TAP ITALY ESMS OFFSHORE EROSION CONTROL AND REINSTATEMENT CCP

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1 Abbreviations and Definitions

The following table provides definitions of acronyms and a glossary of terms used in this document.

Table 1-1 Abbreviations and Definitions

ALARP	As Low As Reasonably Practicable
BAP	Biodiversity Action Plan
Battery Limit Point Italy	The location of the first dry weld of the pipeline in Italy (i.e. the dry weld closest to the sea)
Biorestoration	The use of biological processes (e.g. replanting) with the aim of restoring disturbed land to its previous condition, or as close to this as practicable
BTEX	Benzene, toluene, ethyl benzene and xylene
CCP	Contractor Control Plan
Coastal areas	Areas located between the Battery Limit Point Italy and Mean High Water Springs (MHWS)
COMPANY	TAP AG
Compensation areas	Areas of land that require development by the Project in order to compensate for the loss of biodiversity caused by Project activities
CONTRACTOR	Construction contractors for Italy
Cultural heritage impact	A change to cultural heritage (in this context “cultural heritage” refers to any tangible (e.g. objects, artefacts, structures, spaces) or intangible element which is of value or importance to people’s culture, history and/or identity) which has occurred as a result of Project activities. Impacts may be considered to be positive or negative
EBRD	European Bank for Reconstruction and Development
EEZ	Exclusive Economic Zone (offshore area extending a maximum of 200 nautical miles beyond territorial waters
EHS	Environment, Health and Safety
Environmental impact	A change to the environment (in this context the “environment” refers to any aspect of the natural or semi-natural physical environment (air, water, soil etc.)) which has occurred as a result of Project activities. Impacts may be considered to be positive or negative

ESIA	Environmental and Social Impact Assessment
ESIP	Environmental and Social Implementation Plan
ESMS	Environmental and Social Management System
EU	European Union
FOC	Fibre Optic Cable
GMO	Genetically modified organism
IFC	International Finance Corporation
KP	Kilometre Points relating to the pipeline route as per the base case described in the ESIA Italy. It is possible that the KP locations will change because of a re-routing
LRF	Livelihoods Restoration Framework
Marine areas	Areas located between Mean High Water Springs (MHWS) and the Italy-Albania median line
Median line	An agreed marine territorial boundary separating the Exclusive Economic Zones (EEZs) of 2 or more countries
MHWS	Mean High Water Springs The mean average of the highest levels that spring tides reach over two successive high waters during those periods of 24 hours when the range of the tide is at its greatest, taken over a period of time (typically 19 years). MHWS is considered the point on this project that delineates between marine and coastal areas, which are both considered in the offshore CCPs
Microtunnel	A 3m diameter tunnel extending across the Italian landfall (approximately 1,485 m in length). The microtunnel allows the installation of the pipeline in the landfall area without the need to excavate a trench
MLWS	Mean Low Water Springs The mean average of the lowest levels that spring tides reach over two successive low waters during those periods of 24 hours when the range of the tide is at its greatest, taken over a period of time (typically 19 years)
MS	Method statement
Nearshore	For the purposes of these CCPs, the nearshore marine area in the vicinity of the pipeline landfall is defined as the area seaward from Mean Low Water Springs (MLWS) to approximately 10m water depth

Offshore areas	Areas located between the Battery Limit Point Italy and the Italy-Albania median line. Inclusive of both coastal and marine areas
Pipeline	Proposed pipeline scheme (TAP) including related facilities such as access roads, etc.
PPS	Permanent Pipeline Protection Strip Permanent Pipeline Protection Strip of 8 m width where no deep-routed plants will be allowed
PAH	Polycyclic aromatic hydrocarbons
Project	Proposed pipeline scheme that will bring natural gas from the Caspian region to western and South-Eastern Europe (TAP)
Reinstatement	The process by which disturbed land is restored to its previous condition, or as close to this as practicable
Revegetation	The use of biological processes (e.g. replanting) as a means of restoring disturbed land to its previous condition, or as close to this as practicable
Shoofly	Deviations from the working strip in areas where vehicular use of the working strip is not feasible
Socio-economic impact	A change to the existing socio-economic environment (in this context the "socio-economic environment" refers to the combination of any existing social and economic factors) which has occurred as a result of Project activities. Social factors may include aspects such as demographics, health and wellbeing etc. and may refer to individuals, groups or wider communities of people. Economic factors may include aspects such as employment, finances, livelihoods etc. An impact may be considered to be positive or negative
TAP	Trans Adriatic Pipeline
TAP AG	Trans Adriatic Pipeline joint venture company
TPH	Total petroleum hydrocarbons

1.1 Defining "offshore, "coastal" and "marine" areas

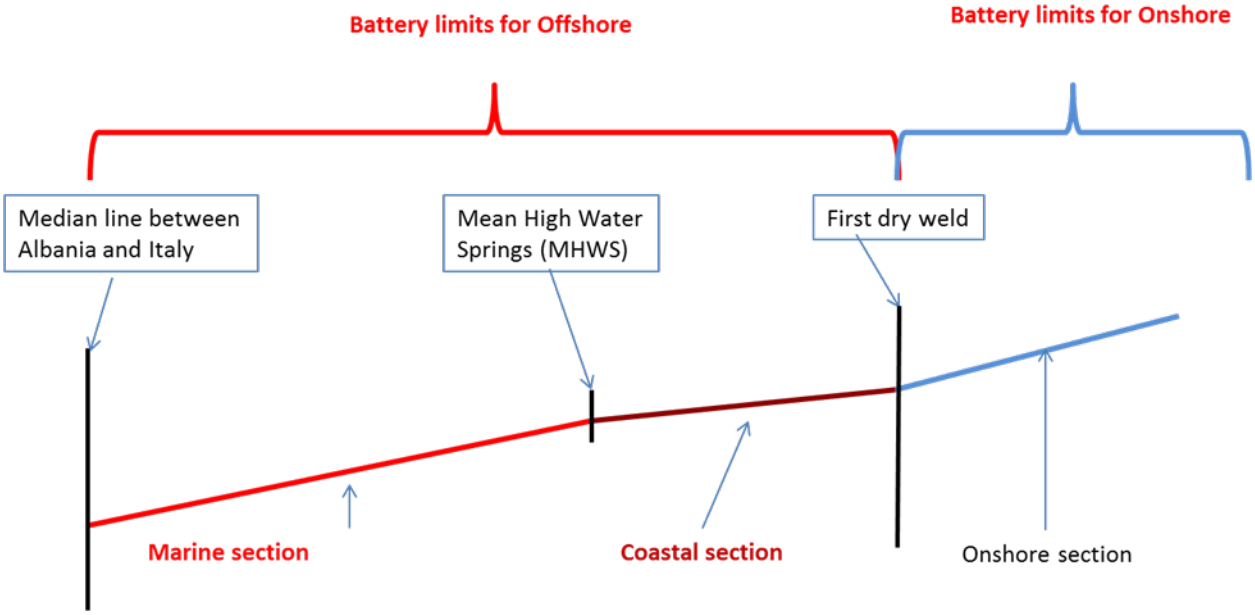
This CCP applies to all offshore areas that might be affected by the Project in Italy. "Offshore" areas include both "coastal" and "marine" areas, which are defined as follows:

"Coastal" areas are defined as all areas located between the Battery Limit Point Italy (i.e. the location of the first dry weld) and the Mean High Water Springs (MHWS)[1]. For further information on the Battery Limit Point location see the TAP Battery Limits Onshore – Offshore Sections (CPL00-ENT-100-F-DFO-0002).

"Marine" areas are defined as all areas located between MHWS and the Italy-Albania median line.

"Offshore" areas include both the marine and coastal areas, and therefore include all areas located between the Battery Limit Point Italy and the Italy-Albania median line.

Figure 1 Marine, coastal and onshore limits



2 Introduction

This CCP identifies the commitments made in relation to offshore erosion control, soil handling and topsoil management and reinstatement during the construction and commissioning phase of the Project in Italy and describes the COMPANY's requirements of CONTRACTOR in terms of meeting these commitments. Where a specific commitment from the Italy Commitments Register

[1] In the case of the Italian landfall, pipeline construction using a microtunnel complicates the issue. Work sites within marine and coastal areas are further clarified in Section 2.2.

is described in this CCP, it is followed by its reference number as stated on the Project Commitment Register Italy (e.g. IT0012). Additional requirements have been included within this CCP where they are deemed to be internationally accepted or best practice. These additional requirements are not followed by a reference number.

As part of its planning and readiness for construction, CONTRACTOR is required to prepare its own Environmental and Social Implementation Plans (ESIPs) setting out how it intends to meet and comply with specific Project commitments set out in each CCP developed by the COMPANY. This CCP shall act as a reference from which CONTRACTOR shall develop an Offshore Erosion Control and Reinstatement ESIP.

