



Land Cover and Land Uses 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 SCOPE

This report describes the land cover and land use 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 land cover and land uses 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 for EA/00042/20.

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 to 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; low down time between failures; 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 Zwejra 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.

Appendix 1 of this report contains a copy of the ToRs for ease of reference.

3.0 METHODOLOGY

This report presents the baseline land cover and land uses data sampled from the Area of Influence (AoI). The methodology was composed of four main elements:

1. A preliminary desktop study to familiarise oneself with the study area;
2. A site survey;
3. A secondary literature review to combine the findings of the initial research and site observations;
4. Final evaluation of the current situation.

An assessment of the potential impacts of the Scheme on land cover and land uses was carried out once the baseline was established (refer to 4.0 for further detail).

3.1 Area of Influence

The Area of Influence (AOI) for the terrestrial component of the study comprised of a 100m buffer zone around the proposed site for the development. The buffer zone is limited to terrestrial habitats and thus a sea cover / sea use element was not relevant to the study.



Figure 2: Area of influence for the Land cover and Land uses study

3.2 Preliminary Literature Review

A preliminary literature review focused on the existing information on historic land cover and land use studies within the Aol. A particularly important component during the review process was the analysis of satellite images on the *Google Earth* platform.

Integration and assimilation of the data collated during the review provided a framework for the formulation of a landscape character assessment and the design of a land use classification. Care was taken to ensure that the distinction between different landscape types and land uses was maintained. Once the draft classification has been finalised, a rough map of the land cover and land uses in the area was drawn.

The preliminary literature review also included a review of the relevant national policy. The most important documents which were consulted included the Strategic Plan for the Environment and Development (SPED, 2015) and the CENTRAL MALTA LOCAL PLAN (2006). This helped provide a wider context for the proposed development.

3.3 Site Survey

The walk-over survey, held on the 25th of August 2023 took into account all of the features and attributes which contribute towards the character of an area. It focused on the present use/s of the proposed Scheme site and surrounding area. Revisions to the draft map which had been designed during the initial literature review stage were made on site.

3.4 Secondary Literature Review

The map and general observations made during the site survey underwent a process of integration and analysis. Emphasis was placed on the assimilation and synthesis of information to be used to develop integrated descriptions of the area and its component landscape types and land uses. Geographic Information Systems (GIS) were used to create the land cover and land uses map.

3.5 Evaluation

An evaluation of the current land cover and land use categories was undertaken to assess and provide judgement related to the inherent sensitivity of the landscape. This included analysis based on the proximity of the different land uses to the Scheme. Current landscape condition (or quality) was based on qualitative judgements about the physical state of the landscape from visual, functional and ecological perspectives. It also reflected the state of repair of individual features and elements which make up the character of the area.

4.0 BASELINE STUDY

4.1 General Description of the Area of Influence

The Scheme site falls within the purview of the Magħtab Environmental Complex (also known as ECOHIVE Complex), which falls within the boundary of the Naxxar Local Council.

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 site currently comprises agricultural land with low-lying trees and remnants of local maquis/advanced garigue community. The site contains shallow terraced fields separated by rubble walls, some of which are in a degraded state. These walls are protected under the RUBBLE WALLS AND RURAL STRUCTURES REGULATIONS (S.L.552.01). The fields slope downwards towards the coastal area of Qalet Marku.

To the north-west and west lie the engineered Għallis and ta' Żwejra landfill sites, respectively. To the North, 100 meters away, lies the recently constructed Anaerobic Digestion Plant. To the East, the landscape is composed of agricultural land subdivided into small parcels by rubble walls. A paved access road runs along the south and west of the Scheme providing access to both the site and the landfill. A dirt track provides access from the road to the Scheme.

The scheme falls under the remit of the CENTRAL MALTA LOCAL PLAN, more specifically within the Baħar iċ-Ċagħaq region of the locality of Naxxar (See Figure 3 to Figure 5 below). An A3 version of these maps is available in Appendix 2.

