



Terrestrial Ecology Technical Study in relation to the Environmental Impact Assessment (EIA) for a new Materials Recovery Facility (MRF)

WASTESERV MALTA LIMITED

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SERVICE TENDER FOR THE ENGINEERING, PROCUREMENT
AND CONSTRUCTION OF A NEW MATERIALS RECOVERY
FACILITY

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1.0 INTRODUCTION

This report describes Terrestrial Ecology impacts arising from the construction and operation of the proposed development of a new Materials Recovery Facility (MRF). The facility is being proposed to treat source-separated and co-mingled dry recyclables collected in Malta, and is hereafter referred to as 'the Scheme'.

The proposed development will form part of the ECOHIVE Complex and will operate in conjunction with the other waste management facilities at Magħtab.

This technical study identifies the terrestrial ecological features in the area and assesses the impacts caused in relation to the EIA for the proposed development, in line with the requirements issued by the ERA under EA 00042/20.

1.1 Project Description

Source separated recyclable waste streams including paper, cardboard, plastics and metals were previously processed at a Material Recovery Facility at the Sant' Antnin Solid Waste Treatment Plant in Marsascale. This MRF operated between February 2008 and May 2017 but was destroyed during a fire. In the absence of such a facility, the processing of the aforementioned waste streams has been restricted to a manual sorting line and a more recent makeshift line at the Malta North Facility within the ECOHIVE complex.

The Scheme is being proposed meet the provisions of Malta's Waste Management Plan and achieve recovery and recycling targets stipulated in the Circular Economy Package. The proposed Scheme aims to minimise as much as possible all landfilling and increase the recovery efficiency of recyclables thus rendering them more suitable for sales and/or export. The facility has also been designed in such a way to ensure that any emissions and environmental impacts arising from operations are in conformity with the latest requirements and standards stipulated in the EU INDUSTRIAL EMISSIONS DIRECTIVE 2010/75/EU (IED). The Scheme also intends to have a low processing cost per tonne of waste; good tolerance to contaminants in feed stock; minimise extended periods when waste cannot be processed, and sufficient contingency planning for planned (or unplanned) maintenance and downtime.

The total processing capacity of the proposed MRF is 70 kilotons per annum to meet future waste demand projections. The site forms part of the ECOHIVE Master Plan and lies eastwards of the Żwejra landfill, adjacent to the existing Anaerobic Digester (AD) Plant. The development footprint of the entire site is around 21,373m². It currently comprises agricultural land, a dense cover of low-lying trees and remnants of local maquis/advanced garigue community.



Figure 1: Proposed site for the new material recovery facility

2.0 TERMS OF REFERENCE

The Terms of Reference related to the study on land cover and land uses for the EIA were issued by the ERA in April 2023. They are replicated hereunder.

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

The existing environmental features, characteristics and conditions, in and around the proposed development site as well as in all locations likely to be affected by the development or by ancillary interventions and operations, are to be identified and described in sufficient detail, with particular attention to the aspects elaborated further in the next sections.

The consultants should also identify (and justify) wherever relevant:

- 1. The geographic area (e.g. viewshed or other area of influence) that needs to be covered by each study;*
- 2. The relevant sensitive receptors vis-à-vis the environmental parameter under consideration (e.g. residential communities, other users, natural ecosystems, specific populations of particular species, or individual physical features);*
- 3. The location of the reference points or stations (e.g. viewpoints, monitoring stations, or sampling points (including depth of multiple sampling points at a single sampling point in the case of water media and sediment, where applicable) to be used in the study; and*
- 4. Other methodological parameters of relevance, also noting that the assessment will normally require both desk-top studies and on-site investigations (including visual observations and sampling, as relevant).*

Note: *It is recommended that these details are discussed in advance with the ERA prior to commencement of the relevant parts of the studies, in order to pre-empt (as much as possible) later-stage issues.*

Wherever relevant to the environmental aspects under discussion, reference to legislation, policies, plans (including programmes and strategies) standards and targets, should also be made, such that the compatibility (or otherwise) of the proposal therewith is also factored into the assessment required by Section 4 below. The discussion should cover the following aspects, in the appropriate level of detail:

- Supra-national (e.g. European Union; United Nations; or other international or regional) legislation, directives, policies, conventions, protocols, treaties, charters, plans and obligations;*
- National legislation, policies and plans (e.g. Structure Plan; National Environment Policy); and*
- Sub-national legislation, policies and plans (e.g. local plans, site-specific regulations, action plans, management plans, and protective designations such as scheduling or Natura 2000).*

Note: In addition to already in-force legislation, policies and plans, the discussion should also cover any foreseeable future updates (or new legislation, policies and plans) likely to be fulfilled, affected or compromised by the proposed project. Furthermore, it should be noted that some cross-cutting legal/policy instruments (e.g. Water Framework Directive and Marine Strategy Framework Directive) may need to be factored into more than one aspect of the discussion.

3.4 Ecology (including terrestrial ecology, avifauna and marine ecology)

The assessment should include:

1. A full bathymetric survey of the existing environment on and around the area likely to be affected, include:
 - a. Offshore bathymetric maps;
 - b. Aerial imagery of the area;
 - c. Details and maps of any services / utilities; and
 - d. Description of the sea-bed morphology and of the sediment characteristics of the site.
2. An investigation of the ecology of the site and its surroundings (including, as relevant: flora, fauna, avifauna, fish and other aquatic organisms, benthic, burrowing and pelagic organisms, and their habitats and ecosystems), duly covering the relevant seasons (e.g. wet and dry seasons, in the case of terrestrial ecology) to ensure adequate coverage of all relevant species and ecosystem components;
3. A reporting of the conservation status and ecological condition of the area and the state of health of its habitats, species and ecological features;
4. A reporting of all protected, endangered, rare, unique, endemic, high-quality, keystone, invasive/deleterious, or otherwise important species, habitats, ecological assemblages, and ecological conditions found in the area under study;
5. A prediction of the potential impacts of the proposed project on the ecology of the site and its surroundings, including loss, damage or alteration of habitats and species populations (including potential increases in ambient noise levels in the marine environment) including alteration in the habitats and species' condition/state of health as measured through indicators used/specified for assessment of status in relevant EU policy;
6. Identification of all relevant species and assemblages (e.g. protected species or habitats, key species relevant to habitat characterisation, and monitoring indicators), and assess their abundance and distribution & patterns as well as the species' ecological niches. The findings should be supported by adequate maps and photographs. Classification of habitat types and species should be conducted in accordance with recognised classification systems (e.g. EUNIS and Palaearctic), to ERA satisfaction;
7. A noise and vibration study providing sufficient detailed information on any impacts on sensitive receptors (fauna and avifauna, natural ecosystems) due to increase in pressure in the area, and the cumulation with other existing sources including maritime vessel traffic and with other predicted sources such as new developments;
8. The nature of the changes (whether temporary or permanent) and effects of such changes on the ecological features; and

9. Other relevant environmental features.

In particular, the study should identify all relevant species and assemblages (e.g. protected species or habitats, key species relevant to habitat characterisation, and monitoring indicators), and assess their abundance and distribution patterns as well as the species' ecological niches. The findings should be supported by adequate maps and photographs. Classification of habitat types and species should be conducted in accordance with recognised classification systems (e.g. EUNIS and Palaearctic), to ERA's satisfaction.

Note 1: *Separate Terms of Reference are being referred by ERA for the Appropriate Assessment required in terms of the Flora, Fauna and Natural Habitats Protection Regulations (S.L. 549.44).*

Note 2: *Where the area of influence encompasses both marine and terrestrial environments, one or more of the sections indicated in these specimen TORs may need to be restructured accordingly to reflect the specific circumstances (e.g. separate reports for marine and terrestrial ecology).*

4.0 ASSESSMENT OF ENVIRONMENTAL IMPACTS AND ENVIRONMENTAL 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.*

5.0 REQUIRED MEASURES, IDENTIFICATION OF RESIDUAL IMPACTS, AND MONITORING PROGRAMMES

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].

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.

5.5 Monitoring Programme

A realistic and enforceable programme for effective monitoring of those works envisaged to have an adverse or uncertain impact. The monitoring programme should include:

- 1. Details regarding type and frequency of monitoring and reporting, including spot checks;*
- 2. The parameters that will be monitored, their units of measurement, the monitoring indicators to be used; and standard analytical methods in line with relevant EU policy;*
- 3. An effective indication of the required action to address any exceedances, risks, mitigation failures or noncompliances for each monitoring parameter;*
- 4. An evaluation of forecasts, predictions and measures identified in the EIA; and*
- 5. An indication of the nature and extent of any additional investigations (including EIAs or ad hoc detailed investigations, if relevant) that may be required in the event of any contingencies, unanticipated impacts, or impacts of larger magnitude or extent than predicted.*

The programme should address all relevant stages, as follows:

(a) Where relevant, monitoring of preliminary on-site investigations that may entail significant disturbance or damage to site features (e.g. archaeological excavations, geological sampling, or any works that require prior site clearance or any significant destructive sampling);. [Note: Official written consent from the competent authorities (e.g. Superintendence of Cultural Heritage) may also be required for such interventions.]

(b) Monitoring of the construction phase, including the situation before initiation of works (including site clearance), during appropriate stages of progress, and after completion of works;

(c) Monitoring of the operational phase, except where otherwise directed by ERA (e.g. where monitoring would be more appropriately integrated into an operating permit); and
(d) Where relevant, monitoring of the decommissioning phase, including the situation before initiation of works, during appropriate stages of progress, and after completion of works.

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 3 – attached to Method Statement as Appendix 1.

