AIS ENVIRONMENT

Project Description Statement for Offshore Aquaculture Facility

As per ERA requirements for TRK 283200

Report

Project Description Statement

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DISCLAIMER

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1 INTRODUCTION

A Project Description Statement (PDS) is hereby being presented in relation to TRK 283200. The application, submitted by Pierre Balzan o.bo. Sea Culture Ltd comprises the installation and operation of a large-scale offshore aquaculture facility off the South-Eastern coast of Malta.

AIS Environment Ltd has been commissioned by Seaculture Ltd (henceforth referred to as the 'Applicant') to prepare a Project Description Statement (PDS) to pre-validate the impacts expected from this proposed development (henceforth referred to as the 'Scheme').

The PDS is a detailed report requested by Environment and Resources Authority (ERA) to provide the necessary information for screening in the Environmental Impact Assessment (EIA) process. The report describes the Scheme, the site of the development and its surroundings, and planned activities during the installation and operational phases of the development, with an indication of the main environmental impacts expected. Through the PDS, the ERA will be able to establish whether or not the planning application requires an EIA.

This PDS has been prepared and structured in accordance with the 2017 ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS (S.L. 549.46).

1.1 PROJECT OVERVIEW

The proposed Scheme involves the establishment of a state-of-the-art offshore aquaculture farm at the southeast border of Maltese territorial waters. The Applicant has filed a number of patents to cover the range of new technology that will be incorporated in the development.

The proposed farm comprises a square platforms measuring a 100m by 100m. The platform structure is connected to four submerged cages measuring 50m by 50m each. The cages may be spilt into smaller sub-cages, and the reared species may vary, depending on consumer demand. It is expected that the farm will produce between 5,000 and 8,000 tonnes of cultivated organisms per year, which will be sold to both local and foreign markets. An integrated, multi-trophic approach will be taken where waste will be for the most part consumed by invertebrate species raised in the same system. Depending on the demand, the cages may also be used for other uses other than the rearing of fish, such as for scientific research purposes or the cultivation of cosmetic and pharmaceutical ingredients.

For further details on the proposed development refer to Section 3.

1.2 SCHEME JUSTIFICATION

1.2.1 Aims

The Scheme will provide a facility for a large-scale fish farm, which has previously been unattainable due to the utilised technologies and methods. By implementing a new range of technologies, the Scheme aims not only to expand the capacity of fish farm production but also eliminate a number of the ecological and environmental issues that are associated with current fish farming practices.

Current food production struggles to sustain the increasing population. Fish is an important aspect of human diets and is potentially a means to reduce the current deficit. The human population currently consumes an average of 27kg of fish per head in Europe, and 22.3kg globally.[1] The proposed innovative approach to fish farming is intended to help reduce food production shortage, by supplying the world's growing population with cost-efficient production processes. Furthermore, the Scheme will also provide the opportunity to cultivate a range of ingredients required in the pharmaceutical and cosmetic industries.

The proposed technology and farm configuration is considered to cover a number of the shortfalls which are associated with current farming practices. At the present time there are three main farming methods: on-shore fish ponds, shallow water systems and deep-water farms. The characteristics and problems associated with each of the methods are summarised in the following subsections.

1.2.1.1 On-shore fish ponds

These systems require large areas of land, which is a limited resource in the Maltese islands. Fish reared in these conditions tend to be of relatively lower quality due to the natural limitations of pools which cause issues such as disease and infection, poor water quality and lower oxygen levels, particularly at higher densities. These systems are relatively inefficient and do not allow for the regulation of growth rates due to the effects of external factors such as weather events.

1.2.1.2 Shallow-water systems (bays, ports and fjords)

Shallow-water systems suffer from similar issues caused by high densities and poor water circulation, including overall poor quality of fish, diseases and infection. These systems tend to generate long-term adverse ecological impacts, and are on occasion a disturbance to people nearby, particularly when these farms are close to swimming zones.

[1] EU Science Hub (2018, September, 27) How much fish do we consume? First global seafood consumption footprint published. Accessed in August 2022 at https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/how-much-fish-do-we-consume-first-global-seafood-consumption-footprint-published-2018-09-27_en

1.2.1.3 Existing deep-water farms

Deep-water farms are considered a preferable alternative to shallow-water systems as the main issues of the former are addressed. The higher water mixing and distance from the coast eliminate risks of coastal fouling and over-accumulation of fish waste and sea lice. However, these systems present other challenges such as an increased risk of fish escapes into the natural environment, regulatory restrictions, and may run at a higher financial cost.

1.2.2 Relevant Policy

1.2.2.1 Strategic Plan for The Environment and Development (2015)

The STRATEGIC PLAN FOR THE ENVIRONMENT AND DEVELOPMENT (SPED, 2015) is designed to direct all future development within the Maltese Islands to ensure that it is sustainable and has minimal adverse impacts upon the natural environment. SPED (2015) encompasses the marine area up to the 25 nautical mile limit of the Fisheries Management Conservation Zone (defined by the Council Regulation EC No. 1967/2006 under the EU Accession Treaty, 2003).

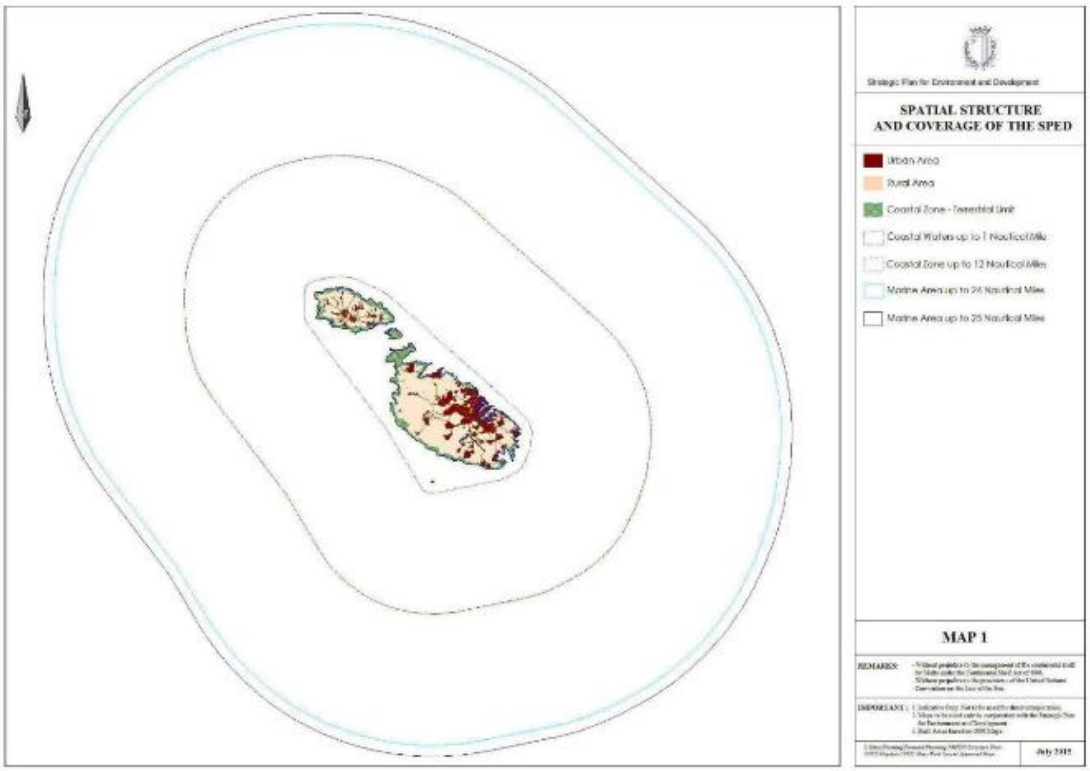

FIGURE 1: SPATIAL STRUCTURE AND COVERAGE OF THE SPED

The vision for both the social and economic growth and coastal and marine area are relevant to the Scheme:

*"The Maltese Islands shall raise their potential for social and economic growth in the core sectors for development of Financial Services, ICT, Tourism, Advanced Manufacturing, Aviation, **Maritime**, Health, Education, Life Sciences, Creative Industries, **Research and Innovation**, Digital Gaming and Eco-Gozo; ……they shall*

move closer to a low-carbon, zero waste, green economy, shall halt the decline of their biodiversity and ***improve the quality of their water resources*** *and shall use space sustainably."*

"The Coastal Zone and Marine Area shall ***maximise the potential for sustainable socio-economic growth*** *and renewable energy infrastructure, shall* ***accommodate legitimate compatible uses, sustain the livelihood of the fishing community****,* ***remain rich in biodiversity*** *and visually striking and become* ***pollution free*** *and accessible for public enjoyment. It shall play a significant enabling role for the Maltese Islands to reduce their impact on climate change and strengthen their capacity to adapt to climate change."*

The SPED states that aquaculture is one of the main activities carried out in the marine area up to the 25 nautical mile Fisheries Management Conservation Zone. This area is dedicated to sustainable fisheries. This being said, the SPED highlights the fact that marine related developments within the Maltese Islands still have a long way to reach their full potential. The SPED forecasts an increase in the diversification of the aquaculture industry. Since the Scheme is located within the 25 nautical mile Fisheries Management Conservation Zone and involves an innovative approach to fish farming, it conforms with the vision for aquaculture development outlined in the SPED.

The SPED also sets out a number of objectives related to the coastal zone. Although the Scheme is not strictly in the coastal zone, the following objectives are still considered to be relevant:

- ***Coastal Objective 1****: To prioritise uses that necessitate a location on the coastal zone and marine area in a manner which minimises user conflicts, does not accelerate coastal erosion, protects biodiversity, cultural heritage, landscape and visual access to them, public access and use and increased resilience to climate change impacts by adopting the boundary of the Territorial Waters as the seaward limit of the Coastal Zone boundary to manage activities and development (shipping, fisheries, infrastructure and oil exploration), promote large scale renewable energy infrastructure to ensure economic viability and maintain good chemical status; and the Fisheries Management Conservation Zone boundary to manage fisheries.*
- ***Coastal Objective 2****: To facilitate the sustainable development and diversification of the fishing and aquaculture industries by prioritising identified fishing ground for fisheries whilst minimising environmental impacts; and facilitating the implementation of the Aquaculture Strategy.*

The Applicant took into account both of the above coastal objectives in the design process of the Scheme to ensure that it fulfils the specific objectives of the SPED.

1.2.2.2 Aquaculture Strategy for the Maltese Islands

The AQUACULTURE STRATEGY FOR THE MALTESE ISLANDS: TOWARDS SUSTAINABILITY 2014 - 2025 (2014) aims to guide the investment and subsequent growth of the aquaculture industry in the Maltese Islands. Malta could act as a role model for sustainable

aquaculture development in Europe. In order to achieve this, the Strategy emphasises the need to improve the efficiency of operations whilst reducing the environmental impacts. The innovative nature of the Scheme will directly contribute towards Malta leading the way within the global aquaculture industry.

The Strategy views aquaculture as a key sector in the Maltese economy, estimating that the industry will provide a gross value added (GVA) of over €70 million to the economy by 2020 and a total of 1,185 full-time equivalent direct and indirect jobs. In order to ensure the industry reaches its full potential, the Government committed to promoting innovation within the sector. The Strategy specifically highlights that the Government will encourage *"research in species diversification, technological improvement, offshore technology and reduction of environmental impacts*". Since the Scheme utilises a range of new technologies which primarily aim to increase production capacity and reduce the environmental impacts of the operations, it fulfils the Government's vision for the future of the industry.

The Scheme will also provide opportunities for research and development activities offshore, in line with the Strategy's aims, which state*: "Marine-based research installations should preferably be located off-shore: research installations closer to shore will be directed towards designated Aquaculture Zones".* The strategy also lists as a primary aim that the Government would like to "*ensure a stronger emphasis on research"* in the sector.

The Government aims to confine all aquaculture activities to dedicated Aquaculture Zones. The operational zones designated as Dedicated Aquaculture Zones at the time of writing of the Policy are shown in Figure 2. Expansion to these zones will be permitted as long as the environmental carrying capacity can accommodate this.

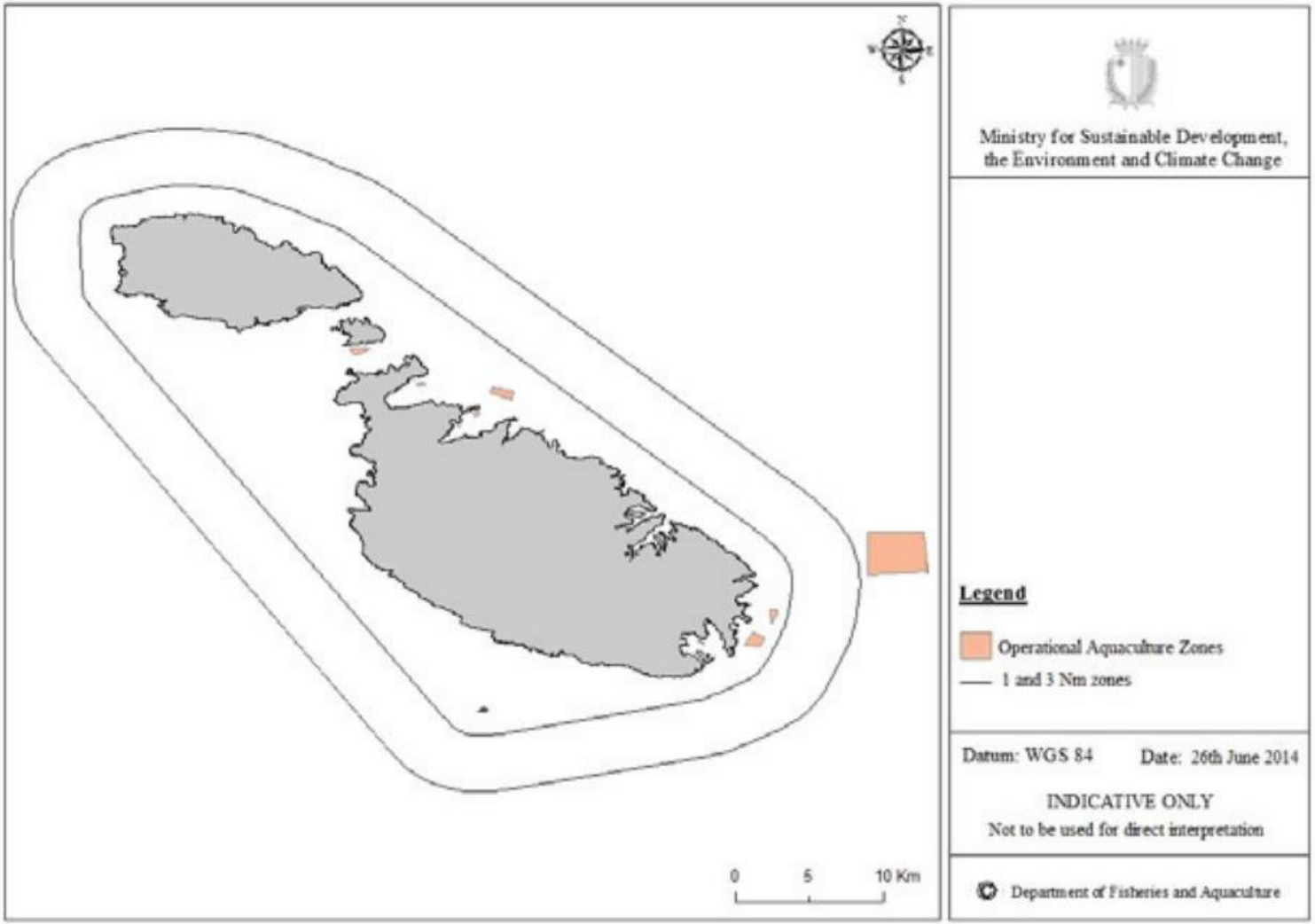

FIGURE 2: OPERATIONAL SITES DESIGNATED AS AQUACULTURE ZONES

The Scheme is located circa 22km off the South-Eastern coastline of Malta (12 nautical miles from the Birżebbuġa shore). The site is located within waters between 60 and 100m deep. The siting of the Scheme is currently not within a Dedicated Aquaculture Zone; however, it is in compliance with the following considerations of the strategy: *"This strategy proposes search areas that can be investigated further for the possible setting up of new Aquaculture Zones that may become required… Such new zones should also cater for operations dedicated to research and development".*

1.2.2.3 MARPOL Regulations

The INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS (MARPOL) concerns the prevention of pollution within the marine environment caused by ships from operational or accidental causes.

