low** impact magnitude;
- 2 = **Low** impact magnitude;
- 3 = **Medium** impact magnitude;
- 4 = **High** impact magnitude; and
- 5 = **Very high** impact magnitude.

The significance of the impact was evaluated as a function of Sensitivity and Magnitude – refer to Table 8-3.

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Magnitude</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 – Very low</td>
</tr>
<tr>
<td>1 – Very low</td>
<td>1</td>
</tr>
<tr>
<td>2 – Low</td>
<td>2</td>
</tr>
<tr>
<td>3 – Medium</td>
<td>3</td>
</tr>
<tr>
<td>4 – High</td>
<td>4</td>
</tr>
<tr>
<td>5 – Very High</td>
<td>5</td>
</tr>
</tbody>
</table>

Notes: Green = Not significant impact; Yellow = Minor impact; Orange = Moderate impact; Red = Major impact.

In the above table, two thresholds are very important, and they are represented by the following values:

- the threshold of significance, equal to 5; and
- the threshold of tolerance, equal to 16.

If the result is less than or equal to 5, which corresponds to a not significant or minor level of impact, the impact of the project on landscape and visual amenity is below the threshold of significance; therefore, the project is considered acceptable.

If the result is between 6 and 15, which corresponds to a level of moderate impact, the impact of the project on landscape and visual amenity is significant, but tolerable.
If the result is above 15, which corresponds to a level of major impact, the impact of the project on landscape and visual amenity is over the threshold of tolerance. In this case the project should be subject to further evaluations.

8.2 Constitutive and representative elements of the landscape

The aim of this analysis is to identify the elements that, by characterizing the landscape and the study area; help in determining the impact of the characteristics of the project elements on the landscape under examination; at the same time, such elements represent the guidelines in the definition of project choices. Through these objectives, elements of historic and cultural value; elements of environmental value; elements of anthropic pressure; and elements that characterise the agricultural landscape were identified.

During the course of the analysis, the following elements were mapped in detail:

- wetlands;
- surface water;
- sinkholes;
- dunes;
- watershed lines;
- woodlands;
- Mediterranean Maquis;
- historic centres;
- buildings for worship;
- areas of archaeological interest;
- dolmens;
- masserie;
- dry stone walls;
- olive groves;
- routes of landscape interest;
- panoramic roads.

The table “Constitutive and representative elements of the landscape” (see Appendix 1 to this Annex) shows that most of the elements of environmental value are concentrated along the coastal strip, while the inland areas are characterised by elements of historical and cultural interest and those characterizing the agricultural landscape.
In detail, the onshore section of the pipeline will originate north of San Foca, in San Basilio, where it will be connected to the landfall area by means of a microtunnel. The microtunnel will end in an area cultivated with olive trees where the work area for the construction of the aforementioned microtunnel and the completion of pre-commissioning activities (hydrotecting) will be located, with a surface area of 26,000 m², as well as the location of the BVS at Kp 0.1.

Moving west, the onshore section of the pipeline (which will be laid in excavated trenches) remains in the area cultivated with olive trees up to Kp 0.6, and then crosses an uncultivated area, up to 1.1 Kp. Beyond the uncultivated area, the pipeline will be laid alongside the municipal road to San Niceta up to 5.8 Kp, exclusively affecting olive trees bordered by dry-stone walls and characterized by the presence of “pagghiare”. In this regard, it should be noted that in order to prepare the working strip for the laying of the pipeline, various stone walls and olive trees will be affected. Upon completion of the construction activities, TAP AG pledges to restore the sites to their pre-construction state by replanting the olive trees and restoring the dry stone walls. With regard to the olive trees, if requested by the owners and in agreement with the competent authorities, alternative methods of compensation will be provided.

At Kp 5.8, the pipeline runs towards the south-west, affecting almost exclusively olive groves except for two uncultivated areas, the first from Kp 6.1 to 6.1 and the second from Kp 7.2 to Kp 7.3, finishing up in an area of arable land with a “pagghiara”, where the PRT will be located.

### 8.3 Analysis of Visual Conditions

The analysis of the visual conditions (see Table "Analysis of the visual conditions" in Appendix 1 to this Annex) aims at identifying all the elements that define the visual space usable by the observer (residents, tourists, users of the mobility network, etc.) in the study area, and then at defining the extent of the disruption that the project activities could cause. Considering the characteristics of the project works, the following have been identified in order:

- axes of scenic viewpoints (roads used by passers-by) which in the Study Area are the provincial roads n. 366, n. 145 and n. 2. In the approved *Regional Landscape and Territorial Plan*¹, provincial road n. 366 is classified as a panoramic road (because of its particular orographic position which presents the visual conditions to see significant aspects of the Apulian territory), while provincial roads n. 145 and n. 2 are classified as roads of interest for the landscape (roads which run through natural landscapes or high-level man-made landscapes from which it is possible to see diversity, peculiarity and complexity of the environment or to see a view or a glimpse of an important aspect);

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¹ The Apulia Region prepared the new Region Landscape and Territorial Plan (PPTR), pursuant to Art. 1 of Regional Law n. 20 of 7 October 2009 “Landscape Planning Regulations” and Legislative Decree 42 of 22 January 2004, “Cultural Heritage and Landscape Code” and subsequent amendments and supplements. The PPTR will be implemented and will replace the PUTT/p only after consultations have been concluded and after the approval of the Plan Proposal (the approval was granted on 11 January, 2010) and the signing of the agreement with the Ministry for the Environment and the Protection of Land and Sea provided for by the “Cultural Heritage and Landscape Code” (Legislative Decree 42/2004).
visual references on the territorial scale (those landscape elements that, for their own characteristics - position and size - are perceptible at short and long distances) such as the olive groves, urbanized areas, wooded areas and the Mediterranean scrub along the coast;

- local visual references (clear elements that characterize the landscape but, due to their small size, can only be seen from short-medium range distances) such as the farmhouses and lodges, pagghiare, places of worship, dry stone walls;

- intervisible areas (all parts of the territory from which the Project would be visible) with boundaries constituted by visual barriers, representing the extreme limits of the horizon and the certain landscape barriers (within the study area, these are the olive groves, wooded areas and watersheds, which constitute visual barriers throughout all the year);

The strip of land interested by the Project is located in a flat area with olive groves and wooded areas and is therefore characterized by a very limited visual catchment. The visual catchment related to the project intervention activities is very limited as they may only be perceived up to a few hundred metres away. The most extensive area of intervisibility is near the San Basilio marshland (Palude di San Basilio).

As regards the construction phase related to the completion of the offshore pipeline, a pipe laying vessel will be visible from the coast for a limited period of time (approximately one month).

### 8.4 Evaluation of Impact Significance on the Landscape

The significance of the impact on the landscape is assessed by combining the Landscape Sensitivity with the Impact Magnitude.

#### 8.4.1 Landscape Sensitivity Analysis of the Study Area

To determine the landscape sensitivity of the areas based on the previous assessments, two “homogeneous landscape areas” were identified within the study area. This step was in order to determine in greater detail the landscape sensitivity class of the area involved and, subsequently, the Impact Magnitude and the Impact Significance of the different portions of the project activities.

In particular, within the study area, the following "homogeneous landscape areas” affected by the different sections of the Project activities have been identified:

- **coastal territory** within which a small portion of the pipeline, the microtunnel and the BVS are located;

- **agricultural plain** area within which the PRT and the majority of the onshore pipeline are located.
8.4.1.1 Coastal territory

- This area is characterised by elements of environmental importance, such as the predominantly rocky coast, the dune, the San Basilio marshland, the woodlands and Mediterranean maquis, and by the provincial road n. 366, classified as a panoramic road in the adopted Regional Landscape and Territorial Plan.

*Table 8-4* shows a synthesis of the landscape sensitivity assessment for the coastal territory.

**Table 8-4** Coastal territory Landscape Sensitivity Assessment

<table>
<thead>
<tr>
<th>Components</th>
<th>Landscape features</th>
<th>Weight assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphological and structural</td>
<td>Morphology</td>
<td>5 – Very high</td>
</tr>
<tr>
<td></td>
<td>Natural features</td>
<td>4 – high</td>
</tr>
<tr>
<td></td>
<td>Protection</td>
<td>4 – high</td>
</tr>
<tr>
<td></td>
<td>Synthetic evaluation</td>
<td>4 – high</td>
</tr>
<tr>
<td>Visual</td>
<td>Scenic viewpoints</td>
<td>4 – high</td>
</tr>
<tr>
<td></td>
<td>Landscape peculiarity</td>
<td>5 – Very high</td>
</tr>
<tr>
<td></td>
<td>Negative effects caused by human activities</td>
<td>2 - low (*)</td>
</tr>
<tr>
<td></td>
<td>Synthetic evaluation</td>
<td>4 – high</td>
</tr>
<tr>
<td>Symbolic</td>
<td>Land use</td>
<td>4 – high</td>
</tr>
<tr>
<td></td>
<td>Historical and cultural values</td>
<td>4 – high</td>
</tr>
<tr>
<td></td>
<td>Synthetic evaluation</td>
<td>4 – high</td>
</tr>
<tr>
<td>Final evaluation</td>
<td></td>
<td>4 – high</td>
</tr>
</tbody>
</table>

*Note: (*) the score of negative effects caused by human activities must be subtracted from the overall landscape value*

The overall sensitivity of the **Coastal territory** is classified as **High**.