3.0 METHODOLOGY

3.1 Area of Influence

The Area of Influence (Aol) for the terrestrial component of the study comprised of a 100m buffer zone around the proposed development.

The Aol is mapped in Figure 2.



Figure 2: Area of Influence for the terrestrial ecology study

3.2 Terrestrial study

This study describes the existing ecology present within the project footprint and surrounding areas. This information was then used to assess the impact of the proposed project on the area's ecology. The Consultant first carried out a thorough literature review of readily available data and previous studies in the AOI. This included a review of the following sources:

- » CENTRAL MALTA LOCAL PLAN
- » SPED (STRATEGIC PLAN FOR THE ENVIRONMENT AND DEVELOPMENT)
- » S.L. 549.44
- » S.L. 549.123
- » LONG-TERM WASTE MANAGEMENT PLAN 2021-2030
- » Previous environmental studies carried out in the same area

Following on from the desktop study, the Consultant conducted a broad-brush terrestrial survey within the AOI in August 2023 and January 2024. The Consultant recorded the vegetation assemblages and any faunal species encountered during the surveys. The baseline survey also included a survey of all species present within the site and buffer zone, including their scientific and vernacular name to identify species protected in line with the TREES AND WOODLANDS PROTECTION REGULATIONS (S.L.549.123) and the FLORA, FAUNA, AND NATURAL HABITATS PROTECTION REGULATIONS (S.L.549.44). Photographic evidence was collected during the field survey.

The report details the conservation status and ecological condition of the area and the state of health of its habitats, species and ecological features. All protected, endangered, rare, unique, endemic, high-quality, keystone, invasive/deleterious, or otherwise important species, habitats, ecological assemblages, and ecological conditions found in the area under study were also noted.

3.3 Impact Assessment

The Consultant evaluated the potential impacts arising from the construction and operation of the proposed Scheme on the local terrestrial ecology. The potential impacts also provided a basis for comparison between the existing conditions and the new conditions established during the operation of the Scheme.

The following information, where available, has been provided for each of the identified impacts:

- » Project phase (construction or operational phase)
- » Policy importance
- » Extent of effect (local, national or international)
- » Duration (temporary or permanent)
- » Type (beneficial or adverse)
- » Reversibility (reversible or irreversible)
- » Sensitivity of receptors (high, medium or low)

- » Probability of occurrence (certain, likely, uncertain, unlikely or remote)
- » Scope for mitigation or enhancement (very good, good or none)

Based on the above criteria, the Consultants assessed the significance level of each of the identified impacts. Different criteria were used for the different components of the study, as summarised in Table 1 to Table 9.

Table 1: Duration of Impact Criterion Description

DURATION OF IMPACT	
Permanent	Impact would still be detectable following decommissioning of project
Temporary	Impact would persist throughout the phase of project under consideration only

Table 2: Extent of Impact Criterion Description

EXTENT OF IMPACT	
Widespread	Impact is expected to affect in the entire area of study and/or may extend beyond the boundaries of direct intervention into adjacent areas
Localised	Impact is expected to affect receptors in the immediate vicinity of its source

Table 3: Consequences of Impact Criterion Description

CONSEQUENCES OF IMPACT	
Direct	Changes that result from the cause-effect consequences of interactions between the environment and project activities
Indirect	Changes that result from cause-effect consequences of interactions between the environment and direct impacts
Cumulative	The cumulative consequences of ecological impact refer to the gradual and long-term effects that result from the combined impact of various ecological disturbances or stressors on an ecosystem over time.

Table 4: Effect of Impact Criterion Description

EFFECT OF IMPACT	
Adverse	A negative effect on the sustainability of the resource under consideration, which are distinguishable from background fluctuations
Beneficial	A positive effect on the sustainability of the resource under consideration, which are distinguishable from background fluctuations

Table 5: Reversibility of Impact Criterion Description

REVERSIBILITY OF IMPACT	
Reversible	The state of the resource is expected to return to baseline state following cessation of the source of impact
Irreversible	The state of the resource is not expected to return to baseline state following cessation of the source of impact

Table 6: Sensitivity of Resources to Impact Criterion Description

SENSITIVITY AND RESILIENCE OF RESOURCES TO IMPACT	
High	The resource under consideration is highly susceptible to a detectable deviation from the background state and its general dynamics
Moderate	The resource under consideration is vulnerable but able to tolerate a degree of detectable deviation from the background state and its general dynamics
Low	The resource under consideration is highly tolerant to a detectable deviation from the background state and its general dynamics

Table 7: Probability of Impact Occurring Criterion Description

PROBABILITY OF IMPACT OCCURRING	
Inevitable	Impact will occur irrespective of any mitigation measures taken
Likely	Impact may occur despite the implementation of mitigation measures
Unlikely	Impact would only occur in cases of major mitigation failure
Remote	Impact would only occur in exceptional circumstances
Uncertain	Probability of impact cannot be predicted reliably due to missing information or unknown factors

Table 8: Impact Significance Criterion Description

IMPACT SIGNIFICANCE	
Major	The effect on the existing state of the feature under consideration will lead to a high or large-scale change in its resilience
Moderate	The effect of the existing state of the feature under consideration will lead to an observable but contextually restricted change, which is sufficiently important for its long-term resilience
Minor	The effect on the existing state of the feature under consideration will lead to no, low or small-scale change that will not alter its resilience

Table 9: Residual Impact Significance Criterion Description

RESIDUAL IMPACT SIGNIFICANCE	
Major	The effect on the existing state of the feature under consideration will lead to a high or large-scale change in its resilience after application of mitigation measures (if any) and impact cessation
Moderate	The effect of the existing state of the feature under consideration will lead to an observable but contextually restricted change, which is sufficiently important for its long-term resilience after application of mitigation measures (if any) and impact cessation
Minor	The effect on the existing state of the feature under consideration will lead to low or small-scale change that will not alter its resilience after application of mitigation measures (if any) and impact cessation
Negligible	The effect on the existing state of the feature under consideration will lead to no significant change that will alter its resilience after application of mitigation measures (if any) and impact cessation

The technical report includes:

- » A comprehensive list of mitigation measures to prevent, minimise and offset significant adverse effects of the proposed development;
- » A description and quantification of any residual impacts remaining after the implementation of the recommended mitigation measures; and
- » A monitoring plan for all phases of the project (before, construction, operational and decommissioning), if deemed appropriate.

4.0 BASELINE STUDY

4.1 General description

The site is situated in the Eastern region of the ECOHIVE complex, across the road from the Żwejra landfill and adjacent to the existing Anaerobic Digester (AD) Plant. The footprint of the entire site is around 21,373m².

The site currently comprises agricultural land, a dense cover of low-lying trees and remnants of local maquis/advanced garigue community.

The area surrounding the site is mostly rural in character, aside of the engineered landfills and waste management operations conducted by Wasteserv. The ecological features nearest to the site are small pockets of afforested areas, coastal garigue and other natural communities reminiscent of garigue, steppe and degraded areas.

While the scheme site and buffer do not directly encroach any protected areas, several terrestrial, avian and marine Natura 2000 sites are present within walking distance of the proposed development.

4.2 Desktop review

4.2.1 Local Plans

The area of influence and its surroundings were assessed through a desktop review of the relevant local plans, legislations and any applicable policy documents. Sites of ecological and environmental importance have been identified in the immediate surroundings.

The Central Malta Local Plan (Malta Environment and Planning Authority, 2006) shows that the scheme site is located within an Ecological Area (CG22) as indicated in Figure 3. The surrounding areas are classified as 'Agricultural Area' (CG24) awaiting classification of agricultural value (see Figure 3). A large-scale version of this map can be found in the Appendix.

Two areas are marked as Sites of Scientific Importance (CG22), within the vicinity of the scheme site. One lies to the North of the facility well outside of the Area of Influence of the scheme, while the second is positioned further South and in close proximity to the ECOHIVE complex South entrance. The area to the South of the site will be considered in further detail due to potential ecological impacts arising from the transportation of material to and from the site via the adjacent access roads. Both are marked in a light purple outline in Figure 3.

The entire coastal stretch of Qalet San Marku is also protected through the provisions of the CENTRAL MALTA LOCAL PLAN as this part of the coast is designated as a "Protected Natural Coast with public access" (NA04). This area is however considered sufficiently detached from the scheme and will not be considered within the assessment.

