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Infrastructure & Utilities in Relation to an Environmental Impact Assessment (EIA)

Undertaking of the permitting activities including environmental impact studies and related actions for the Malta-Italy Gas pipeline interconnection

Technical Report

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1.0 Scope

An Environmental Impact Assessment (EIA) is hereby being presented in relation to PA 08757/17. This application is entitled "*construction of the Malta-Italy gas pipeline EU Project of Common Interest, including a terminal station at DPS, an onshore HDD route through Delimara Peninsula and the laying of an offshore 22" diameter pipeline extending up to Gela, Sicily, Site at Delimara Power Station and offshore route within the Malta Territorial Waters, Delimara, Marsaxlokk, Malta*".

This technical study identifies the infrastructure and utilities in the area and assesses the impacts caused in relation to the Environmental Impact Assessment (EIA) for the proposed gas pipeline between Malta and Sicily. The terrestrial aspect of this study falls within the locality of Delimara, Marsaxlokk.

The study will focus on the Maltese part of the Scheme only i.e. the area of land reclamation at Marsaxlokk bay, the trenchless tunnel route through the Delimara peninsula and the offshore pipeline until the median line between Malta and Sicily.

The project shall connect Malta to the Trans-European Gas Network in Sicily. The primary aim of the project is to import gas from the Italian National Gas network via an approximately 159km long pipeline between Delimara (Malta) and Gela (Sicily) of which approximately 151km is subsea.[1] The length of the onshore pipeline section in Delimara is about 700m and will be connected to a new Terminal Plant by means of a trenchless construction method with the offshore exit target point at approximately 42m below mean sea level. Although the preferred construction method is still under evaluation, the Front End Engineering Designers (FEED) have determined that the microtunnelling solution is the preferred option. A degree of preliminary trenching is required at the underwater target exit point to facilitate the entry of the pipeline from the seafloor into the trenchless borehole. The seabed shall be reinstated after the 22" pipeline installation is completed. The water depth of the offshore proportion of the site ranges from 42m (at the offshore exit point at Delimara) to 158m at the deepest point and then it is buried from a depth shallower than 30m at the Gela side.

Once the project is implemented, the gas pipeline would provide a more reliable source to supply natural gas to Malta, eliminating the need for the Floating Storage Unit (FSU) recently installed to supply natural gas to the reciprocating internal combustion engine plant and the new gas turbines at the Delimara Power Station. The project will contribute to market integration and thus boost competitiveness. Use of sustainable energy will be supported by the project and will contribute towards the reduction of GHG emissions primarily from the LNG shipping and regasification process which currently take place as part of the FSU

[1] *The project was confirmed as a "project of common interest" (PCI) and re-confirmed in the 2nd, 3rd and 4th PCI lists.*

system. Once operational, the gas pipeline will also have the potential to import fuel gases from renewable sources (ex: biomethane) and thus help reduce Malta's carbon footprint.

The gas pipeline project shall be designed to operate in bidirectional mode with the first phase supplying gas from Sicily to Malta and depending on market developments, can in the future be used to supply gas from Malta to Italy. Phase 1 of the pipeline project, i.e. flow of gas from Italy to Malta, shall have an estimated capacity of approximately 1.2 billion standard cubic meters per year, with a guaranteed maximum flow of 141,000 Sm^3/hour

The pipe will make contact with land in Malta on the eastern side of the Delimara peninsula at a depth of approximately 42m below sea level. It will then transect the peninsula and connect to the Delimara Power Station via a trenchless excavation method. The Power Station needs to be extended in order to accommodate the additional infrastructures required for the operation of the pipeline. In order to do this, it is necessary to reclaim an area of 8,000m^2 from the sea.

The Sicilian terminal station will be constructed within the Gela municipality at 37°04'51.80"N; 14° 19'01.00"E. The onshore pipeline route in Sicily is expected to be 7km long, and confined within the Gela municipality. Since the pipeline shall cross two railway lines, a number of roads and the Gela-Ragusa ethylene pipeline, three block valve stations shall be installed onshore Sicily to isolate the pipeline sections as required by Italian legislation.

On the Sicilian shore, several construction methodologies, including HDD are being considered by the FEED (Front End Engineer Design) contractor, Techfem/SPS. For mechanical protection purposes, the underwater pipeline shall be covered when passing through waters shallower than 30m, while in deeper waters, the pipeline shall be laid on the seabed. Since the entry point at the Delimara peninsula (1,200m from the Terminal Plant) is at 42m depth, coverage of the pipe is only necessary in Maltese waters in the areas flagged by the FEED contractor. The pipeline route is located in relatively shallow waters on the Malta-Sicily underwater ridge. Such a route minimises stresses on the pipeline during both the laying of the pipe as well as during the operation of the pipeline itself.

The proposed development, hereinafter referred to as the "Scheme", involves the following interventions (Figure 1):

- Construction and laying of a 22" diameter gas pipeline between Delimara, Malta and Gela Sicily
- Land reclamation adjacent to the Delimara Power Station
- Construction of the terminal station
- Onshore tunnel route across the Delimara Peninsula