These values represent the Landscape Sensitivity, which will be combined with the value of the impact associated with the project (defined as Impact Magnitude), in order to determine the Impact Significance.

8.4.1.2 Agricultural plain

The agricultural plain is characterised by agricultural landscape defining elements such as farmhouses, pagghiare included in the olive groves delimited by dry stone walls. Since the flat area is cultivated mainly in olive groves, it also has very limited visual fields of observation.
Table 8-5 presents a synthesis of the landscape sensitivity assessment for the agricultural plain.

**Table 8-5 Agricultural plain Landscape Sensitivity Assessment**

<table>
<thead>
<tr>
<th>Components</th>
<th>Landscape features</th>
<th>Weight assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphological and structural</td>
<td>Morphology</td>
<td>2 – low</td>
</tr>
<tr>
<td></td>
<td>Natural features</td>
<td>3 – medium</td>
</tr>
<tr>
<td></td>
<td>Protection</td>
<td>3 – medium</td>
</tr>
<tr>
<td></td>
<td><strong>Synthetic evaluation</strong></td>
<td>3 – medium</td>
</tr>
<tr>
<td>Visual</td>
<td>Scenic viewpoints</td>
<td>2 – low</td>
</tr>
<tr>
<td></td>
<td>Landscape peculiarity</td>
<td>4 – high</td>
</tr>
<tr>
<td></td>
<td>Negative effects caused by human activities</td>
<td>2 - low (*)</td>
</tr>
<tr>
<td></td>
<td><strong>Synthetic evaluation</strong></td>
<td>3 – medium</td>
</tr>
<tr>
<td>Symbolic</td>
<td>Land use</td>
<td>4 – high</td>
</tr>
<tr>
<td></td>
<td>Historical and cultural values</td>
<td>4 – high</td>
</tr>
<tr>
<td></td>
<td><strong>Synthetic evaluation</strong></td>
<td>4 – high</td>
</tr>
<tr>
<td><strong>Final evaluation</strong></td>
<td></td>
<td>3 - medium</td>
</tr>
</tbody>
</table>

*Note: (*) the score of negative effects caused by human activities must be subtracted from the overall landscape value*

The overall sensitivity of the Agricultural plain is classified as **Medium**.
8.4.2 Impact Magnitude and Significance

8.4.2.1 Construction and pre-commissioning phase

This Section concerns the construction impacts due to the proposed pipeline works and the related structures on landscape along the length of the pipeline route through the coastal territory and the agricultural plain area.

During construction, potential direct impacts will include:

- physical changes to landscape elements arising from the pipeline construction, including loss of farmland and vegetation. These direct changes will apply to a corridor measuring 26 metres, defined as the Working Strip (the Working Strip will be approx. 11 m wide on one side to allow for the stockpiling of trench excavated material while the other side will be approx. 15 m wide to allow for pipeline assembly and for the transit of vehicles/machinery required for pipeline construction). Field work conducted in July 2013 revealed that construction phase involves:
  
  - about 120 dry stone walls. During the field activities (July 2013), a team of archaeologists mapped out and surveyed the dry stone walls inside the 30 metre corridor of the Project Route (Appendix 5 of Annex 7).
  
  - olive trees of various sizes, about 1,900 olive trees with a diameter greater than 30 cm inside the areas where construction operations are to take place, about 1,650 of which with a diameter between 30 cm and 70 cm, about 200 with a diameter between 70 cm and 100 cm and about 50 cm with a diameter greater than 100 cm. In this regard it must be highlighted that the final list of monumental olive trees, approved by Resolution No. 357/2013 of the Regional Council, does not identify any monumental olive trees within the area affected by the construction operations.
  
  - n. 5 wells .
  
  - n. 3 watershed lines identified in Table 8 “Constitutive and representative elements of the landscape.”

- physical changes to landscape elements arising from the construction of the new roads at specific points along the pipeline route.

- direct changes to the receiving landscape resulting from the introduction of temporary structures and facilities to enable the construction works to take place. These include a main construction site at the end of the pipeline route, where the PRT will be built, and a temporary works site for the construction of the landfall microtunnel at Kp 0 and the completion of hydrotesting activities.

- presence of stationery or moving plants, machinery and vehicles associated with construction activities.
• light impact: for safety reasons, all construction sites will be illuminated at night-time, even if they are not operating.

Considering that:

• the construction phase will be carefully planned in order not to interfere with the tourist season;
• most of the elements that constitute the affected landscape in the agricultural plain area will be restored to their original condition at the end of the construction phase;
• in case of interference with other landscape elements, the need for any restoration measures will be evaluated on a case by case basis with the authorities/owners.
• the soil and all of the vegetation affected will be restored to its original condition at the end of the construction phase;
• the site equipment that will be installed during the construction phase is relatively small in height and therefore it will not significantly change the characteristics of the landscape;
• the area will only be temporarily occupied;
• at the end of this phase, the construction site equipment will be removed and restoration work will begin in the area;
• in terms of the agricultural plain, the main construction site is located in between the towns of Melendugno and Vernole. The worksite will not be visible from either of the inhabited areas mainly due to the presence of trees (especially olive groves);
• throughout the construction phase, the use of lighting equipment in compliance with EU standards and Italian regulations will reduce the light impact at night-time
• in order to reduce the light impact at night, the lighting of the construction sites will be in compliance with the main recommendations stated by the Apulia Region in Regional Law No. 15, dated 23 November 2005, “Urgent measures for the containment of light pollution and saving energy”;

the impact magnitude of the construction phase is considered to be Medium, both for the coastal territory and for the agricultural plain area.

With regard to the coastal territory, by combining the value of the impact magnitude during the construction phase (estimated as Medium) with the landscape sensitivity of the coastal territory, assessed as High, the significance of the impact during the construction phase is classified as Moderate.
With regard to the agricultural plain area, by combining the value of the impact magnitude during the construction phase (estimated as *Medium*) with the landscape sensitivity of the agricultural plain area, assessed as *Medium*, the significance of the impact during the construction phase is classified as *Moderate*.

### 8.4.2.2 Operating Phase

In the operating phase of the coastal territory, the presence of the microtunnel will not have any effect on the landscape, while the Block Valve Station (BVS) in the project, located along the pipeline at Kp 0.100 and consisting of a small electrical substation surrounded by a fence inside a total area of about 13 x 14 m, will occupy an area currently cultivated with olive trees; however considering its reduced dimensions, it will have a minor and localised impact on the landscape.

The main sources of impact on the landscape will be related to the agricultural plain area, particularly near the area from the Pipeline Receiving Terminal (PRT). The onshore pipeline will be underground and the land cover, the vegetation and the dry stone walls will be completely restored once the pipeline is installed. With regard to the presence of other elements that constitute the landscape, the eventual need for restoration measures will be evaluated on a case by case basis with the authorities/owners.

**Figure 8-1 Example of a pipeline after restoration works have been completed**

Source: ERM (October 2011)

In the coastal territory, which was given a sensitivity value of *High*, considering the microtunnel, the portion of the pipeline and the Block Valve Station (BVS) with an overall landscape impact magnitude of *Very small*, the resulting level of significance of the impact is *Low*.
As previously shown, the main sources of impact on the landscape related to the agricultural
plain area and the presence of the Pipeline Receiving Terminal (PRT), which will include a mix of
buildings of greater height and size. Therefore, the impact on the landscape with reference to the
presence of the PRT will be analysed in detail. The following part is a summary of the analysis
results on the impacts of the 3 landscape components being considered (morphologic and
structural component, visual component and symbolic component):

- **Morphological and structural impact**: the new structures of the PRT are located in an area
  where similar installations are not currently located; these could alter the continuity of the
  relationship between historical and cultural elements. However, considering the limited height
  of the buildings of the PRT and the planned mitigation measures that limit the alteration of the
  site’s morphological characteristics, the impact magnitude on the morphologic and structural
  component is considered Medium.

- **Visual impact**: the presence of the PRT will only constitute a visual obstacle just from the
  closest viewpoints to the area (closer than 500 m), while from the other viewpoints, olive trees
  and the forest together with the watershed line, all located east of the area, will hide the
  structures in the project. Therefore, the overall magnitude of the visual impact is classified as
  Medium. Moreover, the PRT, operating 24 hours a day, will also be illuminated at night,
  causing a potential light impact. Considering that the structures of the PRT are relatively low
  (the tallest is about 10 m), which will not be visible from the town of Melendugno and all
  necessary mitigation measures will be taken to reduce the night-time light impact, it is
  confirmed that the magnitude of the visual impact shall be Medium.