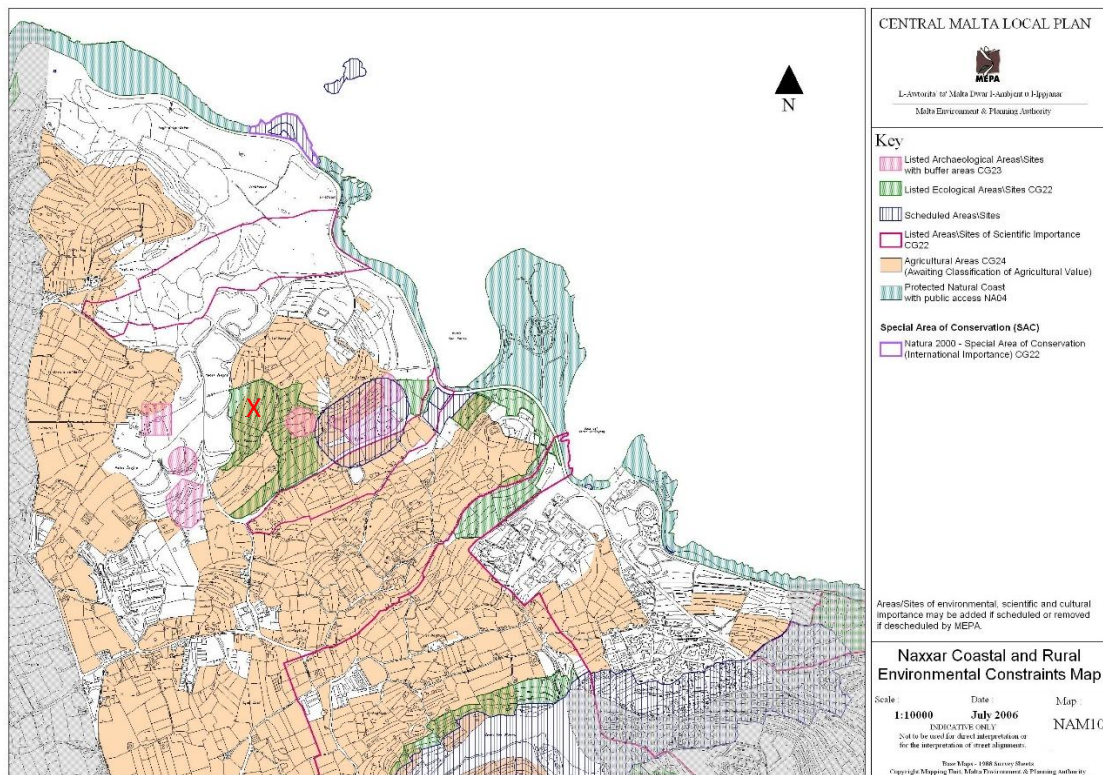


Figure 3: Naxxar coastal and rural environmental constraints map (Central Malta Local Plan, 2006) Site marked as X

In Figure 4, seven Areas of Ecological Importance (AEI) surrounding the scheme and AOI are marked as A to G. These AEIs were identified through the NORTH HARBOURS LOCAL PLAN (NHLP) surveys in 1996 and have been used to designate protection areas in the Local Plans of 2006.

Site A is granted a level 4 degree of environmental protection due to its dense vegetation of maquis-like shrubs and trees intermingled with agricultural land. Both the scheme site and the majority of the AOI fall within the boundaries of Site A. The remaining 6 areas are found in the near vicinity of the scheme site. Due to the considerable distance from the scheme and/or access roads to and from the scheme, it is considered unlikely that impacts from the scheme affect the other 6 designated sites.

Site B, which is located to the north of the scheme site covers a significantly larger tract of land and is designated as a level 3 degree of environmental protection. This area mostly comprises of sections of the Ghallis engineered landfill, but the lower sections closest to the shoreline includes a rocky steppe community dominated by the invasion of the *Agave* spp. plants. These plants were introduced to the area in the mid-20th century and propagated at alarming rates, causing a widespread and characteristic distribution of the species. The coastal stretch leading to the Ghallis Tower comprises of a narrow strip of mature trees (mostly tamarisk trees) and shrubs of prickly pear (*Opuntia ficus indica*).

Site C acts as a buffer for Site D, which comprises of a coastal wetland, better known as I-Għadira is-Safra u l-Iskolla tal-Ghallis, which is also designated as a Natura 2000 site (MT0000008). These two sites are assigned a level 3 and level 1 degree of protection,

respectively. Further details on the coastal wetland of I-Għadira is-Safra u l-Iskolla tal-Għallis is provided in the following sections of the report.

Site E is a large tract of coastal garigue and is given a level 4 degree of protection. This is flanked by Site G, entailing the continuation of the coastal garigue observed at Site E and is therefore granted the same level of protection. Site F on the other hand, is located further inland and comprises of a typical garigue habitat, which is significantly less exposed to invasion from *Agave* spp. and other anthropogenic impacts when compared to other garigue AEIs described in this section.

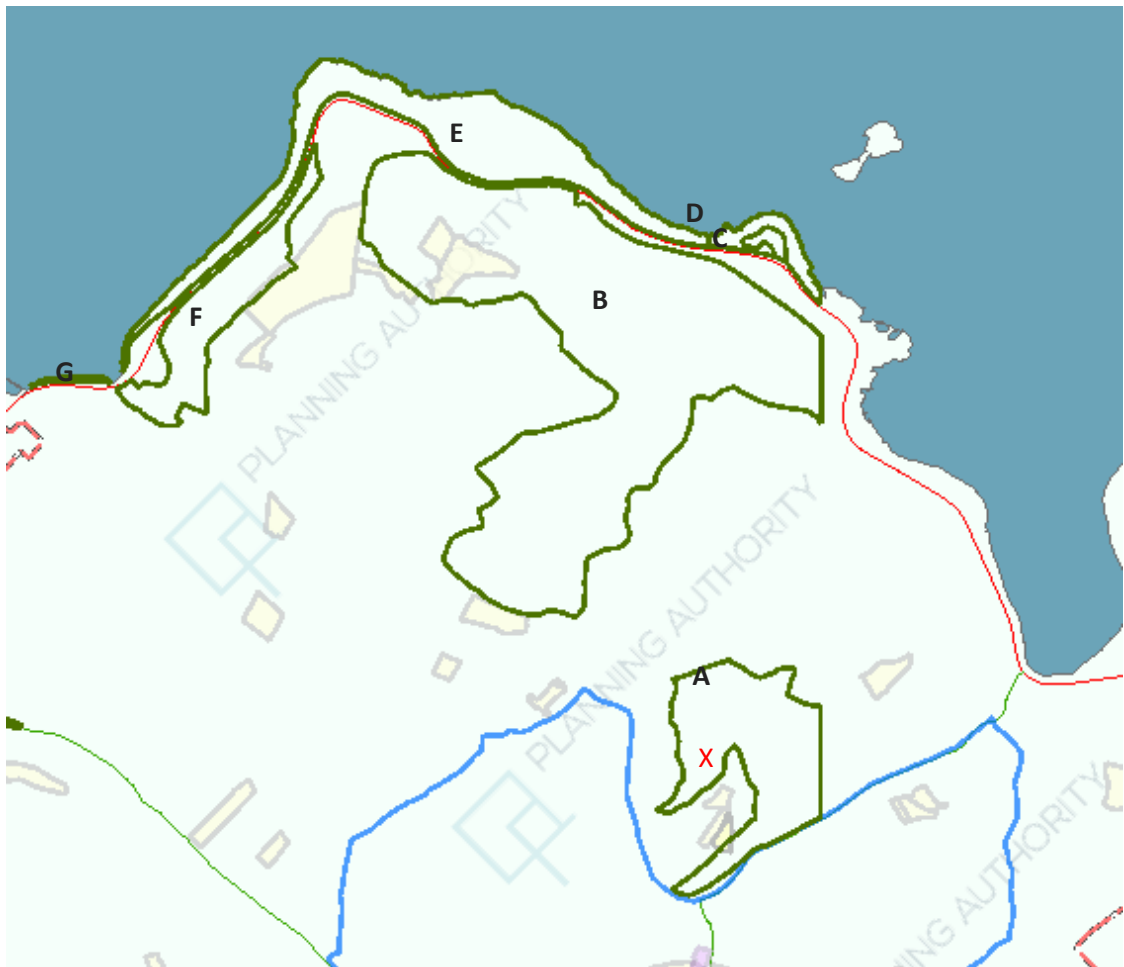


Figure 4: Areas of Ecological Importance (A-G) around the site are marked with a green outline (PA Geoserver) Site marked with a red X

4.2.2 The Strategic Plan for the Environment and Development (SPED)

The SPED issued by the Planning Authority in 2015, describes Malta's strategic vision on planning, environmental, economic and social matters to address overarching concepts of sustainable management of land and sea resources as well as the protection of the environment. A number of thematic objectives are directly applicable to the project and its effect on the biodiversity:

- » Socio-Economic Development, Thematic Objective 1: To manage the available potential space and environmental resources on land and sea sustainably to ensure that socio-economic development needs are met whilst protecting the environment and limiting land take up within the Rural Area by:
 - Socio-economic development should ensure that rural areas are not exploited by uses which are not legitimate or necessary
- Socio-Economic Development, Thematic Objective 7: to promote the efficient use of resources including local stone, water and soil, and manage waste in a manner that safeguard natural processes, and minimises impacts on cultural heritage, landscape and human health by:
 - Supporting the implementation of the National Waste Management Plan and setting out site selection criteria for the location of waste to energy facilities
- Socio-Economic Development, Thematic Objective 8: To safeguard and enhance biodiversity, cultural heritage, geology and geomorphology by:
 - Controlling activities which might have an impact on areas, buildings, structures, sites, spaces and species with a general presumption against the demolition of scheduled and vernacular buildings
- Rural Objective 3: To guide development which is either justified to be located in the Rural Area in approved government policies, plans or programmes, or is incompatible with urban uses and where alternatives are not possible, to the Rural Areas away from protected areas and areas of high landscape sensitivity, preferably on Areas of Containment, previously developed land or existing buildings while ensuring the improvement of the quality of the rural environment by:
 - Setting out policy framework to control the location and design of such development and guide appropriate environmental measures
 - Controlling the cumulative effect of such development
 - Requiring compensation measures to enhance the rural environment

The development is at odds with the following SPED Objectives:

- Socio-Economic Development, Thematic Objective 7: to promote the efficient use of resources including local stone, water and soil, and manage waste in a manner that safeguard natural processes, and minimises impacts on cultural heritage, landscape and human health by:
 - Controlling the location of development to prevent soil sealing and erosion
 - Protecting agricultural land and gardens to prevent loss of soil and soil sealing

- » Rural Objective 1: To facilitate sustainable rural development and the diversification of activities within the Rural Area to sustain agriculture and safeguard its distinctiveness by
 - Protecting good quality agricultural land from development

There are several justifications for this inconsistency. The centralisation of waste management in Malta brings about many operational advantages in terms of logistics and transportation. Additionally, the grouping together of similar developments may reduce environmental impacts, as the take up of land and any other spill-over effects will affect only one location rather than being spread out across many areas in Malta.