Deviations that involve measures different from those contained in this CCP will only be permitted upon approval of the COMPANY.

The Contractor's ESMS Framework Document (CAL00-RSK-601-Y-TTM-0001) provides an explanation of the linkage between CCPs and ESIPs.

2.1 Objectives

This CCP has been prepared to define the mitigation measures necessary to ensure effective erosion control and sediment management so that impacts are prevented or, where this is not possible, are as low as reasonably practicable (ALARP[2]), and to ensure the correct implementation of appropriate reinstatement of disturbed areas following construction, with the ultimate aim of restoring sites as closely as possible to their former condition following the construction phase of the offshore sections of the Project in Italy.

[2] For a risk (or impact) to be ALARP it must be possible to demonstrate that the cost involved in reducing the risk/impact further would be grossly disproportionate to the benefit gained. The ALARP principle arises from the fact that infinite time, effort and money could be spent on the attempt of reducing a risk/impact to zero. It should not be understood as simply a quantitative measure of benefit against detriment. It is more a best common practice of judgement of the balance of risk and societal benefit.

The objective of this CCP is to ensure that any erosion control and reinstatement work undertaken complies with the commitments made in the Environmental and Social Impact Assessment (ESIA) Italy and international best practice.

2.2 Scope

This CCP defines COMPANY requirements (i.e. the commitments and best practice) relating to offshore erosion control, soil handling and management, and reinstatement management that CONTRACTOR shall implement during construction, including hydrotesting and commissioning.

The goal will be to preserve the integrity of the environment (particularly in environmentally sensitive areas) to the greatest extent possible and to maintain existing water quality by implementing the following:

- minimising the extent and duration of disturbance
- protecting exposed soil by diverting runoff to stabilised areas
- ensuring proper sediment management
- installing temporary and permanent erosion control measures
- establishing an effective inspection and maintenance programme.

The scope of this CCP includes:

- marine impact avoidance and mitigation:
    - temporary sediment control measures
    - reinstatement
- coastal impact avoidance and mitigation:
    - procedures for soil management (IT0518), including soil and topography impact prevention, minimisation and mitigation measures
    - temporary erosion and sediment control measures
    - permanent erosion and sediment control measures
    - water body management and protection measures (watercourse crossings are included in the Offshore Watercourse Crossing CCP (IAL00-RSK-601-Y-TTM-0026))
    - reinstatement.

Biorestoration/revegetation of (coastal) disturbed areas is not the responsibility of CONTRACTOR.

Monitoring and *i*nspection requirements related to this plan are detailed in the Offshore Compliance Monitoring CCP (IAL00-RSK-601-Y-TTM-0023).

This CCP applies to all offshore areas that might be affected by the Project in Italy, including both coastal and marine areas. For a further definition as to what is defined as an “offshore”, “marine” or “coastal” area and their respective limits, see Section 1.1.

The marine areas within the scope include, but are not limited to, the following:

- the microtunnel
- the marine pipeline route/trench and immediately surrounding area
- the fibre optic cable (FOC) route/trench and immediately surrounding area
- Italian territorial waters and Exclusive Economic Zone (EEZ) (in terms of the potential extent of any marine impacts as a result of Project offshore construction activities).

The coastal areas within the scope include, but are not limited to, the following:

- the temporary worksite for construction of the microtunnel
- the working strip for approx. 110m of terrestrial pipeline from the Battery Limit Point Italy to the start of the microtunnel
- any roads (including access roads, dirt tracks and public roads), aggregate extraction sites, spoil disposal sites, batch plants, temporary material and waste storage areas, pipe yards, maintenance areas located within the coastal area.

CONTRACTOR should note that where marine-related activities occur in coastal areas (e.g. pipe storage yards for offshore pipe sections and vehicular transport of supplies/personnel), the requirements specified in the coastal impact avoidance and mitigation section of this CCP will apply. Should any offshore-related activities occur in the onshore area (including onshore roads), the requirements specified in the Onshore Erosion Control and Reinstatement CCP (IAL00-RSK-601-Y-TTM-0003) will apply. It is CONTRACTOR’s responsibility to request the onshore CCPs from the COMPANY should they be required.

2.3 Responsibilities

The COMPANY's role is that of compliance assurance as described in the Compliance Assurance Plan .

CONTRACTOR shall be responsible for ensuring that the Project (including all site operations, equipment and machinery) will comply with the defined Project Standards which encompass the requirements of Italian legislation, EU Directives, EBRD Environmental and Social Policy, IFC Performance Standards and IFC EHS Guidelines (IT0036). CONTRACTOR will comply with the requirements of the COMPANY Environmental and Social Management System (ESMS) (IT0516) (including this CCP) and the ESIA Italy.

CONTRACTOR will be responsible for any adverse environmental, socio-economic and cultural heritage impacts arising from its activities and operations and for putting in place any necessary measures to avoid or, if not possible, mitigate them. CONTRACTOR will also be responsible for promptly reacting to accidental events and mitigating any resulting adverse environmental, socio-economic and cultural heritage impacts for which CONTRACTOR is responsible as much as possible. Should any such accidental events occur, CONTRACTOR will immediately inform the COMPANY. Should these accidental events be the responsibility of CONTRACTOR (i.e. events resulting from CONTRACTOR's activities, events in areas which CONTRACTOR is responsible for), CONTRCTOR shall consult the COMPANY on the best way to handle and/or mitigate immediate risks to Project stakeholders.

CONTRACTOR shall put these responsibilities into effect by

- writing an Offshore Erosion Control and Reinstatement ESIP that describes how it will implement the requirements described in Sections 4 and 3 of this CCP and other legal requirements
- implementing the Offshore Erosion Control and Reinstatement ESIP by
    - communicating the contents of the ESIP to its workers and subcontractors and training them to ensure that they understand their responsibilities with respect to offshore erosion control and reinstatement control and management, incident reporting and response

- ensuring that adequate resources are mobilised for offshore erosion control and reinstatement management, including input from any specialist resources necessary to ensure effective planning and implementation of measures
- ensuring compliance by its workers and subcontractors with the procedures established in the ESIP
- implementing effective monitoring of offshore erosion control and reinstatement measures to ensure that the effectiveness of offshore erosion control and reinstatement management activities are assessed and any issues are promptly detected, in accordance with the Offshore Compliance Monitoring CCP (IAL00-RSK-601-Y-TTM-0023)
- ensuring that all environmental, socio-economic and cultural heritage incidents are reported and dealt with effectively and that lessons are learned in accordance with the Contractor's ESMS Framework Document (CAL00-RSK-601-Y-TTM-0001)
- keeping the COMPANY fully informed of any site environmental, socio-economic and cultural heritage issues.

CONTRACTOR shall be responsible for compiling the Offshore Erosion Control and Reinstatement ESIP in a timely manner and submitting it to the COMPANY for review and acceptance a maximum of 30 days after Contract award. The ESIP will not be considered "accepted for construction" until all comments raised by the COMPANY have been addressed by CONTRACTOR to the satisfaction of the COMPANY. Construction will not be allowed to commence before all relevant ESIPs are accepted.

3 Marine impact avoidance and mitigation

The COMPANY has conducted a range of pre-construction marine surveys, from which a marine ecology and geophysical baseline has been developed. The COMPANY shall ensure that CONTRACTOR has access to pertinent marine baseline information prior to CONTRACTOR's commencement of construction activities, from which all mitigation, restoration, and loss / degradation can be measured.

3.1 Sediment control

3.1.1 Seabed sediment handling

3.1.1.1 Trenching

CONTRACTOR shall utilise methods for trenching that minimise excavated material, and hence the potential for suspension of sediments into the water column. The open area excavation of the trench must be limited to just the transition area strictly necessary, using a single digger mounted on a platform on self-elevating legs of the backhoe crane dredge (BCD) (IT0679).

The location of the offshore pipeline route will, as far as practicable, be routed such that sensitive biological communities are avoided.

3.1.1.2 Backfilling

All dredged marine sediments, unless found to be contaminated, will be reused in the backfilling operation, or positioned at the side of the excavation (IT0021). After the installation of the pipeline and the FOC, the excavation waste (from the dig stored in the lighters, consisting of sand and any crushed rocks of various sizes). must be returned to the trench with a hopper or equivalent which descends to the bottom of the trench so that all the discharge of the material takes place within it, limiting the spread of the material into the surrounding water (IT0681).

Any contaminated sediment will need to be properly disposed of as hazardous waste (see the Offshore Waste Management CCP (IAL00-RSK-601-Y-TTM-0019)). Contaminated excavated material will be replaced with the surplus arising from the excavation of other sections of the pipeline (once contamination checks have been completed). If insufficient quantities are available it will be replaced with material from local quarries (IT0050).

This additional material shall be required to meet the technical specification, and will be sourced from sites approved by the COMPANY (see the Offshore Resource Management CCP (IAL00-RSK-601-Y-TTM-0014) for sourcing specifications).