**Symbolic impact**: the agricultural plain area is characterised by the presence of historical and
archaeological evidence dating back to ancient settlements in Salento. The project does not
interfere directly with the aforementioned historical and archaeological sites and structures, and
the PRT structures will be only marginally visible from the surrounding areas, since they are
partially hidden by vegetation. In conclusion, the impact magnitude on the symbolic component is
classified as High.
As described above, the PRT’s impact on the landscape is evaluated by comparing the area’s landscape value (the Sensitivity of the agricultural plain area) with the value of the landscape impacts associated to the presence of the PRT (the Impact Magnitude).

The results of this analysis take into account the Sensitivity of the agricultural plain area and the Magnitude of the impact shown in Table 8-6 below. Overall, the Sensitivity of the agricultural plain area is Medium and the Impact Magnitude due to the presence of the PRT is considered Medium.

### Table 8-6 Impact Magnitude Assessment

<table>
<thead>
<tr>
<th>Component</th>
<th>Sensitivity of the agricultural plain area</th>
<th>Impact Magnitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphological and structural</td>
<td>3 – medium</td>
<td>3 – medium</td>
</tr>
<tr>
<td>Visual</td>
<td>3 – medium</td>
<td>3 – medium</td>
</tr>
<tr>
<td>Symbolic</td>
<td>4 – high</td>
<td>4 - high</td>
</tr>
<tr>
<td>Summary assessment</td>
<td>3 – medium</td>
<td>3 – medium</td>
</tr>
</tbody>
</table>

Finally, Table 8-7 below shows the final value of the impact on the landscape.
### Table 8-7  Evaluation of Impact Significance on the Landscape due to the presence of the PRT

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>1 – Very low</th>
<th>2 – Low</th>
<th>3 – Medium</th>
<th>4 – High</th>
<th>5 – Very high</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Very low</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2 – Low</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>3 – Medium</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>4 – High</td>
<td>4</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>5 – Very high</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>

Notes: Green = Not significant impact; Yellow = Minor impact; Orange = Moderate impact; Red = Major impact.

The resulting value of the impact of the PRT on the landscape is 9. Therefore, the impact is classified as Moderate, which means that it is significant but tolerable.

8.4.2.3 Decommissioning

The potential impacts during the decommissioning of the PRT and the BVS are likely to be similar to the impacts during the construction phase.

With reference to the decommissioning of the pipeline, considering that it will remain buried and will only be filled with a suitable material, the resulting landscape impact is considered insignificant.
9 CONCLUSION

In relation to the purpose of this impact assessment, aimed to provide evaluation elements to ensure the compatibility of the project with the constrained areas in compliance with Italian Legislative Decree no. 42/2004 “Cultural Heritage and Landscape Code”, to date the study has revealed the presence of different types of areas and constrained elements within the Study Area:

- Buildings and areas of "significant public interest", Italian Legislative Decree 42/2004 Part III, Art. 136, such as:
  - The groups of buildings that form a characteristic feature of traditional and aesthetic value, comprising the coastal areas and part of the Municipality of Melendugno characterised by green scrub and the presence of ancient monumental ruins (Art. 136(1)(c), and bound by Law no. 1497/39).
  - The groups of buildings that make up a characteristic feature of aesthetic and traditional value, comprising the "Coastal area of Salento in the Municipalities of Lecce - Vernole - Melendugno and Otranto" (Art. 136(1)(c) and bound by Law no. 1497/39).

- Assets protected by law, Art. 142 of Legislative Decree 42/2004, already bound by Law no. 431/85 (Galasso Low), including:
  - Coastal territories up to 300 m from the shore line (Art. 142(1)(a));
  - Surface water (Art. 142(1)(c));
  - Woods (Art. 142(1)(g)).

- Cultural Heritage, Legislative Decree 42/2004 Part II, Art. 10, including:
  - Items of archaeological interest
  - Items of historic interest

With regard to the "Coastal areas and part of the Municipality of Melendugno characterized by green scrub and the presence of ancient monumental ruins" (Art. 136(1)(c), and bound by Law no. 1497/39) which includes a portion of the onshore section of the project, the interference includes:

- the microtunnel construction phase, which will last for nine months, during which an area cultivated with olive trees will be affected; this area will be restored at the end of construction activities; as regards the presence of the landfall microtunnel in the operating phase, interference is not considered because no activity above ground is envisaged;
the Block Valve Station (BVS) (with a total surface area of about 13 x 14 m within which there will be a small electrical substation) bounded by a fence and planned for construction in the same area cultivated with olive trees, affected by the microtunnel construction phase mentioned above;

the construction phase related to the laying of the pipeline in the ground up to Kp 6.4. With regard to this construction phase of pipeline laying, which will last for 6 months, it should be mentioned (this is also valid for the unaffected land from Kp 6.4 to Kp 8.2) that the elements affected, such as stone walls, roads, vegetation, etc., will be recovered and returned to their original condition once the works are complete. With regard to the presence of other elements that make up the landscape, the actual interference will be considered on a case by case basis and any need for restoration will be discussed with the authorities;

The Coastal area of Salento located within the municipalities of Lecce - Vernole - Melendugno and Otranto (Art. 136(1)(c), already bound by Law no. 1497/39 and the subsequent Ministerial Decree of 01/08/1985) will be affected by the Block Valve Station (BVS), the construction phase of the landfall microtunnel, which will last for 6 months, and by the laying of a portion of the pipeline on the ground (from Kp 0 to Kp 1.2), as described above.

The coastal territory up to 300 m from the shore line (Art. 142(1)(a)) will be crossed only by the microtunnel, for which there will be no interference either in the construction or in the operating phase as no works above ground area are planned for this area.

With respect to the two watercourses subject to protection under Legislative Decree no. 42/2004 (Art. 142(1)(c)) that are located over 300 m away from the pipeline route, any interference can be excluded.

The wooded areas (Art. 142(1)(g)), will be crossed only by the microtunnel, therefore there will be no interference either in the construction or in the operating phase.

As has already been identified, the protected cultural heritage (Legislative Decree No. 42/2004 Part II, Art. 10) present in the study area, closer to the project site, consists of:

- the Masseria San Basilio, located about 300 metres from the pipeline route, for which no significant interference will occur;
- Masseria Incioli (sixteenth to eighteenth century), located approximately one kilometre south of the pipeline route along the road that connects S. Foca to Melendugno, for which no significant interference will occur.
- The remains of a rustic villa, a rural settlement from the Hellenistic/Roman period, located about 200 metres south of the pipeline route, for which no significant interference will occur;
- the chapel of San Niceta, located 200 metres south of the pipeline route, for which no significant interference will occur;
the dolmen “Gurgulante”, dating back to the Bronze Age, located near the road from Melendugno to Calimera about 500 m southeast of the PRT site, for which we believe that no significant interference will occur.

With reference to the applicable Region Thematic Territorial Urban Planning “Landscape” (PUTT/p), the extended territorial areas (ATE) and the distinct territorial areas (ATD), identified components and groupings that are subject to protection, in consideration of the characteristics of the proposed works (underground pipeline) and the fact that, once the construction of the pipeline is complete, the morphological conditions and existing vegetation will be restored (except for the area of the PRT, whose planned location, however, falls within ATE "C"), for which we consider that the completion of the pipeline is not contrary to the directions of the PUTT/p.

With regard to the Regional Landscape and Territorial Plan adopted, considering that the Panoramic Road (provincial road no. 366) and the areas classified as dunes, coastal territories, areas subject to hydrogeological constraints and forests will only be crossed by the microtunnel, therefore removing the possibility of any interference as no works will be carried out above ground in this area, and that, throughout the development of the onshore pipeline, the morphological conditions and pre-existing vegetation, it is believed that the project is consistent with the quality objectives laid down in art. 37 of the technical rules for implementation (NTA).

With regard to the PRT, although located at a distance of more than 1.4 kilometres from the protected areas pursuant to Legislative Decree no. 42/2004, for the most part the building heights will not exceed 6 m, with the exception of the boiler room, which will be 8 m high, and the chimneys/vents, which will be 10 m high; the chimneys will be very narrow (about 1 m). Furthermore, camouflaging activities will be carried out, with the creation of terraces and the planting of native plant species along the perimeter of the area that will help to mitigate interference with the reference landscape.

In addition, although construction activities do not interfere with any tree included in the regional list of “monumental olive trees” (approved by the Regional Council with resolution n. 357 of 7 March 2013), there are olive trees of significant age and size along the working strip. TAP AG commits to restore the condition of the land to the ante-operam status through the reinstatement of the olive groves. Upon request of the landowner, and in agreement with the relevant authorities, alternative compensation measures could apply.