Photographs providing a general overview of the main land cover and uses can be seen in Figure 7 to Figure 16. A map was created to depict the existing land cover and land uses within the Area of Interest (See Figure 6).

LAND COVER & USES

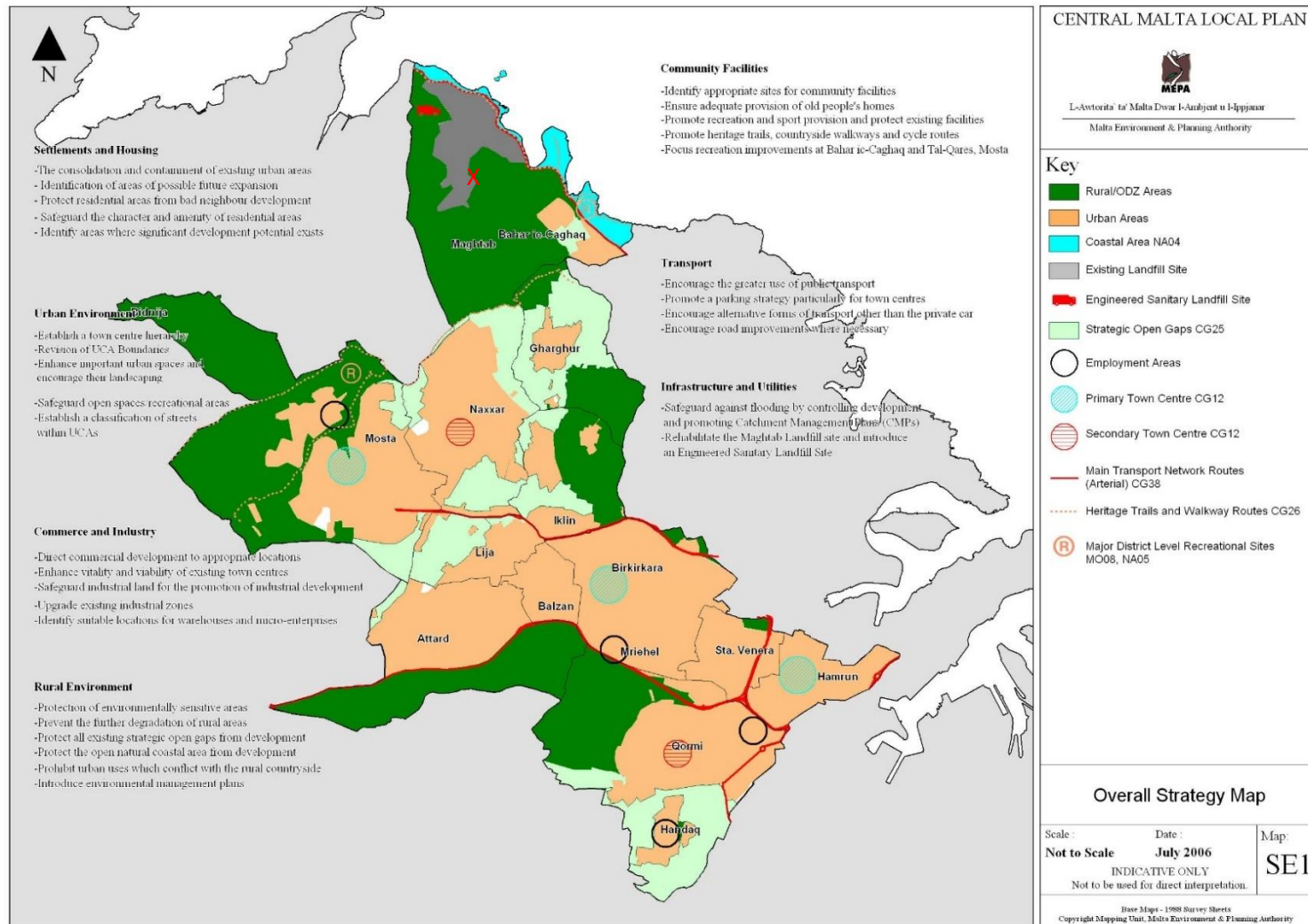


Figure 3: Central Malta Local Plan Strategy Map (Source: CMLP,2006). Site area marked with red X