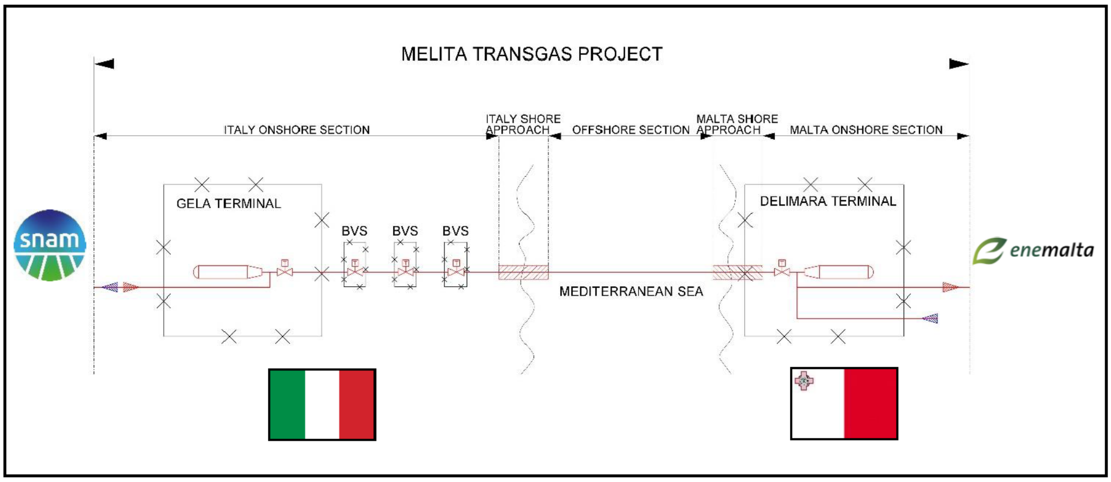

Figure 1: Project schematic

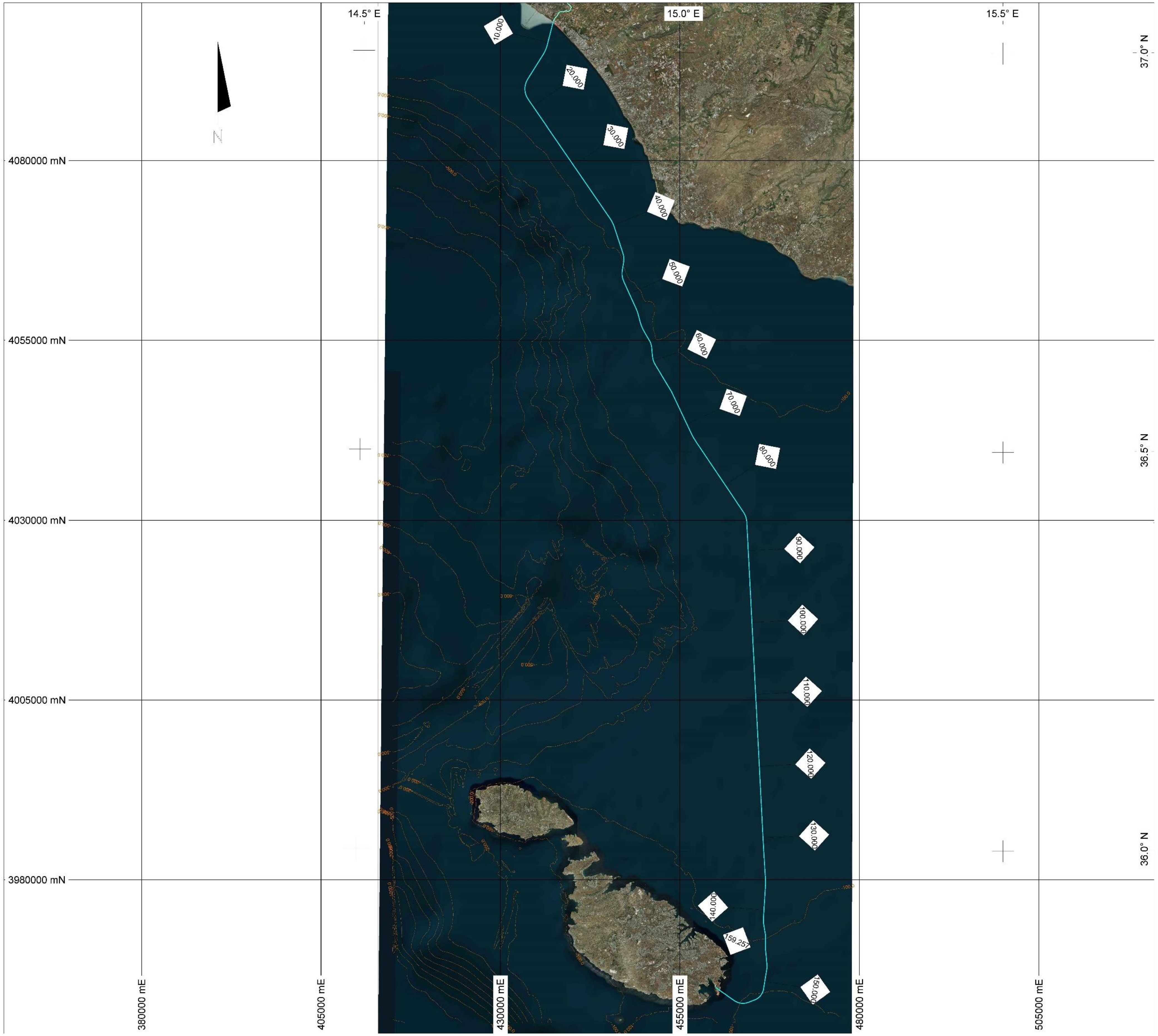

Figure 2: Site plan showing the offshore pipeline route

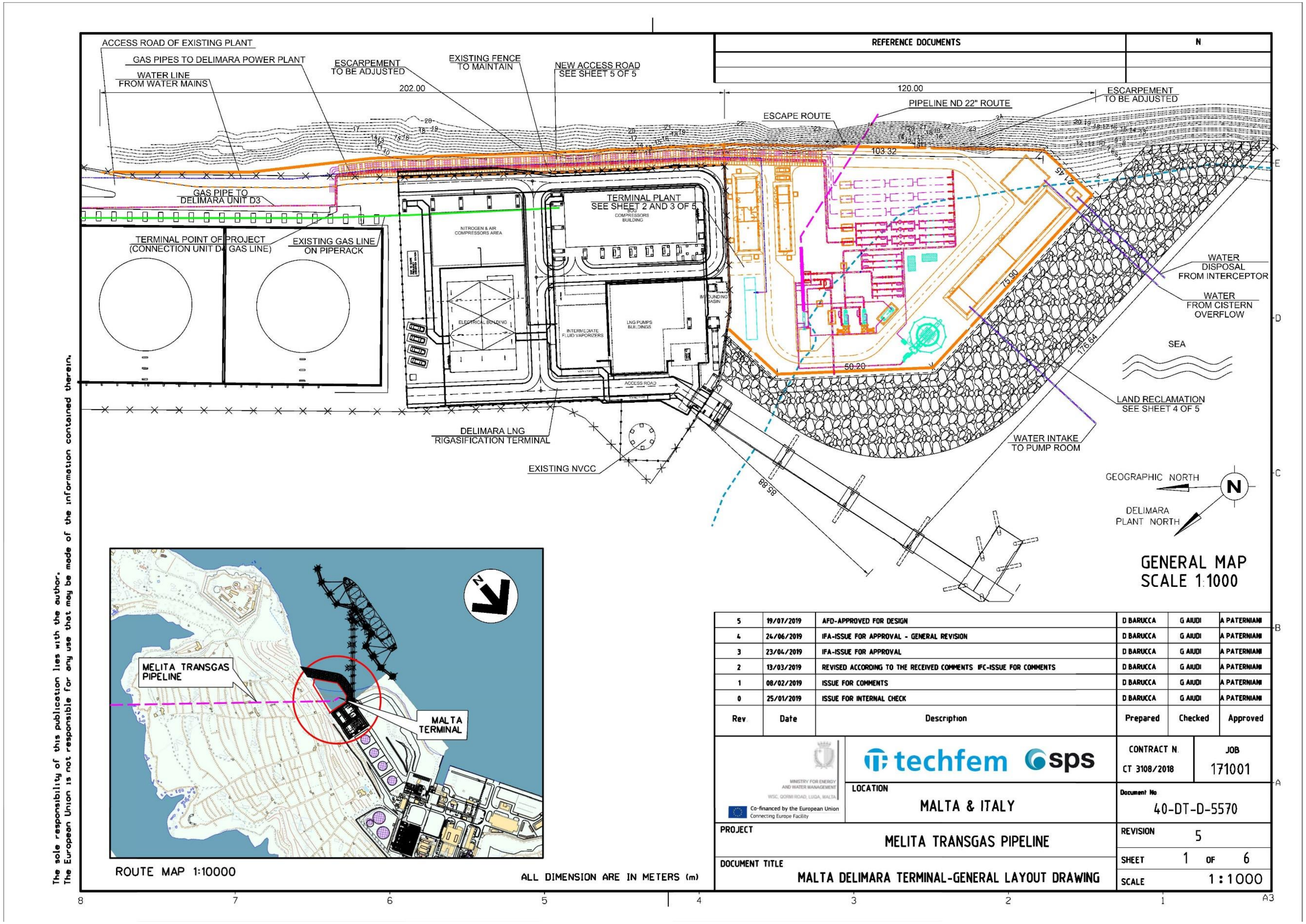

Figure 3: Site plan for the proposed Malta terminal and land reclamation area

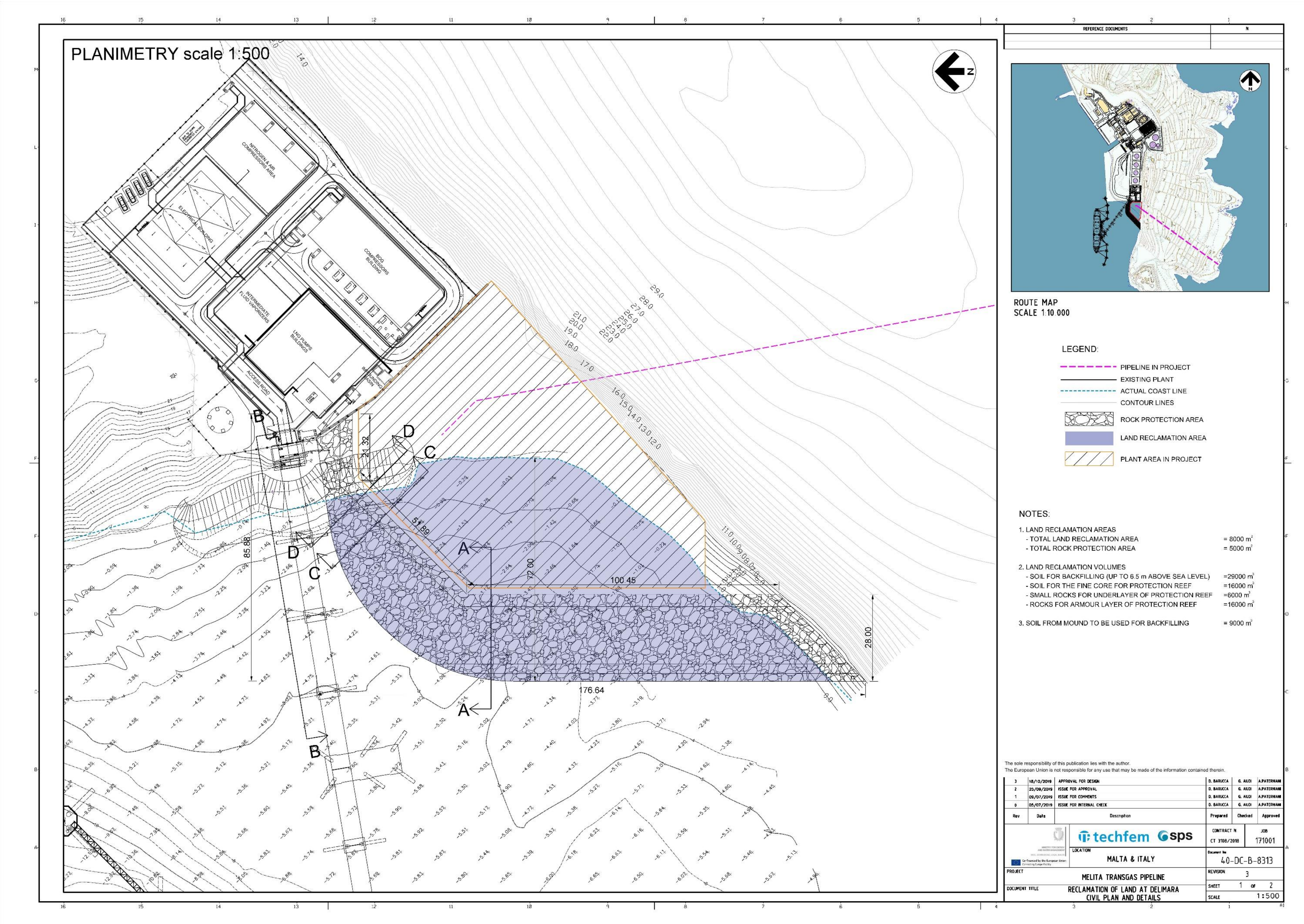

Figure 4: Land reclamation at Delimara

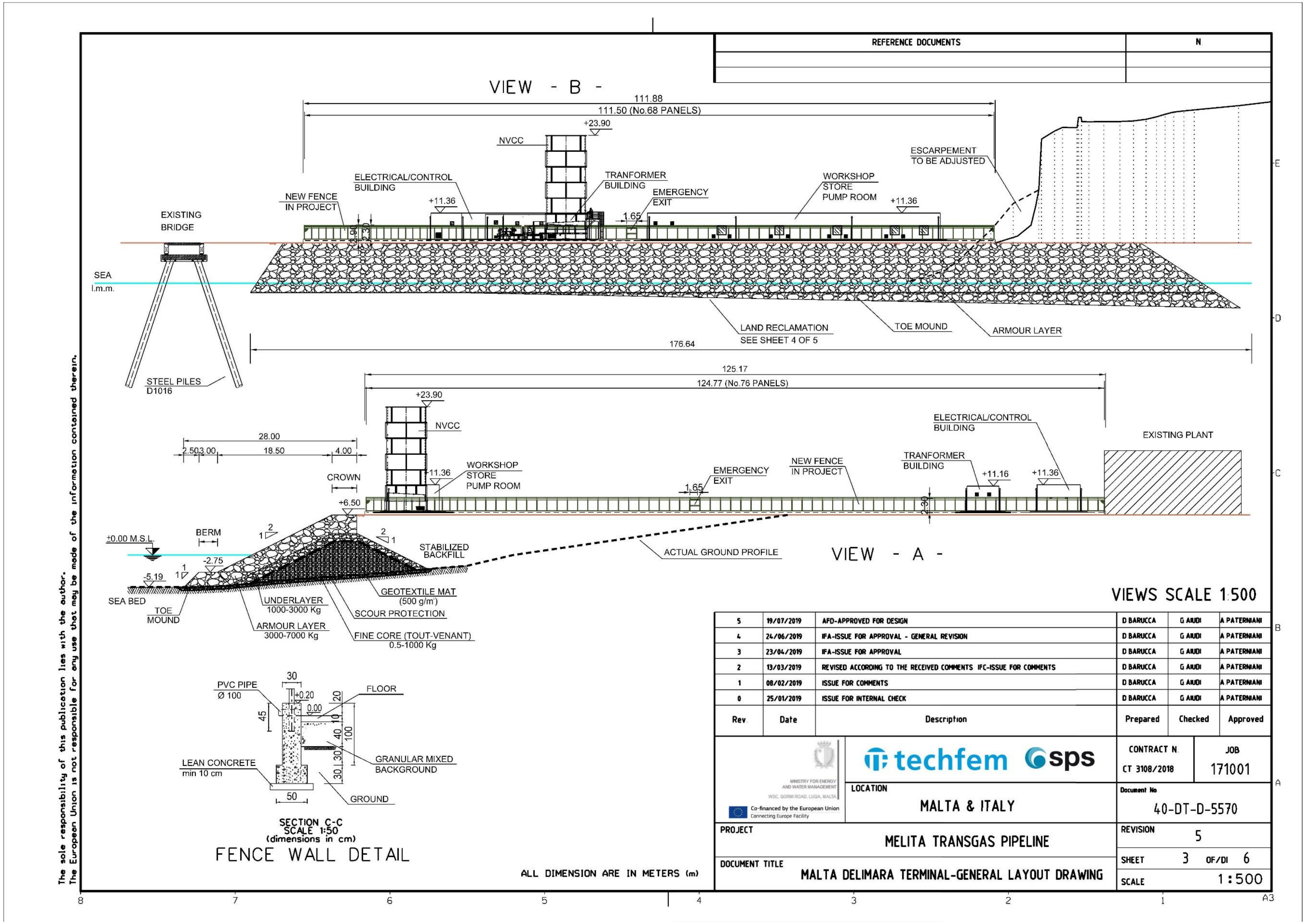

Figure 5: Sections for the proposed Malta terminal

2.0 Terms of Reference

The Terms of Reference related to the study on land/sea cover and land/sea uses for the EIA issued by ERA in March 2018 are:

3.0 A DESCRIPTION OF THE SITE AND ITS SURROUNDINGS (I.E. ENVIRONMENTAL BASELINE)

This description is identified by the area of influence depicted in Figure 6 and Figure 7. This description shall include:

3.8 Infrastructure and Utilities

The assessment should investigate the currently available infrastructural services (including water supply, energy supply, sewerage, telecommunications infrastructure, access roads, parking, etc.), including details about their carrying capacity, physical condition and other relevant practical considerations. It should also compare this information to the infrastructural demands of the project as identified in ***Section 1*** *above, so as to clearly indicate:*

1. whether the current utilities are adequate to meet the demand arising from the proposed development;

2. whether any significant loading, congestion or damaging of the infrastructural or transport network is envisaged; and

3. whether any new or upgraded services/arrangements will be rendered necessary, both in the short-term and in the longer-term. If any requirement for new infrastructure (or upgrading, alteration or extension of the existing infrastructure) is envisaged, the relevant details including associated works and their environmental implications should also be indicated.

The assessment should also identify any existing or projected infrastructural services located within the area of influence of the development (even if not related to the demands of the development) that might be affected by the development or which may need to be displaced or diverted as a consequence of the development or its ancillary operations and interventions.

4.0 ASSESSMENT OF ENVIORNMENTAL IMPACTS AND ENVIRONEMENTAL RISKS

All likely significant effects and risks posed by the proposed project on the environment during all relevant phases (including construction/excavation/demolition, operation and decommissioning) should be assessed in detail, taking into account the information emerging from Sections 1, 2 and 3 above. Apart from considering the project on its own merits (i.e. if taken in isolation), the assessment should also take into account the wider surrounding context and should consider the limitations and effects that the surrounding environmental constraints, features and dynamics may exert on the proposed development, thereby identifying any incompatibilities, conflicts, interferences or other relevant implications that may arise if the project is implemented.