The proposed Scheme will comprise a platform which will be registered as a vessel with all competent Authorities. Therefore, the six Annexes of the international convention apply directly to the Scheme, as follows:

- *Annex I - Regulations for the Prevention of Pollution by Oil*
  This Annex aims to prevent oil spills caused by accidental discharges or operations, and is primarily directed at oil tankers.
- *Annex II - Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk*
  This Annex prevents the release of any noxious substances (circa 250 as defined by the convention) within 12 miles of the nearest land. Reception facilities are to be used for the disposal of such substances.
- *Annex III - Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form*
  The Annex concerns requirements related to standards for packing, marking, labelling, documenting, stowing, exceptions, notifications and quantity limitations of harmful substances. These are defined as the substances identified in the INTERNATIONAL MARITIME DANGEROUS GOODS CODE (IMDG CODE) or which meet the criteria in the Appendix of Annex III.
- *Annex IV - Prevention of Pollution by Sewage from Ships*
  The discharge of sewage into the sea is prohibited by this Annex, except in cases where a) the ship contains an approved sewage plan; b) the discharged sewage is disinfected with an approved system and discharged over three nautical miles from the nearest coast; c) non-treated sewage can only be discharged over 12 nautical miles from the nearest coast

- *Annex V - Prevention of Pollution by Garbage from Ships*
  The location and manner in which different waste streams can be disposed of is covered by this Annex. All forms of plastic disposal at sea are prohibited by this Annex.
- *Annex VI - Prevention of Air Pollution from Ships*
  The Annex sets limitations on Sulphur Oxide and Nitrogen Oxide caused by ship exhausts and bans emissions of ozone-depleting substances. Emission-control areas are designated for the limiting of SOx, NOx and Particulate Matter emissions. Technical and operational energy efficiency measures were set in 2011 within this Annex, aiming to reduce greenhouse gas emissions caused by shipping.

1.2.2.4 European Directives

The European Union BIRDS DIRECTIVE was transposed into local legislation through the Subsidiary Legislation 549.42 – Conservation of Wild Birds Regulations. The S.L. regulates primarily hunting and capture of protected bird species. The legislation also designates several areas as 'Bird Sanctuaries', including most of the country's wetlands, large public parks, and coastal areas.

The European Union Habitats Directive was transposed into local legislation through the SUBSIDIARY LEGISLATION 549.42 - FLORA, FAUNA AND NATURAL HABITATS PROTECTION REGULATIONS. The S.L. designates 'Special Protection Areas' (SPAs) for birds listed in Schedule 1 to the Conservation of Wild Birds Regulations. These form part of the most extensive network of protected areas in Europe - the Natura 2000 Network.

The Scheme is sited at the border of SPA MT0000108 - Żona fil-Baħar fil-Lvant, which is designated for the protection of *Calonectris Diomedea* and *Hydrobates pelagicus's* breeding habitats. Both species are listed under Schedule I of the Wild Birds Regulations. The area is a total of 62,508.79 ha covering a large expanse of the nautical zone to the East of the Maltese Islands.

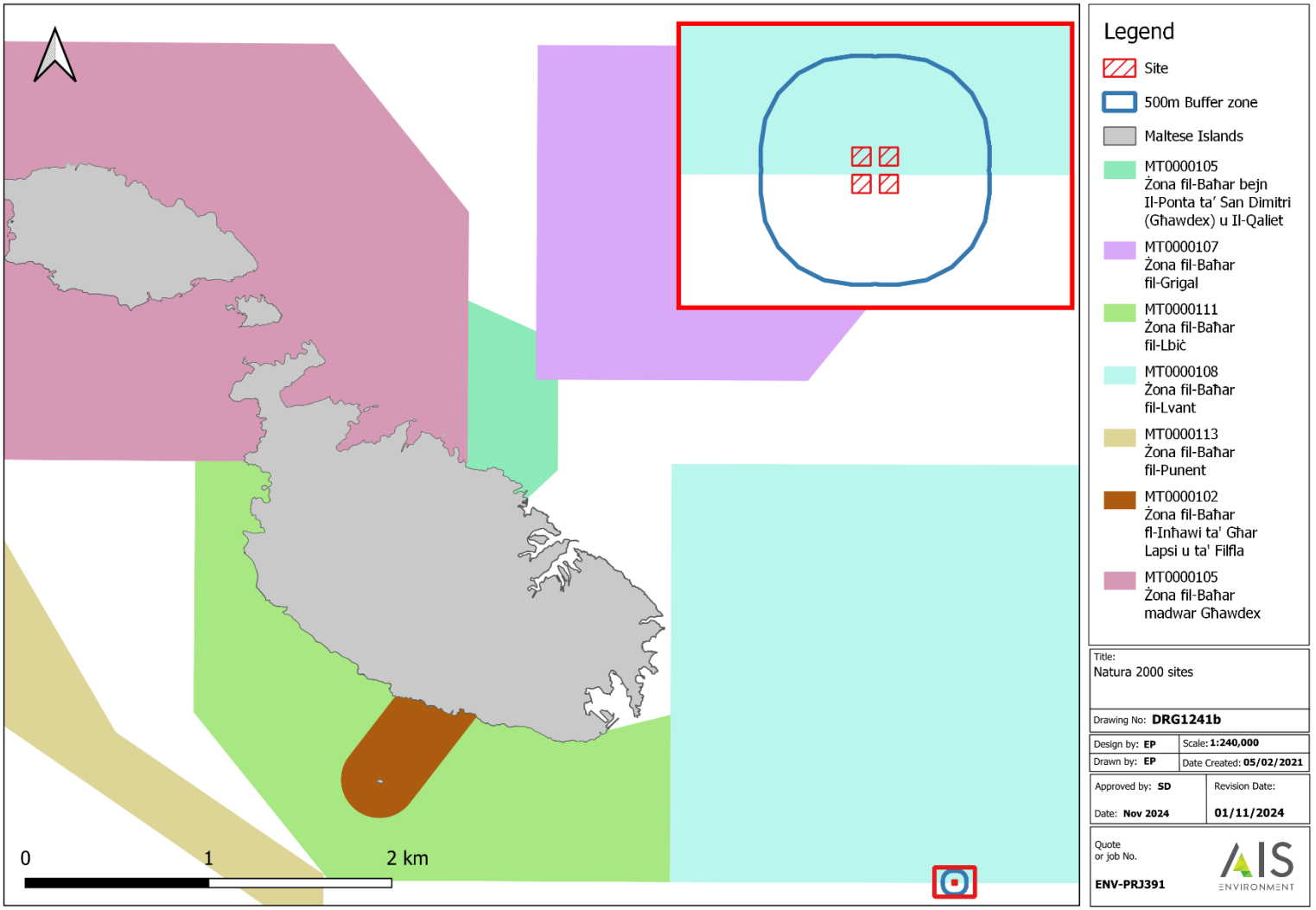

FIGURE 3: NATURA 2000 PROTECTED SITES IN THE MALTESE TERRITORIAL WATERS

2 SCHEME SITE AND SURROUNDING AREA

2.1 SCHEME LOCATION

The geographical location of the proposed development (subsequently referred to as the "Scheme") lies circa 12 nautical miles off the South-Eastern coast of Malta at 35°44'14.47°N, 14°44'49.87°E as shown in Figure 4 and subsequent maps.

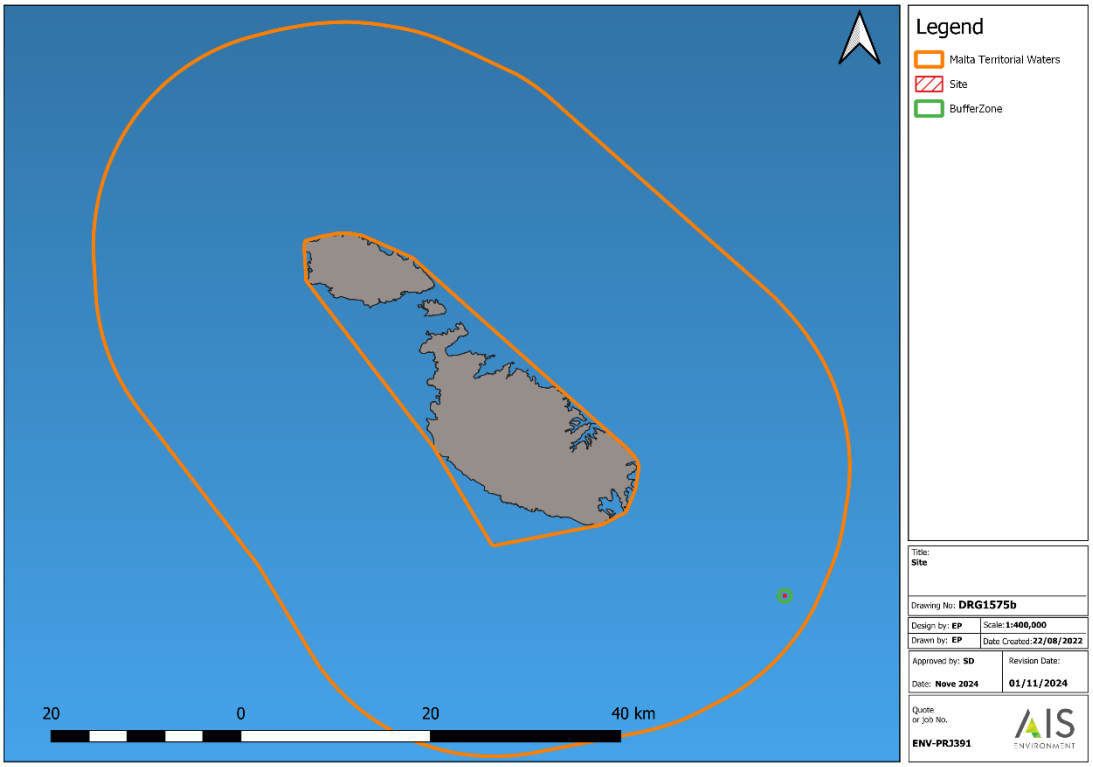

FIGURE 4: LOCATION OF SITE WITHIN THE MALTESE TERRITORIAL WATERS

The site is located within an area approximately between 100 and 140m deep within the Maltese Territorial Waters (See Figure 5). The applicant noted that the platforms will be sited at the deepest point within the indicated area.

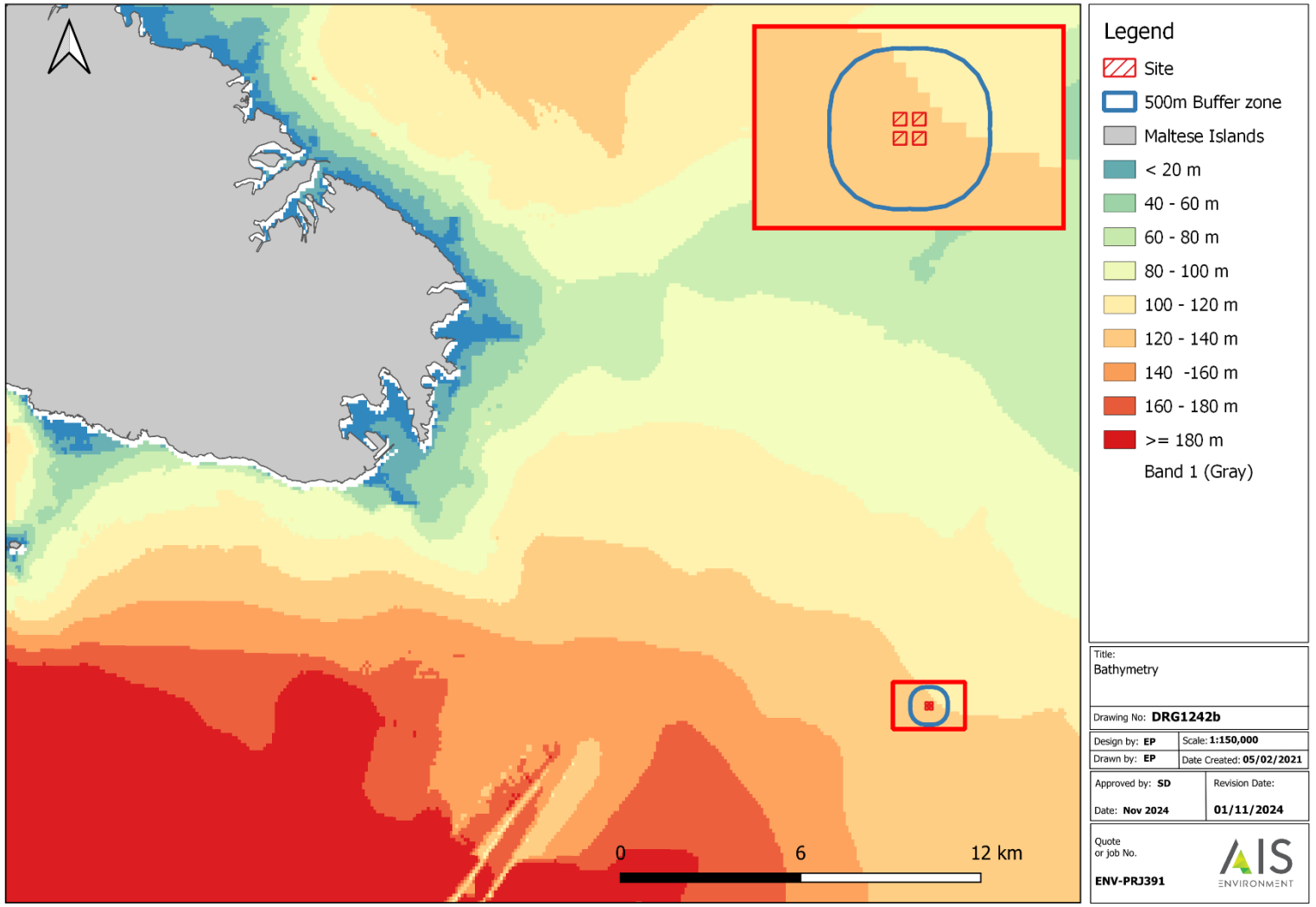

FIGURE 5: BATHYMETRIC MAP OF THE AREA SURROUNDING THE SITE

2.2 SEA USES

The proposed Scheme will be situated entirely within Malta's Marine Territorial waters. These comprise 25 nautical miles around the coast of the Maltese islands. The chosen site is around 12 nautical miles South East of the island of Malta.

The site selected for the proposed development is within a zone where an average of 2 hours of vessel activity is recorded per month, as shown in Figure 6. The shortest route between the nearest coastline and the site overlaps for a substantial distance with areas where the highest vessel density per month is recorded for Maltese waters, over a hundred hours per square kilometre per month.