Additionally, the MRF project helps Malta achieve improved recycling rates, thus reducing the pressure on landfilling and the potential uptake of further land to accommodate future landfills.

4.2.3 S.L. 549.44 (repealing the Flora, Fauna and Natural Habitats Protection Regulations, 2006 [LN 311 of 2006])

This legislation establishes a National Ecological Network of special areas of conservation having National or International Importance. The Legal Notice transposes the obligations of the HABITATS DIRECTIVE which call for the establishment of a European Network of Special Areas of Conservation (Natura 2000) composed of sites having the natural habitat types and species listed in Annexes I and II to the Directive (listed under Schedule I and II of the same Legal Notice). Schedule III lists animal and plant species of community importance whose conservation requires the designation of Special Areas of Conservation, whilst Schedule IV lists the criteria for selecting sites eligible for identification as Sites of National Importance and of International Importance and Designation as Special Areas of Conservation. Schedule V lists animal and plant species of community interest in need of strict protection, whilst Schedule VI lists animal and plant species of national interest in need of strict protection.

Schedule VII lists animal and plant species of community interest whose taking in the wild and exploitation may be subject to management measures, whilst Schedule VIII lists animal and plant species of national interest whose taking in the wild and exploitation may be subject to management measures. Schedule IX includes provisions for identification and monitoring, whilst Schedule X lists endemic species not covered by Regulation 26 of the same Legal Notice.

There are no Special Areas of Conservation within the scheme site or its Area of Interest. The closest protected areas under the Natura 2000 framework are replicated in Figure 5.

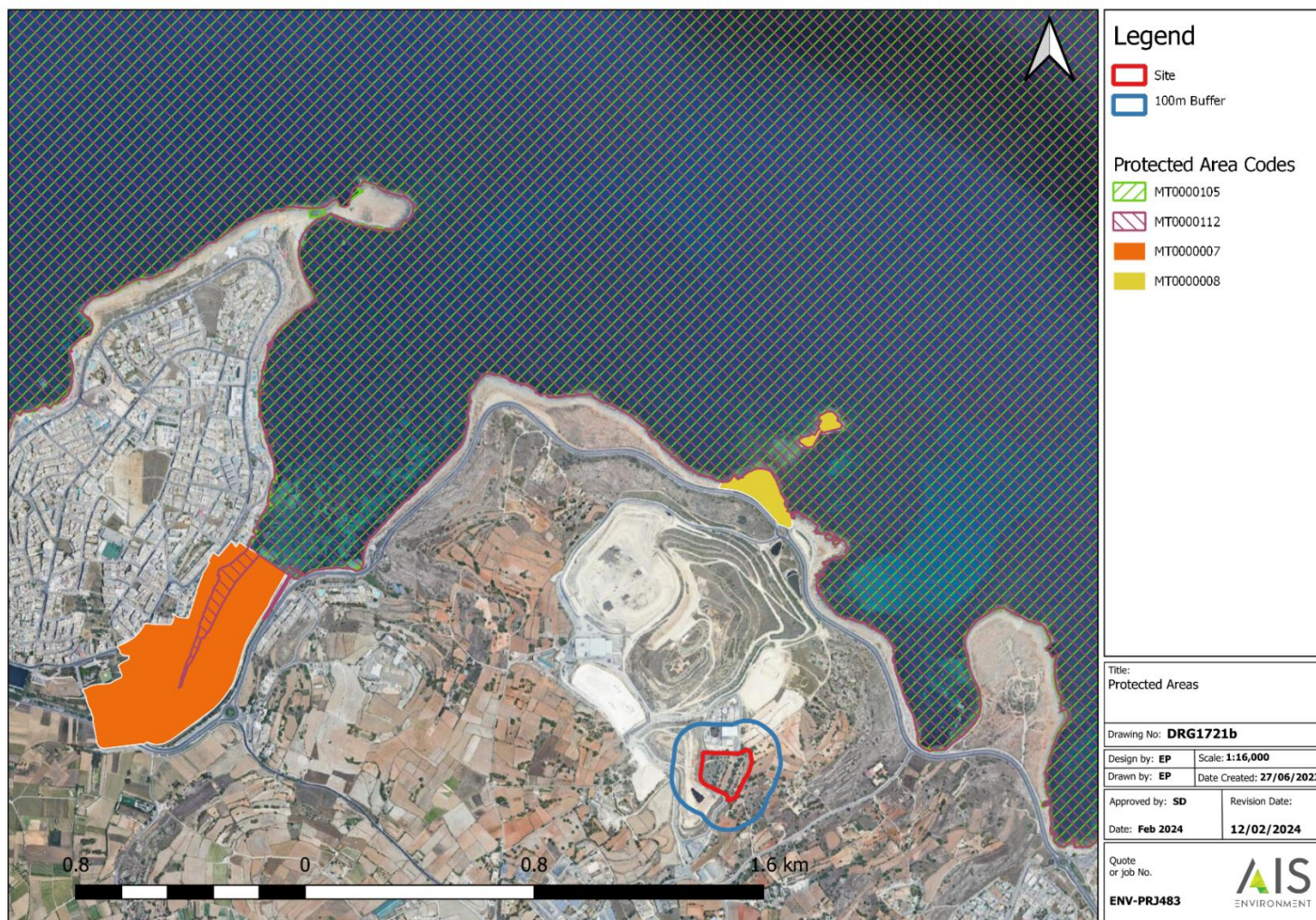


Figure 5: Sites protected within the Natura 2000 framework in close proximity to the site and AOI

4.2.4 S.L.549.123 (Trees and Woodlands Protection Regulations)

This legislation protects trees and woodlands in the Maltese islands to safeguard them from anthropogenic activity and to regulate the activities that may have an effect on them. The legislation identifies the areas and the species of trees which merit protection, subdividing them into distinct Schedules based on their level of protection.

The first Schedule Part A Table 1, lists the trees which are protected in all locations in Malta, Table 2 lists species which are protected within protected areas, in ODZ, green areas, in natural or rural/green enclaves in an urban area or in urban public open spaces only. The Second Schedule lists down the invasive, alien or environmentally incompatible species, whilst the Third Schedule lists down the fees to be paid for registration and permit applications. The Fourth Schedule lists down the penalties to be paid by offending contraveners against these regulations.

4.2.5 Ta' Ħammud vegetation report II – AGL Design Landscape Architects (2018)

The scope of the study was to identify, map and assess the status of trees likely affected by the proposed development. The consultants surveyed the site in the winter period of 2017. The quoted study was a follow-up survey of a similar exercise carried out in 2012, and includes a description and justification of differences between the two reports. The survey resulted in the identification of a variety of trees, mostly native, within the Area of Interest, most notably *Ceratonia siliqua* (Carob), *Olea europaea* (Olive), *Pinus halepensis* (Aleppo Pines) and *Pistacia lentiscus* (Lentisc), which are protected within protected areas and in ODZ. Any works to be carried out on species (of plants) protected through S.L.549.44 and S.L.549.64 shall require permitting in advance by ERA in line with the provisions of the said Regulations. The report also gives recommendations of best practice should the existing trees be considered for transplanting, particularly the Carob and Olive trees, and potentially considered for the Lentisc shrubs. The resulting map of existing trees can be viewed in Figure 6 (see overleaf).



Figure 6: results of vegetation study presented in ta' Hammud Report (2017)

4.2.6 Terrestrial Ecology Baseline Study– Doublet and Zammit (2022)

Wasteserv Malta has commissioned an in-depth study carried out by a third-party consultant for a terrestrial ecology baseline study of a number of proposed developments within the ECOHIVE complex, including the Materials Recovery Facility covered by this EIA but also for the proposal of an Organic Waste Processing Plant (OPP), Thermal Treatment Facility (TTF), storage area and access road within the same complex. The full title is 'Terrestrial Ecology Baseline Study in relation to the removal of soil in areas within the ECOHIVE Complex'.

The scope of the report was to assess whether the schemes will cause impacts on protected sites and natural ecosystems, habitats and species. The schemes' footprints as planned at the time of writing were presented within the report for all aforementioned proposals conjoined. The overall perceived impacts on the identified ecological receptors were discussed, mitigation measures proposed and residual impacts and compensatory measures stated within said report. The assessment addressed Terms of Reference for a terrestrial ecology baseline study (EcIA) as put forward by the Environment and Resources Authority in July 2022.

The report identified a wide variety of flora and fauna recorded within the scheme site and/or observed passing through. The report concluded that impacts of the proposed schema are likely cumulative and will arise primarily from the loss of habitat and food availability for protected species during the construction phase, while during the operational phase, these impacts will persist and further impacts may arise through the illumination of the site and the surrounding area.

The following figures (See Figure 7 and Figure 8) present the habitats and tree species recorded during the assessment.