In this regard, the assessment should address the following aspects, as applicable for any category of effects or for the overall evaluation of environmental impact, addressing the worst-case scenario wherever relevant:

1. *An exhaustive identification and description of the envisaged impacts;*
2. *The magnitude, severity and significance of the impacts;*
3. *The geographical extent/range and physical distribution of the impacts, in relation to: site coverage; the features located in the site surroundings; whether the impacts are short-, medium- or long-range; and any transboundary impacts (i.e. impacts affecting other countries);*
4. *The timing and duration of the impacts (whether the impact is temporary or permanent; short-, medium- or long-term; and reasonable quantification of timeframes);*
5. *Whether the impacts are reversible or irreversible (including the degree of reversibility in practice and a clear identification of any conditions, assumptions and pre-requisites for reversibility);*
6. *A comprehensive coverage of direct, indirect, secondary and cumulative impacts, including:*
   - *interactions (e.g. summative, synergistic, antagonistic, and vicious-cycle effects) between impacts;*
   - *interactions or interference with natural or anthropogenic processes and dynamics;*
   - *cumulation of the project and its effects with other past, present or reasonably foreseeable developments, activities and land uses and with other relevant baseline situations; and*
   - *wider impacts and environmental implications arising from consequent demands, implications and commitments associated with the project (including: displacement of existing uses; new or increased pressures on the environment in the surroundings of the project, including pressures which may be exacerbated by the proposal but of which effects may go beyond the area of influence; and impacts of any additional interventions likely to be triggered or necessitated by situations created, induced or exacerbated by the project);*
7. *Whether the impacts are adverse, neutral or beneficial;*
8. *The sensitivity and resilience of resources, environmental features and receptors vis-à-vis the impacts;*
9. *Implications and conflicts vis-à-vis environmentally-relevant plans, policies and regulations;*
10. *The probability of the impacts occurring; and*
11. *The techniques, methods, calculations and assumptions used in the analyses and predictions, and the confidence level/limits and uncertainties vis-à-vis impact prediction.*

The impacts that need to be addressed are detailed further in the sub-sections below.

4.1 Effects of the environment aspects identified in Section 3

The assessment should thoroughly identify and evaluate the impacts and implications of the project on all the relevant environmental aspects identified in Section 3 above, also taking into account the various considerations outlined in the respective sections.

With regards to Section 3.4 and 3.5 above, the ecological status of the area in question is to be evaluated, taking into consideration the definition of status by relevant EU Policy, and assessing the extent to which the project will cause deterioration in status or compromise the achievement of good status in line with Article 4(7) of the EU Water Framework Directive.