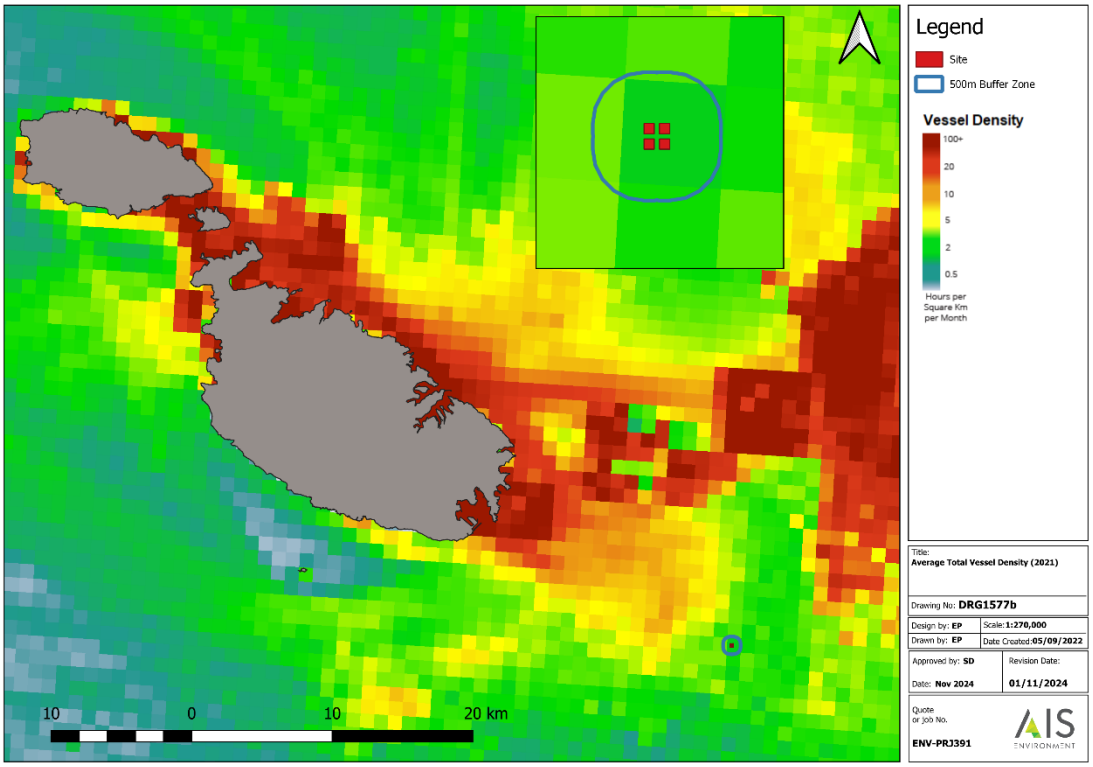

FIGURE 6: AVERAGE TOTAL VESSEL DENSITY (HOURS PER SQUARE KM PER MONTH) WITHIN MALTA'S MARINE TERRITORY IN 2021 (SOURCE: EMODNET)

The total vessel density per annum varies slightly when viewing the data available for each individual vessel type. The highest vessel density (hours per square kilometre per month) pertained to cargo vessels, with a reported average of 2 hours of vessel activity per square kilometre per month within the proposed site area. Tanker vessels and fishing vessels were recorded to contribute an average of 0.5 hours of vessel activity per month within the proposed site area. Passenger vessels were recorded to contribute negligible to no amounts of hours of activity within the proposed site area. Due to the site's remote location, this is to be expected.

See Figure 7 to Figure 10 to view the reported vessel density maps per vessel type.

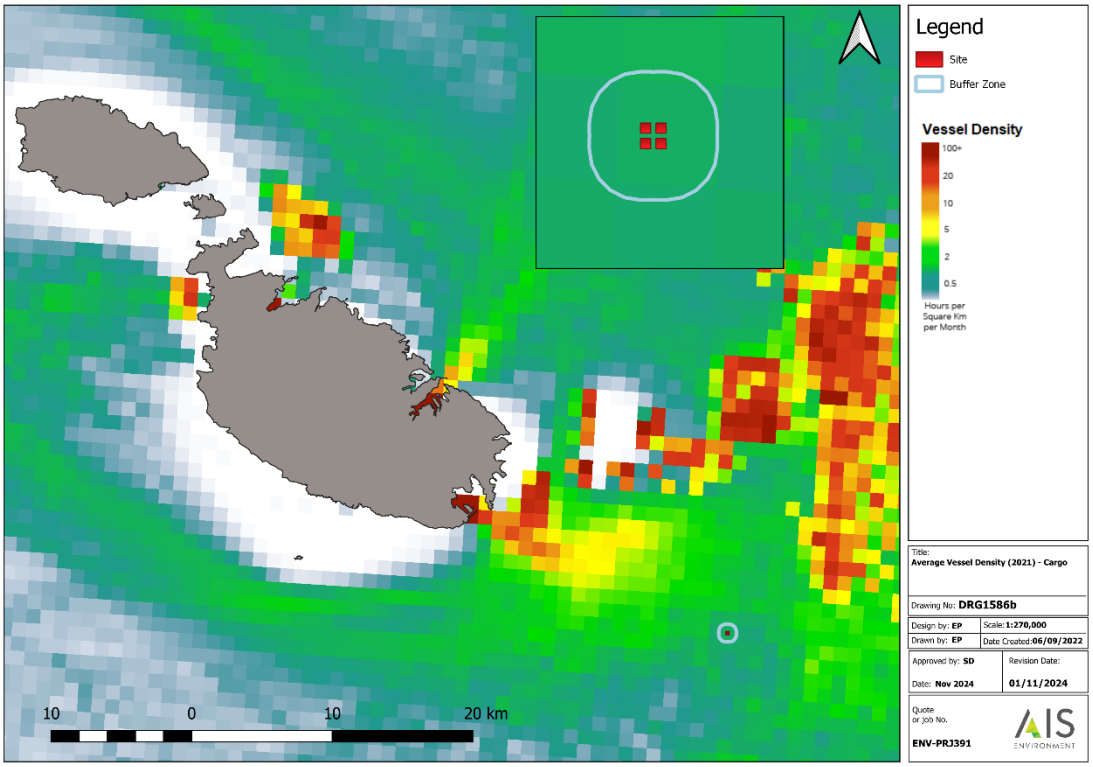

FIGURE 7: TOTAL VESSEL DENSITY (HOURS PER SQUARE KM PER MONTH) OF CARGO VESSELS WITHIN MALTA'S MARINE WATERS IN 2021 (SOURCE: EMODNET)

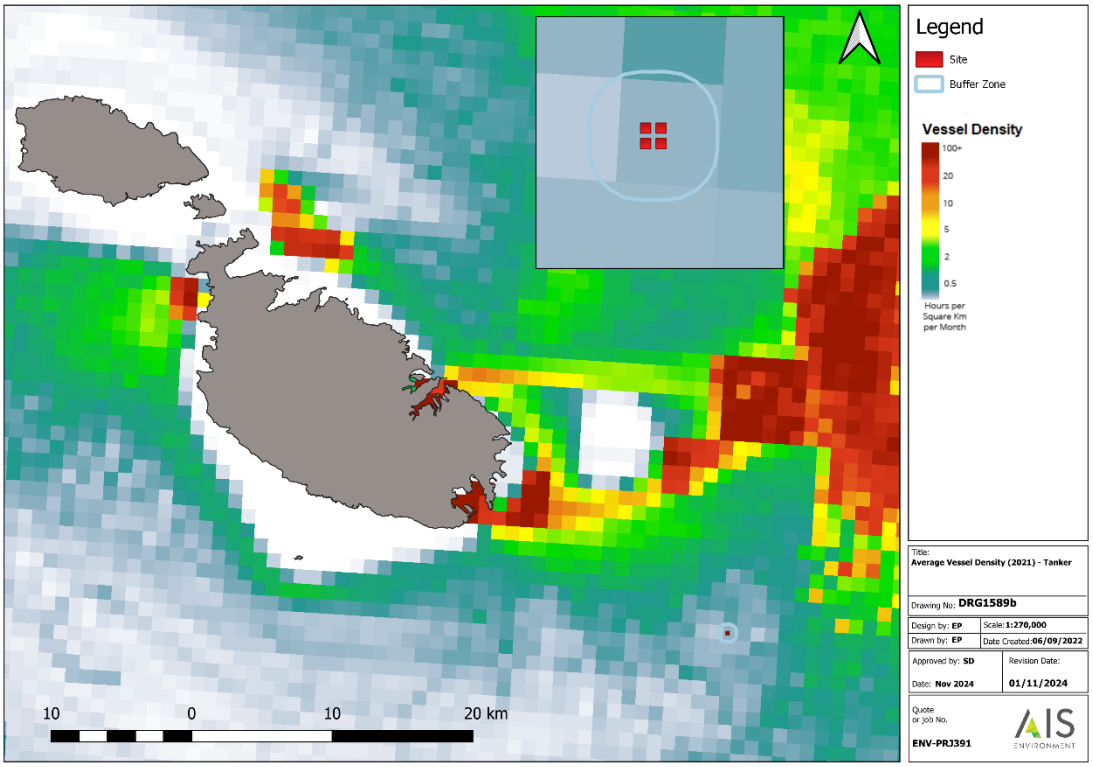

FIGURE 8: TOTAL VESSEL DENSITY (HOURS PER SQUARE KM PER MONTH) OF TANKER VESSELS WITHIN MALTA'S MARINE WATERS IN 2021 (SOURCE: EMODNET)

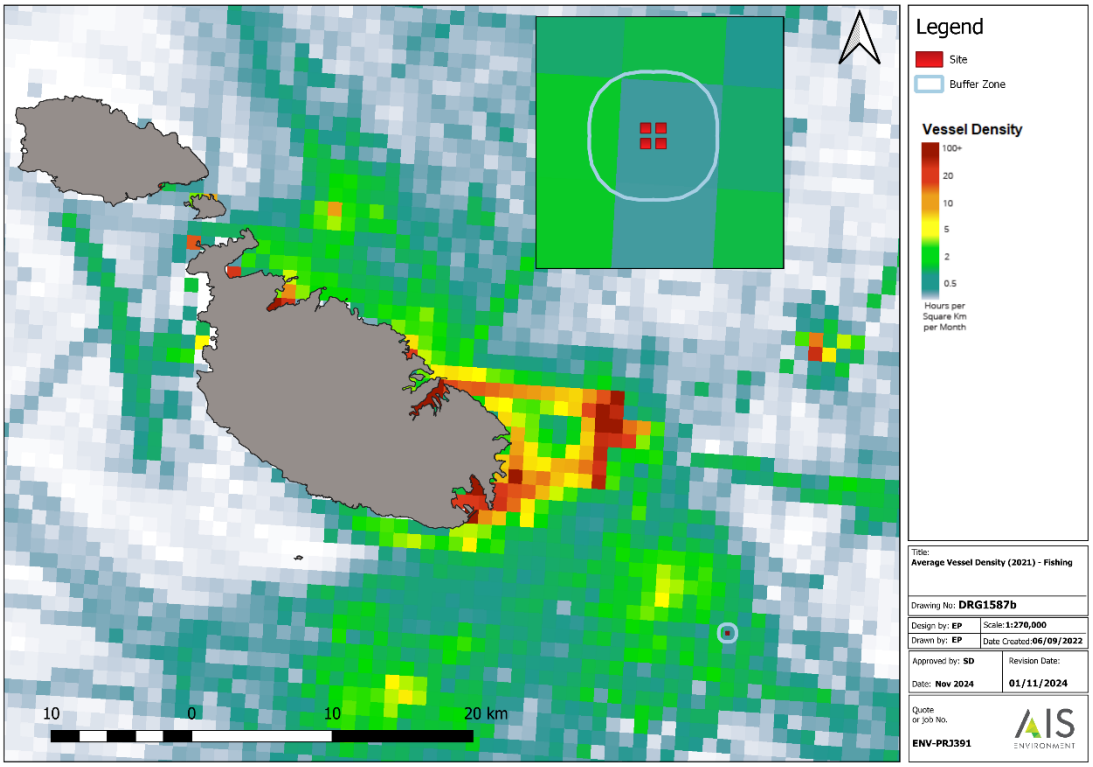

FIGURE 9: TOTAL VESSEL DENSITY (HOURS PER SQUARE KM PER MONTH) OF FISHING VESSELS WITHIN MALTA'S MARINE WATERS IN 2021 (SOURCE: EMODNET)

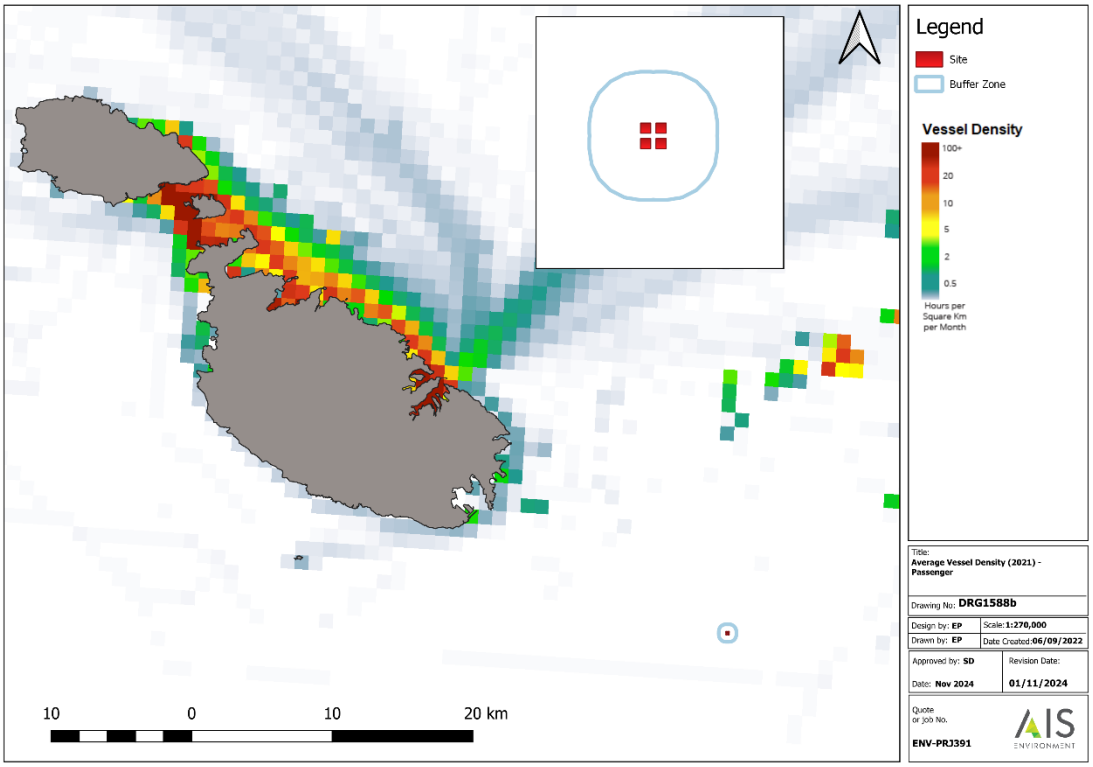

FIGURE 10: TOTAL VESSEL DENSITY (HOURS PER SQUARE KM PER MONTH) OF PASSENGER VESSELS WITHIN MALTA'S MARINE WATERS IN 2021 (SOURCE: EMODNET)

The proposed site and the nautical route to reach it does not coincide with any known telecommunications or power cables situated within the islands' marine territory (See Figure 11).

There are no bunkering areas situated within the islands' marine territory that coincide with the proposed site. The nautical route to reach the site may go through bunkering sites on the Eastern side of the Maltese Territorial Waters (See Figure 12).

Furthermore, the site does not coincide with any existing Major Marine Infrastructure as defined within the STRATEGIC PLAN FOR THE ENVIRONMENT AND DEVELOPMENT (See Figure 13).