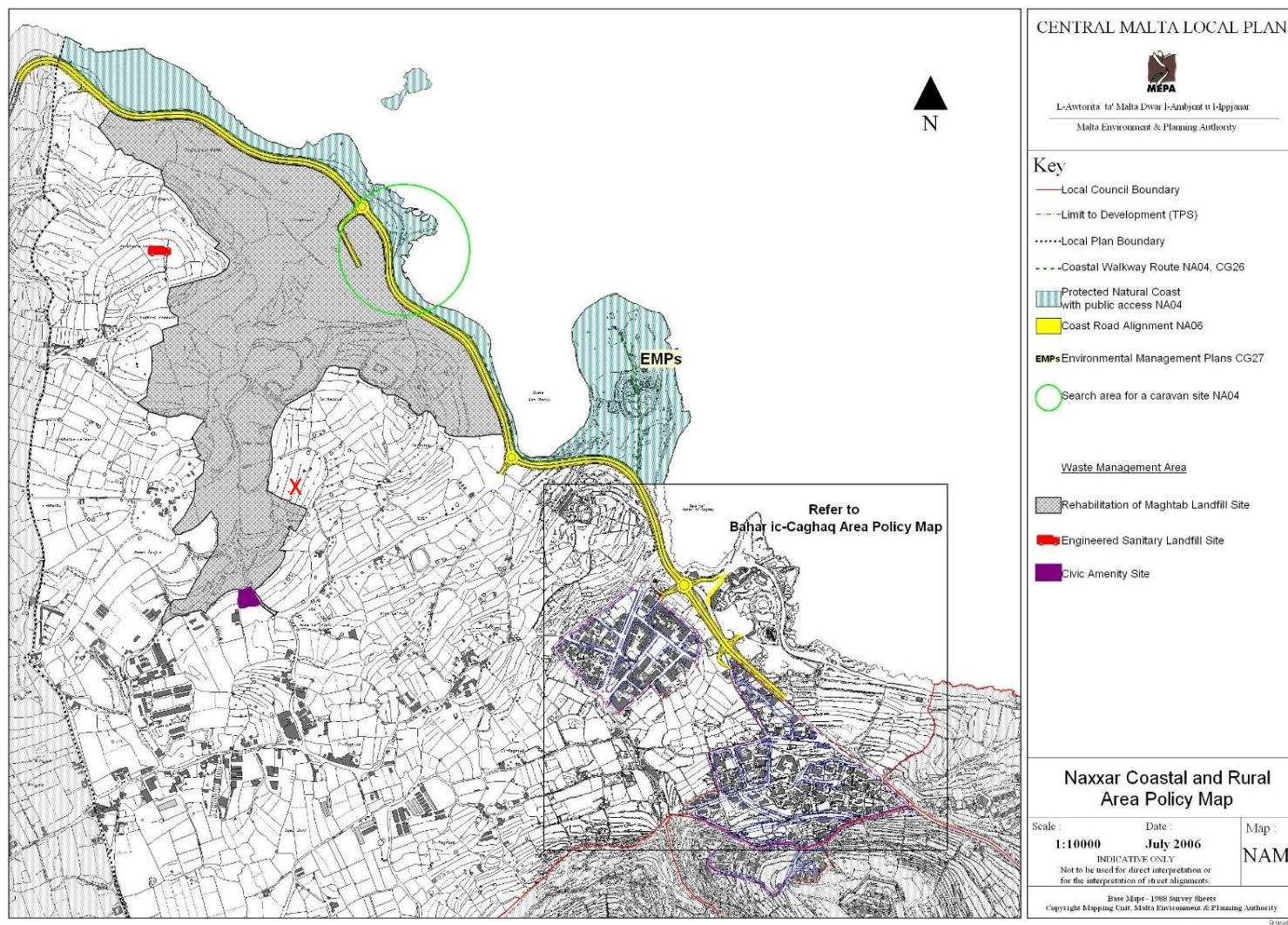


Figure 4: Naxxar Coastal and Rural Area Policy Map (source: CMLP, 2006). Site marked with red X.

