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Appendix 10

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APPENDIX 10 BIOCONSTRUCTIONS MANAGEMENT PLAN (NEAR SHORE ITALY)

Purpose of this document

The purpose of this Bioconstructions Management Plan document is to:

- Introduce the rationale and objectives for bioconstructions management at the Trans Adriatic Pipeline (TAP) Italy landfall as shown in Figures 1 and 2.
- Define consenting conditions relating to bioconstructions.
- Define the specific mitigation measures in place to satisfy these conditions.
- Define how these measures will be enacted, monitored and reported.
- Define responsibilities for mitigation, monitoring and reporting.
- Make provisions for the management and mitigation of other sensitive benthic habitats known to associate with bioconstructions, namely corals, sponges and algae.

This plan should be read in conjunction with the EMP and Appendix 15

This document links with, and defers to, the work undertaken for the Environmental Monitoring Project[1] and provisions made within the Environmental Study for the Micro-tunnel[2] which enact parts of the Italian Ministerial Decree no. 223/2014. The expected outcome of this Bioconstructions Management Plan is the minimisation of residual impacts on the bioconstructions which, along with associated species including cnidarians and sponges, were identified as critical habitat triggers in the Critical Habitats Assessment (CHA).

This draft plan is a 'live' document which will be adapted in line with engagement with the competent Italian authorities. It provides the general overview required to demonstrate implementation of the mitigation hierarchy and measures required to ensure compliance with ESIA commitments, consent requirements and lender performance standards.

Updated details of monitoring activities and mitigation actions will be provided upon approval of the Environmental Monitoring Plan submitted to the authorities to comply with prescription A.31 of ESIA Decree and the set of ESIA prescriptions related to bioconstructions. The plan will then be updated prior to construction.

TAP in-country offices will develop and maintain this and associated documents, with inputs from local experts as required, immediately prior to and during the construction phase of the TAP project.

Introduction

Bioconstructions

The term 'bioconstruction' geologically refers to a 'bioconstructed limestone' (*Fox*[3]*, 2005*). Construction can be via the active or passive collection and cementation of material, or the direct production of mineral matter by organisms, such as the secretion of skeletal calcium carbonate by corals. The latter are strictly bioconstructions, i.e. calcifying organisms with hard skeletons that remain in place after death, becoming secondary substrate for other organisms.

Several typologies of bioconstructions are widespread and common in the whole Mediterranean, as rocky limestone shores, calcareous algae midlittoral rims, coralligenous reefs, oyster beds and mussel banks.

To follow on from the surveys undertaken for the ESIA, further bioconstruction surveys were undertaken in 2016 and 2017 targeting areas of interest identified through review of geophysical survey data. Five main areas were identified within which further investigation using a remote operated vehicle (ROV) has been undertaken to assess the nature and conservation value of the bioconstructions, which were classified in terms of their varying ecological value.

The structures within four (all at distances of greater than 10km from the landfall) of the five surveyed sites were determined to be shell beds of the oyster *Neopychnodonte cochlear* which are not of conservation interest.

At one site approximately 400m distance from the exit point (Area 5, location in Figure 1 below), the structures were found to consist of predominately coralligenous assemblages. The field survey investigations were performed using an ROV on five transects (50m and 25m north of the pipeline; 50m and 25m south of the pipeline; and along the pipeline itself within Area 5). Of the 13 coralligenous bioconstructions identified in this area as being of 'good' or 'moderate' status, only one 'good' and two 'moderate' were recorded close (10 m +/-) to the pipeline alignment (Area 5 C01). Overall, within the surveyed site the majority of outcrops were classified as 'scarce' or 'bad', many of which were characterised by encrusting sponges and hydrozoa. At approximately >70m water depth, a facies with the protected sponges *Axinella cannabina* and *Axinella polypoides* was observed. The condition of bioconstructions within Area 5 was assessed and classified as bad (red), scarce (yellow), moderate (green) and good (blue) – see Figure 2 (refined route).

Figure 2 shows that none of the assemblages overlap with, or are in proximity to, the areas where invasive seabed works, including dredging, trenching and creation of the gravel berm, will be required. The nearest bioconstructions to shore are found along the pipeline route at approximately 400m from the micro-tunnel exit. The majority of 'good' and 'moderate' assemblages identified are beyond the alignment.