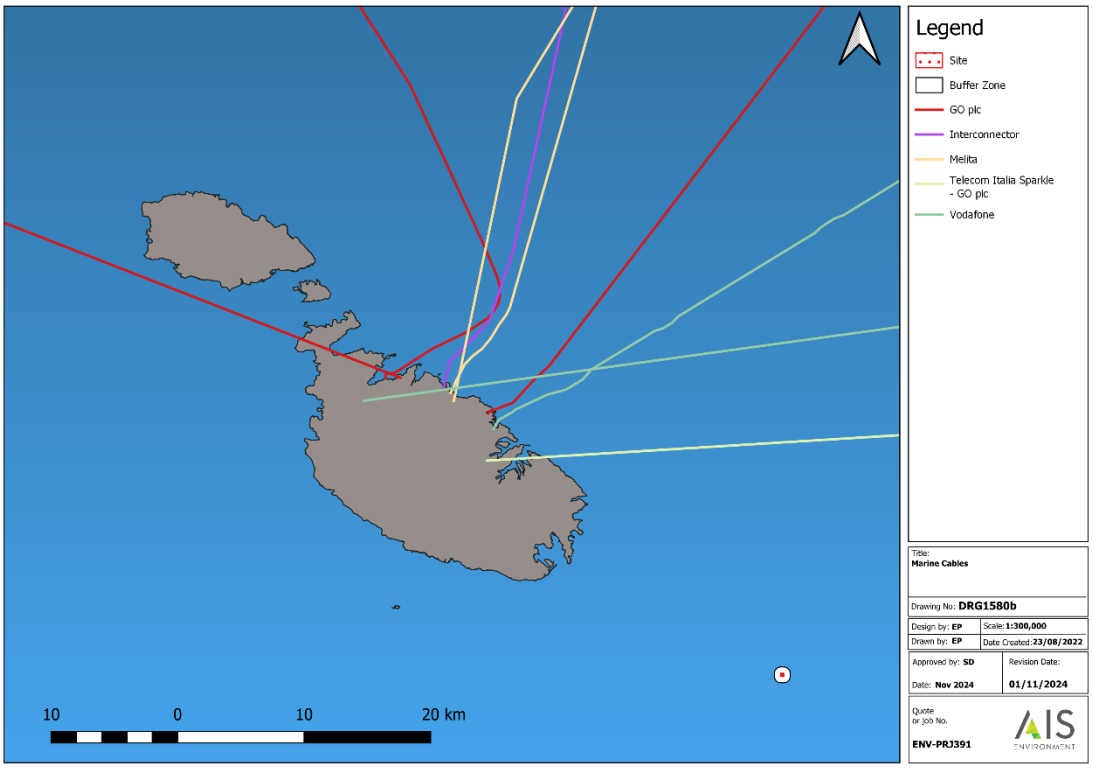

FIGURE 11: TELECOMMUNICATION AND POWER CABLES WITHIN MALTA'S MARINE TERRITORY (SOURCE: EMODNET, 2021)

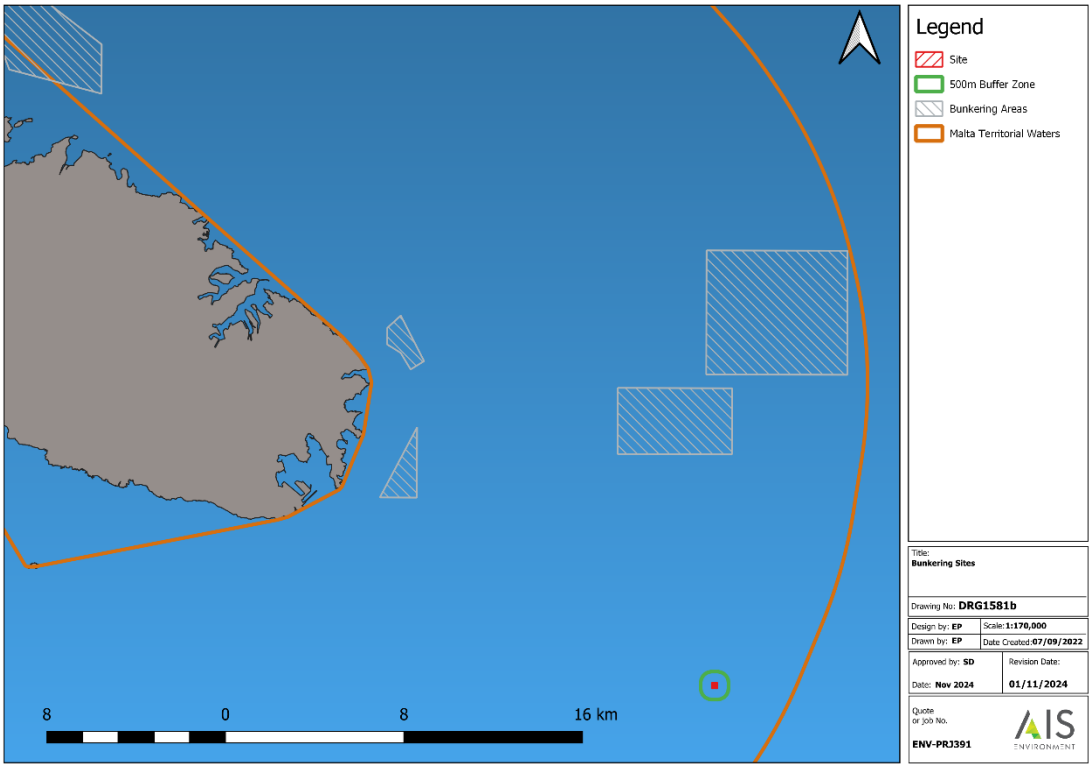

FIGURE 12: BUNKERING AND WAITING AREAS WITHIN MALTA'S TERRITORY (SOURCE: EMODNET, 2021)

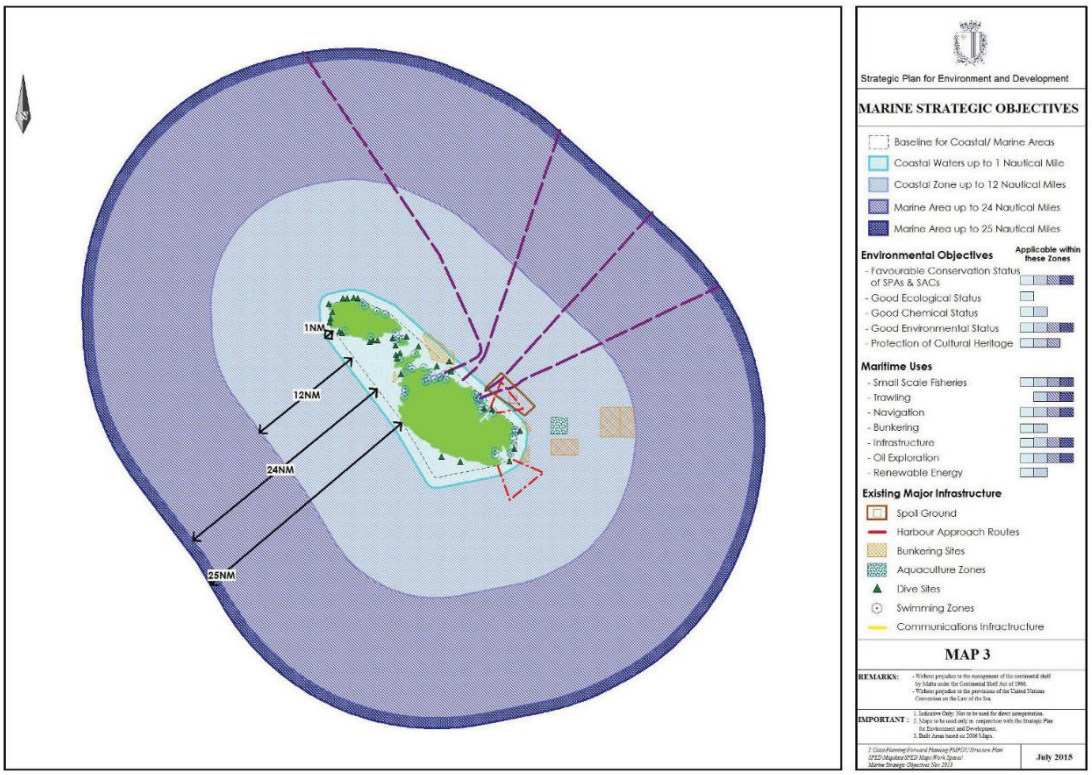

FIGURE 13: MARINE ENVIRONMENTAL OBJECTIVES, MARITIME USES AND EXISTING MAJOR INFRASTRUCTURE (SOURCE: SPED, 2016)

2.3 GEOLOGY AND GEOMORPHOLOGY

The Area of Influence (AoI) lies within pure carbonate sedimentary rock with a calcite (plus aragonite) to dolomite ratio greater than 1 to 1. This geological layer was formed prior to the Quaternary period and includes limestone and dolomitic limestone.

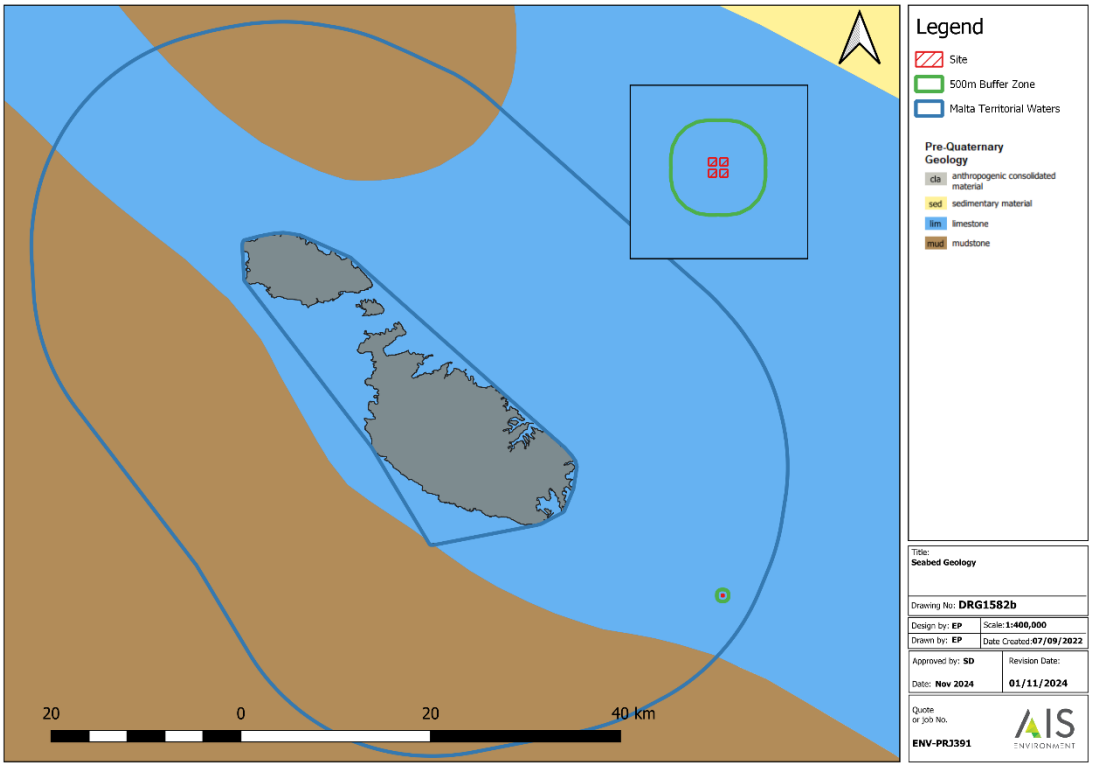

FIGURE 14: PRE-QUATERNARY GEOLOGY WITHIN MALTA'S MARINE TERRITORY (SOURCE: EMODNET, 2021)

The site is located in an area classified as MT-019 Mixed Sediment according to the EMODNET FOLK 7 substrate classification system[2] (See Figure 15). This sediment type is a mixture of different sediment types, within the proportions of 95-10% mud, <90% sand, and >= 5% gravel.

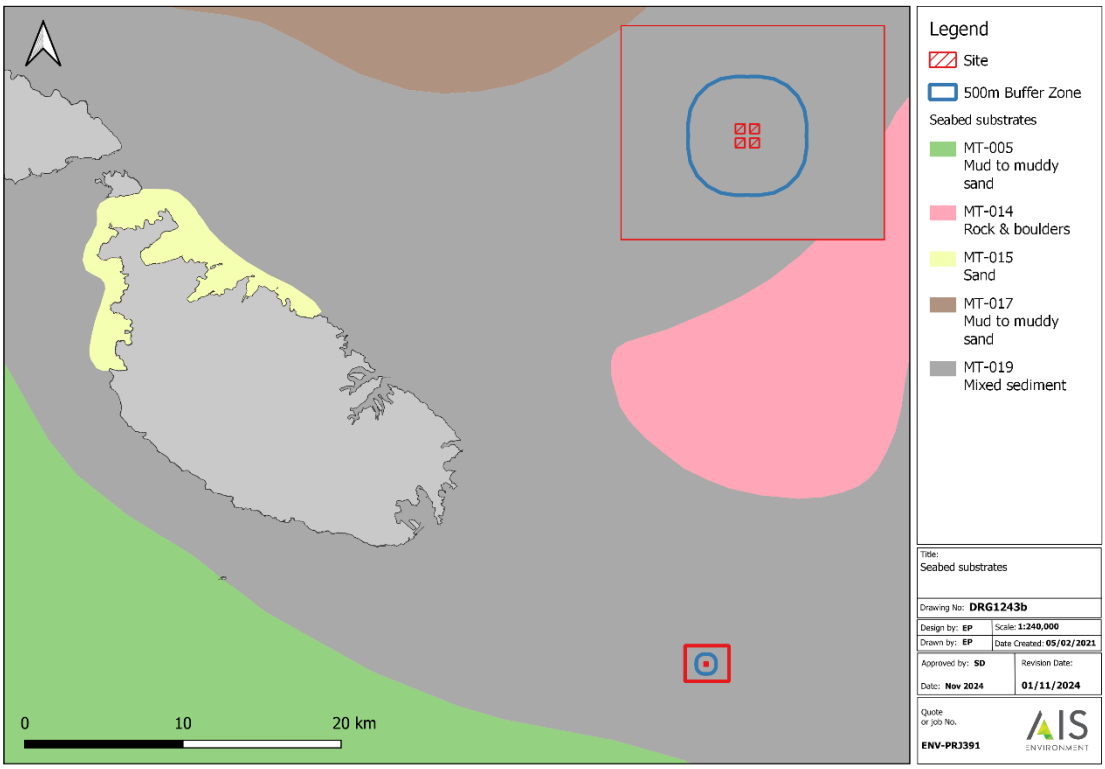

FIGURE 15: SEABED SUBSTRATE MAP OF THE PROPOSED SCHEME SITE AND SURROUNDING AREA (SOURCE: EMODNET, 2019)

2.4 HYDROLOGY

According to THE 2ND WATER CATCHMENT MANAGEMENT PLAN, the scheme lies East of MTC106 and MTC107 marine water bodies, which are classed as being 'exposed and of intermediate depth' (See Figure 16)[3]. The proposed site lies within Malta's territorial waters; however, it is further offshore than the boundary of the designated waterbodies.

[2] European Marine Observation and Data Network (EMODnet) Product Catalogue, (2019). Seabed Substrates Dataset. Accessed August 2022 at https://www.emodnet-geology.eu/data-products/seabed-substrates/

[3] Environment and Resources Authority (2015). The 2nd Water Catchment Management Plan for the Malta Water Catchment District 2015 - 2021.

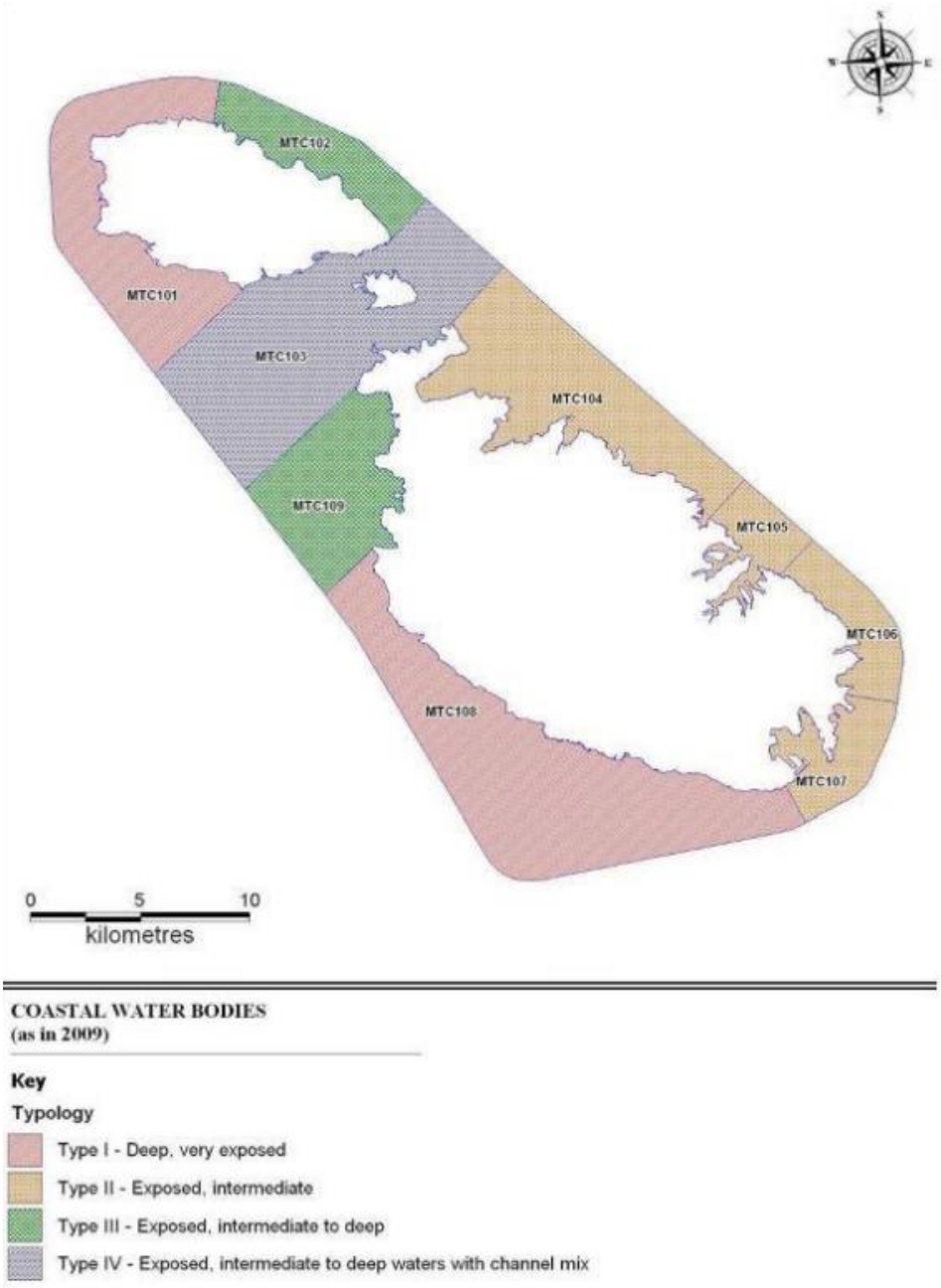

FIGURE 16: LEVEL AND DEPTH OF MALTESE COASTAL WATER BODIES (SOURCE: 2ND WATER CATCHMENT MANAGEMENT PLAN)

The proposed site falls within Malta's Territorial Waters, which correspond to the middle band of the Fisheries Management Zone (See Figure 17). The site does not coincide with any of the designated Trawl Zones.