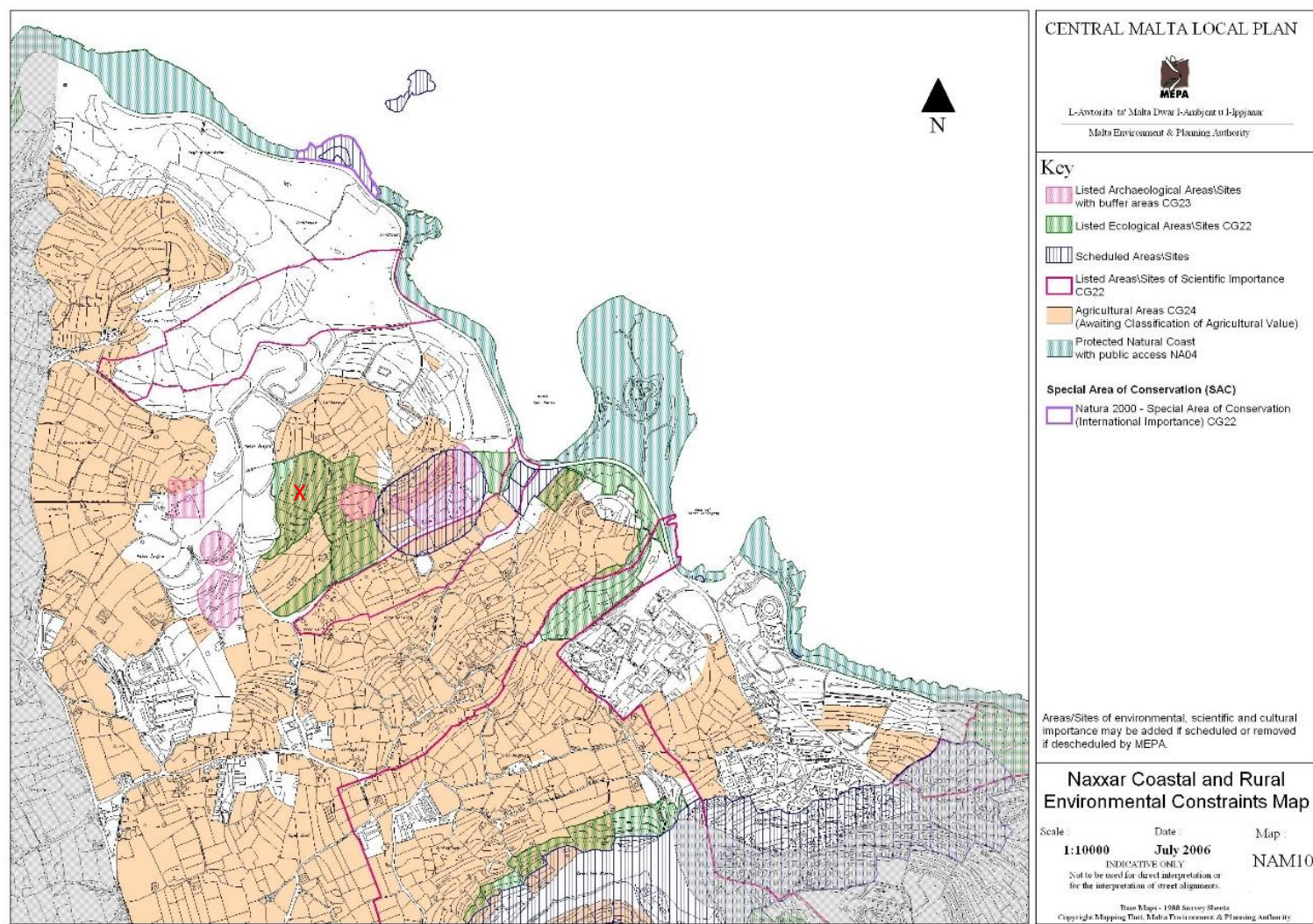


Figure 5: Coastal and Rural policy Map for Baħar ic-Cagħaq, Naxxar (Source: CMLP, 2006). Site marked with red X