Where there is no particular requirement for the offshore pipeline to be buried (away from the coasts) the pipeline will be laid on the seabed and not backfilled. This is subject to engineering feasibility.

3.1.2 Blasting

Blasting is not anticipated to be necessary in the offshore area of the Project. However, if blasting is required, it shall be subject to approval by the COMPANY, and the charge used should be the absolute minimum load required to complete the required objective so that excessive fracturing of bedrock does not occur resulting in accelerated infiltration and drainage.

3.1.3 Excess rock and seabed material

It is not anticipated that there will be excess seabed sediments generated by the marine section of this Project due to the commitment to reuse 100% of marine sediments for backfilling purposes (see Section 3.1.1.2). If excess rock of seabed material is generated CONTRACTOR shall manage the disposal of this material according to the following priorities:

FIRST PRIORITY: REUSE WITHIN THE PROJECT (IT0011)
Where surplus soil and rock is suitable for use as a construction material it will be first considered for reuse on Project areas, for example Project infrastructure works such as stability, erosion control, and roads.

SECOND PRIORITY: REUSE BY A THIRD PARTY (IT0011)
Transfer to third party for re-use purposes as raw or semi-finished materials, for example crushed materials that may be suitable for road construction materials or for rail ballast. CONTRACTOR shall enter into negotiations and agreements with third parties (to be approved by the COMPANY).

THIRD PRIORITY: DISPOSAL (IT0011)
For further information refer to the Offshore Waste Management CCP (IAL00-RSK-601-Y-TTM-0019).

A plan for the re-use of suitable excess rock and seabed material will be prepared by CONTRACTOR, including (IT0644):

- amount to be re-used
- location of any temporary storage area
- location of the area where it will be placed permanently
- the proposed arrangements for disposal of excess material (quantity, collection and disposal arrangements).

The plan will be consistent with the requirements of art. 186 of D.Lgs no. 152/2006 and s.a.s and Italian Legislative Decree 161/2012 (IT0644).

3.1.4 Temporary sediment control (identification and management)

CONTRACTOR shall prepare a Marine Construction Sediment Control Plan and submit to the COMPANY for acceptance. This plan shall describe, on a site-by-site basis, the temporary sedimentation controls to be applied.

Temporary sediment control measures (e.g. silt screens) shall be installed and maintained by CONTRACTOR in order to minimise the spread of suspended sediments as far as practical. CONTRACTOR shall determine the appropriate locations (e.g. during dredging operations, or other seabed interventions), quantities, types and times of use of these measures, and submit this information to the COMPANY for acceptance. CONTRACTOR will install additional measures if required by the COMPANY.

3.1.5 Pre-construction subsea pipeline and FOC route monitoring

Prior to construction, a number of surveys have been completed for the Project. CONTRACTOR shall carry out any of the following surveys along the subsea pipeline and the FOC route that have not been completed prior to commencement of construction:

- detailed geophysical survey in order to characterise the seabed (IT0535)
- ROV survey (in areas where there may be anomalies due to the presence of cables, pipelines, underwater infrastructure etc.) (IT0535).

CONTRACTOR shall ensure that the surveys are conducted by competent persons to a high standard using appropriate technology, and will provide sufficient and adequately detailed information to make an accurate assessment of the area being investigated. The scope of CONTRACTOR's pre-construction surveys will be included in CONTRACTOR's Offshore Erosion Control and Reinstatement ESIP for review and acceptance by the COMPANY.

The pre-construction surveys will provide a baseline from which CONTRACTOR and the COMPANY's post-construction surveys can assess the adequacy of reinstatement.

3.2 Reinstatement

This Section describes the commitments and best practice that CONTRACTOR is responsible for relating to marine reinstatement. For economic liability see the Livelihoods Restoration Framework (LRF) (TAP-LEA-PL-0004). CONTRACTOR liability will continue until the end of the defects liability period.

Three main types of areas requiring reinstatement have been identified for the Project as a whole (see Section 4.2).

Only 'Type 2 Areas' are applicable to the marine part of this project namely: 'Areas of temporarily occupied land that require reinstatement to reach their original pre-construction conditions as far as practicable'. It should be noted that this is only applicable to the sections of the pipeline / FOC that are being trenched / backfilled.

'Type 3 Areas' so-called 'compensation areas' that require development by the Project to compensate for the loss of biodiversity caused by Project activities, may also be identified at a later date. Development of the compensation areas shall be the responsibility of the COMPANY.

3.2.1 General requirements

Once construction work is completed and CONTRACTOR is ready to demobilise, CONTRACTOR:

- shall reinstate the seabed (see detailed requirements below)
- ensure that no restrictions on marine area use remain in place other than those already agreed upon. Such agreements shall be finalised prior to commencement of construction activities and be agreed between CONTRACTOR, appropriate third parties (e.g. marine authorities, parties with land rights) and the COMPANY.

CONTRACTOR shall be responsible for completing the physical reinstatement of all Project-disturbed sites to their original condition, where possible upon completion of construction. Re-contouring work will aim to restore the original and natural appearance of the seabed/beach as far as reasonably practicable. A Marine Site Restoration Plan shall be developed by CONTRACTOR.

As a minimum, CONTRACTOR shall carry out the following reinstatement activities:

Areas affected by the works will be covered, where necessary (e.g. nearshore areas), with the previously removed seabed material / beach material. The seabed excavated during trenching activities (see Sections 3.1.1.1) will be replaced in its original location, covering the pipeline / FOC, to a depth the same as the amount that was removed (i.e. from a minimum of 0.5 m to over 2m in depth). Certain seabed conditions may result in sections of the marine pipeline route where scour of the seabed beneath the pipeline could occur, resulting in free-spans. Where this is considered a possibility, or where additional protection to the marine pipeline is required, aggregate can be placed onto the pipeline to cover. Rock used should be as close to that which naturally occurs in the area and be inert in nature. Any stones used for the marine section of the works will meet the specific requirements of the Project and will consist of quarried, crushed stone that is non-polluting and chemically stable (IT0931).

Broken bedrock displaced during trenching and pipe-laying activities shall not be left haphazardly dumped on the surface of the marine pipeline route where it is incongruous with the surrounding landscape.

Excess rock that cannot be integrated reasonably into the finished working strip surface in harmony with the surrounding environment must be disposed of. CONTRACTOR shall develop a Marine Excess Rock Management Plan that shall describe how the rock will be managed (with reference to the Offshore Waste Management CCP (IAL00-RSK-601-Y-TTM-0019)) and submit it to the COMPANY for acceptance.

CONTRACTOR shall ensure that all waste, debris and other foreign objects are not incorporated into the backfilled trench or re-contouring works. Any contaminated seabed or beach material

shall be removed and disposed of in accordance with the Offshore Waste Management CCP (IAL00-RSK-601-Y-TTM-0019).

Post-construction seabed reinstatement will take into account any changes to the design (e.g. re-routing) of the pipeline (IT0615a).

3.2.2 Post-construction surveys

3.2.2.1 COMPANY surveys

The COMPANY shall conduct an inspection to determine the adequacy or otherwise of all physical reinstatement undertaken by CONTRACTOR, using the pre-construction surveys undertaken (see Section 3.1.5) for reference.

3.2.2.2 CONTRACTOR geophysical surveys

CONTRACTOR will undertake post-construction geophysical surveys of the marine pipeline / FOC route to assess the adequacy of the physical reinstatement of the seabed. CONTRACTOR shall ensure that the geophysical surveys are conducted by competent persons to a high standard using appropriate technology, and will provide sufficient and adequately detailed information to make an accurate assessment of the area being investigated. The scope of CONTRACTOR's post-construction geophysical surveys will be included in CONTRACTOR's Offshore Erosion Control and Reinstatement ESIP for review by the COMPANY. For more information see the Offshore Compliance Monitoring CCP (IAL00-RSK-601-Y-TTM-0023).

Any further monitoring of marine pipeline / FOC route physical reinstatement during the Operation Phase of the Project, shall be undertaken by the COMPANY (see the Compliance Assurance Plan).

4 Coastal impact avoidance and mitigation

CONTRACTOR shall prevent and avoid or minimise as far as possible the exacerbation of impacts caused by natural hazards, such as landslides or floods, which could arise from land use changes due to Project activities.

The COMPANY will establish a coastal pre-construction biodiversity baseline for selected areas and this information will be made available to CONTRACTOR upon Contract award.

However, it is CONTRACTOR's responsibility to establish its own pre-construction coastal biodiversity baseline (record of the conditions of the construction areas prior to construction works (e.g. working strip, storage yards, access roads)) from which all mitigation, restoration, and loss/degradation can be measured.

4.1 Erosion and sedimentation control

Erosion and sediment control is best managed if taken into consideration from the beginning of the construction phase, i.e. from site clearance.

CONTRACTOR will manage the visual impact in accordance with the Offshore Pollution Prevention CCP (IAL00-RSK-601-Y-TTM-0015).