Therefore, based on the results of this impact assessment, the landscape in question, characterized by scenic qualities and distinctive natural and anthropic elements and considering the mitigation measures to be implemented during the construction phase and works in relation to the PRT, can absorb the changes brought about by the project activities without incurring a significant decrease in quality.
Appendix 1
Municipality of Castri di Lecce

Municipality of Vernole

Municipality of Melendugno

Coordinate System: WGS 1984 UTM Zone 34N
Source Reference Map: Regional Technical Map (CTR - 1:5000 - SIT Puglia Region)

The Legend is on a separate sheet

Environmental Resources Management

Map 1 - Chorography

DIMENSIONE ORIGINALE A3

Source Reference Map: Regional Technical Map (CTR - 1:5000 - SIT Puglia Region)
LEGEND

PROJECT COMPONENTS
- BASE CASE ROUTE
- PIPELINE RECEIVING TERMINAL
- BLOCKVALVE
- WORK SITE
- MICRO TUNNEL

STUDY AREA
- 2 km CORRIDOR

NATIONAL CONSTRAINT
- COASTAL AND TERRITORIAL AREA OF MELENDUGNO AND VERNOLE (D.Lgs 42/2004, Art.136, par.1, letter c) and L.1497/39)
- COASTAL AREAS WITHIN 300m FROM THE SHORELINE (D.Lgs 42/2004, Art. 142, par.1, letter a) and L.431/85)
- CONSTRAINT DM 01/08/1985 (Vernole DM 31/08/70 - Melendugno 01/12/70)
- HYDROGEOLOGIC CONSTRAINT (R.D.3267/23)
- WATER COURSE RESPECT ZONE (300m Corridor) (D.Lgs 42/2004 Art.142, par.1, letter c) and L.431/85)

BASE AUTHORITY
- HIGH GEOMORPHOLOGICAL HAZARD - P.G. 2 (Art. 14, PAI)
- VERY HIGH GEOMORPHOLOGICAL HAZARD - P.G.3 (Art. 13, PAI)
- DUNE
- DOWNSTREAM AREA OF ENDOREICH BASIN
- ENDOREICH AREA (UNDER INVESTIGATION BY BASE AUTHORITY)
- (Art. 6, PAI) RIVER BED IN ACTIVE MODELING AND FLOOD PLAINS

HYDROLOGY
- (Art. 10, PAI) DITCH
- WATERSHED

BATHYMETRY
- BATHYMETRIC LINE (SIT PUGLIA REGION)

REGIONAL LANDSCAPE PLAN (P.I.T.T/p)
- ACTIVE QUARRY
- ABANDONED QUARRY
- WOODLAND (D. Lgs. 42/04 - Art.142, par.1, letter g) and L.431/85)
- WOODLAND ADJACENT AREA
- ARCHAEOLOGICAL CONSTRAINT
- ARCHAEOLOGICAL EVIDENCE

TRANS ADRIATIC PIPELINE

DESCRIPTION
- TRANS ADRIATIC PIPELINE
- ENVIRONMENTAL RESOURCES MANAGEMENT

DOCUMENT TITLE
- Map 3 - Constraints Map

Map 3 - Constraints Map
- Sheet 3 of 3
- Scale: 1:15,000
- Sheet No.
- Document No.
- Disciplines Code
- Originating Company
- Document Originator
- Document Approver
- Document Drafter
- Document Digitaliser
- Document Submission Date
- Document Issue Date
- Document Revision

Turid Thormodsen
Simone Poli
Elisabeth Schmidt

Trans Adriatic Pipeline

GIS - File No.
Annex8_Map3_legenda.mxd

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LEGEND

PROJECT COMPONENTS
- BASE CASE ROUTE
- PIPELINE RECEIVING TERMINAL
- MICROTUNNEL
- STUDY AREA
- LANDSCAPE STUDY AREA
- AREAS OF ECOLOGICAL INTEREST
- ZPS (SPECIAL PROTECTION ZONE)
- IBA (IMPORTANT BIRD AREA)
- SIC (SITE OF COMMUNITY IMPORTANCE)
- ADMINISTRATIVE BOUNDARY
- MUNICIPALITY

Map 4 - Protected Areas

Sheet km km
1 0+000 8+200

Scale: 1:40,000

DOCUMENT TITLE
Map 4 - Protected Areas

PROJECT TITLE
TRANS ADRIATIC PIPELINE

ENVIRONMENTAL RESOURCES MANAGEMENT

Trans Adriatic Pipeline

Enrique Padrón

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Issued for Implementation
10-09-2013

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Simone Poli

ERM

Turid Thormodsen

Elisabeth Schmidt

Company Representative

Company Reference

Engineer Representative

Document Originator

A3
Municipality of Vernole

Municipality of Melendugno

Coordinate System: WGS 1984 UTM Zone 34N

Source Reference Map: Regional Technical Map (CTR - 1:5000 - SIT Puglia Region)
Map 6 - Satellite Images Overview

Coordinate System: WGS 1984 UTM Zone 34N

Source Reference Map: © ESRI Basemap

The Legend is on a separate sheet
POINT 1: Direction NE to PRT

POINT 2: Direction NE to PRT

POINT 3: Direction N-NE to PRT

POINT 4: Direction N-NE to PRT

POINT 5: Direction S-SO to Compressors Area

POINT 6: Direction O-SO to Compressors Area

The Legend is on a separate sheet
Coordinate System: WGS 1984 UTM Zone 34N

Source Reference Map: Regional Technical Map (CTR 1:5,000 - SIT Puglia Region)
Appendix 2
Contents
1. Foreword ............................................................................................................................................... 2
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3. Geographical area .............................................................................................................................. 7
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9. Overall vulnerability of the area and proposed works ................................................................. 34
10. Type of works and photo simulations ........................................................................................ 36
11. List of acronyms ........................................................................................................................... 47
1. Foreword

This technical report accompanies the mitigation landscaping project to be implemented within the scope of the works for the construction of the "TAP - Trans Adriatic Pipeline", that is, the construction of the system that will transport the natural gas extracted in the Caspian Sea region, through Greece and Albania to the coasts of Italy and, through the connection with the existing SNAM Rete Gas network, to its points of use in Western and South-eastern Europe. The aim of the project is to guarantee the reliability and diversification of the gas supplies for the European markets.

The project consists of the construction of a subsea pipeline (off-shore pipeline) to connect the gas compression station situated on the Albanian coast to the gas terminal situated on the Italian coast.

The area covered by the project is the area between the coast where the landfall point will be positioned, the route of the underground gas pipeline and the area, situated about 8.5 km from the coast, in which the Pipeline Receiving Terminal (PRT) will be built. For further details see the specialist project reports.

From the geographical point of view, the site under study is situated in the south-eastern part of Puglia, in the Province of Lecce, to be precise in the municipal district of Melendugno near the border with that of Vernole (cf. diagrams showing the characteristics of the territory and of the urban areas).

With regard to the restriction system of the area concerned by the installation, it is pointed out that the Pipeline Receiving Terminal does not lie in any areas protected by Legislative decree no. 42/2004 ("Cultural Heritage and Landscape Code") and subsequent amendments.

In general, the role of landscape planning is to manage the territorial transformation processes and, consequently, to identify the fundamental features of the territory with a view to establishing possible compatibilities between development and conservation. The analysis of historical, cultural, environmental and visual aspects therefore plays an extremely important role in the territorial planning process, as does the identification of the environmental resources involved and the aesthetic values to which the policies of the plans should refer.
In particular, the purpose of this study is to analyse the formal, environmental, aesthetic and visual as well as historical and cultural aspects of the existing landscape, assess the relationships between it and the new constructions and, finally, identify the mitigation measures most capable of improving the visual and, more generally, sensory aspects of the places that contribute to the recognition of environmental quality as a component of wellbeing.

In order to serve as a useful tool for ensuring the environmental compatibility of the works, this study is oriented towards the achievement of the following objectives:

• to safeguard the formal subdivision of the territory in relation to the significant elements that can be read on the basis of categories of interpretation such as spatial form, intervisibility, panorama, surfaces and communication;
• to provide support for the design process;
• to help operators and designers to optimize the cost/result ratio through a project elaboration process capable of combining elements such as design, composition, technology, history, botanical, agricultural and economic aspects, etc.;
• to provide project drawings that ensure a clear interpretation and assessment of all impacts on the landscape.

The overall aim is to be able to consider the works "moderately well integrated" not only on the territorial scale and, thus in respect of the customary restrictions as already studied in the "ESIA", but also on a more local "agricultural landscape” scale, certainly more sensitive to detailed environmental, orographic and landscape indicators of the area and, ultimately, to the latest codes of landscape integration, simulating nature, its morphology and its colours.
2. Principal characteristics of the works

The term "Southern Gas Corridor" is generally used by the European Commission to refer to the projects for the construction of infrastructure for transporting gas from the Caspian Sea and Middle East regions towards Europe, with a view to improving the reliability of the European energy supplies ("European Union Communication on energy infrastructure priorities for 2020 and beyond" – 17th November 2010).