4.2 Surrounding uses at the Aol

In Figure 6 we present the current land cover and land uses within the Area of Interest. In Figure 7 to Figure 16 we provide photographic evidence of each observed land use/cover observed during the site visit conducted on the 25th August 2023. The subsequent sections describe the observed categories.



Figure 6: Land uses in the study area (Based on walkover survey held on the 25th of August 2023)

ECOHIVE Complex

The site is situated within the ECOHIVE complex managed by Wasteserv Malta. The complex can be accessed from two entrances, the main being the South gate which lies to the South West of the Area of Interest. Access into the site is restricted to registered waste carriers and permitted vehicles.

Vehicle use of the Wasteserv site is currently intensive, as the site contains various complexes where the storage and processing of various waste streams is carried out. The use of the main landfill (known as 'Għallis') will, in the near future, be discontinued and a landscaping plan put in place. In its stead, plans for the expansion of the complex are in place which include the Material Recovery Facility covered by this report, as well as a new waste-to-energy plant, engineered landfill, organic processing plant and thermal treatment facility.



Figure 7: ECOHIVE complex adjacent to the proposed site (25th August 2023)



Figure 8: Anaerobic digesters adjacent to the proposed site (25th August 2023)

Access Road

The ECOHIVE complex can be accessed through a newly-tarmacked private access road. The road is flanked with a gutter and a perimeter of limestone boulders to the West, delineating the divide between the road and the landfill site.



Figure 9: Tarmacked road access to ECOHIVE complex (25th August 2023)

Dirt Path

The Scheme site is currently accessible via an unsurfaced dirt path, which winds across a number of fields which currently cover the main land use of the site.



Figure 10: Dirt road access to the proposed site (25th August 2023)

Landfill

Ta' Żwejra landfill lies to the West of the proposed site. This landfill was in operation primarily between 2004 and 2006 as Malta's first engineered landfill. Operations within this area of the Wasteserv complex have since ceased, and municipal or mixed waste is now landfilled in the adjacent site further North, known as Għallis.



Figure 11: Landfill site to the West of the proposed site (25th August 2023)

Agricultural Land

The agricultural land which makes up the area of the site itself consists of predominantly bare fields bordered by what appear to be planted or severely limited remnants of maquis species. The borders of the rubble walls which delineate each field contained the remnants of plant species typical of disturbed ground.



Figure 12: Bare fields flanked with maquis species (25th August 2023)



Figure 13: A typical bare field close-up (25th August 2023)

Tree Plantations

There are trees present on site, bordering the bare agricultural land. The species present are for the most part indigenous species typical of Maltese maquis habitat. They are arranged as dense patches which extend considerably downhill in parallel strips, with fields in between each patch of vegetation. The mature trees are interspersed with low-lying bushes and wild plants typical of disturbed habitats.



Figure 14: Dense patches of indigenous species (25th August 2023)

To the South of the existing ECOHIVE facility lies a stand of mature Great Reeds (*Arundo donax*). Further south, a small stand of Eucalyptus trees was observed. Both species are non-native, however their presence is common across Maltese agricultural land.



Figure 15: Mature Eucalyptus stand (25th August 2023)



Figure 16: *Arundo donax* (Great Reed) at the border between the proposed site and the existing ECOHIVE complex)

The perimeter of the existing anaerobic digester plant is landscaped with various species, including indigenous species such as carob and olive trees.