4.1.1 Worksite clearance

The opening up of the working strip and other coastal worksites (e.g. access roads) will require vegetation clearance in work areas. Vegetation includes crops, trees, shrubs, bushes, grasses and other minor vegetation. Environmental coordinators employed by CONTRACTOR shall be trained in identifying worksite boundaries (which shall be clearly marked) and the controlled felling of trees to prevent impacts beyond worksites. They shall also be trained on the importance of identification and preservation of wild fauna encountered and disturbed during the stripping operation. For further information on employee training and the role of CONTRACTOR environmental coordinators, refer to the Offshore Employment, Training and Worksite Management CCP (IAL00-RSK-601-Y-TTM-0024) and Offshore Ecological Management CCP (IAL00-RSK-601-Y-TTM-0017) respectively.

Where it is not possible to restrict the timing of construction practices, vegetation should be removed outside the bird breeding period (before 1 March or after 30 September) so that works can carry on into this period unhindered.

Any leaning trees that may pose a hazard to the safety of the workers and cause other trees to fall, thereby endangering personnel, equipment and material on worksites, shall be cut outside the marked area of the worksite.

If any trees accidentally fall into watercourses during felling and clearance and pose a risk to the natural flow of water in the channel, they will be removed as soon as practicable as long as it is considered safe to do so.

The felling of trees shall be avoided where possible, with tree surgery (i.e. the removal of particular branches rather than the whole tree) being carried out as an alternative where this is appropriate. Felled trees may be used for building gabions if required for land stabilisation (see Section 4.1.7.3). Vegetative material (slash) is not to be used for construction purposes and shall be stockpiled at the edge of worksites. Areas of gathered plant material shall be separated to prevent flames spreading in the event of a fire.

In addition, CONTRACTOR shall adhere to the following:

- the collection of wild plants is prohibited
- the burning of cut vegetation of fallen tree material on worksites is prohibited
- lighting fires in work areas is prohibited unless specifically authorised by the COMPANY
- it is prohibited to introduce foreign/non-naturalised vegetation to the worksites
- only bushy vegetation on worksites will be removed. Roots and herbaceous vegetation will be left in the soil to increase stability and be removed with the topsoil during stripping
- removed vegetation will be placed far from surface water or the sea (no removed vegetation may be placed at or below MHWS). Large woody debris will be stored along the outside edge of worksites in clear areas. Small twigs, branches and pieces of vegetation shall be used for composting along with biodegradable waste generated in the work areas (see the Offshore Waste Management CCP (IAL00-RSK-601-Y-TTM-0019))
- clearing of vegetation shall be limited to that which is strictly necessary
- where possible removal of vegetation on steep hillsides will be minimal
- buffer zones of a minimum width of 2–3m will be retained along the edges of watercourses (if crossed by the working strip), to prevent soil erosion and sedimentation of downstream watercourses, and will only be cleared as close as reasonably practicable to the time of the watercourse trenching and pipeline installation. For further information, including

requirements for if roads cross a watercourse, refer to the Offshore Watercourse Crossing CCP (IAL00-RSK-601-Y-TTM-0026).

The type of equipment used will be appropriate for the soils and the timing of construction. CONTRACTOR shall provide a list of equipment proposed to be used during construction, including information that demonstrates that its environmental impact is ALARP, to the COMPANY for acceptance, prior to the equipment being mobilised for use on the Project.

Further CONTRACTOR requirements concerning clearance of the working strip are detailed in the Specification for Working Strip Preparation and Maintenance (IAL00-SPF-000-C-TRH-0005).

4.1.2 Topsoil and subsoil handling

Topsoil is the uppermost and most fertile portion of the soil, containing organic matter, seeds and nutrients that promote vegetation growth. Its presence is a key factor in promoting revegetation success. Consequently, preserving topsoil is a key component necessary to enable the future revegetation of worksites and to restore the soil's ability to protect itself against erosion.

In the sections where the work interferes with outcrops of hard rock, special attention must be paid to conserving the topsoil; the top part of rock and soil should be screened and crushed, preserving the fine fraction (humus and gravel), and set aside; at the end of the backfill operation of the pipeline, the part set aside will be replaced as the top layer as a stony matrix with humus (IT0744).

CONTRACTOR shall observe the following basic principles of good topsoil management:

4.1.2.1 Stripping

Topsoil shall be removed from working areas only when absolutely necessary and in accordance with the guidelines specified in this CCP and the Italy Biorestoration Guidance and Preliminary Specification (IAL00-RSK-601-Y-TSP-0001). Areas subject to topsoil stripping will be identified prior to grading activities.

Topsoil and subsoil will be stripped and stored separately.

Stripping shall be in accordance with the requirements outlined below:

- topsoil, which supports plant life and contains seed stock, will be removed from the worksites by suitable earth moving equipment and stockpiled in the form of a continuous ridge along the edge of the strip. The topsoil will be stockpiled no higher than 2 m along one side of the construction corridor (IT0002) to prevent degradation of the soil
- the topsoil and subsoil will be kept free from disturbance to reduce the possibility of physical damage and compaction and will be stored in such a way that they are not mixed with other trench materials and are not driven over by vehicles (IT0004)
- where the depth is equal to or less than 300 mm, the topsoil shall be carefully stripped to its full depth and stored in a dedicated place
- where the depth is equal to or less than 100 mm, additional precautions will be taken when the topsoil is stripped (see paragraph below)
- where the depth of topsoil is greater than 300 mm, only the top 300 mm shall be similarly stripped and stored. Topsoil below 300 mm shall only be removed if this is required for reinstatement; where this is the case, it shall be stored as topsoil provided the stockpiling specification given below can be reasonably met
- any plant, turf layer or root mass will be stripped together with the topsoil.
- topsoil shall not be stripped from areas that will only be used for storing topsoil
- modification of these requirements may apply subject to COMPANY approval, e.g. for areas where the ground is solid rock.

Additional precautions in areas of thin topsoil (where the depth is equal to or less than 100 mm) that should be implemented by CONTRACTOR (other methods can be proposed for COMPANY approval) include:

- constant supervision during topsoil stripping so that only the agreed topsoil strip depth is implemented
- in areas where machinery is not able to achieve the topsoil strip depth and there is a risk of subsoil mixing, stripping by other means will be implemented
- storing stripped topsoil in sensitive (thin) topsoil areas at the edge of the working strip
- protecting topsoil piles with a light, waterproof covering (e.g. tarpaulin) where topsoil is very thin and at risk of wind and water erosion
- if significant amounts of topsoil are lost because of poor topsoil handling then CONTRACTOR may be required to replace it with topsoil of similar chemical, biological and physical characteristics. Any use of topsoil, with chemical-physical characteristics different

from that affected by the works, must be carefully evaluated and considered in order to preserve the ecological continuity in the surrounding areas (IT0677).

- CONTRACTOR providing a method statement on how to deal with sensitive soils.

If the topsoil is considered too wet to be worked during stripping without resulting in harmful effects on its structure such as compaction and shearing then stripping works will cease until such time that the topsoil is dry enough to handle without causing long-term damage.

Further CONTRACTOR requirements concerning stripping and levelling of the working strip are detailed in the Specification for Working Strip Preparation and Maintenance (IAL00-SPF-000-C-TRH-0005).

4.1.2.2 Stockpiling and maintenance of structure and fertility

Without prejudice to the mitigation measures set out in the Project, the following must occur in the site and deposit areas: all the appropriate measures for the protection of the soil and subsoil must be pre-arranged and, in particular, the surfaces concerned must be made impermeable with suitable tarpaulins, in accordance with the most advanced technology, to be removed at the end of the work so that even the least infiltration into the soil and subsoil is prevented (IT0703).

Topsoil shall be stored in a windrow along the edge of the non-working side of the working strip furthest from the works, but within permitted limits, where it will be least disturbed during the construction phase and until final grading of the particular working segment of the working strip has been completed. Topsoil from worksites other than the working strip shall be stored in a similar manner.

Excavated subsoil will be placed separately from the topsoil pile to prevent mixing during storage (IT0822). Soil will be stored along one edge of the working strip. The topsoil stockpile will be protected by diversion ditches, slope breakers, and silt fences, if needed. The installation of geotextile fences as a separation medium may be especially required where topsoil is stockpiled in very close proximity to trench spoil or other cut subsoil material on segments of the working strip with steep side slopes because of its width constraints and there is a high risk of mixing (i.e. cross contamination) of distinct-type soil materials.

CONTRACTOR shall minimise compaction of soft and waterlogged ground to aid subsequent reinstatement and to prevent damage in areas of cultural heritage (no areas of known cultural heritage are located in the coastal area, but there is the possibility that unanticipated discoveries of cultural heritage (Chance Finds) may occur).