5.0 REQUIRED MEASURES, IDENIFITICATION OF RESIDUAL IMPACTS, AND MONITORING PROGRAMME

5.1 Mitigation Measures

A clear identification and explanation of the measures envisaged to prevent, eliminate, reduce or offset (as relevant) the identified significant adverse effects of the project during all relevant phases including construction, operation and decommissioning [see ***Section 1.2.3*** *above]. Such measures could include technological features; operational management techniques; enhanced site-planning and management; aesthetic measures; conservation measures; reduction of magnitude of project; and health and safety measures. Particular attention should be given to mitigation of impacts on the marine resources and of conflicts between the different uses on site.*

As a general rule, mitigation measures for construction-phase impacts should be packaged as a holistic Construction Management Plan (CMP). Whilst the detailed workings of the CMP may need to be devised at a later stage (e.g. after the final design of the project has been approved and/or after a contractor has been appointed), the key parameters that the CMP must adhere to for proper mitigation need to be identified in the EIA. Broadly similar considerations also apply vis-à-vis operational-phase impacts [which may need to be mitigated through an operational permit] and decommissioning-phase impacts [see ***Section 5.4*** *below], where relevant.*

Mitigation measures for accident/risk scenarios should be packaged as a holistic plan that includes the integration of failsafe systems into the project design as well as well-defined contingency measures.

The recommended measures should be feasible, realistically implementable to the required standards and in a timely manner, effective and reliable, and reasonably exhaustive. They should not be dependent on factors that are beyond the developer's and ERA's control or which would be difficult to monitor, implement or enforce. The actual scope for, and feasibility of, effective prevention or mitigation should also be clearly indicated, also identifying all potentially important pre-requisites, conditionalities and side-effects.

5.2 Residual Impacts

Any residual impacts [i.e. impacts that cannot be effectively mitigated, or can only be partly mitigated, or which are expected to remain or recur again following exhaustive implementation of mitigation measures] should also be clearly identified.

5.3 Additional Measures

Compensatory measures (i.e. measures intended to offset, in whole or in part, the residual impacts) should also be identified, as reasonably relevant. Such measures should be not considered as an acceptable substitute to impact avoidance or mitigation.

If the assessment also identifies beneficial impacts on the environment, measures to maximise the environmental benefit should also be identified.

In both instances, the same practical considerations as indicated vis-à-vis mitigation measures should also apply.

5.6 Identification of required authorisations

The assessment should also identify all environmentally-relevant permits, licences, clearances and authorisations (other than the development permit to which this EIA is ancillary) which must be obtained by the applicant in order to effectively implement the project if development permission is granted. Any uncertainty, as to whether any of these pre-requisites is applicable to the project, should be clearly stated.

Note on Sections 5.1 to 5.6 above:
The expected effects, the proposed measures, the residual impacts, the proposed monitoring etc. should also be summarised in a user-friendly itemised table that enables the reader to easily relate the various aspects to each other. An indicative specimen table is attached in ***Appendix 4*** *- attached to Method Statement as Appendix 1.*

3.0 Methodology

The baseline information in this report presents an integrated view of the infrastructure and utilities present in the area under study.

3.1 Area of Influence

The study was divided into two main Areas of Influence (AoI). The first AoI encompassed the terminal station, land reclamation area, terrestrial pipeline route and landfall site with a 100m buffer zone around the aforementioned features, as mapped in Figure 6.

The second AoI covered the survey corridor around the offshore pipeline route up until the median line between Malta and Sicily, as shown in Figure 7. The offshore corridor is 2km wide (1km on each side of the route) for the first nautical mile and 1.2km wide (600m on each side of the route) for the remaining offshore section.

Figure 6: AoI covering the onshore works with a 100m buffer zone

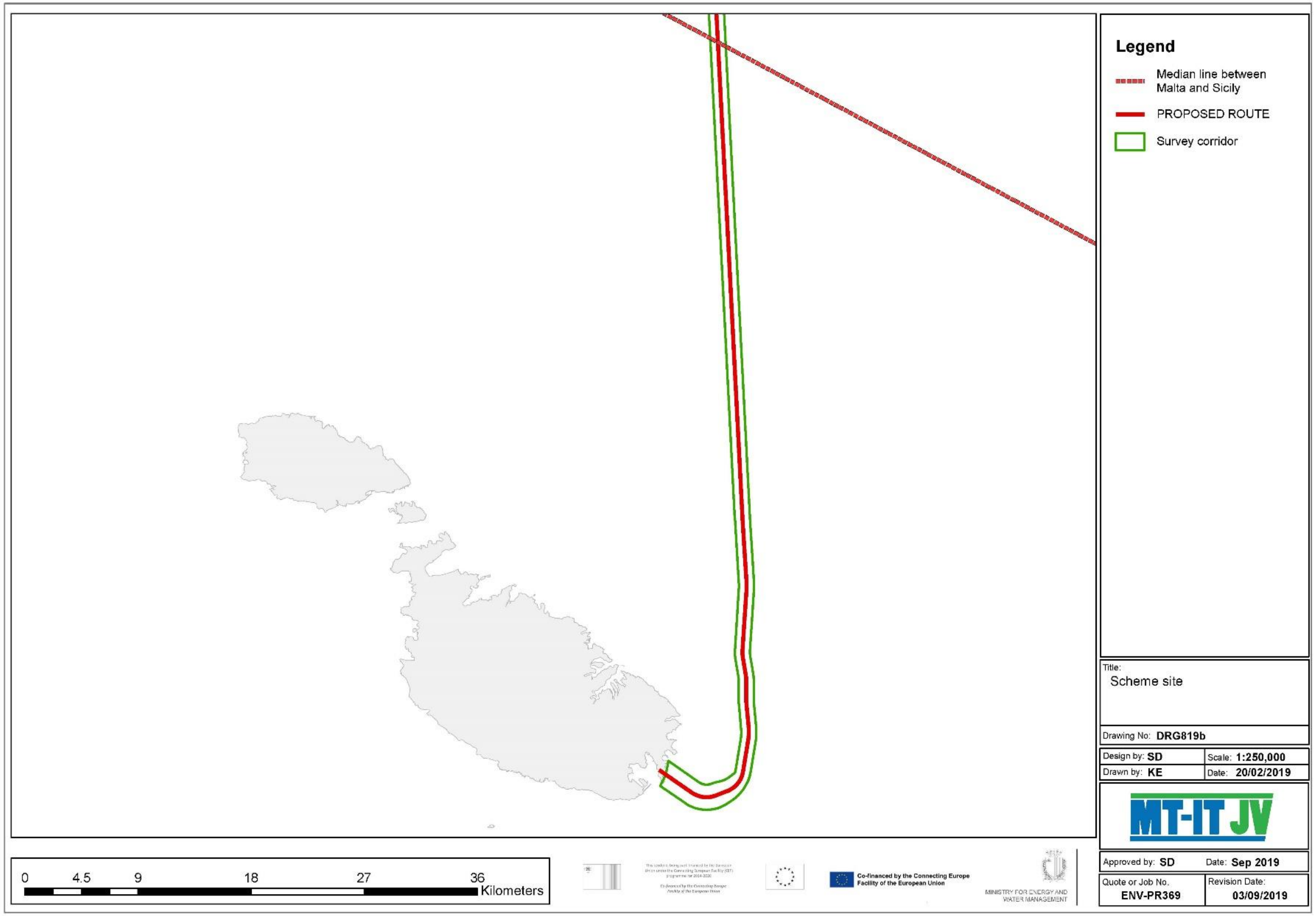

Figure 7: AoI around the offshore pipeline

3.2 Study Methodology

The infrastructure and utilities investigation has been structured as a desktop study complemented by field visits to validate the data collated. A description of the existing infrastructure on land and offshore has been compiled, along with any foreseeable infrastructure in the study area.

The terrestrial literature review included the analysis of satellite images from sources such as Landsat/Copernicus (Google Earth). Since such services are often not representative of real-time arrangements, the information obtained from the desktop study were verified on site. Verification was represented by means of photographic evidence. Additional information was gathered from relevant commercial companies and competent authorities.

Since the infrastructures located offshore will all be submerged, the methodology for this aspect of the study was composed entirely of desktop study and investigations unearthed during the preliminary marine route survey that was carried out by a third-party contractor (Lighthouse S.p.A). Information about the existing infrastructures and utilities was obtained from the relevant commercial companies and competent authorities and analysed in the context of the Scheme.

Geographic Information System (GIS) software was used to map the existing and proposed changes to the infrastructure and utilities.

4.0 Existing Infrastructure & Utilities

4.1 Onshore features

The infrastructure and utility features present on land are summarised in Table 1 and mapped in Figure 8. Aerial infrastructure noted during the site walkover survey is visualised in Figure 9 to Figure 11. Additional WSC potable water pipes are being proposed through PA 01103/18, although the application was "suspended at the perit's request" at the time of writing.