[3] Fox W.T., 2005. Bioconstruction. In: Encyclopaedia of Coastal Science. (Ed. Schwartz M.L) Springer Netherlands. 186-188pp DOI 10.1007/1-4020-3880

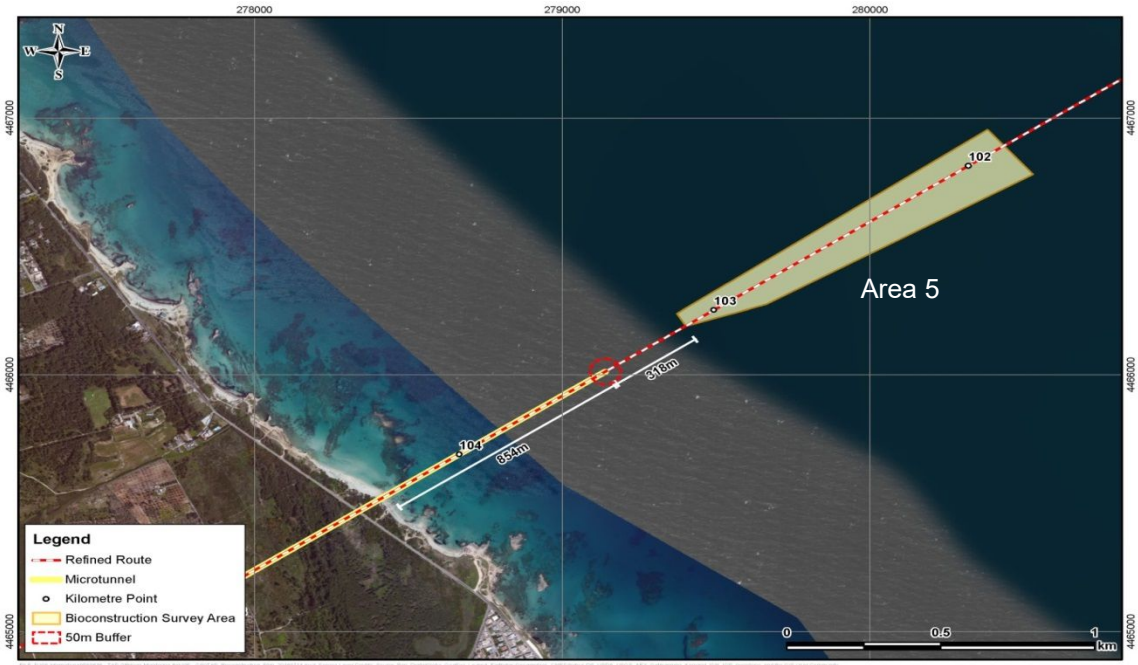

Figure 1: bioconstruction survey, Area 5

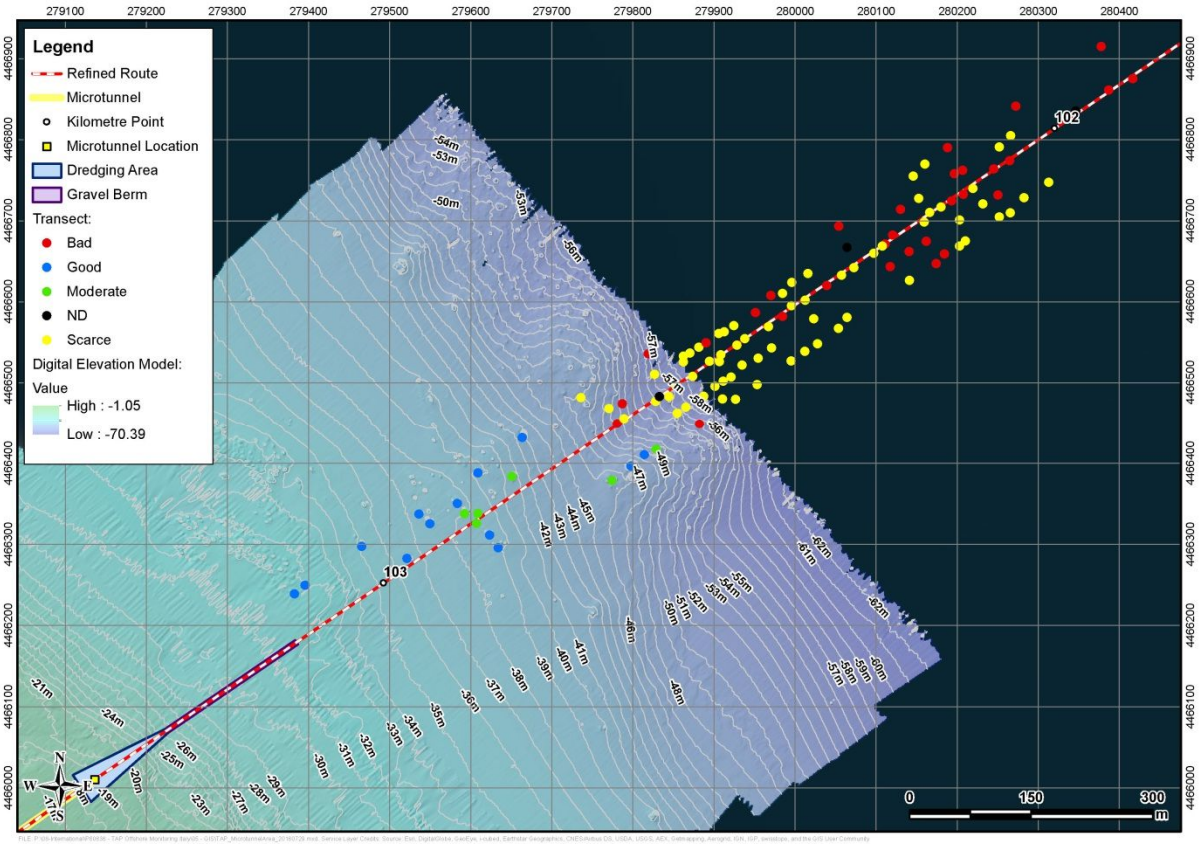

Figure 2: classified bioconstructions found in Area 5.

The first coralligenous bioconstructions found along the pipeline route are approximately 400m from the micro-tunnel exit. Of the 13 coralligenous bioconstructions identified in this area as being of 'good' or 'moderate' status, only one 'good' and two 'moderate' were recorded along the pipeline alignment. Overall, within the surveyed site the majority of outcrops were classified as

'scarce' or 'bad' and were mostly characterised by encrusting sponges and hydrozoa. Two protected species of sponge were also identified – *Axinella polypoides* and *Axinella cannabina.* These were predominately associated with the bioconstructions further offshore.

In addition to bioconstructions being included within the broad critical habitat trigger of 'reefs', both sponges were found to conservatively qualify as Tier 2 critical habitat. *Axinella cannabina* is described as 'frequent in the Adriatic but rare in the western Mediterranean basin' (Ballesteros[4], 2006).

Mitigation and Management Measures

Consultation with the Italian regulators on proposed mitigation measures is ongoing at the time of writing (Q4 2017).

Upon completion of pre-construction data collection, bioconstruction sensitivities will be further defined. This will include a review of geophysical data for the entire alignment to identify any habitat features of ecological or geological interest for further investigation with Drop-Down Video (DDV) or ROV.