CONTRACTOR's Offshore Erosion Control and Reinstatement ESIP shall include details of locations where soil compaction may be a particular issue and shall include provision for:

- preparing a method statement to address construction through soft ground that includes consideration of the use of load-bearing materials (e.g. bog mats, geotextile membranes or other as proposed by CONTRACTOR) to support heavy loads in soft ground
- identifying fragile and sensitive soils in advance of work and implementing the method statement as necessary or as advised by the COMPANY.

Topsoil shall be stockpiled in piles no more than 2 m high and with a slope angle equal to its angle of repose, but no more than 45% to prevent the risks of excessive compaction and anaerobic conditions and possible damage to the natural seed-bank within the topsoil that is essential for reinstatement.

Topsoil shall be provided with a cover, if necessary, to protect it from erosion or from potential mixing with subsoil or rock materials. Vehicles and machinery shall be prohibited from travelling over the topsoil and subsoil stockpiles even if the action is performed as a means to travel up and down the working strip or during occasions when the usual access route along the working strip is muddy or waterlogged impeding conventional access.

Wet subsoil and mud slurry or other subsoil cuttings shall not be placed onto topsoil stockpiles, as this would result in cross-contamination of the materials.

In order to manage sediment run off, spoil and soil materials will not be stored close to water bodies, and diversion drains will be installed to intercept surface run off and divert it away from the construction area (IT0288). Topsoil shall not be placed where it could be eroded and enter surface water/watercourses/the sea (IT0270) including:

- within 10 m of watercourses
- within 10 m inland of MHWS
- below MHWS.

Topsoil shall not be placed along sides of steep slopes to prevent its loss by gravity sliding or during storm events. If this is not possible, erosion control fencing or similar measures shall be installed to ensure topsoil piles remain in place and no erosion or down slope movement takes place.

In low-lying areas gaps shall be left in the topsoil stockpile to allow drainage of the working strip. These gaps shall be carefully selected to avoid scour and erosion outside the working strip.

Material from the working strip topsoil stockpile shall not be used for bedding, padding or filling backfill material in trenches for supporting pipe sections. Should non-organic material from the subsoil stockpile or the surface of the stripped and graded working strip be unsuitable as support material for the welded pipe string then alternative material meeting the technical specification and sourced from sites approved by the COMPANY shall be sourced by CONTRACTOR (see the Offshore Resource Management CCP (IAL00-RSK-601-Y-TTM-0014) for sourcing specifications).

Topsoil should be stored for a limited time only. If the topsoil requires long-term storage (longer than 6 months), aeration and raking up will be carried out regularly to avoid compaction (IT0007).

4.1.2.3 Grading

Worksites shall be levelled using tractors, bulldozers and backhoes to create a reasonably uniform working area allowing the safe transit of equipment and traffic. Excavated material shall be stockpiled in a manner so as not to obstruct transit and construction activities.

To minimise the impacts on the soil and vegetation of the working strip, the following guidelines for grading shall be observed:

- in the event that substantial alterations to the original topography are necessary, topsoil intended for reinstatement shall be gathered and stored according to the procedures outlined in Sections 4.1.2.1 and 4.1.2.2
- material shall not be side cast off slopes. Where there is insufficient workspace on the working strip material shall be removed and stored in temporary or permanent disposal

sites (for further information refer to the Offshore CCP for Additional Land Take (IAL00-RSK-601-Y-TTM-0018)).

To mitigate the potential impact of erosion and earth movement in highly susceptible areas (slopes on friable soil; gorges; ravines), slope stabilisation and erosion control systems shall be implemented (see Sections 4.1.6, 4.1.7 and 4.1.9).

Reusable material shall be placed in suitable areas preventing its movement outside the working strip.

Areas that have been cleared and graded will be inspected weekly to identify possible erosion, with emphasis placed in advance of predictable major storms where possible. Once identified, areas with the potential to be affected by erosion shall have the appropriate erosion control measures installed or existing measures improved and periodically maintained (see Sections 4.1.6 and 4.1.7).

4.1.2.4 Trenching

CONTRACTOR shall utilise methods for trenching that minimise excavated material and ensure that trench material is not mixed with topsoil. In areas identified as containing sensitive wildlife, escape ramps shall also be installed (for further information, refer to the Offshore Ecological Management CCP (IAL00-RSK-601-Y-TTM-0017)).

4.1.2.5 Backfilling

Padding for the immediate layer surrounding the pipe will be selected from the trench-excavated soil where possible. There will be a minimum of 1.5 m depth of cover on top of the pipeline (IT0044). 60% of coastal excavated soil will be reused for backfilling purposes. The remaining portion of the material will be sent for disposal to appropriately licensed landfill sites (IT0997) (see the Offshore Waste Management CCP (IAL00-RSK-601-Y-TTM-0028)).

Any contaminated soil will need to be properly disposed of as hazardous waste, and any pumped groundwater, if contaminated, will need to be treated by mobile treatment units before discharge (see the Offshore Waste Management CCP (IAL00-RSK-601-Y-TTM-0019). Contaminated

excavated material will be replaced with the surplus arising from the excavation of other sections of the pipeline (once contamination checks have been completed) (IT0050).

If insufficient quantities of material are available it will be replaced with material from local quarries (IT0050). This additional material shall be required to meet the technical specification, and will be sourced from sites approved by the COMPANY (see the Offshore Resource Management CCP (IAL00-RSK-601-Y-TTM-0014) for sourcing specifications).

In the event that non-contaminated excavated material is not useable or is surplus to requirements for trench backfill or restoration, it shall be managed in accordance with Section 4.1.4. If additional land for excess material management is required, the process in the Offshore Additional Land Take CCP (IAL00-RSK-601-Y-TTM-0017) will be followed.

As the pipe will displace a significant proportion of the material extracted from the pipe trench, the surplus shall be disposed of in accordance with current law (IT0709) at pre-selected and approved disposal sites (for further information refer to the Offshore Waste Management CCP (IAL00-RSK-601-Y-TTM-0019)).

4.1.3 Blasting

Coastal blasting measures will have the same requirements as described in Section 3.1.2, but be applicable to coastal areas.

4.1.4 Excess soil and rock

Any excess soil material generated during the construction and commissioning process will be removed and managed in accordance with the Italian Legislative decree 152/06 and its subsequent amendments and supplements (IT0009).

CONTRACTOR shall manage the disposal of excess soil, rock and beach material according to the three priorities described in Section 3.1.3 (IT0011).

A plan for the re-use of suitable excess soil and rock will be prepared by CONTRACTOR, including (IT0644):

- amount to be re-used

- location of any temporary storage area
- location of the area where it will be placed permanently
- the proposed arrangements for disposal of excess material (quantity, collection and disposal arrangements).

The plan will be consistent with the requirements of art. 186 of D.Lgs no. 152/2006 and s.a.s and Italian Legislative Decree 161/2012 (IT0644).

4.1.5 Identification of areas likely to require erosion and sediment control

CONTRACTOR shall prepare a Coastal Construction Erosion and Sediment Control Plan and submit to the COMPANY for acceptance prior to commencing work. The Coastal Construction Erosion and Sediment Control Plan shall:

- identify areas that require temporary erosion and sediment control, see Section 4.1.5
- identify areas that are likely to require permanent erosion and sediment control to be applied as defined in Section 4.1.7
- describe on a site-by-site basis the erosion and sedimentation controls to be applied as defined in Sections 4.1.6, 4.1.7 and 4.1.8.
- take into account the measures to be applied at specific locations as described in Section 4.1.9
- define erosion control inspection and maintenance requirements.

Following final contouring, CONTRACTOR shall update the Coastal Construction Erosion and Sediment Control Plan to create a Coastal Post-Construction Erosion and Sediment Control Plan. The requirements of the Coastal Post-Construction Erosion and Sediment Control Plan will be essentially the same as for the Coastal Construction Erosion and Sediment Control Plan, except that the areas identified as requiring permanent erosion and sediment control will be definitive.

Following completion of the construction phase and finalization of the Contract by CONTRACTOR, the responsibility for the effective maintenance of all temporary and permanent erosion and sediment control measures during the operational phase will pass to the COMPANY.

4.1.6 Temporary erosion and sediment control

Temporary erosion and sediment control measures shall be installed and maintained by CONTRACTOR along the working strip during construction in order to minimise erosion as far as practical. CONTRACTOR shall determine the appropriate locations, quantities and types of these measures, which will be agreed with the COMPANY. CONTRACTOR will install additional measures should the COMPANY require.

Run-off from the working corridor will be intercepted. Surface water run-off will be reduced and will undergo measures to trap and reduce sediment. Measures to be employed to intercept the run-off and reduce the sediment load of the water prior to its discharge into watercourses include sandbags and settlement tanks or lagoons (IT0291). Alternatively, the water may be filtered through a suitable membrane such as a geotextile material to clean the water prior to discharge. Filters such as straw bales or ‘sedimats’ will be positioned downstream to act as a filter to trap any sediment that is released into the watercourse (IT0291). Cut-off ditches will be employed to prevent water from entering excavations. Access roads located in the proximity of surface water will be paved; in the absence of pavement, they will be dampened periodically.