Figure 7: Habitat map of the AOI (Source: Baseline ..., Doublet and Zammit, 2022)

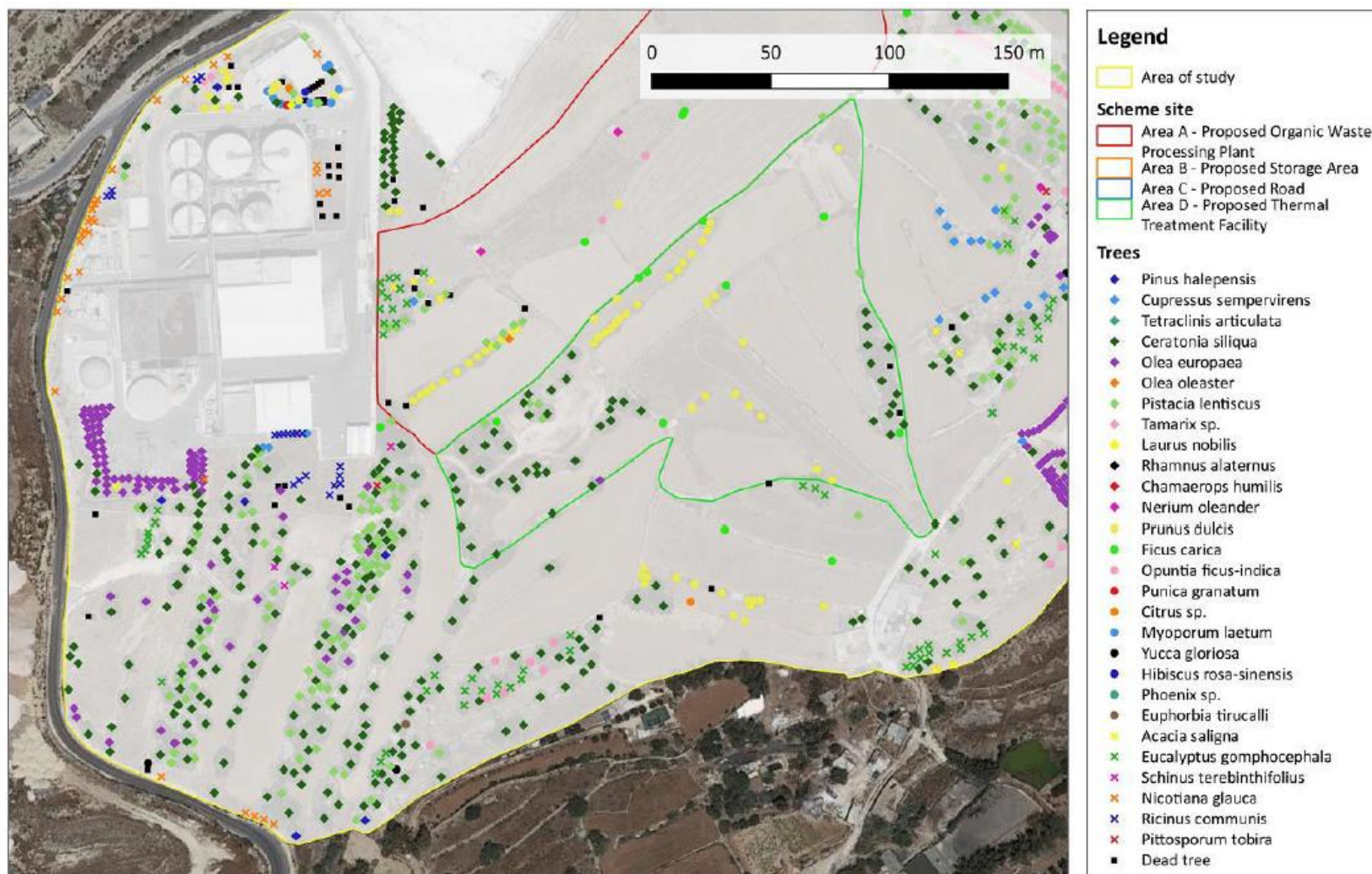


Figure 8: Trees in the AOI (Source: Baseline ..., Doublet and Zammit, 2022)

4.3 Site survey

A broad-brush terrestrial survey was conducted within the AOI in August 2023 and January 2024. The main ecological components of the scheme site and surrounding AOI comprise of:

- » the Žwejra landfill border hosting ruderal and opportunistic species
- » soft landscaping around the existing bio-digester plant complex
- » small patches of mature invasive species to the North of the site
- » a considerable area of disturbed ground to the North-East of the site
- » the scheme site and a considerable area to the South-East comprise remnants of maquis communities bordering bare (tilled) or fallow fields

Inside the ECOHIVE complex, the ecological landscape dynamics are considerably influenced by ongoing waste management operations.

Dense populations of *Glebionis coronaria* (White wall-rocket), *Avena sterilis* (Sterile oat), *Arundo donax* (Greater reed), *Diplotaxis tenuifolia* (Perennial wall-rocket), *Borago officinalis* (Borage), *Foeniculum vulgare* (Common fennel) and *Ricinus communis* (Caster oil plant) amongst other species cover the large heaps of the Žwejra landfill to the South-West of the site. To the West of the site, these communities become patchy and less diverse. The observed species overall hold little ecological importance, while some species are considered invasive.



Figure 9: Opportunistic species covering the Southern heaps of the Žwejra landfill



Figure 10: Patches of opportunistic species covering the western heaps of inert material and the adjacent abandoned fields

The ECOHIVE complex is surrounded by soft landscaping which incorporates some notable tree species, including a predominance of *Olea europea* (Olive trees) and scattered *Ceratonia siliqua* (Carob trees). A number of invasive species have naturally colonized the spaces in between the native trees.



Figure 11: Soft landscaping, predominantly olive trees around the existing biodigester plant (Taken August 2023)



Figure 12: Soft landscaping, predominantly carob trees, around the existing biodigester plant (Taken August 2023)

Between the proposed site and the ECOHIVE complex lies a narrow plot of land which is currently dominated by invasive species such as *Arundo donax*. The Eastern border of this area, which is delineated by a shallow rubble wall, contains some specimens of native species such as *Pinus halepensis* (Aleppo pine) and *Ceratonia siliqua* (Carob trees)



Figure 13: Narrow strip of land surrounding the existing Biodigester plant dominated by the invasive *Arundo Donax* (taken January 2024)



Figure 14: Eastern border of the natural area adjacent to the biodigester plant containing native species (Taken January 2024)

Adjacent to the aforementioned area, to the South (within the proposed scheme boundary) is a small patch of mature *Eucalyptus gomphocephala* (Tuart tree), which is listed within the ERA ANNEX II – INDICATIVE LIST OF ALIEN SPECIES THAT SHOULD NOT BE PLANTED IN RURAL AREAS, with the exception of eucalyptus trees intended for use in apiculture.



Figure 15: Small patch of mature Tuart trees South of the existing biodigester plant (Taken January 2024)

To the North-East of the proposed site lies a large area of severely degraded land. The area appears to have been excavated and cleared of any soil or vegetation. The resulting landscape remains as an expanse of exposed bedrock. The motive and entity responsible for this clearing is not known.



Figure 16: degraded land North East of the proposed site (Taken January 2024)

The agricultural land within the AOI is encircled by low-lying rubble walls. Due to their historical and environmental importance, the conservation and maintenance of rubble walls is governed by LEGAL NOTICE 426 OF 2007 – RUBBLE WALLS AND RURAL STRUCTURES (CONSERVATION AND MANAGEMENT). Rubble walls contribute to soil retention against the effects of surface water runoff and provide shelter for small mammals, reptiles and invertebrates which use agricultural land as their habitat. The majority of the rubble walls observed within the buffer zone were quite degraded, with the exception of the boundary wall South of the existing biodigester plant.

Vegetation species which were observed along rubble walls include *Ferula communis* (Common fennel), *Sonchus oleraceus* (Crown daisy), *Asparagus aphyllus* (Mediterranean Asparagus), as well as monocot grasses such as *Piptatherum miliaceum* (Smilgrass).



Figure 17: Vegetation assemblages on degraded rubble walls and rubble structures



Figure 18: Fallow agricultural land encircled by degraded rubble walls within the AOI

The predominant assemblages within the site boundary and to the East – South-East of the AOI are fallow fields bordered by corridors of advanced maquis communities. The maquis assemblages are comprised of *Olea europea* (Olive trees), *Ceratonia siliqua* (Carob trees) and *Pistacia lentiscus* (Lentisc). The fallow fields were bare in the summer months, while in January the area was characterised by fast-growing grasses and flowering plants within the open areas, while more specialised assemblages colonised the maquis and rubble wall borders, and formed scattered patches where conditions are more sheltered.