![Diagram of the transnational natural gas pipeline network](source: www.trans-adiatic-pipeline.cam)

The project proposed by the company "TAP - Trans Adriatic Pipeline", a joint venture set up with the mission of designing, developing and constructing the TAP natural gas pipeline, was officially selected on 28th June 2013 by the Shah Deniz Consortium, the company that owns the gas fields in Azerbaijan.

In short and in general terms, in addition to the construction of an underground gas pipeline crossing Greece and Albania, it consists of the construction of a subsea pipeline that will cross the channel of Otranto and, having reached the Italian coast in the municipal district of Melendugno (LE), an underground pipeline about 8.5 km long and a Pipeline Receiving Terminal connected directly to the existing SNAM Rete Gas network.
The infrastructure to be constructed in the municipality of Melendugno will consist of:

- subsea (off-shore) pipeline in a microtunnel;
- landfall point situated on the coast between Torre Specchia Ruggeri (to the North) and San Foca (to the South);
- underground (on-shore) pipeline running from East to West from the landfall point to the Pipeline Receiving Terminal (PRT);
- Block Valve Station (BVS) near the landfall point but not in a protected area;
- Pipeline Receiving Terminal (PRT) where the infrastructure for measuring and controlling the gas and connecting to the existing national SNAM Rete Gas network will be located.

The latter, in particular, will run across a surface of about 12 hectares of land on which offices and rooms for housing the technical instruments for measuring and controlling the gas and emergency and security facilities will be built.
STUDIO TECNICO
with: esse ingegneria s.r.l.

TAP - Trans Adriatic Pipeline

OGGETTO / SUBJECT

CLIENTE / CUSTOMER

Descriptive and technical report

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3. Geographical area

The area under study, which will house the gas pipeline terminal is situated west of the village of Melendugno, near the border with the municipal district of Vernole, about 8.5 km from the Adriatic as the crow flies.

The area, situated at an altitude of nearly 40 m a.s.l., has quite regular orographic features, characterized by gradual differences in level which, according to the topographic survey conducted, reach 8-9 m over a distance of about 2 km, in both the longitudinal and transverse directions.

At present, the surrounding agricultural area is cultivated with olive groves (the groves with a regular layout are made up of younger trees while those with an irregular layout have older trees); there are also some areas of Mediterranean scrub (of a limited size) where eucalyptus, Mediterranean pines and holm oaks have been identified.
The area under study, identified for the future installation of the plant is not cultivated and is free of trees though there are some natural shrubs belonging to the typical species of Mediterranean scrub (myrtle, lentisk, wild fennel, wild olive, rosemary).

From the centre of Melendugno the area may be accessed by heading westwards from Provincial Road no. 29 (which connects Melendugno to Calimera) and from secondary municipal roads (via Vecchia Vernole to the north and municipal road Castri-Melendugno to the south).
4. Examination of restrictions

The detailed analysis of the thematic maps, both those available on the SIT site of the Apulia Region, and those that can be viewed on the site of the Basin Authority and the local town-planning documents of the municipality of Melendugno, paved the way for a correct interpretation of the project strategies. In fact, it permitted in-depth screening to identify the restrictions and scopes of the project with a view to developing a design process as close as possible to the community. On the thematic maps attached to this report, the area covered by the project has been put into relation with the restrictions laid down in both the P.U.T.T./P. and the PAI.

From the territorial point of view, on the basis of the classifications made in the P.U.T.T./P., the area lies in the Extended Territorial Area (ATE) with value "C", that is, "where several constituent assets are present with or without existing restrictions". For these areas, the protective strategies laid down in Art. 2.02 of the Technical Rules for Implementation consist of "the safeguarding and enhancement of the current condition if qualified; the transformation of the current condition, if jeopardized, for restoration and further qualification; transformation of the current condition that is compatible with landscape qualification".

Extract of the P.U.T.T./P. — Restrictions on animals
source: http://www.sit.puglia.it
The "dog training area " restriction, indicated in the figure shown above, whose institution rules are laid down in the Regional Hunting Plan, does not represent a limit for the construction of the PRT as this restriction was revoked following REGIONAL COUNCIL DECISION no. 2232 of 19th October 2010.

Repeated investigations in situ revealed the presence of a large number of rural buildings, called "pagghiare", small shelters with dry stone walls, scattered across the agricultural landscape of Salento.

Even though the thematic maps do not expressly indicate a direct restriction on this type of rural architecture, the "pagghiare", in any case, represent a widespread asset of the rural territory protected as laid down in art. 3.14 of the Technical Rules for Implementation of the P.U.T.T./p in force.

There are no direct restrictions on the area under examination from the hydrogeomorphological point of view either.

In relation to the forms and elements associated with surface hydrographic features, we report the presence of an endorheic basin in an area to the south of the work site but, in any case, outside it and covering an area of just under one hectare.
From the town-planning point of view, the area covered by the project is situated in a zone standardized by the municipal town plan in force (approved through Acting commissioner decision no. 1 of 3rd February 1995 and subsequently approved with specifications and conditions through decision no. 105 of the Apulia Regional Council of 13th February 2001) as "ZONE E1 - Farmland".
5. Topographical survey

In order to determine the actual orographic and morphologic features of the area under study, the area of analysis was extended to a radius of 1 km and a "topographical survey with a georeferenced GPS system" was conducted in situ, making several inspections. This system guarantees centimetric precision through the use of instruments with dual-frequency phase receivers.

Topographical survey: overlaid with extract of aerial photograph

source: esse ingegneria archive
An analysis of the results enabled the lie of the land to be determined accurately. As regards altitude, the area is quite flat. The principal differences in altitude were found in the Northwest – Southeast direction with a difference in level of about 4 m over a distance of 0.95 km. and in the East-West direction with a difference in level of about 8 m over a distance of 0.75 km.

In these directions, we identified and checked the critical viewpoints from which the future PRT will be most visible and thus have its main visual impacts (see both the diagrams attached to this report and the section entitled "Sensitive routes and local environmental components").

Critical view 1 bis – Panoramic view
source: Arch. Fragasso I esse ingegneria archive

Critical view 3 bis – Panoramic view
source: Arch. Fragasso I esse ingegneria archive
6. Examination of the principal tree and shrub species

The repeated inspections enabled us to identify both the natural plants and those planted by man (trees, vegetable and sowed crops, etc.). The rural landscape examined is characterized by a marked prevalence of olive groves, often in the form of a single crop, with both high and low-density planting, associated with some arable land. These crops combine perfectly with an almost tabular morphology that enhances their extension. Along the thick network of dry stone walls that mark the boundaries between farms there are often bordering species (fruit trees such as the Indian fig) or natural vegetation (for example, wild olives, bay trees, blackberry brambles, lentisk hedges, etc.).

The presence of the olive groves that almost entirely surround the work site together with that of tall trees (eucalypti along the farm road or in small areas of woodland) form a thick barrier that does not allow a free or direct view of the future plant.

Where vegetation is not present, near the boundary to the south (view 3 bis) or the farm road along the ridge to the northeast (view 1 bis), there is no shielding effect, which makes it indispensable to take the mitigation landscaping measures described in the following sections and illustrated in the documents attached.

Olive groves and bordering natural vegetation

source: Arch. Fragasso 1 esse ingegneria archive

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SIGLA-TAG REV DESCRIPTION - DESCRIPTION 02/08/13 14 46
7. **Examination of the existing types of buildings and related boundary roads**

The analysis of the restriction maps and the direct examination of the existing types of buildings confirmed the lack of buildings with direct protective restrictions both in the area concerned by the project and in the surrounding areas. It is situated about 2.0 km. from the villages of Melendugno and Vernole. The rural landscape between the two villages is characterized by a marked reduction in settlements and few buildings scattered here and there, which are common features of the countryside around villages in the province of Lecce.

The urban expansion process in progress along the main roads leading to the villages may be said to be characterized by a lack of relations with the open spaces and surrounding countryside which, on the whole, jeopardizes the visual relations between the village itself and the countryside, and by low-quality buildings. In fact, at a distance of about 1 km east of the work site, the buildings consist of houses with one or two floors, with a proliferation of high boundaries made of various materials that constitute authentic artificial visual barriers towards the surrounding agricultural landscape, in complete antithesis to the thick network of dry stone walls dotted across the surrounding rural territory.