FIGURE 17: MALTA FISHERIES MANAGEMENT ZONE (FMZ) MAP WITH DESIGNATED TRAWL ZONES (SOURCE: MINISTRY FOR AGRICULTURE, FISHERIES AND ANIMAL RIGHTS)

2.5 ECOLOGY

2.5.1 Biological zone

The scheme is located within the Circalittoral Zone. This zone typically extends between 30 to 200 m deep and contains the maximum depth at which plant life can still be observed in the sea (See Figure 18).

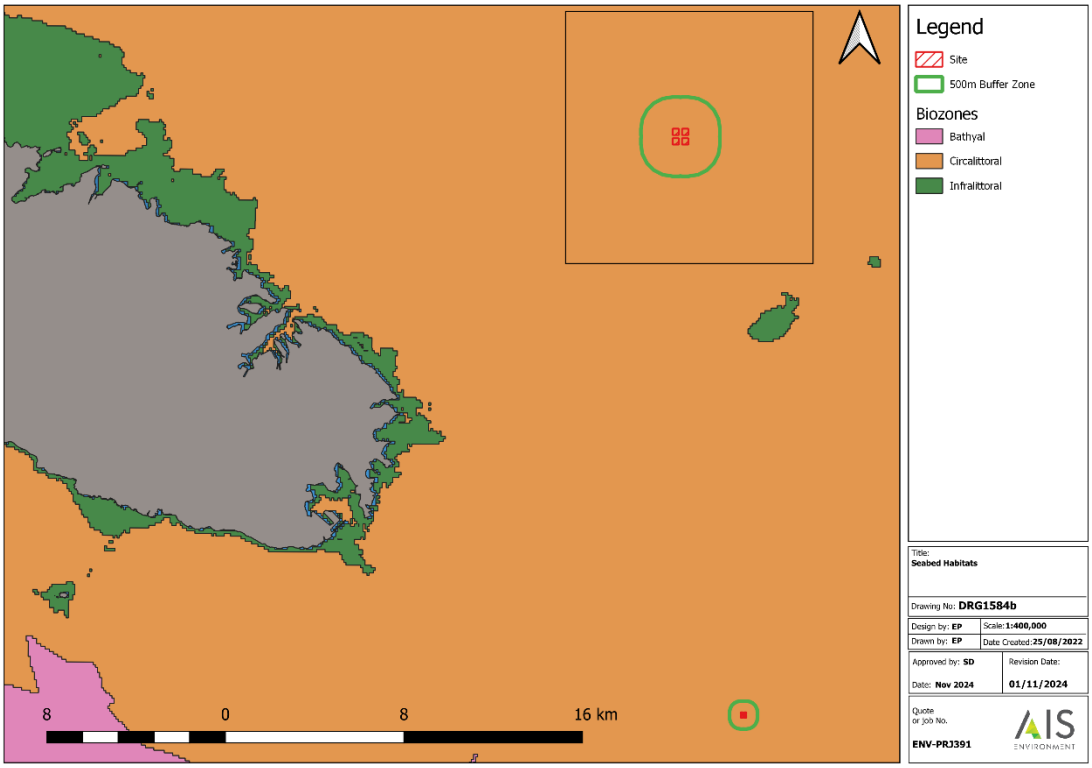

FIGURE 18: EUSEAMAP (2021) BROAD-SCALE PREDICTIVE HABITAT MAP - BIOLOGICAL ZONES (SOURCE: EMODNET, 2021)

2.5.2 Seabed Habitat Type

The EUNIS habitat type in the area is classified as A5.46: MEDITERRANEAN BIOCEONOSIS OF COASTAL DETRITIC BOTTOMS (See Figure 19). This seabed habitat type is typical of waters deeper than 20m. It is comprised of gravelly sands or mixtures of shells, cobbles and pebbles on top of mud, sand or gravel. This sediment type typically supports a diverse and variable range of marine species.

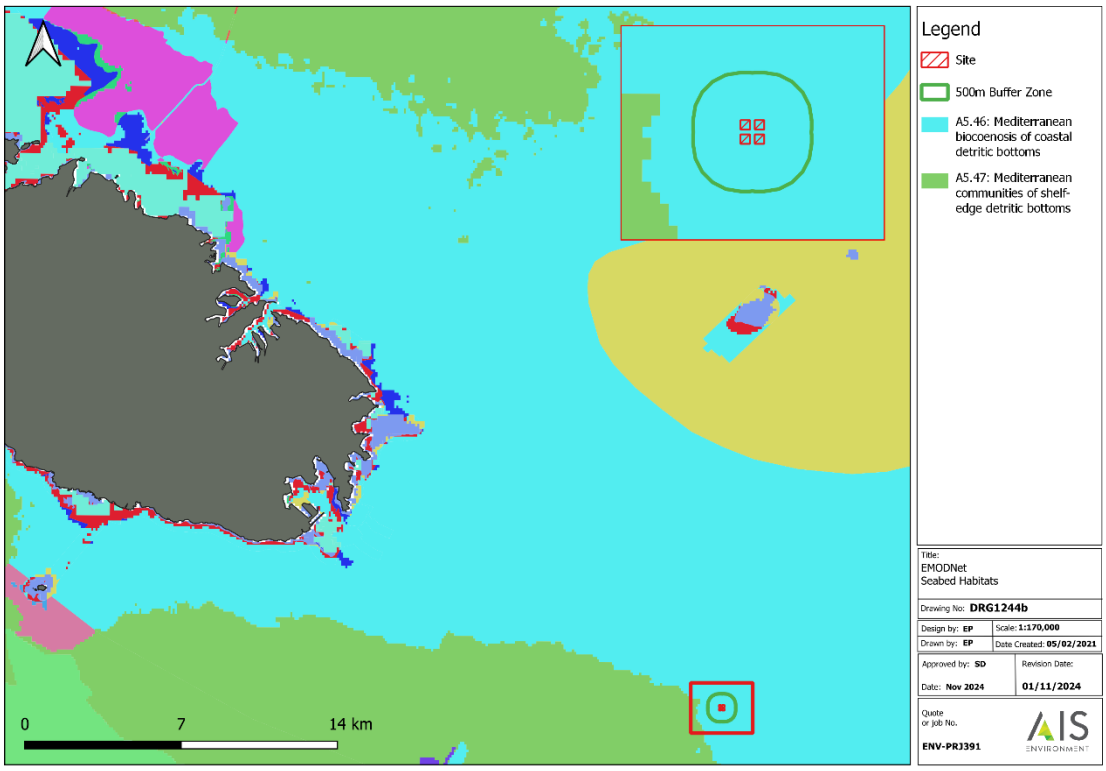

FIGURE 19: EUSEAMAP (2021) - SEABED HABITAT TYPES (SOURCE: EMODNET, 2021)

2.5.3 Natura 2000 Site Designations

The Scheme is located within the Natura 2000 Site MT0000108 - Żona fil-Baħar tal-Lvant. The Site is designated as a Special Protection Area (SPA) for *Calonectris Diomedea* (Scopoli's Shearwaters) and *Hydrobates pelagicus* (European Storm Petrel) birds under the HABITATS DIRECTIVE (92/43/EEC).

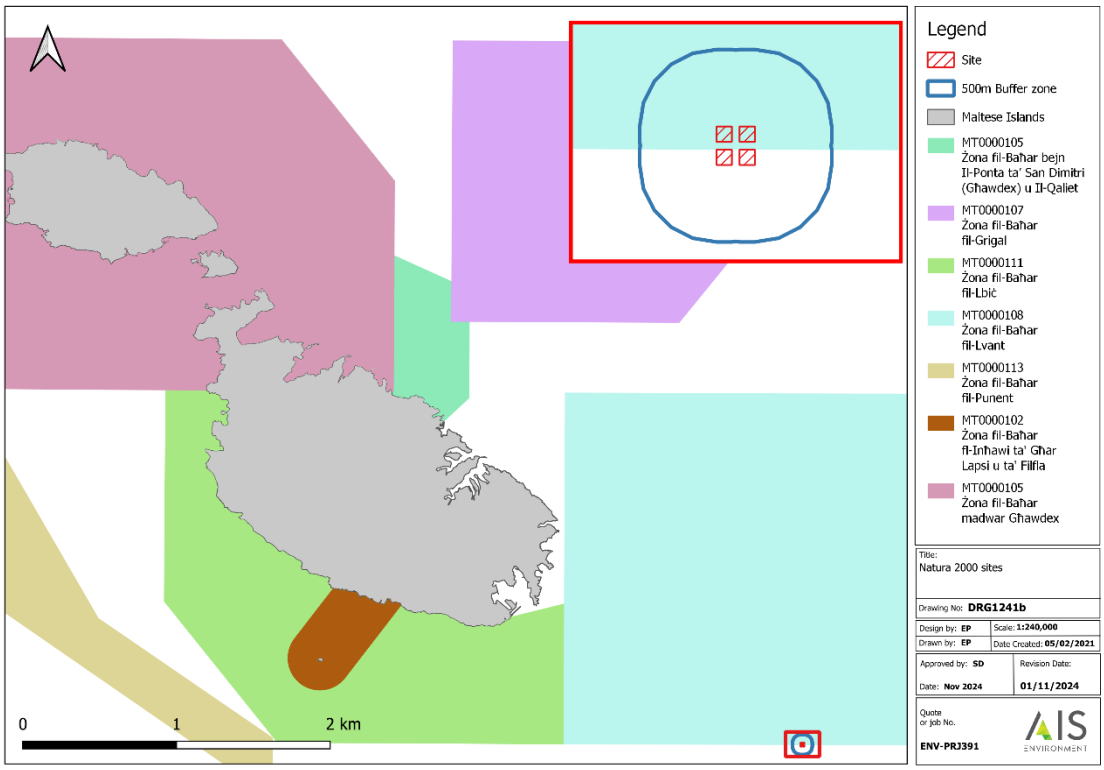

FIGURE 20: NATURA 2000 SITE DESIGNATIONS WITHIN THE MALTESE TERRITORIAL WATERS

2.5.4 Protected Species

2.5.4.1 Avifauna

Scopoli's Shearwater

The Scopoli's Shearwater is currently listed as Least Concern by the IUCN. It is listed under Annex I of the EU-Birds Directive. The species is endemic (breeding) to the Mediterranean basin, with major colonies in the Central Mediterranean.

For the Maltese islands, the total population estimates for Scopoli's Shearwater in 2018 was 2,670-3,605 breeding pairs according to the latest MSFD report[4], roughly equating to around 1.6-1.9% of the global breeding population. Previous figures reported in 2013 had estimated the total Maltese population to be 3,046-3,962 breeding pairs. The available data suggests a decreasing population trend.

Scopoli's shearwaters typically feed on surface-dwelling fish and squid, capturing prey up to 15 metres deep. They are attracted to fishing vessels, and are frequently

[4] Environment and Resources Authority (2020). Update of Articles 8, 9 and 10 of the Marine Strategy Framework Directive (2008/56/EC) in Malta's Marine Waters – Second Assessment Report

observed picking off fish from the decks of vessels, fish farms, and around foraging cetaceans and tuna.

The breeding season starts in March for this species. Eggs are laid by the end of April, and hatch by the beginning of July. Chicks fledge in October, after which the young fly out to sea. The most common breeding habitat for this species is cliffs, caves and crevices on the coastline of islands and islets. Therefore, the North-Western coastline of Malta is a favoured breeding habitat for these species. During the maturation period, which can last between 3 and 6 years, the chicks spend their entire time at sea. The species demonstrates a high roost fidelity, where the juveniles typically return to the same breeding site once matured to look for potential partners. The species is migratory, with a variable migration route depending on the population, sex and changes in the environment.

The main threats to the species are invasive species and predators (ex. rats in breeding sites); light pollution and habitat loss[5]. It has been proven to also be sensitive to by-catch in pelagic and demersal long-line fisheries (the latter during setting).

European Storm Petrel

The IUCN lists the European Storm Petrel overall as Least Concern. The species is also listed under Annex I of the EU-Birds Directive. The Mediterranean subspecies *H. pelagicus melitensis* is endemic to the Mediterranean basin and therefore has a relatively restricted distribution range. The most recent population size estimates for the Mediterranean sub-species are 8,500–15,200 pairs, roughly 2-3% of the global population.

Storm petrels typically share the same breeding site requirements as the shearwaters, including rock crevices under boulders and burrows. The breeding season for this species starts in March, with the eggs laid in May and June. The chicks fledge in July and August, and immediately venture out to sea. Unlike the Scopoli's shearwater, which migrates Westward to spend the non-breeding season in the East and South-East Atlantic, returning on land only to breed; the European Storm Petrel remains largely localised in the Maltese waters and the nearby Mediterranean Sea year-round. Also, in contrast with the shearwaters, which are typically found in the North West and West side of Malta, Storm Petrels are more commonly observed in the Southeast and South region of Malta.

This species feeds on crustaceans and small pelagic fish, and is commonly associated with fishing vessels, cetaceans and shoals of large fish such as tuna. The species frequents tuna pens and the oil slick surrounding traditional aquaculture establishments caused by fish feed. The main threat to this species is invasive

[5] Birdlife International. (2021, July, 28). Seabird of the month: Scopoli's Shearwater (Calonectris diomedea), Accessed August 2022 at https://www.birdlife.org/news/2021/07/28/seabird-month-scopolis-shearwater-calonectris-diomedea/

mammalian land predators such as rats[6]. Adults and fledglings are also rather sensitive to light pollution.

2.5.4.2 Marine Turtles

The EU Marine Strategy Framework Directive (MSFD), Article 8 (1)(a) and Annex III as amended by Commission Directive 2017/845/EU requires that Malta studies and describes the population and status of the marine reptiles observed within its marine waters.

The Maltese marine waters host five species of marine turtles: Loggerhead turtles (*Caretta caretta*), Leatherback turtles (*Dermochelys coriacea*), Green sea turtles (Chelonia mydas), Kemp's ridley sea turtle (*Lepidochelys kempii*) and Hawksbill sea turtles (*Eretmochelys imbricata*). The latter three species are only known by single records in the Maltese waters. Leatherback turtles were recorded regularly in the 1970s and 1980s, however it is not considered a Mediterranean species at present, but rather an accidental visitor. Only loggerhead turtles have been recorded to nest in the Maltese islands.

The observations presented in the MSFD report[7] were primarily recorded within the LIFE+ MIGRATE PROJECT and the LIFE BAĦAR FOR N2K PROJECT. These surveys concluded that Loggerhead turtles demonstrate a wide distribution within the Maltese marine waters. The data indicates that the range of this species remained stable over time. There is a predominance of sightings of this species within the North-West and South-West regions of the Maltese waters in recent years.