Figure 19: Bare land bordered by maquis communities including carob and olive trees (Taken August 2023)



Figure 20: Fallow fields colonised by grasses and flowering plants bordered by maquis communities (Taken January 2024)



Figure 21: Fallow fields colonised by grasses and flowering plants bordered by maquis communities 2 (Taken January 2024)



Figure 22: Lentisc shrubs within the maquis communities (Taken January 2024)

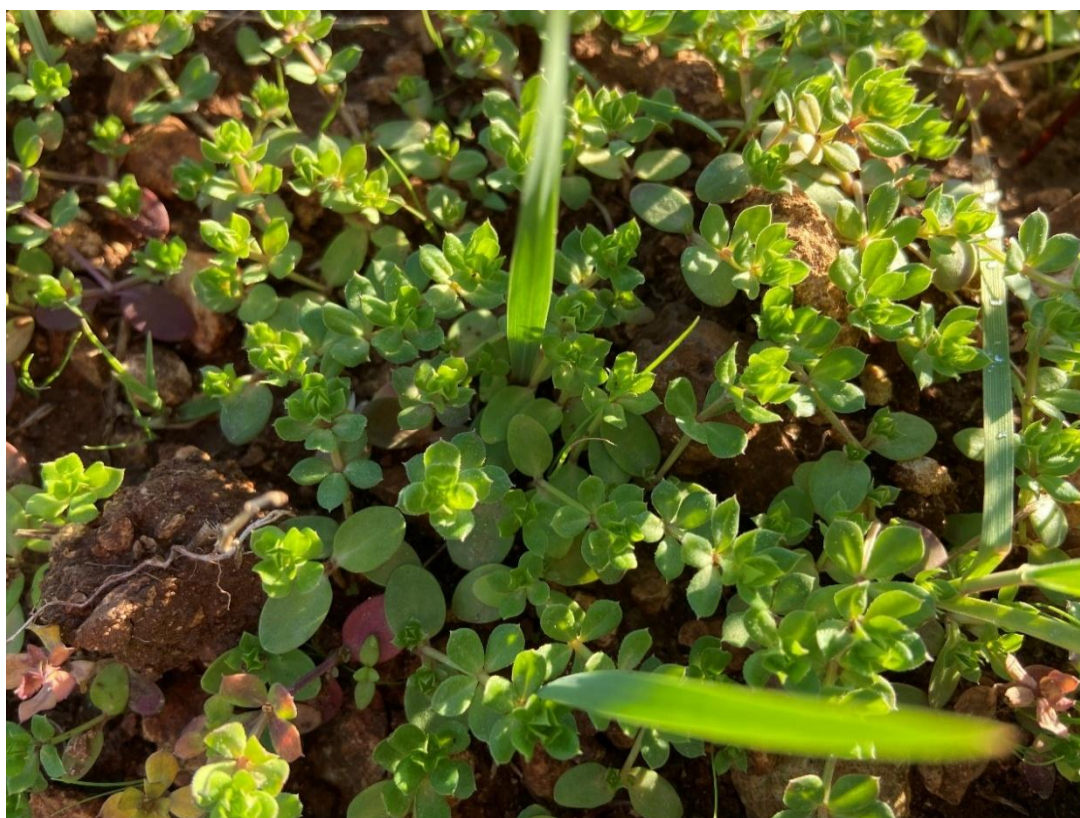


Figure 23: opportunistic *Portulaca* species colonising fallow fields (Taken January 2024)



Figure 24: *Ferula Communis* (Wild fennel) stands present at maquis borders (Taken January 2024)



Figure 25: Asphodel stands observed in sheltered areas (Taken January 2024)

A list of floral species encountered during the broad-brush survey within the Aol (including fauna) is provided in Table 10.

No fauna species were observed during the survey; however, the habitat likely supports a variety of mammalian, reptile and insect species. Previous studies¹ with a seasonal sampling frequency recorded the presence of the following species: the Algerian Hedgehog (*Atelerix algirus*), the Western whip snake (*Coluber viridflavivorus*), the Leopard snake (*Elaphe situla*), the Moorish wall gecko (*Tarentola mauritanica*) and the Oscillated skink (*Chalcides ocellatus*) among others.

The presence of avian species has been assessed and presented within a separate chapter of the EIA.

The presence of bats cannot be excluded from this area, as old dilapidated farmland buildings in the vicinity of the AOI can provide attractive roosting sites, and the maquis and agricultural land may offer foraging opportunities. No roosts are documented publicly within the AOI at

¹ Terrestrial Ecology Baseline Study by Mr Doublet and Mr Zammit (2022)

the time of writing, however previous studies¹ recorded the presence of four species using the general area as feeding or commuting grounds.

Table 10: List of vegetative species encountered on site

SPECIES NAME	ENGLISH NAME	PROTECTION	TYPICAL HABITAT IN AOI	Approx Quantity
<i>Antirrhinum tortuosum</i>	Greater snapdragon	None	Agricultural land & disturbed areas	Several
<i>Arundo donax</i>	Greater reed	None	Agricultural land & disturbed areas	Several
<i>Asparagus aphyllus</i>	Mediterranean asparagus	None	Agricultural land, disturbed areas & maquis	Several
<i>Asphodelus aestivus</i>	Summer asphodel	None	Maquis areas	Several
<i>Avena sterilis</i>	Sterile oat	None	Agricultural land, disturbed areas	Several
<i>Borago officinalis</i>	Borage	None	Disturbed areas & agricultural land	Several
<i>Bromus spp.</i>	Brome grass	None	Agricultural land, disturbed areas	Several
<i>Capparis orientalis</i>	Caper bush	Schedule VIII of S.L. 549.44	Soft landscaped areas	Scattered individuals
<i>Ceratonia siliqua</i>	Carob tree	Schedule I Part A Table 2 S.L.549.123	Maquis	162
<i>Conyza bonariensis</i>	Hairy Fleabane	None	Soft landscaped area	Few individuals
<i>Cupressus semprevivens</i>	Cypress tree	Schedule I Part A Table 2 S.L.549.123	Soft landscaped areas	1
<i>Diploaxis tenuifolia</i>	Perennial wall rocket	None	Agricultural land & disturbed areas	Several
<i>Dittrichia viscosa</i>	False yellowhead	None	Agricultural land & disturbed areas	Several
<i>Ecbalium elaterium</i>	Squirting cucumber	None	Agricultural land & disturbed areas	Several
<i>Eucalyptus gomphocephala</i>	Tuart tree	None (not located in public urban space or used for beekeeping)	Agricultural land	12
<i>Foeniculum vulgare</i>	Common fennel	None	Disturbed areas,	Several

			agricultural land & maquis	
<i>Galactites tomentosa</i>	Mediterranean thistle	None	Agricultural land & disturbed areas	Several
<i>Glebionis coronaria</i>	Crown daisy	None	Agricultural land & disturbed areas	Several
<i>Ipomoea alba</i>	Moonflower vine	None	Soft landscaping areas	Scattered individuals
<i>Lavatera arborea</i>	Mallow tree	None	Disturbed areas, & soft landscaped areas	Several
<i>Lonicera implexa</i>	Evergreen honeysuckle	None	Agricultural land	Scattered individuals
<i>Mercurialis annua</i>	Annual mercury	None	Soft landscaped areas & disturbed areas	Several
<i>Nicotiana glauca</i>	Tree tobacco	Schedule II (invasive) S.L. 549.123	Disturbed area & soft landscaped areas	5
<i>Olea europaea</i>	Olive tree	Schedule I Part A Table 2 S.L. 549.123	Maquis	24
<i>Oxalis pes-caprae</i>	Bermuda buttercup	None	Disturbed areas, Agricultural land	Several
<i>Pinus halepensis</i>	Aleppo pine tree	Schedule I Part A Table 2 S.L. 549.123	Soft landscaped areas, Maquis	9
<i>Piptatherum miliaceum</i>	Smilgrass	None	Agricultural land, disturbed areas	Several
<i>Pistacia lentiscus</i>	Lentisk tree	Schedule I Part A Table 2 S.L. 549.123	Maquis	48
<i>Pittisporum tobira</i>	Japanese mock orange	None	Soft landscaped areas	Scattered individuals
<i>Plantago</i> spp.	Plantain	None	Disturbed areas	Several
<i>Portulaca</i> spp.	Purslane	None	Agricultural land	Several
<i>Ricinus communis</i>	Castor oil tree	Schedule II (invasive) S.L. 549.123	Disturbed areas	Several
<i>Sulla coronaria</i>	Sulla	None	Agricultural land	Several
<i>Sonchus oleraceus</i>	Sow thistle	None	Disturbed areas & garigue	Several

Table 11: Protected tree species within the AOI

SPECIES NAME	ENGLISH NAME	PROTECTION	TYPICAL HABITAT IN AOI	AMOUNT IN AOI
<i>Capparis orientalis</i>	Caper bush	Schedule VIII of S.L. 549.44	Soft landscaped areas	Scattered individuals
<i>Ceratonia siliqua</i>	Carob tree	Schedule I Part A Table 2 S.L.549.123	Maquis	162
<i>Cupressus sempervirens</i>	Cypress tree	Schedule I Part A Table 2 S.L.549.123	Soft landscaped areas	1
<i>Olea europaea</i>	Olive tree	Schedule I Part A Table 2 S.L. 549.123	Maquis	24
<i>Pinus halepensis</i>	Aleppo pine tree	Schedule I Part A Table 2 S.L.549.123	Soft landscaped area, Maquis	9
<i>Pistacia lentiscus</i>	Lentisk tree	Schedule I Part A Table 2 S.L. 549.123	Maquis	48
Total protected trees affected by the proposed development				244



Figure 26: Terrestrial ecology map showing habitats and land uses within the scheme's AOI

5.0 IMPACT ASSESSMENT

5.1 Construction phase

The site footprint takes up 21,373 sq.m total. The complex comprises the following areas:

- » Reception Hall = c. 3750 sq.m
- » Processing Building 1 = c. 1800 sq.m
- » Processing Building 2 = c. 1600 sq.m
- » Recovery Building = c. 4250 sq.m
- » Storage Building = c. 2900 sq.m
- » Basement parking area = c. 2600 sq.m
- » Offices (incl. ancillary spaces related to office such as canteen, lobby, bathrooms) = c. 551 sq.m
- » Ancillary spaces (incl. substation, workshop areas, lifts and stair cores, changing rooms and showers, switch rooms, etc) = c. 550 sq.m
- » Reservoir = c. 1400 sq.m

The following phases are envisaged during the construction of the plant:

- » Phase 1: Hoarding, site preparation, removal and re-distribution of vegetation, clearing loose material, excavation setting out and excavation.
- » Phase 2: Foundation setting out and construction of lower-level walls
- » Phase 3: Further excavation and movement of backfill to be utilised in the relevant areas; engineering of site with backfilling; removal of backfill which will not be utilised off site
- » Phase 4: Formalisation of landscaped areas with transplanted elements, inclusive of further hoarding.
- » Phase 5: Setting out and construction of foundations at various levels
- » Phase 6: Construction of main buildings and ancillaries
- » Phase 7: Commissioning

Phase 1 will require the removal of all of the trees and vegetation within the site boundary. The project will impact approximately 244 individual protected tree species, which are comprised predominantly by Carob trees (162), followed by Lentisk trees (48), Olive trees (24), Aleppo pines (9) and Cypress trees (1). Some individuals of the Caper bush may also be affected. For further information, refer to the list of species provided in Table 10.