---

*Masseria Capitano*

source: Arch. Fragasso I esse ingegneria archive
Paghiara
source: Arch. Fragasso I esse ingegneria archive

Rural building
source: Arch. Fragasso I esse ingegneria archive
<table>
<thead>
<tr>
<th>COORDINATE GEOGRAFICHE</th>
<th>LATITUDINE LATITUDE</th>
<th>LONGITUDINE LONGITUDE</th>
</tr>
</thead>
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<tr>
<td>GEOGRAPHIC COORDINATES</td>
<td>40°16'26&quot;N</td>
<td>18°19'28&quot;E</td>
</tr>
<tr>
<td>DISTANZA DAL SITO DI INTERVENTO</td>
<td>590 m</td>
<td></td>
</tr>
<tr>
<td>DISTANCE FROM SITE OF INTERVENTION</td>
<td>590 m</td>
<td></td>
</tr>
<tr>
<td>COMUNE DISTRICT</td>
<td>Melendugno</td>
<td></td>
</tr>
<tr>
<td>PREGIO ARCHITETTONICO ARCHITECTURAL MERIT</td>
<td>edificio di recente costruzione recent building</td>
<td></td>
</tr>
<tr>
<td>STATO CONSERVATIVO CONDITIONS</td>
<td>buono good</td>
<td></td>
</tr>
</tbody>
</table>

Examination of types of buildings — typical sheet
source: Arch. Fragasso 1 esse ingegneria archive
8. Sensitive routes and local environmental components

The sensitive routes and related impacts were studied by drawing six radial sections and assessing the views across a radius of 1 km and a radius of 500 m so as to determine the potential alterations generated by the future gas pipeline terminal.

The radial sections unequivocally demonstrated that the existence of the olive groves with trees planted with both a high and a low density reduce the visual impact in most directions considerably.

The morphology of the land, with differences in altitude limited to 6-8 mt over a distance of 1 km, ensure a "visual absorption" of the future works without interfering with the visual quality of the agricultural landscape.

The analysis of the views shown below, each accompanied by a short assessment of its visual quality (visual works), vulnerability (mitigation works at boundary) and existing natural mitigation (ability to visually absorb the alterations without reducing quality) reveal critical problems in two cases only.

The amount of artificial light at night around the area concerned by the project was also checked.

As there are few buildings in the area and the roads are municipal and/or farm roads, the amount of light was almost null and limited to the building situated to the east of the work site on the via Vecchia Vernole road.

Consequently, in planning the mitigation measures to be taken, this aspect was assessed with a view to avoiding major impacts and adopting solutions with a low total amount of light (see the paragraphs that follow).
<table>
<thead>
<tr>
<th>Viewpoint number</th>
<th>1</th>
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</thead>
<tbody>
<tr>
<td>geographical coordinates</td>
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</tr>
<tr>
<td></td>
<td>longitude 18°19′25″E</td>
</tr>
<tr>
<td>altitude (m. a.s.l.) of the target position</td>
<td>37 mt</td>
</tr>
<tr>
<td>visual works</td>
<td>low, East side</td>
</tr>
<tr>
<td>mitigation works at boundary</td>
<td>none</td>
</tr>
<tr>
<td>existing natural mitigation</td>
<td>good</td>
</tr>
</tbody>
</table>

The vegetation present and, in particular, the orographic features of the land eliminates the critical views of the work site.
Viewpoint number 1 bis

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>geographical coordinates</td>
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</tr>
<tr>
<td>latitude</td>
<td>40°16.24&quot;N</td>
</tr>
<tr>
<td>longitude</td>
<td>18°19.17&quot;E</td>
</tr>
<tr>
<td>altitude (m. a.s.l.) of the target position</td>
<td>43 mt</td>
</tr>
<tr>
<td>visual works</td>
<td>high</td>
</tr>
<tr>
<td>mitigation works at boundary</td>
<td>medium</td>
</tr>
<tr>
<td>existing natural mitigation</td>
<td>poor in parts</td>
</tr>
</tbody>
</table>

The shielding effect of the existing eucalyptus wood helps to mitigate the perception of the works but does not completely eliminate the visual effects on the area.
### Viewpoint number 2

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<th>Description</th>
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<tr>
<td>Geographical coordinates</td>
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</tr>
<tr>
<td>Latitude</td>
<td>40°16'7&quot;N</td>
</tr>
<tr>
<td>Longitude</td>
<td>18°19'15&quot;E</td>
</tr>
<tr>
<td>Altitude (m. a.s.l.) of the target position</td>
<td>40 mt</td>
</tr>
<tr>
<td>Visual works</td>
<td>none</td>
</tr>
<tr>
<td>Mitigation works at boundary</td>
<td>none</td>
</tr>
<tr>
<td>Existing natural mitigation</td>
<td>good</td>
</tr>
</tbody>
</table>

**Viewpoint 2 - Panoramic photo**

Source: Arch. Fragasso 1 esse ingegneria archive

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**Descriptive technical report**

<table>
<thead>
<tr>
<th>02/08/13</th>
<th>0</th>
<th>Descriptive technical report</th>
<th>Data-Date</th>
<th>Pag.</th>
<th>TOT.</th>
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<td>REV</td>
<td>DESCRIPTION - DESCRIPTION</td>
<td>02/08/13</td>
<td>21</td>
<td>46</td>
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</table>
The agricultural land surrounding the study area is cultivated with olive trees. There are also a few fruit trees near rural buildings that are inhabited seasonally or continuously. The thick vegetation does not permit a direct view of the area from the point indicated where the photograph was taken.

<table>
<thead>
<tr>
<th>Viewpoint number</th>
<th>2 bis</th>
</tr>
</thead>
<tbody>
<tr>
<td>geographical coordinates</td>
<td>latitude 40°16 10&quot;N&lt;br&gt;longitude 18°19 4&quot;E</td>
</tr>
<tr>
<td>altitude (m. a.s.l.) of the target position</td>
<td>39 mt</td>
</tr>
<tr>
<td>visual works</td>
<td>none</td>
</tr>
<tr>
<td>mitigation works at boundary</td>
<td>none</td>
</tr>
<tr>
<td>existing natural mitigation</td>
<td>good</td>
</tr>
</tbody>
</table>

Viewpoint 2 bis - Panoramic photo
source: Arch. Fragasso 1 esse ingegneria archive
The existing vegetation, which consists mainly of olive trees, provides a natural visual mitigation of the work site, without any impacts on the views.

<table>
<thead>
<tr>
<th>Viewpoint number</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td>geographical coordinates</td>
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</tr>
<tr>
<td>latitude</td>
<td>40°16 1”N</td>
</tr>
<tr>
<td>longitude</td>
<td>18°18 50”E</td>
</tr>
<tr>
<td>altitude (m. a.s.l.) of the target position</td>
<td>40 mt</td>
</tr>
<tr>
<td>visual works</td>
<td>none</td>
</tr>
<tr>
<td>mitigation works at boundary</td>
<td>none</td>
</tr>
<tr>
<td>existing natural mitigation</td>
<td>good</td>
</tr>
</tbody>
</table>

Viewpoint 3 - Panoramic photo
source: Arch. Fragasso I esse ingegneria archive
The anthropized landscape is not characterized by typical elements or elements associated with the local culture. The view is not critical as there is no free, direct view of the area.

<table>
<thead>
<tr>
<th>Viewpoint number</th>
<th>3 bis</th>
</tr>
</thead>
<tbody>
<tr>
<td>geographical coordinates</td>
<td>latitude</td>
</tr>
<tr>
<td></td>
<td>longitude</td>
</tr>
<tr>
<td>altitude (m. a.s.l.) of the target position</td>
<td>38 mt</td>
</tr>
<tr>
<td>visual works</td>
<td>high</td>
</tr>
<tr>
<td>mitigation works at boundary</td>
<td>high</td>
</tr>
<tr>
<td>existing natural mitigation</td>
<td>poor</td>
</tr>
</tbody>
</table>

Viewpoint 3 bis - Panoramic photo
source: Arch. Fragasso | esse ingegneria archive
The view examined near the work site had no vegetation to shield it and consequently there are clear views of the work site.

<table>
<thead>
<tr>
<th>Viewpoint number</th>
<th>4 - 4 bis</th>
</tr>
</thead>
<tbody>
<tr>
<td>geographical coordinates</td>
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</tr>
<tr>
<td></td>
<td>longitude 18°18.25&quot;E</td>
</tr>
<tr>
<td>altitude (m. a.s.l.) of the target position</td>
<td>39 mt</td>
</tr>
<tr>
<td>visual works</td>
<td>none</td>
</tr>
<tr>
<td>mitigation works at boundary</td>
<td>none</td>
</tr>
<tr>
<td>existing natural mitigation</td>
<td>good</td>
</tr>
</tbody>
</table>

Viewpoint 4-4bis - Panoramic photo
source: Arch. Fragasso I esse ingegneria archive
The view examined was not found to be critical as there is no clear view of the work site, due to the presence of thick vegetation that forms an effective natural visual barrier. We report the presence of “bordering” vegetation made up of bramble and cacti (Indian figs).