Temporary erosion and sediment control measures may include but are not limited to erosion matting, silt fences, straw bales, sediment traps and basins, diversion berms and trench breakers. All erosion control measures shall be inspected to ensure effectiveness weekly or immediately after a major storm event.

If CONTRACTOR is required to temporarily demobilise from any section of the working strip because of the onset of poor weather CONTRACTOR shall detail to the COMPANY all temporary erosion and sediment control measures implemented to stabilise the working strip during the entire demobilisation period. CONTRACTOR will install additional measures should the COMPANY require.

CONTRACTOR shall agree with the COMPANY when temporary erosion control measures are to be removed. The timing of the removal of the temporary erosion control measures should aim to reduce the potential for erosion to occur between CONTRACTOR’s reinstatement activities (i.e. removal of erosion control measures) and revegetation (which is not being carried out by CONTRACTOR).

4.1.6.1 Silt screens

Appropriate silt screening shall be utilised to minimise sedimentation and erosion during construction and intervention works. Silt screens shall be installed along the working strip, at water bodies, and in other areas as deemed necessary by CONTRACTOR.

4.1.6.2 Diversion berms

In coastal areas diversion berms shall be constructed to provide a drainage system on the working strip that collects and carries surface run-off to natural channels or areas with stable soil and vegetation cover off the working strip. The collected run-off shall be discharged in a manner that does not pose a threat to the integrity of the pipeline, infrastructure, neighbouring properties or the environment.

Silt fences and silt traps should be placed at the end of diversion berms to entrap as much sediment as possible before drainage off the working strip.

The diversion berms should extend far enough to the edge of the working strip so that run-off is unable to drain back onto the working strip. Only subsoil material shall be used for diversion berms and the material should be compacted adequately to minimise erosion. The upslope side of the berm should be grooved, smoothed and cleared of debris to allow free, unobstructed drainage of run-off along the face of the berm towards the edge of the working strip.

Temporary diversion berms should be of minimum height and graded to allow safe crossing by vehicles. They should be angled slightly from perpendicular to the slope to facilitate drainage along the barrier but limit run-off velocity to prevent erosion and scour.

Spacing of the temporary diversion berms will depend on factors such as soil erosion potential, average precipitation in the area and terrain slope. The proposed spacing for the temporary berms will be considerably wider than that for permanent berms so as not to be an impediment or safety hazard to construction traffic. CONTRACTOR is responsible for the spacing and installation, which is to be agreed with the COMPANY.

Silt traps shall be built at drainage discharge points and at the end of diversion berms. Collected sediment in the pits may have to be removed periodically to maintain their effectiveness. Sediments can be placed on subsoil storage areas or spread along the working strip to dry out but should not be placed on the topsoil stockpile or outside the working strip. After they have completed their function these pits can be covered, ready for revegetation. CONTRACTOR shall record the location of each pit and communicate this to the COMPANY, so that revegetation can take place following completion of reinstatement by CONTRACTOR.

4.1.6.3 Temporary trench breakers

On steep slopes with open trenches, temporary trench breakers consisting of unexcavated material shall be left in the trench line to interrupt surface flow and prevent scouring of the trench bottom. Temporary trench breakers shall be spaced as required and combined with slope plugs where necessary. Temporary trench breakers shall be left in place until actual pipe installation takes place.

4.1.6.4 Wooden fences

In certain site-specific coastal locations such as steep slopes, where no other alternative is available to retain cut material, wooden fences may be temporarily installed during construction of the working strip.

CONTRACTOR shall ensure any such fences are capable of safely supporting the loads imposed. Fences shall be inspected regularly to ensure safe operation and structural integrity and be removed during reinstatement of the working strip.

4.1.6.5 Transverse drainage in access/logistics roads and construction areas

During construction access/logistics roads and shooflies are bare surfaces susceptible to erosion. Vehicles can churn up wet soils and increase sediment loads to water bodies.

In erodible materials where normal roadway drainage considerations are absent or inadequate (side ditches, road crown, cross slope, etc.), transverse drainage systems shall be constructed with spacing and dimensions appropriate to the slope of the road. These drainage systems shall serve to remove water from the road surfaces and discharge it to areas with sufficient vegetation

to prevent erosion or energy dissipaters, or other appropriate systems such as silt fences shall be installed.

4.1.6.6 Energy dissipater

When ditches and other drainage systems flow directly into natural bodies of water and it is impractical to achieve a low gradient with the drainage system alone, structures should be installed that reduce water velocity thus reducing the possibility of erosion and allowing sediment to drop out of suspension before reaching the water body to avoid creating erosion outside the working strip. The drainage system should direct water flow by following the gentlest slope towards natural water bodies.

4.1.6.7 Vehicle and machinery restrictions

Vehicles and other machinery may be a significant cause of erosion and compaction of soils, and unwanted increased sediment loads in water bodies. In order to mitigate these impacts in areas not being used directly for construction CONTRACTOR shall ensure that all machinery and vehicles will be restricted to the designated working strip and approved access roads (IT0286).

4.1.7 Permanent erosion and sediment control

Following final contouring of the surface layer, a survey shall be undertaken by CONTRACTOR to define the location, quantity and type of all permanent erosion control measures required. The Coastal Construction Erosion and Sediment Control Plan shall be updated and re-submitted as the Coastal Post-Construction Erosion and Sediment Control Plan to the COMPANY for acceptance.

In wet areas with steep slopes and access difficulties, wooden stakes, blankets and biodegradable sheets may be required to control topsoil erosion on a long term basis.

4.1.7.1 Erosion matting

Erosion matting may be installed to provide an immediate protection for slopes against erosion, prevent the washing-out of seeds and enhancing the micro-climatic conditions in the soil for plant

growth. Erosion matting is used to provide temporary protection of the soil surface until sufficient natural vegetation cover has been established.

The erosion matting shall consist of Geojute or similar and be biodegradable, open weave 11 mm x 18 mm mesh size and 2 mm-thick fibres with a mass/area ratio of 500 g/m^2. The mat shall be capable of absorbing water to 500 % of its dry weight on saturation.

The erosion matting shall be unrolled from the top of the slope, allowing it to lay naturally on the soil surface over all the local undulations. The material shall not be taut so that it forms 'bridges'.

The mat shall be secured to the slope using wooden or metal pegs as recommended by the manufacturer, except in cases where metal pegs pose a hazard to animals, in which case wooden pegs shall be used.

Erosion matting, once installed shall be regularly inspected for degradation and installation integrity by CONTRACTOR. CONTRACTOR shall be responsible for:

- defining where erosion matting is required and agreeing those locations with the COMPANY
- maintaining and replacing matting as required throughout the construction period.

4.1.7.2 Permanent trench breakers

Temporary trench breakers (Section 4.1.6.3) shall be left in place until pipe installation takes place. Permanent trench breakers (e.g. consisting of sack breakers) shall be installed in the pipeline trench after the pipeline has been installed to interrupt surface flow and prevent scouring of the trench bottom. Permanent trench breaker spacing shall be informed by Table 4-1 below.

Table 4-1 Permanent trench breaker spacing guidelines

Degrees (%)	Spacing (range) (m)
< 9	Do not need
13	15–40
18	9–40
23	8–35
27	8–11

>30	6.5–8 (or more regular as required, to be determined by CONTRACTOR)

4.1.7.3 Gabions

Gabions and gabion mattresses shall be used where there is a requirement to form flexible, permeable, monolithic structures such as retaining walls, revetments and weirs for earth retention. In some cases, it will be necessary to undertake a geotechnical survey to clarify the necessity of installing a retaining wall.

Gabion walls may be constructed and utilised for permanent recovery of the working strip and stabilisation of watercourse banks and steep slopes. Gabions structures shall be designed and constructed in accordance with the manufacturer's specifications.

4.1.8 Water body management and protection

The following types of water bodies may be found along the coastal working strip: watercourses, field drainage/irrigation systems.

4.1.8.1 Watercourses

Watercourses are not anticipated within the coastal working strip. However, information on erosion control and reinstatement measures to be performed at watercourses can be found in the Offshore Watercourse Crossing CCP (IAL00-RSK-601-Y-TTM-0026).

4.1.8.2 Field drainage/irrigation systems

The working strip has significant potential to alter the natural and any man-made drainage systems that may be present in the land it crosses. CONTRACTOR is responsible for the identification, management and mitigation of any significant impacts to the nearby drainage system as a result of construction activities.

A condition survey will be carried out to assess field drains within the working strip to enable an assessment to be made of any damage created during construction and to allow reinstatement measures to be targeted appropriately.

Where appropriate, prior to construction, header drains will be installed to connect all existing viable field drains on the high side of the working strip. This will ensure continuity of functioning of the existing field drainage.