Figure 17: Landscaped area around the existing anaerobic digester plant (23rd August 2023)

Degraded Agricultural Land

Two extensive patches of degraded land were observed on site, one to the North East and one to the South East of the proposed site. The former appeared to be exposed bedrock following the removal of the soil layer (See Figure 18), while the latter is a field containing an extensive amount of fine gravel material (See Figure 19).



Figure 18: Exposed bedrock to the North-East of the site (23rd August 2023)



Figure 19: Fine gravel covering a field to the South-East of the site (23rd August 2023)

5.0 IMPACT ASSESSMENT

The following sections describe the envisaged impacts on the Scheme on the land cover and land uses of the AoI.

5.1 Impact Significance Criteria

The qualitative assessment determines the potential impacts on the present land uses. The potential impacts that may arise from the Scheme could result in a restriction or limited accessibility to current land use activities, along with the permanent loss of certain land uses.

The tables presented in this section (Table 1 to Table 8) provide a definition for each of the criteria used in Table 9, which summarises the assessment of impacts on land use activities.

Table 1: Criteria for the duration of the impact

DURATION OF IMPACT	
LEVEL	DEFINITION
Permanent	Impact would still be detectable during the concerned phase.
Temporary	Impact would not persist through the whole duration of the concerned phase.

Table 2: Extent of Impact Criterion Description

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

Table 3: Criteria for the probability of the impact occurring

PROBABILITY OF IMPACT OCCURRING	
LEVEL	DEFINITION
Inevitable	Level of certainty that impact will occur is greater than 90%
Likely	Level of certainty that impact will occur ranges between 50-90%
Unlikely	Level of certainty that impact will occur ranges between 30-50%
Remote	Level of certainty that impact will occur is below 30%

Table 4: Criteria for the nature of the impact

EFFECT OF IMPACT	
LEVEL	DEFINITION
Adverse	Land and/or sea uses would suffer consequences as a direct result of the proposed development.
Beneficial	Land and/or sea uses would benefit as a direct result of the proposed development.

Table 5: Criteria for the consequences of the impact

CONSEQUENCES OF THE IMPACT	
LEVEL	DEFINITION
Direct	Direct impact refers to the immediate changes that occur as a result of features or activities related to the proposed development.
Indirect	Indirect impacts are effects caused by the proposed development's features or activities that occur later in time or are farther removed in distance than direct impacts.
Cumulative	Impacts resulting from an accumulation of the project impacts and other past, present or known planned developments, activities and land uses.

Table 6: Criteria for the sensitivity & severity of receptors to the impact

SEVERITY, SENSITIVITY & RESILIENCE OF RECEPTORS TO THE IMPACT	
LEVEL	DEFINITION
High	This action is a major contributor to the activities in the area of influence.

Medium	This action is a moderate contributor to the activities in the area of influence.
Low	This action is a minor contributor to the activities in the area of influence.

Table 7: Criteria for the reversibility of the impact

REVERSIBILITY OF IMPACT	
LEVEL	DEFINITION
Reversible	State of the resource is potentially expected to return to baseline background level following cessation of the impact.
Irreversible	Impact is expected to cause partial or total destruction of the resource under consideration and a return of the state of the resource to baseline levels is considered highly improbable.

Table 8: Criteria for the impact significance

IMPACT SIGNIFICANCE	
LEVEL	DEFINITION
Negligible	No significant impact.
Minor Significance	The impact is minimal and therefore unlikely to have a noticeable or long-lasting effect on land/sea use. In the case of adverse impacts, mitigation is either easily achieved or requires minimal effort
Moderate Significance	Impact on land/sea use is tangible but not substantial in relation to other impacts that might take effect. In the case of adverse impacts, mitigation is both feasible and fairly easy.
Major Significance	The impact is of substantial and noticeable magnitude. In the case of adverse impacts, there is little or no possible mitigation that could offset the impact. A substantial change in the use, or intensity of use, of land/sea including, or in its capacity to support existing uses.