Where deemed possible, mature trees will be relocated to the perimeter of the site, which will feature a landscaping scheme of circa 2690sqm. The landscaping scheme as currently proposed features 37 trees and shrubs, as described in Table 12.

Table 12: Proposed Landscaping plan tree species

SCIENTIFIC NAME	ENGLISH NAME	QUANTITY
<i>Olea europaea</i>	Olive tree	14
<i>Ceratonia siliqua</i>	Carob tree	14
<i>Tamarix africana</i>	African tamarisk	3
<i>Laurus nobilis</i>	Bay laurel	2
<i>Rosmarinus officinalis prostratus</i>	Rosemary	4
Total individual trees/shrubs		37

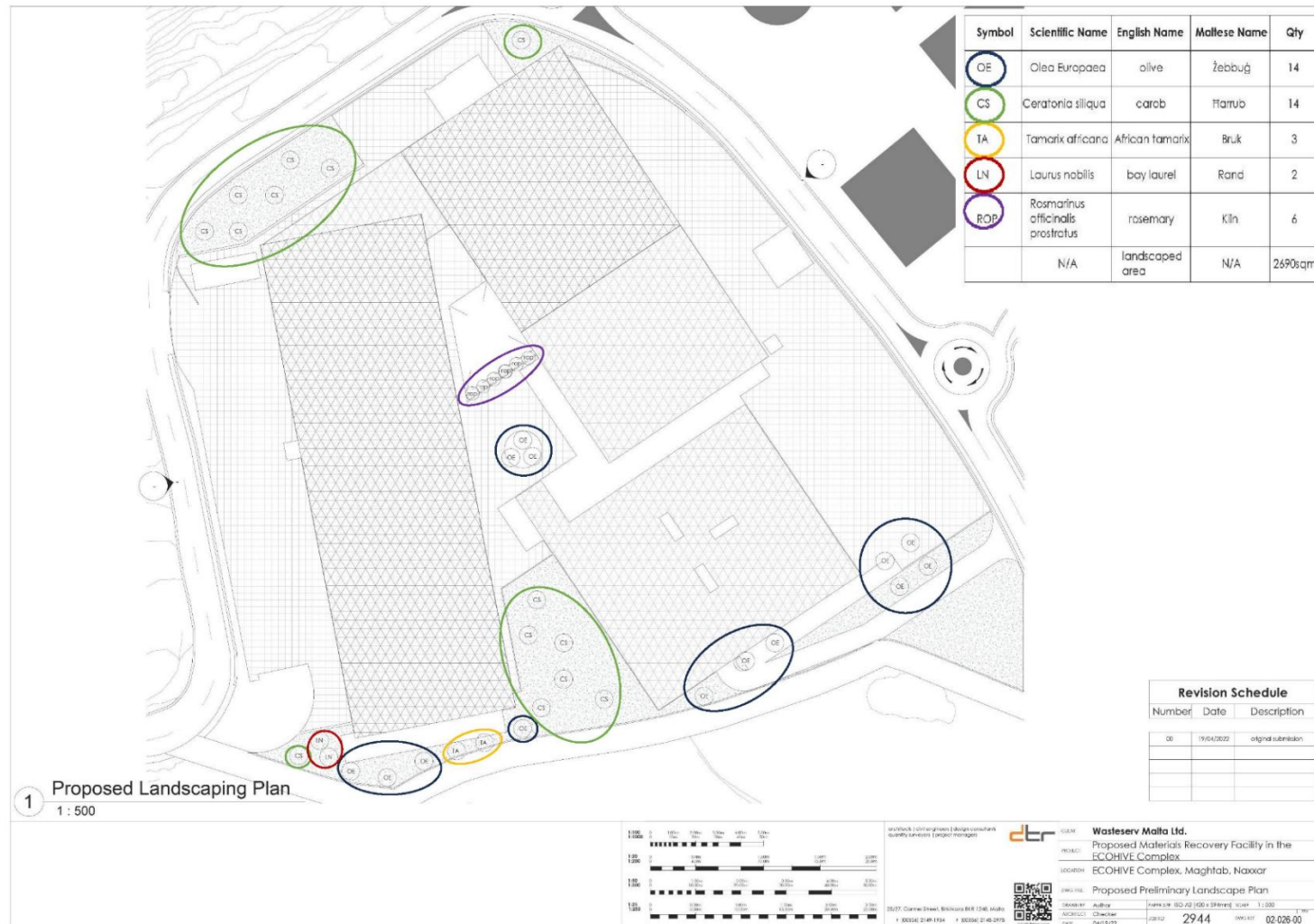


Figure 27: Proposed landscaping plan (Large-scale version provided in Appendix)

The option of relocation or removal will be determined by the soil depth, which will be confirmed at the start of the excavation phase. Should the soil depth be confirmed as too shallow to remove the full root ball without damages, the trees will be removed and not transplanted as the chance of survival is low. Adequate compensation will be provided as advised by the ERA within the planned planting scheme or in the near vicinity of the site, with care taken to plant a cohort of species typical of the ecosystems expected within maquis habitats.

Additional indirect impacts may occur during the excavation period, which is likely to generate a significant amount of dust and noise. These impacts can be adequately mitigated by using site hoarding around the perimeter of the planned excavation area, employing the use of wheel-washing facilities and wetting down any exposed stockpiles.

Surface runoff generated from the construction and excavation site, has the potential to act as a vector for a range of physicochemical contaminants, thereby exerting both acute and chronic impacts on adjacent marine ecosystems. During precipitation events, overland flow may mobilize elevated loads of suspended sediments, increasing turbidity and total suspended solids (TSS) in receiving coastal waters. This can reduce light penetration, impairing photosynthetic efficiency in primary producers such as phytoplankton, seagrass meadows (e.g., *Posidonia oceanica*), and benthic macroalgae.

Sediment deposition may also result in smothering of benthic habitats, leading to hypoxic or anoxic microenvironments that adversely affect infaunal and epifaunal communities. In addition, runoff may contain hydrocarbons, heavy metals (e.g., lead, zinc, copper), nutrients (notably nitrogen and phosphorus), and alkaline particulates from concrete works, potentially altering seawater chemistry and contributing to eutrophication. Such nutrient enrichment can stimulate algal blooms, with subsequent decomposition processes reducing dissolved oxygen concentrations and causing localized eutrophic or hypoxic conditions. The cumulative effect of these stressors may lead to shifts in community structure, loss of sensitive or keystone species, and a decline in overall marine biodiversity.

5.2 Operational phase

The operational phase will cause two main impacts to the surrounding area: a) increased vehicular traffic and b) increasing lighting in the currently dark areas. These impacts will persist throughout the duration of the works. Vehicular traffic increases the deposition of particulate matter and gases related to combustion, however the envisaged frequencies will be comparable to the current traffic present in the wider ECOHIVE complex. Mitigation measures such as sensor-operated lights, down-turned light fixtures and other measures as indicated in the GUIDELINES FOR ECOLOGICALLY RESPONSIBLE LIGHTING² will be implemented to the extent possible to minimise the potential light spillover into the adjacent agricultural areas.

² Source: <https://birdlifemalta.org/wp-content/uploads/2020/07/Guidelines-for-Ecologically-Responsible-Lighting.pdf>

5.3 Decommissioning phase

The decommissioning phase was not assessed within this report.

6.0 MITIGATION MEASURES

The proposed development is not situated within any terrestrial Natura 2000 site, and it does not have any direct or indirect impacts on such sites. Therefore, no mitigation measures are being suggested within the boundaries of the neighbouring Natura 2000 site. However, there are several ecologically significant areas within the Area of Interest (AOI) that require the implementation of best practice and mitigation measures to reduce some of the identified impacts.

The ENVIRONMENTAL MANAGEMENT CONSTRUCTION SITE REGULATIONS (S.L. 522.09) should be enforced to avoid the impacts from being generated in the first place and to ensure that environmental degradation is kept as low as possible. These regulations provide details on the containment and transportation measures for loose construction material on site and in transit, and other measures to prevent carrying out and/or depositing particulate matter.

Some of the proposed mitigation measures are highlighted below:

- Heavy machinery should not trample on natural areas located outside of the scheme site boundary
- Chemical spillages from machinery should be avoided by storing wastes and chemicals in bunded areas within the construction site
- All construction debris and soil should not be stockpiled near the base of trees and/or natural areas, but should be hauled away for proper recovery or disposal or in designated waste management areas
- Compensatory planting should not be carried out during the summer period.
- The necessary environmental permits to carry out interventions on protected species are obtained from the ERA
- Uprooting of invasive alien species should follow the recommendations in the ERA Guidelines on Works Involving Trees (2019) on managing non-native plant invaders and restoring native plant communities in terrestrial settings in the Maltese islands.
- Replacement/compensatory planting is necessary, with some of the species to be considered include: *Olea europea*, *Ceratonia siliqua* and *Pistacia lentiscus*.
- Should transplanting of trees be necessary, they should be pruned (not more than 25% of overall crown) to stimulate growth and reduce water loss. The trees should be watered for two consecutive days before removal, and the branches should be tied together during the transplantation phase.
- Before transplanting mature trees, the soil depth needs to be determined. For trees which are within soil less than 75cm deep, transplanting is not recommended as the majority of the root ball will be within the bedrock.
- Root pruning is recommended to ensure the root ball is of equal size to the tree canopy. This practice is not relevant to Aleppo pines, which are not suitable for transplanting as they are tap-root species.