Full reinstatement of land drainage features will take place if disturbed during construction.

Other requirements relating to field drainage/irrigation systems can be found in the Offshore Infrastructure and Utilities CCP (IAL00-RSK-601-Y-TTM-0025).

4.1.9 Erosion and sediment control requirements at specific sites

CONTRACTOR shall conduct geophysical and geotechnical studies at specific sites where there is considered to be a significant risk of potential collapses prior to the commencement of any excavation activities. The scope of CONTRACTOR's geophysical and geotechnical studies will be included in CONTRACTOR's Offshore Erosion Control and Reinstatement ESIP for review and acceptance by the COMPANY.

On the basis of the results of CONTRACTOR's detailed pre-construction geophysical studies, specific pre-construction, during-construction, and post-construction monitoring plans will be prepared and agreed with the relevant authorities (IT0629) after approval from the COMPANY. The COMPANY will be responsible for implementing the Coastal Post-Construction Erosion Control Monitoring Plan following finalisation of reinstatement (see the Erosion Control and Reinstatement Management Plan). See the Offshore Compliance Monitoring CCP (IAL00-RSK-601-Y-TTM-0023) and the Compliance Assurance Plan for more information.

CONTRACTOR shall ensure that all geophysical surveys are conducted by competent persons to a high standard using appropriate technology, and will provide sufficient and adequately detailed information to make an accurate assessment of the area being investigated. The scope of CONTRACTOR's geophysical surveys will be included in CONTRACTOR's Offshore Erosion Control and Reinstatement ESIP for review by the COMPANY.

It is the responsibility of CONTRACTOR to ensure all sites requiring erosion and sediment control measures are identified and adequately managed.

4.1.9.1 Microtunnel

CONTRACTOR will carry out all necessary geological, geotechnical and hydrogeological surveys at the landfall to confirm the technical and environmental suitability for construction of the microtunnel (taking into account the risks of construction through karst geology) and along the pipeline route. Survey methodology will be approved by the COMPANY and the relevant authorities, with particular reference to protection of the Cassano marshland (IT0540).

4.2 Reinstatement

This section describes the commitments and best practice that CONTRACTOR is responsible for relating to coastal reinstatement. For economic liability see the LRF (TAP-LEA-PL-0004). CONTRACTOR liability will continue until the end of the defects liability period.

In general three main types of areas requiring reinstatement have been identified:

- Type 1: Areas with erosion potential that require the stabilisation of slopes and protection against erosion. Reinstatement may include the use of geotextiles, jutematting or similar. Type 1 also includes the 8 m wide permanent pipeline protection strip (PPS)
- Type 2: Areas of temporarily occupied land (e.g. storage and lay-down areas and the pipeline working strip beyond the PPS) that require reinstatement to reach their original pre-construction conditions as far as possible
- Type 3: So-called “compensation areas” that require development by the Project to compensate for the loss of biodiversity caused by Project activities. These areas will be identified by the Biodiversity Action Plan (BAP) and development activities are likely to include the planting of trees, shrubs and other native vegetation, including translocated sensitive species. Development of the compensation areas shall be the responsibility of the COMPANY.

4.2.1 CONTRACTOR reinstatement surveys

4.2.1.1 Pre-construction surveys

In order to accurately assess the adequacy of the physical reinstatement, both the COMPANY and CONTRACTOR shall make records of the existing condition of the construction area prior to

the commencement of work by CONTRACTOR. As part of this, topographic and photographic records will be realized to characterise the existing condition of the pipeline route and the access roads, to assess the quality of reinstatement following construction (IT0054). These records will then be used by both parties as the standards against which the quality of the restoration work will be judged when construction work is completed. The COMPANY shall conduct an inspection to determine the adequacy or otherwise of all physical reinstatement undertaken by CONTRACTOR.

4.2.2 General requirements

Reinstatement of the ROW and temporary works areas will aim to restore sites to their original condition, to the extent possible (IT0313).

Once construction work is completed and CONTRACTOR is ready to demobilise, CONTRACTOR:

- shall reinstate the land
- following reinstatement, locate all posts and markers in a way to minimise interference with agricultural activities (IT0073)
- ensure that no restrictions on land use remain in place following the return of the land to landowners and users, other than those already agreed upon. Such agreements shall be finalised prior to commencement of construction activities and be agreed between CONTRACTOR, appropriate third parties (such as landowners, those with rights of access) and the COMPANY.

CONTRACTOR shall be responsible for completing the physical reinstatement of all Project-disturbed sites to their original condition, where possible upon completion of construction. Before construction personnel and equipment are demobilised, temporary buildings and equipment, tools and any excess material brought onto site or generated during the construction and commissioning programme will be removed (IT0068). In agreement with the relevant land owner, any building demolished on a temporary work site will be reinstated to its pre-construction condition (IT0141).

Re-contouring work will aim to restore the original and natural appearance of the land as far as reasonably practicable (IT0908). A Coastal Site Restoration and Landscape Management Plan

shall be developed by CONTRACTOR as part of the ESMS (IT0534). Specialist contractors will be employed to carry out reinstatement following pipeline construction (IT0737).

As a minimum, CONTRACTOR shall carry out the following reinstatement activities:

Areas affected by the works will be levelled and covered with the previously removed topsoil and subsoil. Stored topsoil (and the seed bank within it) will be replaced above the subsoil in the pipeline trench in order to maintain the structure and fertility of the soil (IT0750). The soil removed during topsoil stripping and trenching activities (see Sections 4.1.2.1 and 4.1.2.4) will be replaced in its original location and to a similar depth (IT0872). There will be a minimum of 1.5 m depth of cover on top of the pipeline (IT0044).

Attempts will be made to maintain the same profile and original stratification of horizons of reinstated soil. The soil level will be left a few centimetres above the surrounding terrain in consideration of the natural settling (IT0971). During ground levelling, particular care will be taken to avoid leaving holes or depressions that could create problems for subsequent farming activities (IT0140).

After the trench is backfilled the ground will be contoured to pre-existing conditions as far as is reasonably practical (IT0067). Re-contouring work will aim to restore the original and natural appearance of the land as far as reasonably practicable. A Coastal Site Restoration and Landscape Management Plan will be developed by CONTRACTOR as part its Offshore Erosion Control and Reinstatement ESIP (IT0534).

In general, soil reinstatement should start as soon as practical after trench backfilling (IT0042).

Any disposal will be carried out on stable ground, then compacted and covered with local topsoil to aid the growth of vegetation to avoid any later landslides or excessive erosion of the deposit. Further information regarding waste disposal is provided in the Offshore Waste Management CCP (IAL00-RSK-601-Y-TTM-0019).

Landscape restoration processes (including pipeline burial and topsoil reinstatement) will commence at the end of the construction phase soon after the trench is backfilled. This is of particular importance in steep areas.

After backfill activities, tillage of the soil will be realized through mechanical agitation with the aim of aerating the top layer of soil compacted by machinery (IT0287), and to relieve compaction and optimise soil humidity prior to placement of topsoil or other imported material serving as a topsoil replacement. Tillage will be up to a depth of 60 cm. Particular attention shall be given to this method on any route sections running through agricultural land (including olive groves) and permanently cultivated fields.

Once the topsoil has been replaced any large stones that are not in keeping with the surrounding soil texture will be removed (IT0081). Rocks may be returned to the surface of the working strip where they are characteristic of the preconstruction landscape on or off the working strip. Rock morphology, size and distribution should reflect the pre-construction character and that of the surrounding, undisturbed landscape.

Broken bedrock displaced during trenching and pipe-laying activities shall not be left haphazardly dumped on the surface of the working strip where it is incongruous with the surrounding landscape and shall not be left in stockpiles or cairns along the working strip.

Where broken rock and stones remain on the ground surface or within the topsoil layer in greater quantities than its pre-construction condition CONTRACTOR will undertake stone picking to return the soil to its original form. Particular attention shall be given to this method on route sections running through agricultural land (including olive groves) and permanently cultivated fields.

Excess rock that cannot be integrated reasonably into the finished working strip surface in harmony with the surrounding environment must be disposed of. CONTRACTOR shall develop a Coastal Excess Rock Management Plan that shall describe how the rock will be managed (with reference to the Offshore Waste Management CCP (IAL00-RSK-601-Y-TTM-0019)) and submit it to the COMPANY for acceptance.

CONTRACTOR shall inspect the excavated material to ensure that all waste, debris and other foreign objects (such as sections of cable, debris of anti-corrosive coatings, etc.) are not incorporated into subsoil placement, re-contouring works or topsoil re-spreading (including backfilling and pipe bedding). The foreign bodies, must be removed, collected and disposed of in

accordance with current law (IT0709) (see also the Offshore Waste Management CCP (IAL00-RSK-601-Y-TTM-0019)).

No contaminated material will be used for reinstatement purposes (IT0035). Any contaminated soils shall be removed and disposed of in accordance with the Offshore Waste Management CCP (IAL00-RSK-601-Y-TTM-0019).