<table>
<thead>
<tr>
<th>Viewpoint number</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>geographical coordinates</td>
<td></td>
</tr>
<tr>
<td>latitude</td>
<td>40°16'25&quot;N</td>
</tr>
<tr>
<td>longitude</td>
<td>18°18'12&quot;E</td>
</tr>
<tr>
<td>altitude (m. a.s.l.) of the target position</td>
<td>36 mt</td>
</tr>
<tr>
<td>visual works</td>
<td>none</td>
</tr>
<tr>
<td>mitigation works at boundary</td>
<td>none</td>
</tr>
<tr>
<td>existing natural mitigation</td>
<td>good</td>
</tr>
</tbody>
</table>

Viewpoint 5 - Panoramic photo
source: Arch. Fragasso I esse ingegneria archive

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The existing vegetation, even though not densely planted, at a distance of about 1 Km, does not allow a clear view of the work site as it forms a natural visual barrier.

<table>
<thead>
<tr>
<th>Viewpoint number</th>
<th>5 bis</th>
</tr>
</thead>
<tbody>
<tr>
<td>geographical coordinates</td>
<td></td>
</tr>
<tr>
<td></td>
<td>latitude 40°16 30&quot;N</td>
</tr>
<tr>
<td></td>
<td>longitude 18°18 37&quot;E</td>
</tr>
<tr>
<td>altitude (m. a.s.l.) of the target position</td>
<td>39 mt</td>
</tr>
<tr>
<td>visual works</td>
<td>none</td>
</tr>
<tr>
<td>mitigation works at boundary</td>
<td>none</td>
</tr>
<tr>
<td>existing natural mitigation</td>
<td>good</td>
</tr>
</tbody>
</table>
Although the vegetation here is less thick, it still does not allow a clear view of the work site. The patterns of dry stone walls can be seen clearly both along the existing municipal roads and around each farm.

<table>
<thead>
<tr>
<th>Viewpoint number</th>
<th>6 - 6 bis</th>
</tr>
</thead>
<tbody>
<tr>
<td>geographical coordinates</td>
<td>latitude 40°16.50°N</td>
</tr>
<tr>
<td></td>
<td>longitude 18°18.30°E</td>
</tr>
<tr>
<td>altitude (m. a.s.l.) of the target position</td>
<td>38 mt</td>
</tr>
<tr>
<td>visual works</td>
<td>none</td>
</tr>
<tr>
<td>mitigation works at boundary</td>
<td>none</td>
</tr>
<tr>
<td>existing natural mitigation</td>
<td>good</td>
</tr>
</tbody>
</table>

Viewpoint 6 bis - Panoramic photo

source: Arch. Fragasso l esse ingegneria archive

Viewpoint 6 bis - Panoramic photo

source: Arch. Fragasso l esse ingegneria archive
Although the existing vegetation here is less thick, it helps to naturally shield the view of the work site. The view shows the typical “bordering” vegetation made up of brambles.

<table>
<thead>
<tr>
<th>Viewpoint number</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>geographical coordinates</td>
<td>latitude 40°16'54&quot;N</td>
</tr>
<tr>
<td></td>
<td>longitude 18°18'49&quot;E</td>
</tr>
<tr>
<td>altitude (m. a.s.l.) of the target position</td>
<td>44 mt</td>
</tr>
<tr>
<td>visual works</td>
<td>none</td>
</tr>
<tr>
<td>mitigation works at boundary</td>
<td>none</td>
</tr>
<tr>
<td>existing natural mitigation</td>
<td>good</td>
</tr>
</tbody>
</table>

Viewpoint 7 - Panoramic photo

source: Arch. Fragasso 1 esse ingegneria archive
Although the existing vegetation is not densely planted, it helps to naturally shield the view of the work site.

<table>
<thead>
<tr>
<th>Viewpoint number</th>
<th>7 bis</th>
</tr>
</thead>
<tbody>
<tr>
<td>geographical coordinates</td>
<td>latitude 40°16'45&quot;N</td>
</tr>
<tr>
<td></td>
<td>longitude 18°18'54&quot;E</td>
</tr>
<tr>
<td>altitude (m. a.s.l.) of the target position</td>
<td>43 mt</td>
</tr>
<tr>
<td>visual works</td>
<td>medium</td>
</tr>
<tr>
<td>mitigation works at boundary</td>
<td>medium</td>
</tr>
<tr>
<td>existing natural mitigation</td>
<td>medium</td>
</tr>
</tbody>
</table>

Viewpoint 7 bis - Panoramic photo
source: Arch. Fragasso | esse ingegneria archive

Table: Viewpoint 7 bis - Panoramic photo

<table>
<thead>
<tr>
<th>Viewpoint number</th>
<th>7 bis</th>
</tr>
</thead>
<tbody>
<tr>
<td>geographical coordinates</td>
<td>latitude 40°16'45&quot;N</td>
</tr>
<tr>
<td></td>
<td>longitude 18°18'54&quot;E</td>
</tr>
<tr>
<td>altitude (m. a.s.l.) of the target position</td>
<td>43 mt</td>
</tr>
<tr>
<td>visual works</td>
<td>medium</td>
</tr>
<tr>
<td>mitigation works at boundary</td>
<td>medium</td>
</tr>
<tr>
<td>existing natural mitigation</td>
<td>medium</td>
</tr>
</tbody>
</table>
The viewpoint is close to the work site. The existing vegetation is not densely planted and does not entirely shield the view of the work site.

<table>
<thead>
<tr>
<th>Viewpoint number</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>geographical coordinates</td>
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</tr>
<tr>
<td></td>
<td>longitude 18°19 13&quot;E</td>
</tr>
<tr>
<td>altitude (m. a.s.l.) of the target position</td>
<td>43 mt</td>
</tr>
<tr>
<td>visual works</td>
<td>none</td>
</tr>
<tr>
<td>mitigation works at boundary</td>
<td>none</td>
</tr>
<tr>
<td>existing natural mitigation</td>
<td>good</td>
</tr>
</tbody>
</table>

Viewpoint 8 - Panoramic photo

source: Arch. Fragasso I esse ingegneria archive
Although the existing vegetation, made up mainly of olive trees, is not densely planted it still naturally shields the view of the work site.

<table>
<thead>
<tr>
<th>Viewpoint number</th>
<th>8 bis</th>
</tr>
</thead>
<tbody>
<tr>
<td>geographical coordinates</td>
<td></td>
</tr>
<tr>
<td>latitude</td>
<td>40°16 39&quot;N</td>
</tr>
<tr>
<td>longitude</td>
<td>18°19 11&quot;E</td>
</tr>
<tr>
<td>altitude (m. a.s.l.) of the target position</td>
<td>46 mt</td>
</tr>
<tr>
<td>visual works</td>
<td>none</td>
</tr>
<tr>
<td>mitigation works at boundary</td>
<td>none</td>
</tr>
<tr>
<td>existing natural mitigation</td>
<td>good</td>
</tr>
</tbody>
</table>

Viewpoint 8 bis - Panoramic photo
source: Arch. Fragasso I esse ingegneria archive

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The existing vegetation, made up mainly of olive groves, naturally shields for the view of the work site. The picture shows the tamped earth roads between farms.
9. Overall vulnerability of the area and proposed works

The analysis and processing of the data collected in situ and the study of the project proposed by the company TAP with its layout of the terminal enabled the study to be focused even more closely on the relations between the constructions planned, the materials, the technologies to be used and the surrounding area.

The study was therefore not limited to determining the visual impacts from ground level but also included an examination of the overhead views with the specific aim of blending the work into its surroundings, which consist of a rich mosaic of farmland, so that the landscape under transformation does not clash with the existing landscape.

On the basis of the aforesaid objectives, the following project guidelines (illustrated at various meetings between the engineers, the authorities and representatives of the proposing companies) were identified:

- **Reduction of daytime and night-time overhead visual impacts:**
  - colour and material camouflage of the areas not paved or covered by vegetation;
  - reduction of light pollution created by artificial light and assessment and control of light indices towards the outside environment;
  - elimination of reflective surfaces (e.g. photovoltaic roofing system) even if provided for by the legislation in force;
  - colour camouflage of road surfaces;
  - irregular, natural-looking planting.

- **Reduction of planimetric and altimetric visual impacts (daytime and night-time):**
  - reduction of the height of the new constructions;
  - mitigation of critical views with shielding vegetation;
  - blending of the site boundaries into their surroundings;
**Pipeline Receiving Terminal - Melendugno (LE)**

**STUDIO TECNICO ARCH. GIUSEPPE FRAG ASSO con: esse ingegneria s.r.l.**

**TAP - Trans Adriatic Pipeline Pipeline Receiving Terminal - Melendugno (LE)**

**Interventi di mitigazione paesaggistica - Landscaping Mitigation Measures**

**e.on**

- blending of the new security fences into their natural surroundings;
- use of finishing materials of the surfaces typical of rural architecture;
- colour camouflage of the technological elements of the plant (horizontal pipes, cold vent stacks, safety valves, etc.);
- use of native tree and shrub species;
- assessment and control of light indices towards the outside environment.