- For trees found within soil of adequate depth, an excavator or hand-held tools are necessary to dig a trench around the tree which is of equal depth to the tree height. The excavator/manual tools should also dig a new pit which is around twice the original size of the root ball. The assumption is made that the root ball is roughly equivalent to the above-ground tree. Should the root ball be confirmed by the ecological monitor to be of smaller size, a shallower excavation would be acceptable as long as the root ball is not damaged.
- Transplanting of *Olea europea* and *Ceratonia siliqua* should take place between February and March, and the tree should be regularly monitored for growth. Follow-ups are required for at least 3 years after the specimen has been transplanted
- Transplanting should ideally be carried out in two phases: The first year (wet season) soil depth is determined and trees earmarked for transplanting are subjected to root pruning. In the second year, the same trees are relocated to the transplanting area.
- Negligence during construction activities can be mitigated through regular and effective environmental monitoring to ensure that the construction impacts are not spilling over into the adjacent habitats.
- Hoarding should be set up (in line with the ENVIRONMENTAL MANAGEMENT CONSTRUCTION SITE REGULATIONS, 2007) along the construction site to minimise dispersion of particulates. This should be covered with suitable mesh or material that precludes dispersion of particulate matter.
- Pre-soaking, dust suppressors and covered stockpiles are considered good practices to minimise dust emissions.
- Works should not be carried out during the night time due to the recorded presence of nocturnal species in the area
- Although rodent control is encouraged when setting up a construction site, care must be taken not to negatively influence any resident fauna in the immediate surroundings
- Construction vehicles and machinery should be well-maintained and serviced such that they can be operated at the best of their environmental performance.
- If lighting is required, downward facing luminaires should be installed within the facility to reduce light pollution during the operational phase

7.0 RESIDUAL IMPACTS

Residual impacts are those impacts which are bound to remain after taking into consideration the proposed mitigation measures. Despite the comprehensive adoption of the recommended mitigation measures, a number of unavoidable residual impacts are still expected to arise, namely:

- Impact on ecologically sensitive terrestrial ecosystems and assemblages falling directly within the footprint of the site.
- Accumulation of minimal dust, vibration and noise impacts within the immediate terrestrial ecosystems abutting the construction site boundary
- Increase in night-time light in previously dark agricultural areas in the surroundings

8.0 MONITORING PROGRAMME

Should the Scheme be permitted to be developed, a monitoring programme should be set up and implemented during the construction phases of development. The construction management plan prepared at project planning phase will be updated by the chosen contractor in order to ascertain that the best practicable environmental options available are followed through.

During the construction phase, periodic monitoring is being recommended to ensure that mitigation measures are in place and working as they should. This would ensure that no unwarranted impacts arise due to deviations from proposed working practices. Such deviations could have additional impacts over and above those originally predicted. All monitoring data should be presented to the relevant authorities at pre-agreed frequencies.

A tree specialist is recommended to oversee/enact interventions directly related to the pruning or relocation of the native tree species. All interventions related to protected native trees are subject to permits provided by the Environment and Resources Authority.

9.0 SUMMARY OF IMPACTS TABLE

Impact Type and Source			Impact Receptor		Effect and 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	Receptor Type	Sensitivity & Resilience Towards Impact	Direct/Indirect/Cumulative	Beneficial/Adverse	Severity	Physical/Geographic Extent of Impact	Short/Medium/Long Term	Temporary/Permanent	Reversible/Irreversible					
Destruction of habitats and species (circa 244 individuals)	Excavation, backfilling	Construction	Vegetation & Fauna	High	Direct	Adverse	High	Localised	Long-term	Permanent	Irreversible	Inevitable	Major	Transplanting trees where possible, compensatory planting as an alternative. Monitoring construction activities to minimise avoidable impacts	Moderate	N/A
Dust generation	Excavation, backfilling, building construction	Construction	Vegetation & Fauna	Moderate	Direct	Adverse	Moderate	Localised	Short-term	Temporary	Reversible	Likely	Minor	Dust suppression techniques, controlled storage and transport of materials, regular clearing of affected areas, construction monitoring	Negligible	N/A
Runoff spreading particles & contaminants to sea	Excavation, backfilling, building construction	Construction	Marine life	Moderate	Direct	Adverse	Moderate	Localised	Short-term	Temporary	Reversible	Likely	Minor	Site containment measures to prevent rainwater discharge from the site with high turbidity and/or contamination (chemical bunding and waste handling)	Negligible	N/A
Light & Noise	Excavation, backfilling, building construction	Construction	Fauna	High	Direct	Adverse	Moderate	Local and near vicinity	Short-term	Temporary	Reversible	Likely	Minor	Works will be limited to daylight hours.	Negligible	N/A

														Use of lighting for safety reasons should be limited to downward facing, shielded and low-frequency lights. Equipment well maintained to avoid excessive noise.		
Light, Air Pollution & Noise	Operation of the MRF	Operation	Vegetation & Fauna	High	Direct	Adverse	Moderate	Local and near vicinity	Long-term	Permanent	Irreversible	Likely	Minor	Minimising noise spillover by using BAT and keeping apertures shut during operational hours. Ensure equipment is well-maintained and within national emission limits. Limit night-time lighting to the bare minimum and use of down-facing lights.	Negligible	N/A

APPENDIX

LARGE-SCALE FIGURES

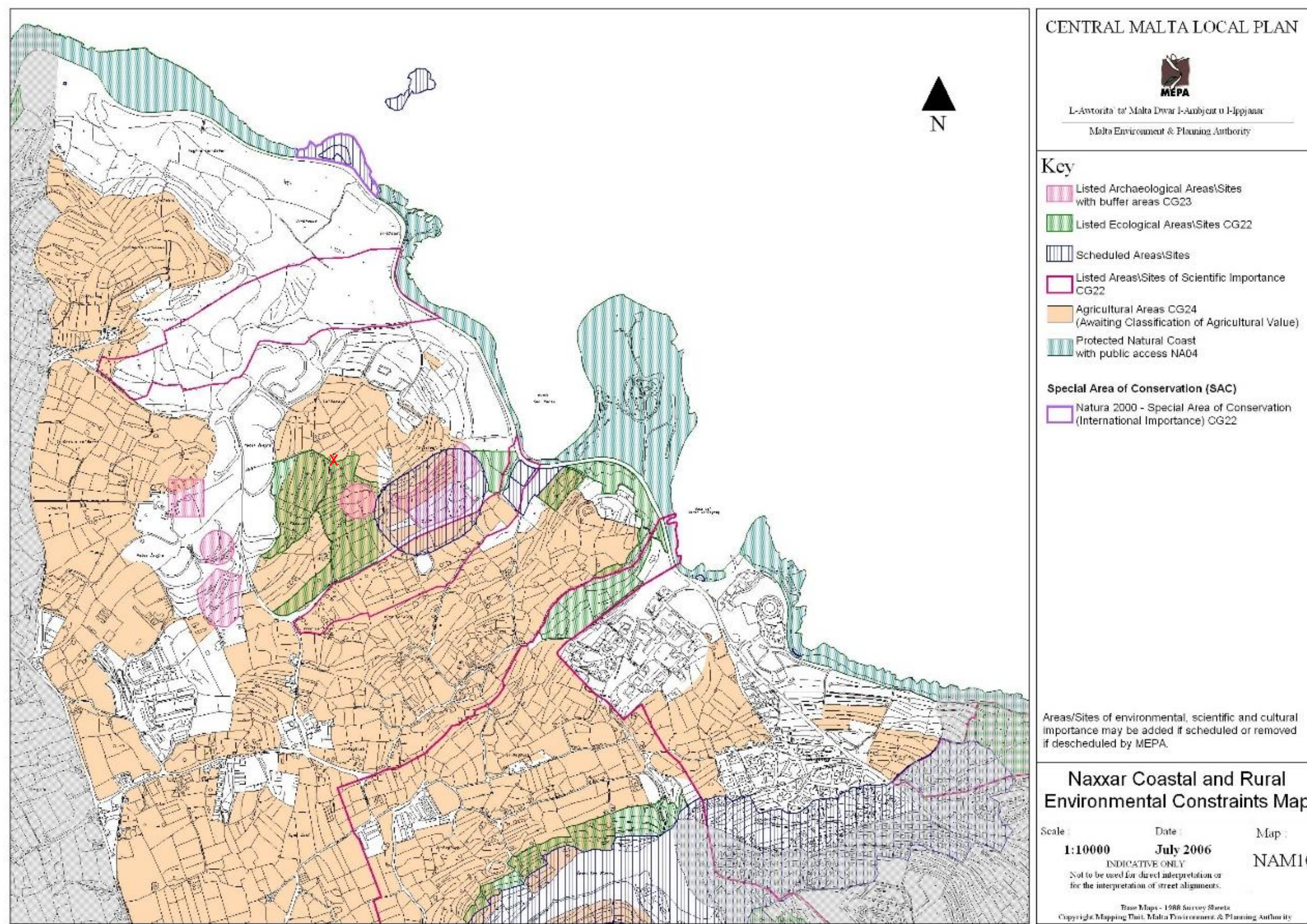


Figure 28: Large-scale Naxxar coastal and rural environmental constraints map (Central Malta Local Plan, 2006)



Figure 29: Large-scale terrestrial ecology and land use map