Table 1: Onshore infrastructure & utilities

Operator	Feature type	Present?
Go plc	Aerial cable	Y
	Underground cable	Y
	Antennae	Y
Vodafone plc	Aerial cable	N
	Underground cable	N
	Antennae	N
Melita plc	Aerial cable	N
	Underground cable	N
	Antennae	Y
Water Services Corporation	Water mains pipes	Y
	Wastewater mains pipes	N
Electrogas Ltd	Regasification plant	Y

Although the Enemalta plc power station is located outside the 100m buffer zone, it has nevertheless been discussed in this report due to its sensitivity. Infrastructure located within the power station include:

- Street lighting
- Aerial cable
- Underground cable

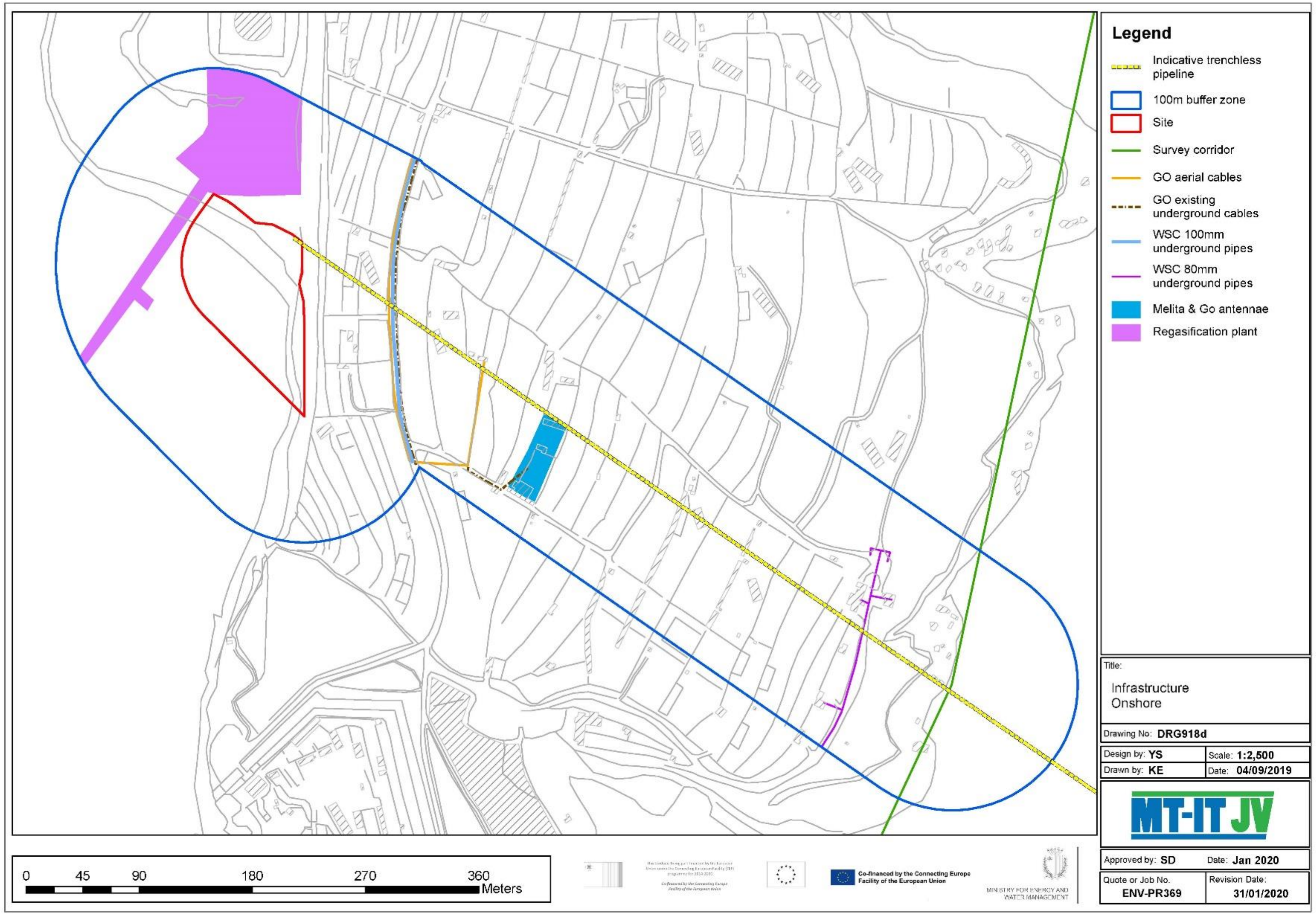

Figure 8: Existing onshore infrastructure in the AoI

Figure 9: Enemalta power station

Figure 10: Street lighting and aerial cables

Figure 11: Antennae in broadcasting station

The Delimara Power Station has a number of features which contribute to the generation of electricity, including the following:

- Phase 2A generating plant and chimney (operated by Enemalta plc)
- Phase 2B generating plant and chimney (operated by Enemalta plc)
- Phase 3 generating plant and chimney (operated by Delimara 3 Power Generation Ltd)
- Phase 4 generating plant and chimney (operated by Electrogas Ltd)

Within the Power Station, there is also a regasification plant operated by Electrogas Ltd, which converts liquefied natural gas (LNG) from the floating storage unit (FSU) into gas. The unit has the following features:

- LNG pumping station and LNG pipes
- Power cables of varying voltages
- Air compressors and nitrogen generation plant area
- Electrical switch rooms and batteries
- BOG compressors
- Intermediate fluid vaporisers
- Control room
- Power transformers
- Static frequency converter (supplying the FSU with electricity)
- Street lighting
- NVCC and NVCC KO drum
- Administration building/workshops
- Firefighting equipment/pipes

Electrogas also operate the jetty which connects the FSU to the regasification plant. This jetty has the following relevant infrastructure and utilities features:

- LNG pipes
- Firefighting equipment / pipes
- Nitrogen lines
- Potable water

Infrastructure related to accessibility of the area and parking is detailed in the Public Access chapter.

4.2 Offshore features

The offshore infrastructure and utilities features identified through a literature review of the available public information from Enemalta, WSC, Melita, Go and Vodafone are visualised in Figure 12. Geophysical surveys carried out by the PMRS contractor identified 21 total cable crossings along the proposed pipeline route, 15 of which are located in Maltese waters (Table 2).

Table 2: Offshore cable crossing data in Maltese waters

CROSSING DATA				
PIPELINE/CABLE TO BE CROSSED	CROSSING POINT COORDINATES		KP	CROSSING ANGLE
	EAST	NORTH		
PROBABLE CABLE_(ARTEMIS OOS)	464722.80	4021775.15	93.60	76
UNKOWN CABLE AS FOUND	465007.43	4016241.05	99.14	23
MENA FOC AS FOUND	465056.07	4015295.52	100.09	63
SEA-ME-WE-S4 FOC AS FOUND	465206.85	4012363.77	103.03	44
SEA-ME-WE-2-SEG5 OOS AS FOUND	465686.57	4003036.85	112.37	62
UNKOWN CABLE AS FOUND	465874.30	3999386.82	116.02	16
CATANIA-MALTA FOC AS FOUND	466372.33	3989703.74	125.72	45
PROBABLE CABLE (MALTA-POZZALLO_NO2)	466565.85	3985941.28	129.48	51
PROBABLE CABLE (GO-1)	466608.71	3985107.89	130.32	69
PROBABLE CABLE (ALEXANDRIA-MALTA_NO6 OOS)	466689.10	3983785.98	131.64	79
VODAFONE MALTA SR2A AS FOUND	466788.67	3982179.75	133.25	65
PROBABLE CABLE MALTA-BENGHASI NO2 OOS	466888.60	3980567.50	134.87	52
PROBABLE CABLE (ALEXANDRIA-MALTA_NO4 OOS)	466835.53	3977875.58	137.56	55
PROBABLE CABLE (ALEXANDRIA-MALTA_NO3 OOS)	466756.96	3976637.26	138.81	84
PROBABLE CABLE (ALEXANDRIA-MALTA_NO1 OOS)	466924.91	3970543.71	144.93	64