All slash not usable as timber or in erosion control structures shall be re-spread along the coastal working strip (excluding areas of beach) once grading and topsoil reinstatement is complete. Slash shall not be mixed in with subsoil and fill materials during levelling and re-contouring works.

Reinstatement of the offshore microtunnel construction site will use the same material that was excavated. A minimum amount of stone will be used to cover the pipeline (IT0834).

4.2.3 Hydrogeological reinstatement

The hydrogeological balance will be restored by CONTRACTOR using appropriate techniques such as (IT0839):

- backfilling the excavation trench with granular material
- execution of waterproof partitions made of clay for the entire excavation section
- prompt confinement of the open fractures and construction of waterproof constraints.

4.2.4 Landscape and visual amenity

CONTRACTOR shall implement the mitigation measures concerning potential impacts to coastal landscape and visual amenity, as shown by Table 4-2 below.

Table 4-2 Landscape and visual mitigation measures (amended from the ESIA Italy – Section 8, Table 8-120)

Impacts	Mitigation Commitments to Reduce the Impact
Physical changes to landscape features	Careful planning of the construction period to avoid interfering with the summer season. Restore the original conditions of any structures interfered with (dry stone walls, wells etc.) by the Project.

Visual impact	Construction works will be carried out taking into account the importance of the summer season. The work site equipment that will be installed during the construction phase, due to their moderate height, will not significantly alter the characteristics of the landscape – no associated mitigation measures required.

CONTRACTOR will check in with relevant stakeholders following re-construction of physical structures to make sure these structures are built to expectations (IT0368).

4.2.4.1 Olive tree reinstatement

Olive tree reinstatement is the responsibility of the COMPANY (for more information see the Erosion Control and Reinstatement Plan).

4.2.5 Reinstatement: requirements for specific locations

4.2.5.1 Storage areas

Reinstatement of storage facilities shall be carried out according to the requirements of this CCP. Improvements/infrastructure may only be left on site by mutual consent between the landowner(s), CONTRACTOR and the COMPANY (see Section 4.2.2 for requirements on agreements between landowners, CONTRACTOR and the COMPANY).

As part of worksite abandonment, CONTRACTOR shall restore the site as closely as possible to its initial state. Any features affected by the Project (wiring, gates, service roads, drainage ditches, fences, etc.) shall be restored.

The surface preparation process of these areas will include the remediation of contaminating substances (e.g. hydrocarbons) in the soil. As necessary, soils will be excavated and mixed with organic material in order to restore their original physical and mechanical characteristics. Landowners will be consulted beforehand to identify future land use.

Once the site is abandoned, samples of the soil will be obtained and analysed for pollutants, including but not limited to Total Petroleum Hydrocarbons (TPH), benzene, toluene, ethyl benzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAH), lubricants, any other chemicals used during the constructions phase and heavy metals from those areas where fuel

was stored and any machinery yard/maintenance area were located. Where contamination is observed the clean-up limits as required by the Offshore Spill Prevention and Response CCP (IAL00-RSK-601-Y-TTM-0020) and the Environmental Project Standards Italy will be achieved.

4.2.5.2 Borrow pits and quarry reinstatement

No borrow pits or quarries are currently anticipated to be located within the coastal Project area. However, in the event that they should be required, the following section shall be applicable.

Before any borrow pit or quarry is opened, an environmental, socio-economic and cultural heritage assessment shall be carried out identifying the mitigation measures for its operation and reinstatement (for further information, refer to the Offshore Additional Land Take CCP (IAL00-RSK-601-Y-TTM-0018)).

Temporary quarries used for extracting materials shall be shut down following completion of construction. The land surface shall be levelled out using leftover waste rock that has accumulated in the periphery of the quarry areas. Access roads shall be closed and reinstated to prevent erosion. Soil removed during initial access road construction shall be spread out to encourage natural revegetation.

Quarry re-contouring work shall result in stable slopes; if necessary, terraces shall be built to reduce the slope length and angle. Drainage systems shall be implemented in areas of high rainfall. Finally, the topsoil shall be replaced to expedite revegetation.

No quarrying activities will be allowed in or around streambeds.

4.2.5.3 Irrigation infrastructure

Where construction works may affect land drainage and/or irrigation systems along the route, CONTRACTOR will agree with individual land owners the measures to be adopted to avoid such interference and any compensatory work. Full reinstatement of land drainage/irrigation features by CONTRACTOR will take place following construction (IT0069).

Should any irrigation channel crossings be necessary, procedures shall be the same as the crossing of minor watercourses (see the Offshore Watercourse Crossing CCP (IAL00-RSK-601-Y-TTM-0026)). Reinstatement should achieve original conditions or better, and should take into account all Project-disturbed irrigation structures, including but not limited to channels, wheels, pipes etc.

Following the pipeline backfilling operation, prior to the completion of the restoration works, the reactivation of pre-existing flow lines will be carried out (IT0078).

Construction shall preferably be carried out during the time when channels are not being used. Where this is not practical, provisions shall be made to maintain water flow during pipeline installation, and coordination with the landowner and users shall be carried out through the COMPANY to minimise the impact on the use of irrigation infrastructure (see the LRF (TAP-LEA-PL-0004).

For more information see the Offshore Infrastructure and Utilities CCP (IAL00-RSK-601-Y-TTM-0025).

4.2.5.4 Roads

CONTRACTOR will finance and will be responsible for the repair/upgrade work on roads required prior to heavy transportation; the maintenance of access roads during construction; and the reinstatement works after completion of the pipeline construction (IT0392).

For road crossings, 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 (IT0875).

4.2.5.4.1 Abandonment of logistics / access and shoofly roads

As determined by the COMPANY, newly built access roads developed for use during the construction phase of the Project may later be converted into service roads for pipeline maintenance or for long-term community use during the operations phase. Upgraded existing roads will also be required for use by the community and / or Project use. Consequently, CONTRACTOR shall restore the sides of roads that have been disturbed or that require erosion protection works.

In the case of shooflies, areas will be restored by decompacting and ensuring the re-conformation of slopes to a state as close to the original as possible and incorporating disturbed top soil in an effort to return original physical and mechanical characteristics..

4.2.5.5 Areas of identified contaminated soil

CONTRACTOR will sample and analyse any areas where polluted soil is identified on finalisation of construction works. For further information refer to the Offshore Compliance Monitoring CCP (IAL00-RSK-601-Y-TTM-0023).

4.3 Revegetation

Revegetation of disturbed areas is not the responsibility of CONTRACTOR.

5 Training

The training requirements relating to offshore erosion control and reinstatement can be found in the Offshore Employment, Training and Worksite Management CCP (IAL00-RSK-601-Y-TTM-0024).

6 Monitoring and Inspection

The monitoring and inspection requirements relating to offshore erosion control and reinstatement can be found in the Offshore Compliance Monitoring CCP (IAL00-RSK-601-Y-TTM-0023).

7 Related documents

The following is a list of documents that, amongst others, have content relevant to this CCP:

- Contractor's ESMS Framework Document (CAL00-RSK-601-Y-TTM-0001)
- Compliance Assurance Plan
- Biodiversity Action Plan Onshore Erosion Control and Reinstatement CCP (IAL00-RSK-601-Y-TTM-0003)
- Offshore Resource Management CCP (IAL00-RSK-601-Y-TTM-0014)
- Offshore Pollution Prevention CCP (IAL00-RSK-601-Y-TTM-0015)
- Offshore Ecological Management CCP (IAL00-RSK-601-Y-TTM-0017)
- Offshore Additional Land Take CCP (IAL00-RSK-601-Y-TTM-0018)
- Offshore Waste Management CCP (IAL00-RSK-601-Y-TTM-0019)
- Offshore Spill Prevention and Response CCP (IAL00-RSK-601-Y-TTM-0020)
- Offshore Compliance Monitoring CCP (IAL00-RSK-601-Y-TTM-0023)
- Offshore Employment, Training and Worksite Management CCP (IAL00-RSK-601-Y-TTM-0025)
- Offshore Infrastructure and Utilities CCP (IAL00-RSK-601-Y-TTM-0025)
- Offshore Watercourse Crossing CCP (IAL00-RSK-601-Y-TTM-0026)
- Italy Environmental Project Standards
- Italy Biorestoration Guidance and Preliminary Specification (IAL00-RSK-601-Y-TSP-0001)
- Livelihood Restoration Framework (TAP-LEA-PL-0004)
- Specification for Working Strip Preparation and Maintenance (IAL00-SPF-000-C-TRH-0005)
- TAP Battery Limits Onshore – Offshore Sections (CPL00-ENT-100-F-DFO-0002)
- International Finance Corporation (IFC) 2007. Pesticide Handling and Application. Website. http://www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines
- Legislative Decree No. 152. 2006. Approving the Code on the Environment.