**Protection of existing elements:**

- conservation of the "pagghiara" situated in the area covered by the project in relation with the constructions;
- recovery of the existing farm roads;
- safeguarding of the limited number of existing trees removed in order to execute the works and their replanting.
10. Type of works and photo simulations

In conformance with the guidelines identified and described in the previous section, the proposed works include a series of mitigation measures that will not entail making evident changes to the consolidated landscape and its perception and that will reduce the visual impacts both at a height and on ground level.

**Colour and material camouflage**

The area around the two cold vent stacks, equivalent to 60% of the entire work site, is identified as a "sterile area". For technical and safety reasons, no trees or shrubs may be planted in this area within a radius of 90 m from each vent stack. As this concerns an area of almost 7 hectares, the measures proposed to mitigate the overhead view found was to deposit on it a layer of assorted crushed stone taken from quarries in the area, distributing it in a non-uniform way so as to create an irregular pattern, using various colours resembling those of the tuff topsoils present in the province of Lecce.

Detail of mitigation of the sterile area
source: Arch. Fragasso 1 esse ingegneria archive
Reduction of the light impact

The work site currently presents virtually no night-time light pollution at all. The construction of the gas pipeline terminal includes the installation of a lighting system that ensures an excellent level of security and a constant control of the operating area. With a view to attenuating and limiting the amount of light pollution, the project adopts lighting with an indirect downward beam and low-energy consumption for the roads. For the pathways, the proposal consists of hooded side lighting that serves the specific purpose of marking the way; again to mitigate the visual impact, pole lighting is only used in areas where strictly necessary while, in the remaining areas, the lights will be applied directly to the buildings to be constructed.

Elimination of reflective surfaces

In order to reduce the impacts on the overhead views (commonly used when navigating with a web browser) “green roofs” will be installed so as to mitigate the effects of these horizontal surfaces. They will be applied exclusively in the office area, while the remaining stone surfaces will be of a colour similar to green so that they fit well into the overhead setting. These solutions will be adopted instead of installing photovoltaic panels, as laid down by the legislation in force.

STRATIGRAPHY:
1. Support
2. INDEVER or ECOVER primer
3. Steam barrier PROMINENT or TECTENE BV STRIP - SELFTENE BV BIADHESIVE
4. Thermal insulation
5. FLEXTER TESTUDO SPUNBOUND POLYESTER
6. DEFEND ROOT-RESISTANT POLYESTER
7. Draining elements with water tank
8. Filtering layer
9. Boundary draining
10. Tilled soil

Source: www.index-spa.com

Extensive green roof - detail
**Colour camouflage of road surfaces**

The internal road surfaces, even if limited to the areas adjacent to the administrative buildings and the plant area, were mitigated using asphalt of colours resembling those of the tuff topsoils typical of the province of Lecce. For the external road surfaces (security boundary road) use will be made of stabilized stone, duly steamrolled, so as to reproduce the type of farm roads already present all over the surrounding countryside.

**Irregular planting**

An analysis of the aerial pictures reveals that in most of the areas covered by olive groves, the trees are planted with an irregular layout. The more recent olive farms, however, have a square layout as they are served by artificial irrigation systems. In order to make the works appear as natural as possible, new groves will be planted with a density of 110/120 trees per hectare with an irregular layout, thus favouring the traditional farming method.

It should be pointed out that in the area to the north, along the incoming route of the underground pipeline, the trees will be planted in such a way as to be compatible with the pipeline itself.
**Reduction of the height of the new constructions**

Following the topographical survey that was conducted to determine the morphology of the ground, the actual impacts of the constructions were analysed and assessed in relation to the existing surroundings. The lie of the land, which slopes slight downwards from North to South, with a difference in level of about 4 m, enabled the buildings to be positioned below the level of the horizon, by taking advantage of this slope. In addition, for the technical facilities (fire protection water storage tank), the part protruding above ground will be camouflaged by a soil embankment on which grass will be sown and shrubs planted.

![Detailed section of fire protection water storage tank](source: Arch. Fragasso I esse ingegneria archive)

**Mitigation of critical views**

The critical views were analysed in order to estimate the actual impacts of the constructions and to orient the choice of the most appropriate mitigation measures.
Both for the view identified as "1 bis" and that identified as "3 bis" below, the same mitigation measures were taken, using shielding trees (for the former viewpoint) or multi-level terraces with shielding plants (for the second critical viewpoint). The photo simulations shown below enabled a comparison to be made between the places as they appear today and how they will appear following the mitigation measures using natural elements (olive trees) characteristic of the existing countryside.

As also indicated on the visual impact assessment sheets, the site has a fair basic visual absorption capacity due to the presence of eucalyptus woodland. The olive trees completed the shielding effect, thus almost entirely cancelling out the impact of the new constructions.
**Blending of the site boundaries into the surrounding environment**

The repeated inspections carried out revealed the existence and excellent condition of the dry stone walls delimiting the farms and running alongside the country roads. With a view to making the works fit well into the environment, the decision was made to use as a site boundary the same kind of property boundary already present in the area under examination, so as to create a philological link between the recognized and culturally rooted landscape and the new constructions built to the greatest possible degree in respect of the traditional construction techniques.
**Blending of metal fences into their natural surroundings**

The terminal project includes a second, internal type of fencing characterized by a higher level of security and protection. The proposal made to reduce its visual impacts was to turn it into a natural barrier by planting climbing plants at its base.
Use of finishing materials linked to traditional rural architecture

Materials normally used in rural architecture will be adopted in the constructions that are to house the administrative offices, technical and security rooms. To be more specific, projecting walls will be covered with natural rough-cut stone while rendered walls will be finished with hydraulic lime render as it is a natural material that ensures a high degree of breathability and strength and a limited need for maintenance.

Colour camouflage for the technical elements of the plant

In the PRT area, behind the “boiler house”, there will be an area with overhead gas pipes and their safety valves. Also in this case, the aim of the mitigation measures is to minimize the visual impacts of the pipes and colours resembling those of the surrounding vegetation will be chosen in order to obtain a camouflaging effect and a limited impact.

Use of native tree and shrub species

For all the mitigation measures in which tree and/or shrub species are to be used, these species will be chosen from the native ones listed in the analytical documents annexed to this report. Naturally, the choice of the species will depend upon the use. Tall trees, such as eucalyptus, will be used as natural shielding barriers; medium-height species, such as olive trees, will be used both as natural shielding barriers and to reduce the overhead visual impacts by planting the trees in an irregular layout.
List of the principal tree and shrub species

1. olive
2. eucalyptus
3. Indian fig
4. lentisk

source: Arch. Fragasso I esse ingegneria archive
Assessment and reduction of the light impact

The light impacts on the ground level views were also assessed. The measures described in the "Reduction of the light impact" section above are also valid for this case.

Conservation of the "pagghiara"

The mitigation measures also include works to protect and recover constructions that, in accordance with the Technical Rules for Implementation of the PUTT/P in force in Puglia, are considered "widespread assets of the area" (art. 3.14). In the specific case, the "pagghiara" (conical-shaped dry-stone shelter often made by the farmer himself using the stones on his land) will be recovered with a view to conserving one of the most important elements of the farming culture of Salento.

Pagghiara on the work site to be recovered

source: Arch. Fragasso I esse ingegneria archive
Recovery of existing farm roads

Closely linked to the previous operation is the recovery of the existing roads, which is also aimed at conserving the traces not only of the rural landscape but also of the most ancient rural civilization.

Protection of the limited existing vegetation

The works for the construction of the PRT and those for the construction of the underground pipeline also involve small areas with olive groves. The principle of conservation and protection will also be adopted to safeguard the tree species by removing the trees situated on the work site and replanting them in an alternative location.

It should be pointed out that the works proposed represent useful and important guidelines for the landscape mitigation project that accompanies this report and that, as it was elaborated during a preliminary phase, may undergo further changes during the execution phase in which the design is refined.
11. List of acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>BVS</td>
<td>Block Valve Station</td>
</tr>
<tr>
<td>ESIA</td>
<td>Environmental and Social Impact Assessment</td>
</tr>
<tr>
<td>PRT</td>
<td>Pipeline Receiving Terminal</td>
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<tr>
<td>PPTR</td>
<td>Regional Landscape and Territorial Plan</td>
</tr>
<tr>
<td>PRG</td>
<td>Municipal Town Plan</td>
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<tr>
<td>PUTT/P</td>
<td>Thematic Territorial Urban Planning “Landscape”</td>
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<td>TAP</td>
<td>Trans Adriatic Pipeline</td>
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