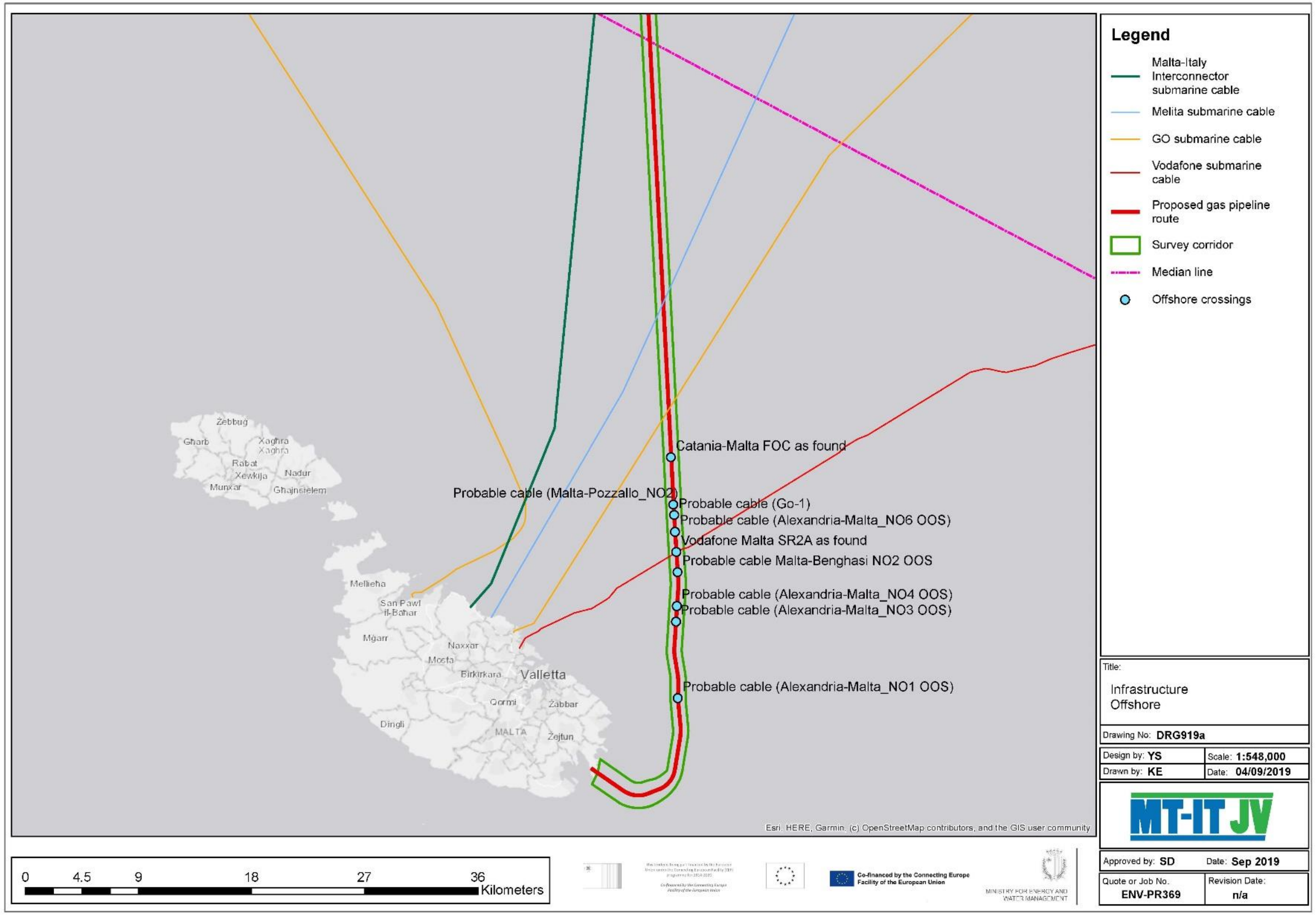

Figure 12: Existing offshore infrastructure

5.0 Impact Assessment

The following is a description of the potential impacts on the infrastructure and utilities of the AoI.

5.1 Impact Significance Criteria

A qualitative assessment has been carried out to determine the potential impact on the present infrastructure and utilities arising from the proposed pipeline. The potential impacts that may arise from the Scheme are those that could cause damage to existing infrastructure and utilities. The tables below (Table 3 to Table 11) provide a definition for each of the criteria used in Table 12, which summarises the assessment of impacts on infrastructure and utilities.

Table 3: Criteria for the sensitivity of resources to impact

Sensitivity of receptors to impact	
Level	**Definition**
High	The receptors are highly sensitive to the impact and will be affected by the impact to a major degree
Medium	The receptors are moderately sensitive to the impact and will be affected by the impact to a moderate degree
Low	The receptors are minimally sensitive to the impact and will be affected by the impact to a small degree

Table 4: Criteria for the consequences of impact

Consequences of Impact	
Level	**Definition**
Direct	Changes that result from direct cause-effect consequences of interactions between the result of action under consideration and the proposed project
Indirect	Result from cause-effect consequences of interactions between the action under consideration and indirect impacts
Cumulative	Result from cause-effect consequences of interactions between the action under consideration and other related projects

Table 5: Criteria for the effect of impact

Effect of Impact	
Level	**Definition**
Adverse	Infrastructure and utilities would suffer consequences as a direct result of the proposed development
Beneficial	Infrastructure and utilities would benefit as a direct result of the proposed development

Table 6: Criteria for the severity of impact

Severity of Impact	
Level	**Definition**
High	This action is a major contributor to the infrastructure and utilities in the area of influence
Medium	This action is a moderate contributor to the infrastructure and utilities in the area of influence
Low	This action is a minor contributor to the infrastructure and utilities in the area of influence

Table 7: Criteria for the physical extent of the impact

Physical extent of Impact	
Level	**Definition**
Local	Impact would affect the areas in the nearby surroundings
National	Impact would affect Malta on a national scale
International	Impact would affect Malta and/or other countries

Table 8: Criteria for the duration of impact

Duration of Impact	
Level	**Definition**
Permanent	Impact would still be detectable during the concerned phase
Temporary	Impact would not persist through the whole duration of the concerned phase

Table 9: Criteria for the reversibility of impact

Reversibility of Impact	
Level	**Definition**
Reversible	State of the activity/action is potentially expected to return to baseline background level following cessation of the source of impact
Irreversible	Impact is expected to cause partial or total destruction of the action under consideration and a return of the state of the resource to baseline levels should be considered highly improbable

Table 10: Criteria for the probability of impact occurring

Probability of Impact Occurring	
Level	**Definition**
Inevitable	Level of certainty that impact will occur is greater than 90%
Likely	Level of certainty that impact will occur ranges between 50-90%
Unlikely	Level of certainty that impact will occur ranges between 30-50%
Remote	Level of certainty that impact will occur is below 30%

Table 11: Criteria for the overall impact significance

Impact Significance	
Level	**Definition**
Not significant	Negligible significance
Minor significance	Low order impact and therefore likely to have little real effect on infrastructure and utilities. In the case of adverse impacts, mitigation is either easily achieved or little will be required, or both.
Moderate significance	Impact on infrastructure and utilities is real but not substantial in relation to other impacts that might take effect within the bounds of those that could occur. In the case of adverse impacts, mitigation is both feasible and fairly easily possible.
Major significance	Of the highest order possible within the bounds of impacts on infrastructure and utilities that could occur. In the case of adverse impacts, there is little or no possible mitigation that could offset the impact.

5.2 Construction impacts

5.2.1 Onshore features

Some impacts may occur during the excavation and construction phase, namely caused by direct damage to the existing infrastructure present in the Terminal Plant AoI. Since the gas terminal station is adjacent to the power station boundary, regular meetings shall be held with the stakeholders (Enemalta plc, Electrogas Ltd and Delimara 3 Power Generation Ltd) prior and during the construction phases in order to inform and coordinate any action and/or precaution that may need to be taken during these phases. Any damage should be immediately reported to the relevant Authorities and to the operators of the respective infrastructure. Since the equipment at Delimara is specialised, any damage is to be repaired by the operators at the expense of the Contractor/s responsible. Damage to the infrastructure, while unlikely, constitutes an adverse impact of moderate significance due to the sensitivity of the features.

No impacts on the existing infrastructure are envisaged from the microtunnelling of the onshore pipeline route. The existing infrastructure is limited to the first few metres from ground level, and the pipeline will be installed at a depth of at least 30m below ground level, as shown in Figure 13.

A summary of the envisaged impacts on the current infrastructure and utilities in the area are outlined in Table 12.

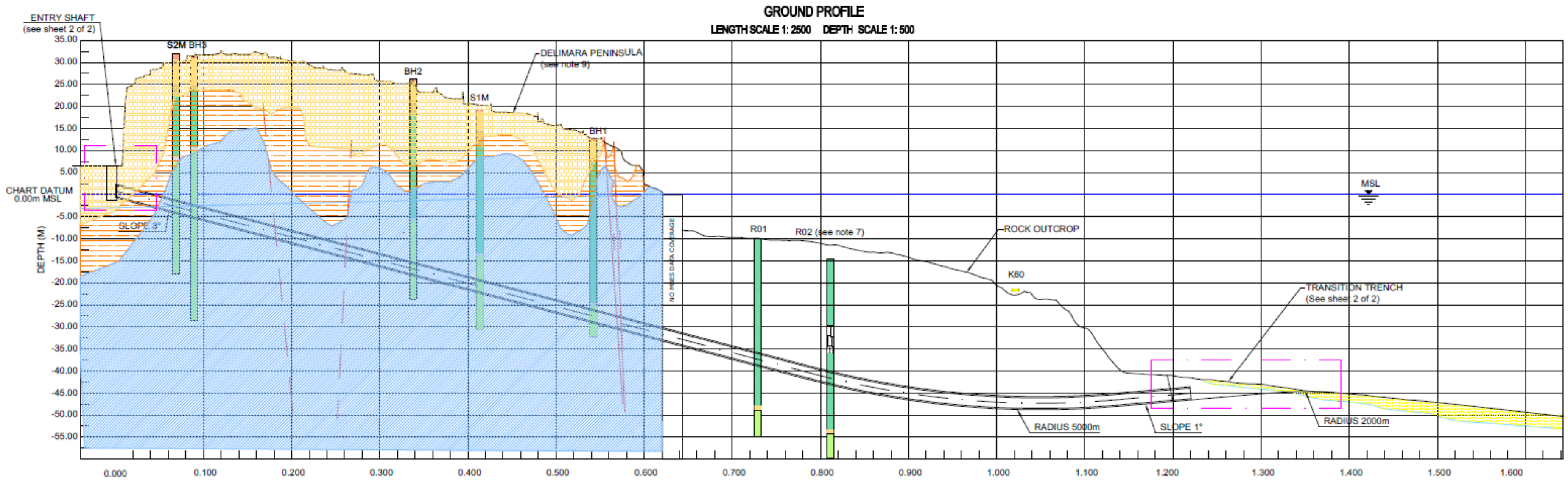

Figure 13: Profile for the onshore tunnel and shore approach

5.2.2 Offshore features

Some impacts may occur during the excavation and construction phase, namely direct physical damage to the existing infrastructure along the pipeline route. In order to preserve existing infrastructure as much as possible, certain protection measures will be taken during the construction works, namely the installation of mattresses (concrete fabric or bitumen type) and/or gravel installation perpendicular to the existing infrastructure (e.g. cables) as shown in Figure 15 and Figure 16, respectively.