[6] Environment and Resources Authority (2019, September). BioSnippet – Issue 45, Accessed August 2022 at https://era.org.mt/wp-content/uploads/2019/09/BioSnippet_45-Mediterranean_Storm_Petrel.pdf

[7] Environment and Resources Authority (2020) Update of Articles 8, 9 and 10 of the Marine Strategy Framework Directive (2008/56/EC) in Malta's Marine Waters – Second Assessment Report

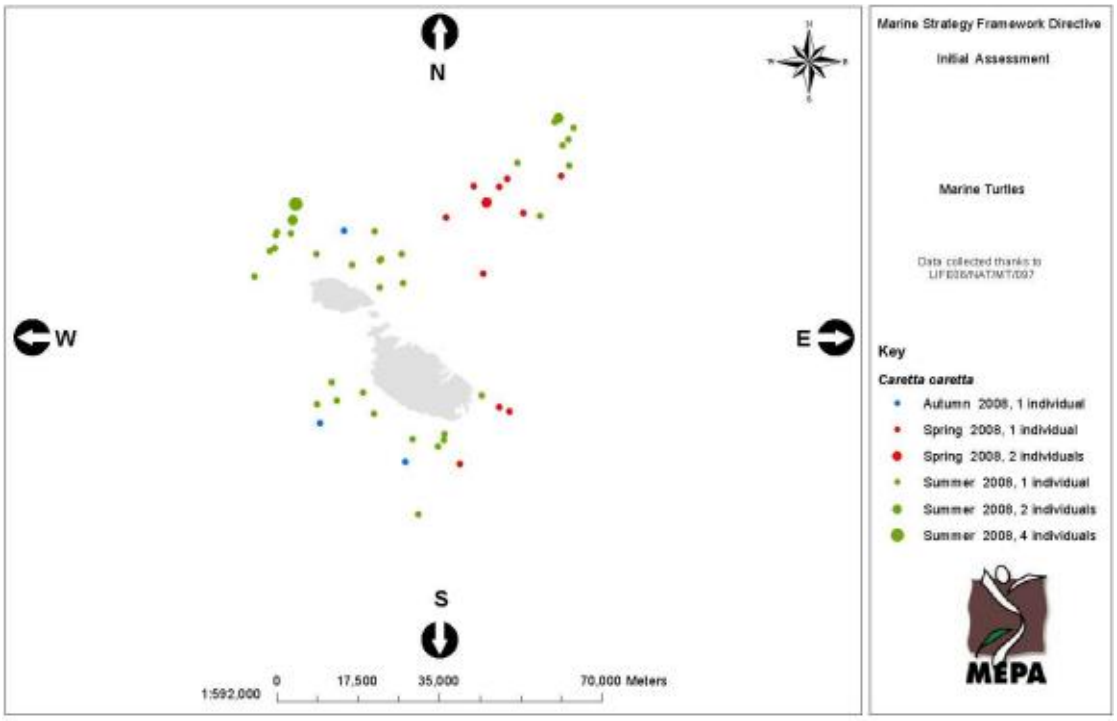

FIGURE 21: SIGHTINGS OF LOGGERHEAD TURTLES OBSERVED BY BIRDLIFE MALTA IN 2008 (EU LIFE YELOUKAN SHEARWATER PROJECT)

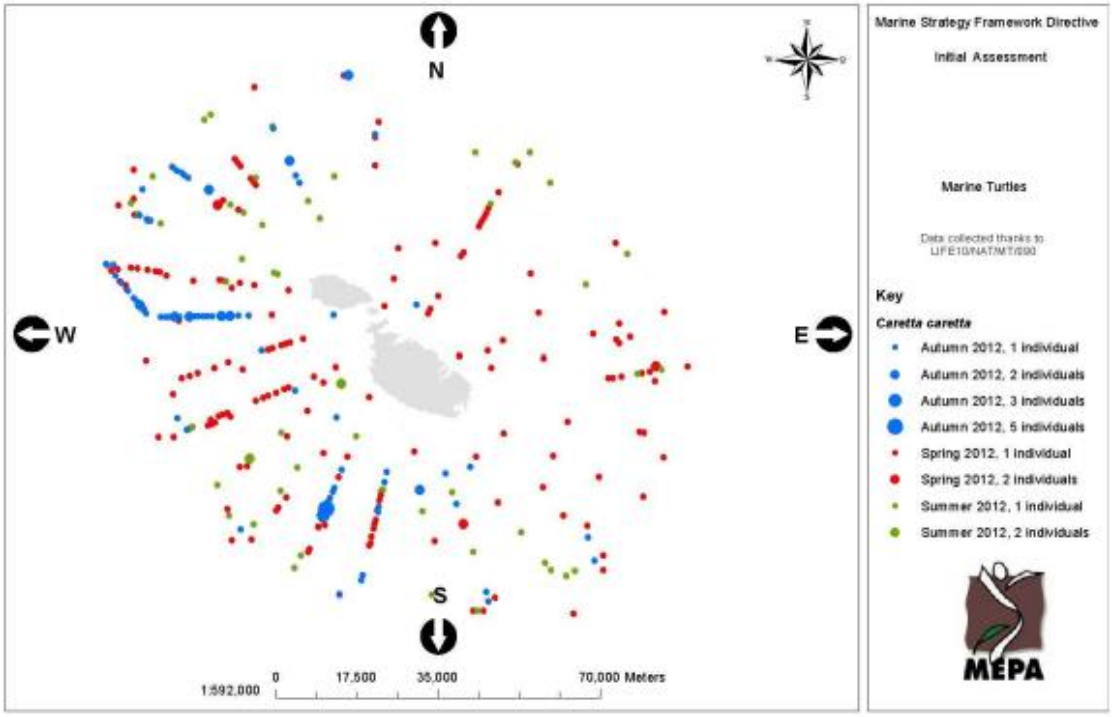

FIGURE 22: SIGHTINGS OF LOGGERHEAD TURTLES OBSERVED BY BIRDLIFE MALTA IN 2012 (EU LIFE+ MALTA SEABIRD PROJECT)

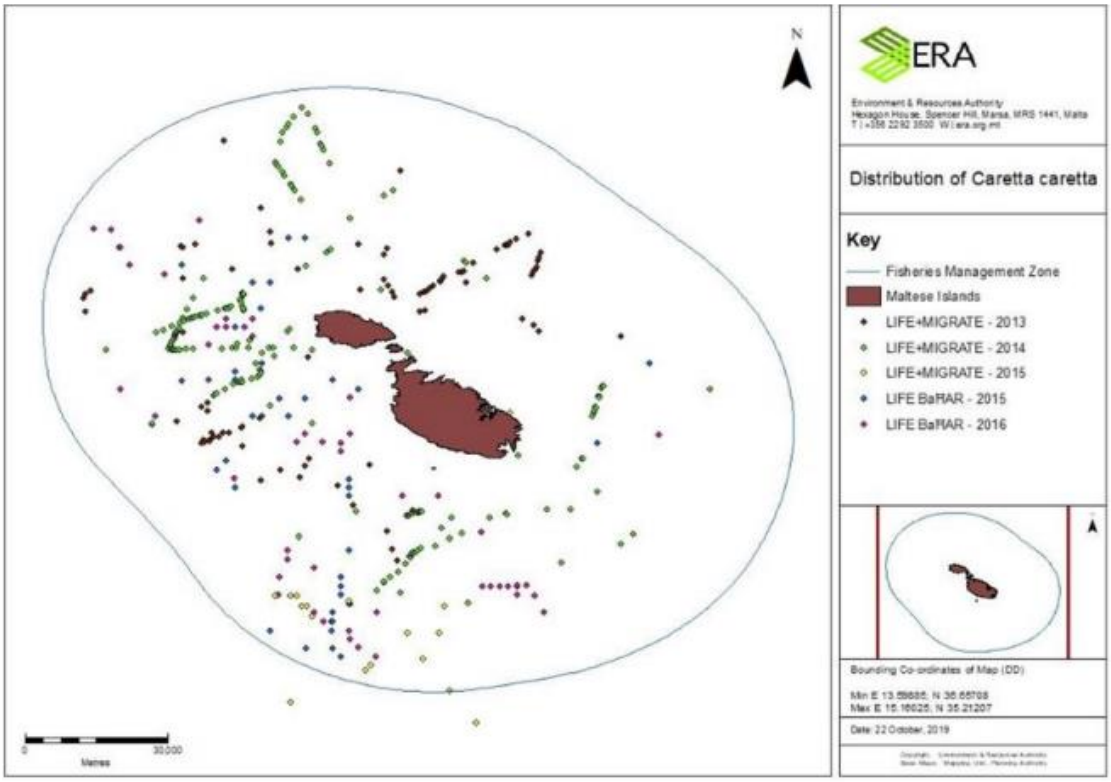

FIGURE 23: SIGHTINGS OF LOGGERHEAD TURTLES REPORTED BY THE LIFE+MIGRATE PROJECT (2013-2015); AND LIFE BAĦAR FOR N2K PROJECT (2015-2016)

2.5.4.3 Cetaceans

The EU MARINE STRATEGY FRAMEWORK DIRECTIVE (MSFD), ARTICLE 8 (1)(A) AND ANNEX III as amended by COMMISSION DIRECTIVE 2017/845/EU requires that Malta studies and describes the population and status of the marine mammals observed within its marine waters. The latest MSFD report, published in 2020[8], provides an updated assessment of cetaceans' status in Maltese waters. The data reported was derived primarily through the project LIFE11 NAT/MT/1070- LIFE+MIGRATE (LIFE+ MIGRATE PROJECT, 2013) and the project LIFE12 NAT/MT/000845- LIFE BAĦAR FOR N2K (LIFE BaĦAR for N2K, 2014).

Four whale species and four dolphin species were reported from Malta in the latest surveys. The species observed are: Fin whales; Sperm whales; Cuvier's beaked whales and Long-finned pilot whales; Risso's dolphins; Common dolphins, Striped dolphins and Bottlenose dolphins.

The updated assessment of status focused on the species group 'Small-toothed cetaceans' composed of the three delphinid species: the Common dolphin, Striped Dolphin and Bottlenose dolphin. The remaining five species were reported in numbers which were not sufficient to enable an accurate assessment.

[8] Environment and Resources Authority (2020) Update of Articles 8, 9 and 10 of the Marine Strategy Framework Directive (2008/56/EC) in Malta's Marine Waters – Second Assessment Report

The studies show these species to be present in relatively small numbers in the Maltese waters and the populations (based on both strategic and sporadic observations) appear to be stable.

The Malta Environment and Resources Authority is subscribed to ACCOBAMS (AGREEMENT ON THE CONSERVATION OF CETACEANS OF THE BLACK SEA, MEDITERRANEAN SEA AND CONTIGUOUS ATLANTIC AREA), which identifies underwater noise and marine litter as two major pressures for this species groups.

The ERA presents range distribution data for the cetacean species recorded in Maltese territorial waters. Historically, observations of cetaceans were evenly spread across the marine waters (See Figure 24).

Recent scientific surveys funded by the LIFE+MIGRATE Project (2013-2015); and LIFE Baħar for N2K Project (2015-2016) revealed that the three most commonly-occurring species are typically observed within the Western and Southern regions of the Maltese territorial waters (See Figure 25, Figure 26 and Figure 27).

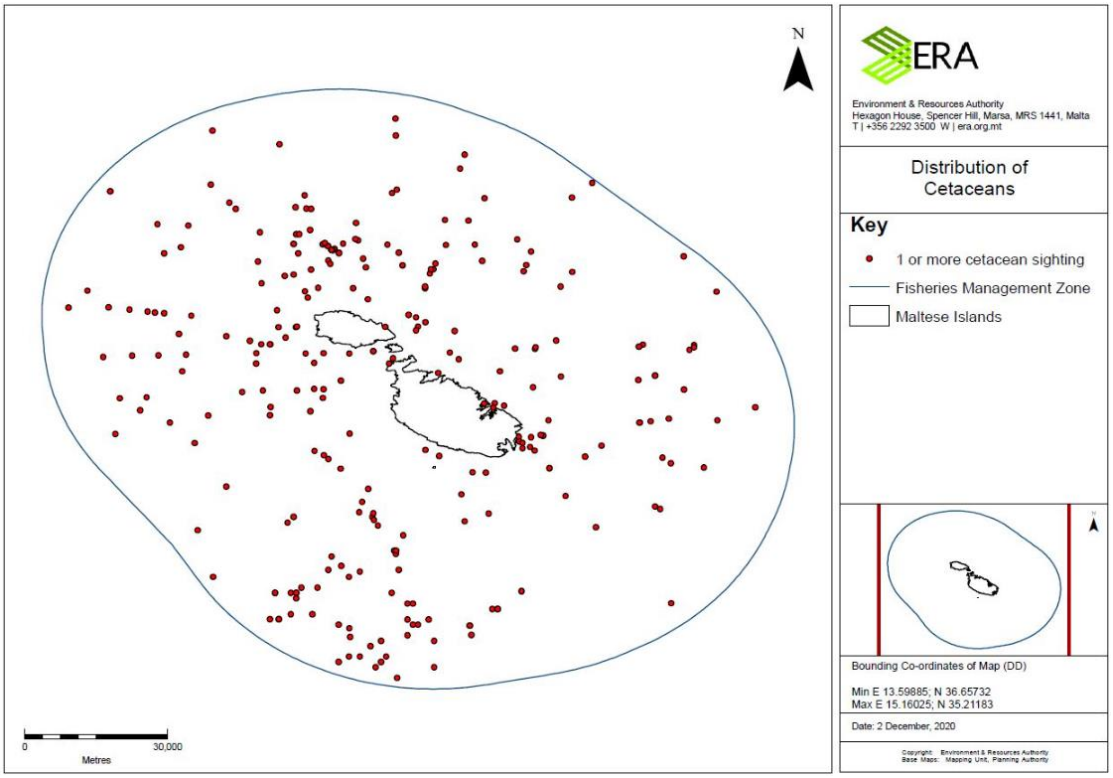

FIGURE 24: CETACEANS DISTRIBUTION WITHIN MALTESE TERRITORIAL WATERS (SOURCE: ERA, 2020)[9]

[9] Environment and Resources Authority (2021, October, 21). Strong presence of cetaceans confirmed around the Maltese islands [Press release] Accessed in August 2024 at https://era.org.mt/press-releases/strong-presence-of-cetaceans-confirmed-around-the-maltese-islands/

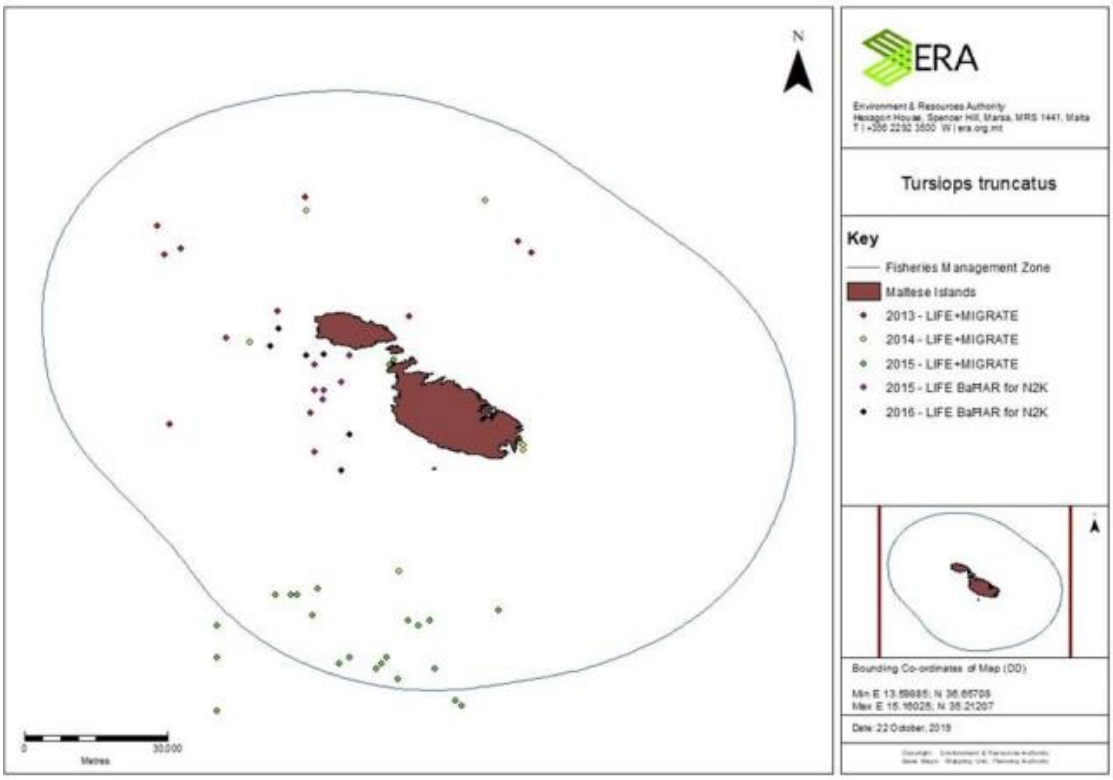

FIGURE 25: SIGHTINGS OF COMMON BOTTLENOSE DOLPHINS REPORTED BY THE LIFE+MIGRATE PROJECT (2013-2015); AND LIFE BAĦAR FOR N2K PROJECT (2015-2016)