5.2 Impacts on Land Uses

5.2.1 Construction Phase

The proposed development will give rise to a permanent change of land use to the area within the footprint of the proposed new complex. The land use of the existing 21,373m² of indigenous tree plantations, rubble walls and agricultural land within the site boundary will change to commercial land permanently. The impact is considered adverse and of major significance. The residual impacts are mitigated in terms of the tree plantation, as the proposed development includes a back-filled landscaped area which will include a proportion of the original trees.

Additional land may be temporarily required for the storage of excavated material and construction vehicle access, washings and facilities for construction personnel during the construction phase. Provided that all necessary mitigation measures are in place, the impacts of these activities are considered of temporary, reversible and minor adverse significance.

The agricultural land, trees and tarmacked access road within the 100m buffer zone may be temporarily affected by the generation of dust which is envisaged during the construction phase, particularly during the first and second phases, which include excavation and backfill of bedrock. In the case of agricultural land, dust deposition on crops may decrease yield and affect the overall pH of the soil if deposited in large amounts. This impact can be mitigated with appropriate site hoarding and therefore is considered of temporary, reversible and minor significance.

5.2.2 Operational Phase

The operational phase will only give rise to further impacts on the land use in the event of incidents such as fuel spills, fires, water leaks causing flooding or other extreme events which will only constitute indirect impacts from the site operations and can be substantially mitigated and/or prevented in their entirety. For this reason, the potential impacts are considered of remote probability, but potentially major significance, which will be reduced to minor residual significance if the appropriate Emergency Response Plan is in place.

6.0 MITIGATION MEASURES, RESIDUAL IMPACTS AND MONITORING

6.1 Mitigation Measures and Residual Impacts

During the construction phase, the following mitigation measures will be put in place:

- » Reducing the construction footprint to the minimum possible
- » Use of equipment and methods that minimise the generation of dust
- » Dust mitigation measures such as site hoarding with dust curtains in place around the trench, wetting of the working area, etc.
- » Spill trays in place underneath any equipment that may cause oil leaks
- » Restoring surrounding natural areas to their pre-existing condition
- » Compensating for the loss of native trees
- » Close communication with land-owners (such as farmers in the surrounding area) throughout the construction phase
- » Adhering to all construction codes of best practice
- » Emergency response plans in place for the prevention, containment and mitigation of any extreme events (flooding, heatwaves, oil spills etc).

The residual impacts to the land use and cover remain of major significance due to the change of use of workable agricultural land and tree plantations into commercial uses. However, all indirect impacts related to the construction phase will be reduced to minor significance should the aforementioned mitigation measures be in place.

6.2 Monitoring

It is recommended that general construction site monitoring is carried out during the construction phase. Such monitoring will ensure that the Contractor is abiding by the ENVIRONMENTAL CONSTRUCTION SITE REGULATIONS OF 2007 (S.L.552.09) to help keep the adverse impacts of the works to a minimum.

Monitoring during the operational phase is not deemed necessary.