The portions of the pipeline to be protected in Maltese territorial waters have been studied in detail in the INTERVENTION WORKS DESIGN REPORT AND DRAWINGS. At this stage, six locations have been identified as mapped in Figure 14 and listed below:

- Section 1: From KP= 144,321.75 to 145,272.31 (length of 951m)
- Section 2: From KP= 146,779.07 to 147,306.18 (length of 527m)
- Section 3: From KP= 147,811.86 to 148,084.32 (length of 273m)
- Section 4: From KP= 149,649.70 to 150,050.411 (length of 401m)
- Section 5: From KP= 153,951.23 to 154,2070.11 (length of 256m)
- Section 6: From KP= 155,980.27 to 157,056.33 (length of 1076m)

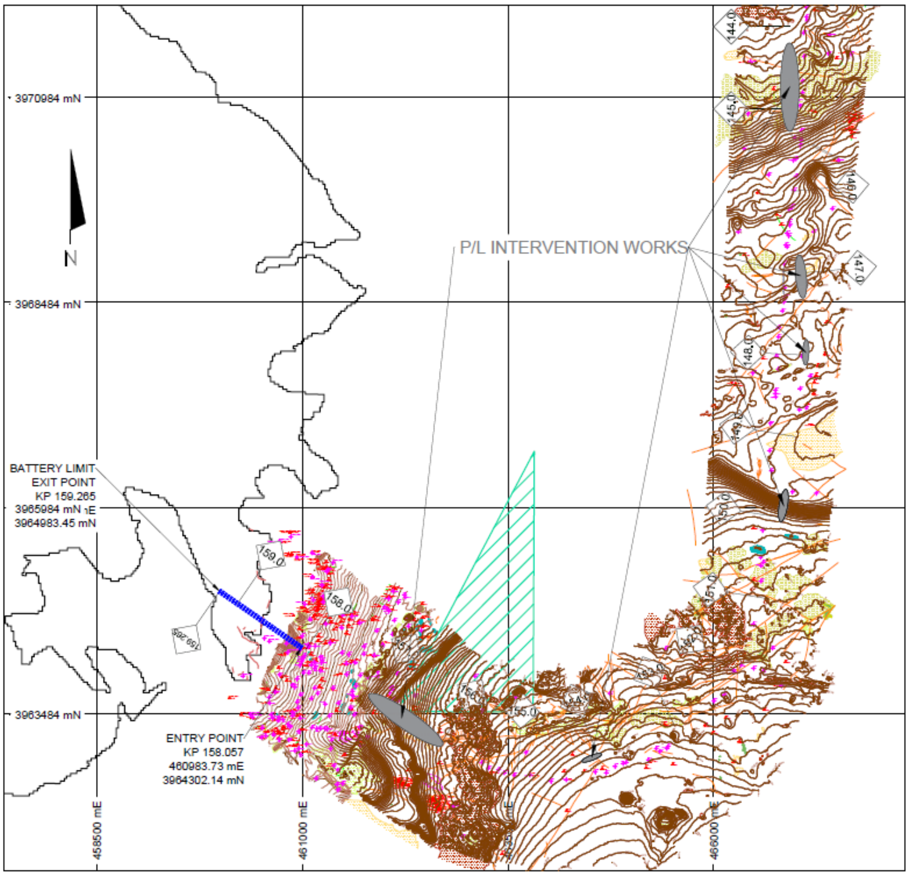

Figure 14: Intervention works with rock protection

Additional sites may be identified at a later stage in the process. Further detail is provided in the INTERVENTION WORKS DESIGN REPORT AND DRAWINGS prepared by the FEED contractor.