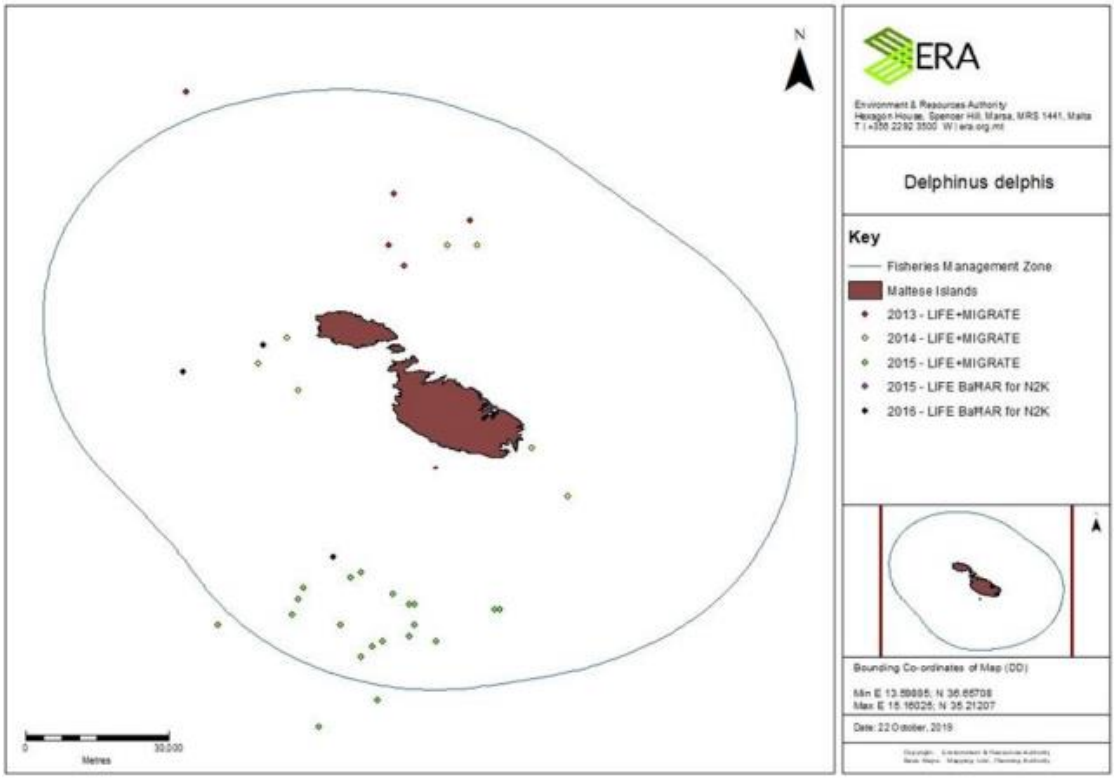

FIGURE 26: SIGHTINGS OF SHORT-BEAKED COMMON DOLPHINS REPORTED BY THE LIFE+ MIGRATE PROJECT (2013-2015) AND LIFE BAĦAR FOR N2K PROJECT (2015-2016).

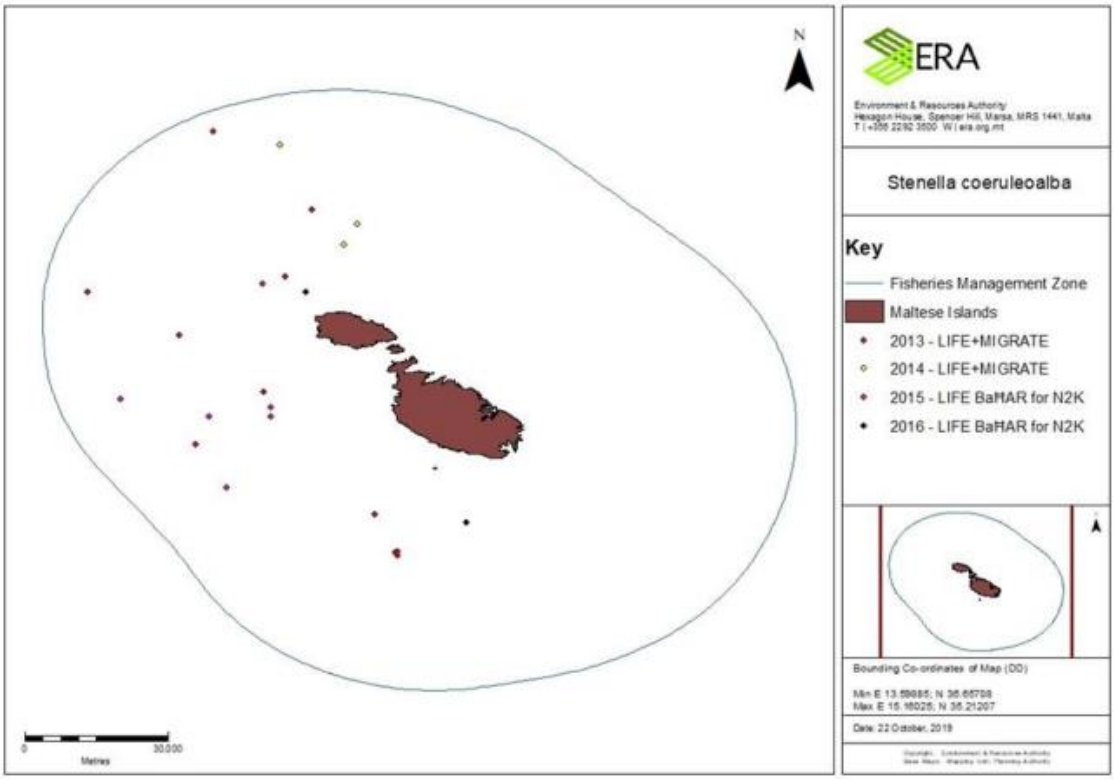

FIGURE 27: SIGHTINGS OF STRIPED DOLPHINS AS REPORTED BY THE LIFE+ MIGRATE PROJECT (2013-2015) AND LIFE BAĦAR FOR N2K PROJECT (2015-2016)

2.5.5 Non-Indigenous and Invasive Species (NIS)

NIS are described as '*species, subspecies or lower taxa introduced outside of their natural range and outside of their natural dispersal potential. They constitute a biological pressure that is particularly relevant for the Mediterranean marine region, where there has been an increasing trend of new introductions reaching an unparalleled rate of one new record per 10–14 days* (Zenetos, 2010)'.

Potential causes include rising sea temperatures which allow for changes in the natural ranges of species, and intentional or unintentional introductions caused by human activities.

The EU MARINE STRATEGY FRAMEWORK DIRECTIVE (MSFD), ARTICLE 8 (1)(A) and ANNEX III AS AMENDED BY COMMISSION DIRECTIVE 2017/845/EU require that Malta conduct an assessment of the identified pathways through which NIS were introduced into the Maltese waters. This research falls within the actions of the IUCN SPECIES SURVIVAL COMMISSION – INVASIVE SPECIES SPECIALIST GROUP. The group has defined the following main pathways of NIS in marine waters:

- Release in nature
- Escape from confinement
- Transport – as a contaminant
- Transport – as a stowaway
- Corridor – interconnected waterways/basins/seas

- Other

Ballast Water

Through the International Maritime Organisation, Malta adopted the CONVENTION FOR THE CONTROL AND MANAGEMENT OF SHIPS' BALLAST WATER AND SEDIMENTS (BWMC). The Convention requires a 'Ballast Water and Sediments Management Plan' for all international seafaring vessels. This requires the vessels to comply with standards for ballast water and sediment discharge, and record-keeping of these activities.

Ships transporting ballast between ports are a main component of transport-related spread of NIS. Ballast water and associated sediments can transport a wide variety of species in different stages as aquatic hitchhikers. Plankton, crustaceans, fish, larvae, eggs or cysts can all be transported within ballast. Ships' sea chests, which are containers of seawater used for cooling, firefighting and pumping of ballast water aboard, may also constitute vectors of dispersal for NIS. All vessels entering Maltese territories are required to follow the International Ballast Water Regulations (S.L. 234.55).

Hull Fouling

Hull fouling is another recognised transport pathway of NIS in marine waters, and is recognised within MALTA'S NATIONAL STRATEGY FOR IAS. Encrusting or sessile species attach to the hull of vessels and other external structures. In a harbour, these organisms may be dislodged through abrasion with the quay or during hull cleaning. These may eventually settle into the environment and establish a reproductive population. Antifouling paint and the increased speed of modern vessels has reduced the incidence of this vector; however, it is still relevant particularly for smaller vessels.

The MSFD REPORT[10] lists records of new NIS observed during monitoring held between 2017 and 2018. The species introduced via transport-related pathways are the following: *Branchiomma bairdi, Caprella scaura, Celleporaria brunnea, Celleporaria vermiformis, Codium fragile, Dendostrea folium, Hippopodina sp., Mesanthura cf. romulea, Paranthura japonica and Stenothoe georgiana.*

The report also lists records of new NIS reported in the available literature. These species introduced via transport-related pathways are the following: *Abudefduf hoefleri, Caulerpa taxifolia var. distichophylla, Cephalopholis nigri, Hydroides dirampha, Littorina saxatilis, Martigrella fuscopunctata, Pomacanthus maculosus, Watersipora arcuata.*

Furthermore, the report lists previously recorded NIS species which were also observed during dedicated monitoring sessions in 2017-2018. The species introduced

[10] Environment and Resources Authority (2020) Update of Articles 8, 9 and 10 of the Marine Strategy Framework Directive (2008/56/EC) in Malta's Marine Waters – Second Assessment Report

through transport-related pathways include: *Amathia verticillate, Brachidontes pharaonis, Hydroides elegans, Percnon gibbesi, and Styela plicata.*

2.6 SERVICES AVAILABLE

2.6.1 Energy and Water

The proposed scheme is required to be largely self-sufficient due to its offshore location. The scheme will be supplied with electricity derived primarily from solar panels and batteries installed on the platform itself, supplemented by on-site generators running on a hybrid system of diesel and hydrotreated vegetable oil (HVO) in emergency situations. All lighting within the scheme will follow COLREGS recommendations related to vessel lighting and kept to the minimum possible.

Water supply for consumption by the workers will be provided through an on-site reverse osmosis plant. Effluent derived from this system (saltwater and other impurities found within the surrounding seawater) will be discharged back into the sea.

Detailed information on the technical specifications of the solar panels, generators and reverse osmosis plant will be confirmed at a later stage.

2.6.2 Sewage

It is envisaged that the site will only generate sewage wastes related to the workers present on the platform site. Blackwater created from the onboard toilets will be stored within the platform temporarily, housed within holding tanks. The sewage effluent will be processed on board and returned to the sea, as done on board typical vessels.

Detailed information related to the quantities of sewage generated from the proposed scheme and the frequency of transport to shore will be determined at a later stage.

2.6.3 Surface Water Run-Off and Storm Water Drainage

Any rain water that falls onto the Scheme site will flow naturally from the platform surface into the sea through the platform scuppers.

3 THE SCHEME

3.1 SIZE, SCALE AND DESIGN

The offshore fish farm platform will be registered as a shipping vessel, observing all applicable maritime regulations including all local regulations enforced by TRANSPORT MALTA, THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS (MARPOL) and CONVENTION ON THE INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA, 1972 (COLREGS).

The offshore fish farm will comprise of platforms measuring 100m by 100m, with an adjustable depth of up to 70m. Each platform will be connected to four submerged cages measuring 50m x 50m each. The total site footprint will amount to circa 0.09 km^2 including the anchoring points, which will be placed at a distance of 200m from the platform edge. A total of four anchoring points will be set in place, one at each corner of the platform. An additional 2 emergency anchors will be stored on the platform corners, along with 4 towing bollards.

The platforms will house 2 lifeboats alongside them, and a helipad on deck, which will be used to evacuate the staff in case of an emergency. The helipad will also be used for the regular transport of staff and between the platform and shore. The platform deck will also house 2 gantry cranes which will carry out any movement of the cages and equipment, and other supporting activities as necessary.

The feed will be stored within the legs of the structure and dispensed accordingly. The feeding process will be fully automated, dispensing feed according to the weight, life stage and condition of the reared fish, using infra-red sensors to collect the necessary data.

The cages will be constructed with materials which are naturally resistant to the accumulation of debris. The cages will also be cleaned regularly with the use of a remotely-operated vehicle (ROV) directed by certified divers. Maintenance of the cages will be carried out as required following frequent inspections. The cages have been designed in a way that large-scale maintenance is only expected on an 8-year basis. Due to their modular nature, any maintenance or repairs of individual parts can be done while a replacement part is put in place.

A multi-trophic cage system will be implemented where the upper levels will be dedicated to fish production, while the lower levels will host bottom feeders such as crustaceans. This system is highly efficient and drastically reduces the amount of discharges from the site which are typical of conventional fish farms. The species which will be reared will vary according to seasonality and consumer demand. Fries will be bought readily hatched from a foreign supplier and then raised in the cages. It is expected that the farm will produce 5,000 – 8,000 tonnes of fish per year, which will be sold to both local and foreign markets.

Once the fish reach maturity, they will be harvested on the platforms and transferred to the clients directly.

The platforms will be manned on a 24-hour basis; however, it is not envisaged that there will be regular activities carried out after sundown. All lighting within the scheme will follow the COLREGS recommendations related to vessel lighting and kept to the minimum possible. Electricity on the vessel will be provided primarily through solar panels and associated batteries, which will be supplemented by duel-fuel (diesel and HVO) generators in emergency situations. The electricity consumption will be primarily attributed to the human occupancy aspects of the site, such as air conditioning and lighting. The platform will also house a reverse osmosis, which will provide freshwater for the use of the staff on board.

The platform will rise to approximately 20 metres above sea level. The gantry cranes comprise the highest part of the structure, with a maximum reach of 36 metres. The site offices will be located on the platform and are comparatively small in the context of the entire installation. Therefore, it is not expected that the air-conditioning system and photovoltaic panels will increase the impacts (environmental and visual) of the structure as a whole.