Consultation on construction techniques and mitigations during rock armouring and pipe lay is currently ongoing (Q4/17) with the relevant Italian authorities. Detailed mitigation measures agreed for the protection of bioconstructions will be provided within the next revision of this plan.

This will include detailed anchor and rock placement management plans.

Throughout Area 5, any required rock and the pipeline will be laid on the seabed with an ROV providing live feedback to the vessel (guided lay). This will ensure that the lay is carried out extremely accurately and will provide the greatest possibility of avoiding direct impacts upon any coralligenous bioconstructions of significant dimensions and the greatest conservation importance.

If any engineering constraints arise that require direct placement of armouring (e.g. rock placement, mattresses) on a bioconstruction, a review of armouring design options will be undertaken with the Italian authorities. An appraisal of the % loss of total bioconstructions in the area, and % loss of bioconstructions of ecological / conservation value, (including associated species also triggering critical habitat) will be undertaken to assess whether or not impacts are residual and therefore require net gains.

Level 3 site files will be developed for all Priority Diversity Features (PBFs) and Critical Habitats (CH) which will include mitigation, monitoring and, if necessary, offset requirements to achieve No Net Loss (NNL) and Net Gain (NG).

[4] Ballesteros, E., 2006. Mediterranean coralligenous assemblages: a synthesis of present knowledge. Oceanogr. Mar. Biol. Annu. Rev, 44: 123-195.