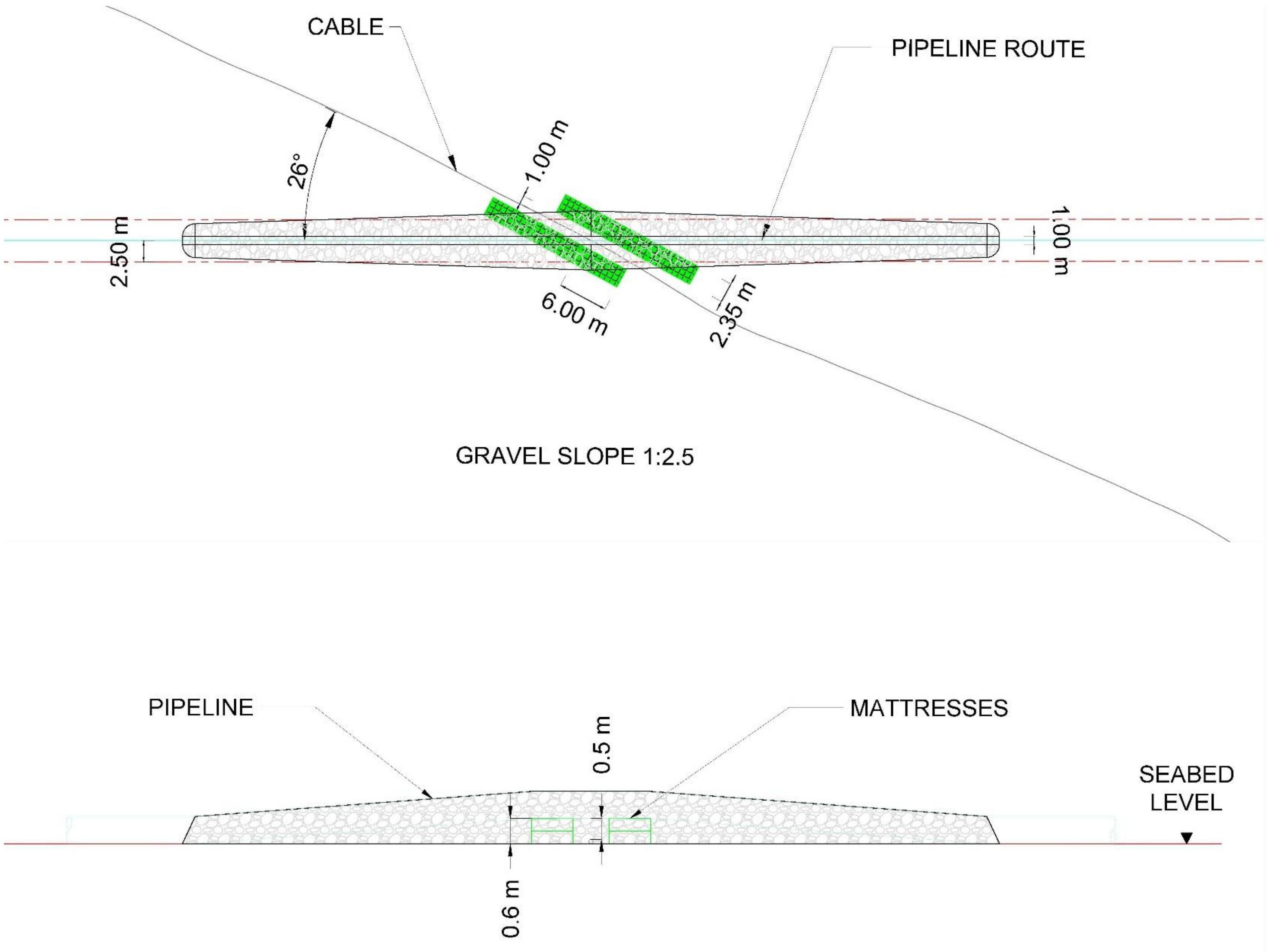

Figure 15: Layout at crossings by flexible mattress

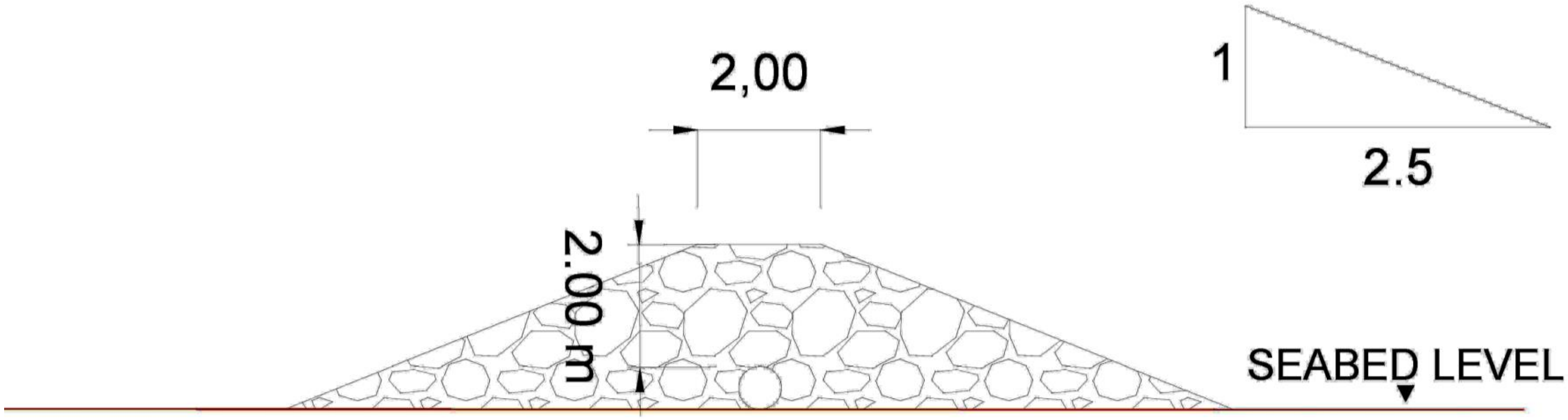

Figure 16: Layout at crossings by gravel installation

Each operator of the existing underwater infrastructure is being contacted at this stage by the FEED contractor with the design of the proposed crossing methods to be adopted for each respective crossing. The operators will have the right to reject or modify the proposed infrastructure crossing in order to ensure the protection of his/her infrastructure. Only after the approval of the crossing method by each owner/operator will the crossing designs be concluded. Moreover, during the pipeline laying phase, each owner/operator shall have the opportunity to be present on board the pipe laying vessel in order to check that the actual crossing works is according to the approved design.

Any damage should be immediately reported to the relevant Authorities and to the operators of the respective infrastructure. Due to the potential sensitivity of the infrastructure, any damages are likely to be repaired by the operators at the expense of the contractor/s responsible (subject to agreements with the respective operators). Damage to the infrastructure constitutes an adverse impact ranging in significance between minor to major, depending on the type of infrastructure, its sensitivity and the extent of damage that arises.

A summary of the envisaged impacts on the current infrastructure and utilities in the area are outlined in Table 12.

5.3 Operational impacts

Two beneficial impacts will result from the operational phase of the proposed development, both of which constitute beneficial impacts of major significance, as described below.

Firstly, the introduction of the pipeline will improve the infrastructure and utilities of the Maltese Islands as a whole since the gas pipeline will increase the security of the natural gas supply when compared to the existing FSU. The DPS Phases 3 and 4 electricity generators will therefore run on gas supplied directly from the European Gas Network/Grid, thereby eliminating the need for both the FSU and the regasification plant. The proposed gas pipeline increases the capacity for potential future local electricity generation, such as a new power generating facility. Energy generation from renewable sources in Malta (such as photovoltaics) bring about instability, such as fluctuations in production during overcast weather and seasonality. The power generated through the proposed pipeline will effectively mitigate against these instabilities, especially in instances when the electrical interconnector is shut down.

Secondly, since the pipeline is also less vulnerable to physical damage than the FSU, there will also be a reduction in various operational risks and hazards and an improvement on existing infrastructure, thereby addressing thematic objective 4 of the SPED (2015), which is "*to seek to ensure that existing strategic infrastructure is safeguarded and that provision is made for infrastructure (water, electricity, sewers, fuel storage, telecommunications) to sustain socio-economic development needs whilst encouraging the Best Available Technology and protecting the environment*".

Although the pipeline will improve on existing national energy infrastructure, the proposed project fails to address two existing limitations in Malta's national energy supply, namely:

- The insecurity associated with gas supply from overseas, thereby depending on other Member States to keep our lights on; and
- Near-absolute reliance (97.3%) of Malta's national energy production on imported non-renewable fossil fuels, which are finite in nature.[2]

Malta's energy supply originates from two primary sources, namely the Malta-Sicily interconnector and the Delimara power station. The interconnector is a transnational, underwater power cable which supplies Malta's national electrical grid with power directly from Sicily. The Delimara power station burns diesel oil and natural gas to generate electricity. The proposed pipeline will supply natural gas to the power station.

Although the proposed gas pipeline will connect Malta to the European Gas Network (as required by EU guidelines), Malta's dependency on international energy sources limits our energy security. Security of energy supply can never be fully guaranteed when imported from other countries, but an energy mix can enhance the security of supply. In this context, the gas pipeline will support the stability and security of the existing national grid in Malta.

The BP Statistical Review of World Energy (2019) concluded that if global demand for oil and natural gas sources continue at present rates, both non-renewable supplies are expected to run out on a global scale in about 50 years.[3] The proposed pipeline is designed to enable the supply of gas produced from renewable sources (ex: biomethane). However, the type of gas supplied through the pipeline depends on international availability/production of gas, meaning the project taken in isolation will not:

- Guarantee Malta's transition from non-renewable to renewable energy sources; and
- Ascertain Malta's achievement of the EU-stipulated 32% target for renewable energy production by 2030.

The abovementioned project limitations do not constitute adverse impacts on the national energy supply, but are shortcomings of our national energy supply which will not be addressed by the proposed pipeline. It is therefore vital that the pipeline project is not considered as an isolated solution for Malta's energy supply and should be supported by local renewable energy production.

A summary of the envisaged impacts on the national infrastructure and utilities are outlined in Table 12.

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[2] *European Commission (2017). Energy Union Factsheet Malta. https://ec.europa.eu/commission/sites/beta-political/files/energy-union-factsheet-malta_en.pdf.*

[3] *https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2019-full-report.pdf*

6.0 Mitigation measures, residual impacts and monitoring

6.1 Mitigation measures

During the construction phase, the following mitigation measures should be implemented to minimise the impacts on infrastructure and utilities:

- Operators of existing infrastructure should be informed of proposed works in order to ensure effective communication;
- Care should be taken when carrying out excavation and construction works to ensure that risk of damage to existing infrastructure is avoided; and
- Any damage to existing infrastructure will be immediately repaired by the operators, at the expense of the Contractor/s responsible.

During the operational phase of the pipe, the maintenance of existing infrastructure becomes slightly more difficult at the crossings with the proposed pipeline. This impact can be mitigated through two-way communication between the operators before the start of maintenance works and the use of BAT to carry out such works.

6.2 Residual impacts

As with all works involving excavation, some residual impacts on the infrastructure and utilities of the area are still expected to occur. If the proposed mitigation measures are properly implemented, the envisaged impacts would reduce in significance.

6.3 Monitoring

Monitoring of excavation and construction works should be undertaken by technically competent persons to ensure that damage to existing infrastructure is avoided wherever possible. Repairs on damaged infrastructure should also be overseen by technically competent persons to return to original conditions.

7.0 Summary of Impacts

Table 12: Summary of expected impacts of the proposed Scheme

Impact type and source			Impact receptor		Effect & Scale							Probability of impact occurring (Inevitable/ Likely/ Unlikely/ Remote/ Uncertain)	Overall impact significance	Proposed mitigation measures	Residual impact significance	Other requirements
Impact type	**Specific intervention leading to impact**	**Project phase (construction/ operation/ decommissioning)**	**Receptor type**	**Sensitivity & resilience toward impact**	**Direct/ Indirect/ Cumulative**	**Beneficial/ Adverse**	**Severity**	**Physical/ geographic extent of impact**	**Short-/ Medium-/ Long-term**	**Temporary (indicate duration) / Permanent**	**Reversible (indicate ease of reversibility)/ Irreversible**					
Damage to onshore infrastructure	Trenching at Terminal Plant	Excavation and construction	Existing infrastructure	High	Direct	Adverse	High	Surrounding areas/Maltese Islands	Short-medium	Temporary	Reversible	Unlikely	Moderate	Two-way communication with operators, construction monitoring, repair of damaged infrastructure	Minor	N/A
Damage to offshore infrastructure	Pipeline installation	Excavation and construction	Existing infrastructure	High	Direct	Adverse	High	Surrounding areas/Maltese Islands	Short-medium	Temporary	Reversible	Unlikely	Minor – major	Two-way communication with operators, construction monitoring, repair of damaged infrastructure	Negligible – moderate	N/A
Increased security of NG source	Gas pipeline operation and removal of FSU	Operation	Electricity generation	High	Direct	Beneficial	Medium	Maltese Islands	Long	Permanent	Irreversible	Inevitable	Major	N/A	N/A	N/A
Reduced operational risks and hazards	Gas pipeline operation and removal of FSU	Operation	Electricity generation	High	Direct	Beneficial	Medium	Maltese Islands	Long	Permanent	Irreversible	Inevitable	Major	N/A	N/A	N/A