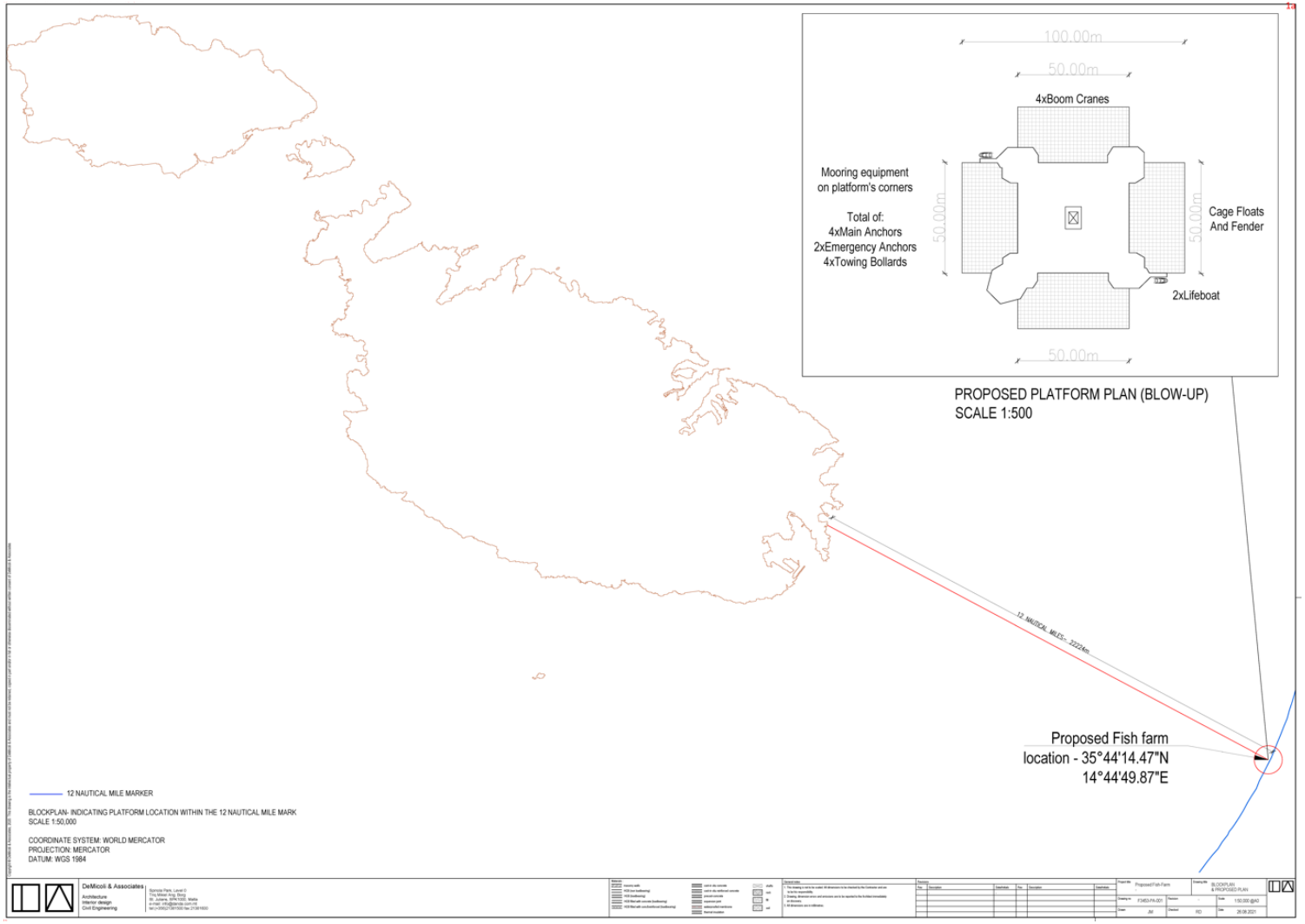

FIGURE 28: PROPOSED SITE AND PLAN OF THE FIRST PLATFORM

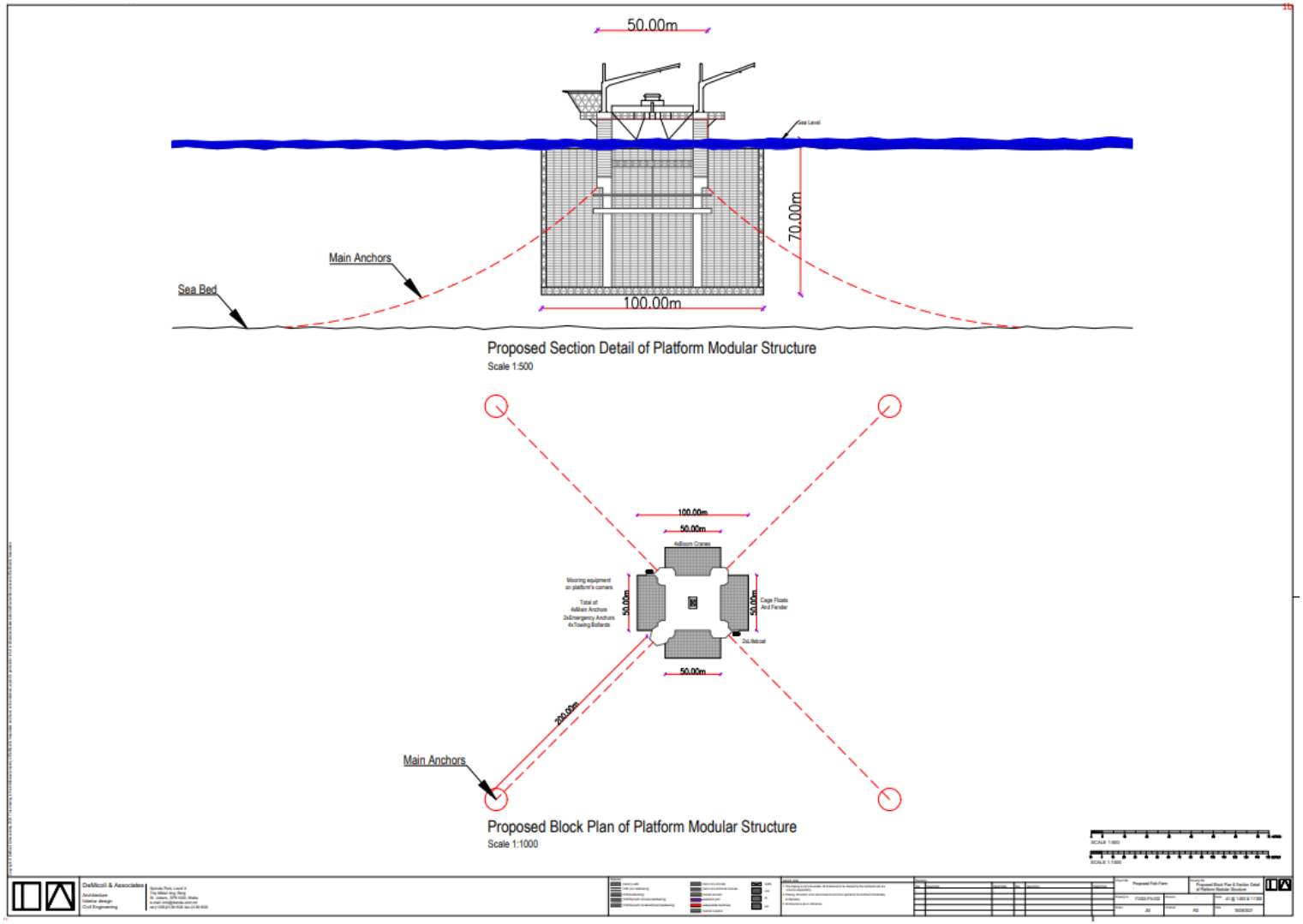

FIGURE 29: BLOCK PLAN AND SECTION DETAIL OF PLATFORM MODULAR STRUCTURE

3.2 INSTALLATION PHASE

The assembly of the platforms will be carried out offsite. Once the platforms are fully assembled, they will be towed to the proposed site. The cages will be assembled on the platforms themselves. Installation on site will include setting up anchoring points at each corner of the platforms, and the setting up of all automated processes that will be available on the platforms.

3.2.1 Number of Employees

Minimal staff is required at the installation stage as the majority of the assembly will occur off-site. Minor assembly will occur on-site as described in the previous section.

3.2.2 Phasing

This project involves the installation and operation of four platforms. The first platform will serve as the pilot for three additional platforms to be installed at a later stage in the process.

The installation phase of the first platform is expected to take around 18 months. Following the set-up of the first platform, a trial period for operations will be run for 12 months, following which the second platform installation will commence. The third and fourth platforms will be installed with a shorter interim gap of operations, which is yet undefined and is dependent on market demand.

3.2.3 Raw Materials

The cages used will be made out of reinforced material and arrive in Malta pre-cast and assembled.

3.2.4 Machinery

The assembly of the platforms will be carried out onshore in a foreign facility, following which the platform will be towed to the site. The cages will be assembled by the vessel personnel and installed using the on-site boom cranes. Therefore, no external machinery is required for the on-site installation.

3.2.5 Energy

Energy consumption during installation is not relevant to the report, since the assembly will be carried out in a foreign facility. Energy will only be used to transport the platform to the earmarked site, primarily through fuel.

3.2.6 Waste

The installation phase will not cause waste generation other than small amounts of municipal waste expected to be generated by the workers involved in the transport and installation of the platform and on-site assembly of the cages. Water chemical systems (for greywater and blackwater) will be used as done on commercial vessels with IMO systems.

3.2.7 Access

Due to the site's offshore location, access is available only to registered marine vessels and subject to nautical permits. The site will be manned on a 24/7 basis by company personnel. A 500m buffer zone will be set around the proposed site, which may act as a restricted zone during the installation phase of the project.

3.3 OPERATIONAL PHASE

During the first year of operations, the fish fries will be delivered hatched to the platform from a foreign supplier, then raised within the cages until maturity. The species of the fry will vary depending on client requests.

The proposed feeding system is fully automated. Infrared sensors will trigger feeding in quantities which depend on the fishes' condition, life stage and target weight. Crustaceans will be housed at the bottom of the fish cages. These will feed on detritus resulting from the fish feeding process, thus clearing the seabed of leftovers and residue. The location and depth of the cages will be adjustable - when the sea is rough, the cages will be submerged further to minimise damages, losses to yield and fish stress caused by wave action. Once matured, the animals will be transported directly from the platform to the clients' vessels.

The platform will be self-sufficient through the function of a reverse osmosis system and solar panels and batteries. Additional energy will be provided through hybrid (diesel and HVO) generators in emergency situations.

The operations will be transported to and from the platform to supply fish feed and other materials, supplies for the workers, and to changeover the staff themselves. Currently, these trips are envisaged to be carried out via helicopter and/or marine vessels, according to operational needs. The frequency of the trips required to service the platform are currently undefined.

3.3.1 Number of Employees

The platform will be manned continuously by personnel working in shifts. Regular trips are expected to and from the platform to transport staff to the shore and back. In the case of medical emergencies, personnel will be transported from the platform to the nearest hospital via helicopter. The platform contains a helipad to cater for these instances. The total number of staff required for during the operational phase is yet to be defined.

3.3.2 Phasing

The platform will be operational throughout the year. Phasing of the production period for each cage will be dependent on the market demand and the species being produced at the time. Eventually, three additional platforms will be added and similarly operated (See 3.2.2 for a full description of the envisaged phases).

3.3.3 Raw Materials

The raw materials which will be used during the operational phase of the proposed scheme are the following:

- Feed (live or dry)
- Seawater for Reverse Osmosis plant
- Cleaning supplies
- Food and emergency medical supplies for the employees

The exact type and quantity of the materials necessary for operating the scheme are currently undefined.

3.3.4 Machinery

Each platform is furnished with two boom cranes. These will be used to move the cages and harvesting of the fish. The feeding system will be fully automated, using infrared technology to determine when the fish are hungry. The automated system will then distribute feed of different type, quantity and frequency, depending on the species, life stage, condition and weight targets of the animals being reared.

3.3.5 Energy

The platform operations will be supplied with electricity through solar panels and batteries installed on the platform deck. These will be backed up by hybrid (diesel and HVO) generators in emergency situations. The electricity consumption will be primarily attributed to the human occupancy aspects of the site, such as air conditioning and lighting.

3.3.6 Waste

The following are the waste streams expected to be produced through the operations of the proposed scheme:

- Blackwater
- Greywater
- Municipal waste

The quantity of waste generated for each waste type is currently unavailable. Water chemical systems (for greywater and blackwater) will be used as done on commercial vessels with IMO systems.

3.3.7 Access

The proposed Scheme can only be accessed by a registered marine vessel due to its location in offshore waters. A 500m buffer zone will be established around the proposed site which will serve as a restricted zone during operations.

4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A preliminary indication of the environmental impacts that are likely to be associated with the Scheme are described in this section, and may serve as an initial scoping assessment in the context of the Environmental Impact Assessment Regulations of 2017 (S.L. 549.46).

The impact of the installation phase in general was considered as negligible, as the assembly of the platforms will be carried out abroad. The assembly of the cages will be carried out on the platforms themselves. The operational phase is also considered to cause minimal impacts due to the scheme's inbuilt sustainability measures. The potential impacts of the Scheme and their respective mitigation measures are listed in Table 1.

TABLE 1: POTENTIAL IMPACTS AND THEIR MITIGATION MEASURES

THEME	RECEPTOR	DESCRIPTION OF IMPACT	MITIGATION MEASURES
Land and Sea Uses	Cables and Pipelines	**No Impact** The proposed site does not coincide with any known underwater cables or pipelines.	N/A
	Maritime Areas	**No Impact** The proposed site does not infringe on any areas designated for specific maritime uses	N/A
Marine Ecology	Predator fish, elasmobranchs and cetaceans	**Minor-Moderate Adverse** The presence of large quantities of reared fish may attract large marine fish, elasmobranchs and cetaceans, leading to the accidental injury or bycatch of such species during the site operations.	If cetaceans are observed frequently at the site, acoustic deterrents can be considered. Vessels used during operations should operate at low speeds when approaching the cages to reduce the likelihood of accidental collisions.
	Deterioration of seagrass	**Minor-Moderate Adverse** Detritus produced from fallen feed may negatively impact seagrasses and related ecosystems on the seabed beneath and/or adjacent to the proposed scheme site.	The inclusion of crustaceans in the production mix is a valuable mitigation measure in this regard, as these will consume the vast majority of uneaten fish feed. The cages should be frequently maintained and cleaned to maintain a healthy water circulation.
Avifauna	Seabirds	**Minor Adverse** The farm will be located in a Natura 2000 SPA MT0000108, designated for the protection of	The cages will be submerged, therefore it is unlikely that these will serve as an attraction to avifauna. The applicant should ensure that the pens are properly

THEME	RECEPTOR	DESCRIPTION OF IMPACT	MITIGATION MEASURES
		seabirds. These species typically roost in coastal cliffs and are primarily active at night. Excessive lighting can disorient seabirds active at night, causing collisions with the platform structure. Reflective solar panels can also disorient seabirds, leading to an increase in accidental collisions. The panels will be installed at a height above the typical trajectory of sea birds therefore this risk is minimised.	submerged at all times, and install physical, audio or biological deterrents when/if cages are at the surface. Only the absolute minimum lighting required at night should be used. A light management plan should be in place and adjusted seasonally to account for the bird migratory seasons. Downward-pointing and shaded light sources should be used wherever possible. All lighting on the platforms should adhere to COLREGS regulations. Solar panels should be of the non-reflective type to avoid disorientating seabirds.
Non-Indigenous Species	Native Biodiversity	**Negligible** Transport of NIS may occur during the transport of the platform to the site.	The impact significance is considered negligible as the transport of the platforms to the site is a one-time occurrence and all applicable regulations will be followed to further minimise risk of NIS transport. The provisions within the CONVENTION FOR THE CONTROL AND MANAGEMENT OF SHIPS' BALLAST WATER AND SEDIMENTS (BWMC) and MALTA'S NATIONAL STRATEGY FOR IAS should be adhered to throughout the installation period to minimise the potential transport of NIS between foreign waters and the site.
Hydrogeology	Seabed morphology	**Negligible** The presence of large-scale platforms and the associated cages may cause a deviation of pre-	N/A

THEME	RECEPTOR	DESCRIPTION OF IMPACT	MITIGATION MEASURES
		existing currents in the site area, leading to an unnatural movement of nutrients and sediment. This impact is considered unlikely to be significant due to the small scale of the proposed development and distance from the shore.	
Noise	Marine Species	**Minor-Moderate Adverse** The operations will cause a slight increase in the noise levels of the area due to the use of generators (in emergency situations) and operations of the platform in an area previously devoid of any artificial structures. The generator use envisaged will be related to the running of housing facilities such as lighting. Excessive noise causes a nuisance to birds, cetaceans and other marine life, and may have an effect on their regular movements, such as site avoidance.	Any emergency generators used need to be placed in housing and mounted on rubber feet. All machinery used will require regular maintenance and should be switched off when not in use to minimise unnecessary noise.
Discharges	Native Biodiversity	**Minor Adverse** Typical fish farm operations may cause a number of discharges including faecal matter, excess feed and oils dissipating from live and frozen feed. The accumulation of these discharges on the sea floor disrupts the existing ecosystems and may lead to a build-up of nutrient levels which cause unsanitary conditions in the farm.	The proposed system incorporates detritus feeders which will significantly minimise these effects. These species will be fed exclusively on the excess discharges, therefore these potential impacts will be minimised if not eliminated. Further mitigation strategies include optimising of the feeding strategy through trial and error.

THEME	RECEPTOR	DESCRIPTION OF IMPACT	MITIGATION MEASURES
			Standards of good practice such as adequate spacing between cages, regular cleaning and appropriate feeding will prevent most issues which require antibiotics.