7.0 SUMMARY OF IMPACTS

Table 9: Summary of impacts table

IMPACT TYPE AND SOURCE			IMPACT RECEPTOR		EFFECT AND SCALE							PROBABILITY OF IMPACT OCCURRING	OVERALL IMPACT SIGNIFICANCE	PROPOSED MITIGATION MEASURES	RESIDUAL IMPACT SIGNIFICANCE
IMPACT TYPE	SPECIFIC INTERVENTION LEADING TO IMPACT	PROJECT PHASE	RECEPTOR TYPE	SENSITIVITY	DIRECT/ INDIRECT/ CUMULATIVE	EFFECT OF IMPACT BENEFICIAL/ ADVERSE	SEVERITY	PHYSICAL/ GEOGRAPHIC EXTENT OF IMPACT	SHORT/ MEDIUM/ LONG TERM	DURATION OF IMPACT TEMPORARY/ PERMANENT	REVERSIBLE/ IRREVERSIBLE				
Change of land use	Construction of the site	Construction and Operations	Existing agricultural land, practices, and ecological components	High	Direct	Adverse	High	Site	Long term	Permanent	Irreversible	Inevitable	Major	Minimising construction site size and spillover effects, Including a landscaping element in project design	Major
Dust emissions and tracking	Excavation works	Construction	Access roads, adjacent fields and trees	High	Direct	Adverse	Medium	Local surrounding area	Short	Temporary	Reversible	Likely	Minor	Following L.N. 340 of 2022, Construction monitoring	Negligible
Trampling of vegetation, spills	Spill-over effects of construction works	Construction	Access roads, adjacent fields and trees	High	Indirect	Adverse	Low	Local surrounding area	Short	Temporary	Reversible	Likely	Minor	Following L.N. 340 of 2022, Construction monitoring	Negligible
Increased pollution	Use of construction vehicles, Increased flow of waste carriers	Construction and Operations	Surrounding agricultural land	High	Direct	Adverse	Medium	Local surrounding area	Long term	Permanent	Irreversible	Inevitable	Moderate	Minimising vehicle idling times, Planting of windbreaker species adjacent to access road	Minor
Extreme events	Oil leaks/ spills, accidents, flooding, fires, site failure etc.	Construction and Operations	Existing roads and adjacent tree plantations and agricultural land	High	Direct	Adverse	High	Local surrounding area	Medium	Temporary	Reversible	Remote	Moderate	Emergency Response Plan and prevention practices in place before start of operations	Minor

APPENDIX 1

TERMS OF REFERENCE

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.*

3.1 Land / Sea Uses

A description of the land and sea uses within the area of influence of the project, including roads, marine traffic and public access routes. Details including nature, magnitude, proximity to site, etc. should be included.

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.

4.1 Effects of the environment aspects identified in Section 3

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

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

4.2 Impacts related to Climate Change and Climate Change Adaptation

The assessment should address the following aspects, as relevant:

1. *The contribution of the project to greenhouse gas (GHG) emissions and climate change, including:*
 - i. *The direct, indirect and off-site GHG emissions and related impacts during all relevant phases of the project, including those arising as a result of the electrical power demand of the project;*
 - ii. *Any massive GHG emissions that may occur as a consequence of accidents or malfunctions;*
 - iii. *The impacts of the proposal on carbon sinks (e.g. wooded/afforested areas, agricultural soils, landfills, wetlands, and marine environments);*
 - iv. *The components of the project that are expected to contribute to renewable energy generation on site or to a reduction in GHG emissions through substitution of current generation facilities, including a quantification and critique of their reliability and actual net contribution to climate change mitigation as well as an identification of the impacts of such components on other aspects of the environment (e.g. landscape, land take, avifauna); and*
The implications of the project and its operations and ancillary demands on National GHG emission targets.

2. *The implications of climate change on the proposal, including:*

- i. *The aspects/elements of the project that are likely to be affected by changes or variability in climate-related parameters (e.g. temperature, humidity, weather patterns, sea level, etc.);*
- ii. *The potential impacts that such changes may have on the proposal, including any possible impacts resulting from changes to multiple parameters; and*
- iii. *The adaptability of the project and its components and operations vis-à-vis the relevant climate change parameters and trends.*

4.3 Environmental risk

The assessment should also address, in sufficient detail, any relevant environmental risk (including major-accident scenarios such as contamination, emissions, explosions, blast, flooding, major spillages, etc.) likely to result in environmental damage or deterioration. The range of accident scenarios considered should exhaustively cover, as relevant:

1. *one-time risks (e.g. during construction or decommissioning works);*
2. *recurrent risks during project operation; and*
3. *risks associated with extreme events (e.g. effect of earthquakes or natural disasters on the project).*

The assessment should include, as relevant: a quantification of the risk magnitude and probability; and risk analysis vis-à-vis any hazardous materials stored, handled, or generated on site or transported to/from the site.

4.4 Effects on Human Populations resulting from impacts on the environment

This assessment should also identify any impacts of the development on the surrounding and visiting population (e.g. effects on public health or on socio-economic considerations), that may result from impacts on the environment. In the case of health-related effects, reference should be made to published epidemiological and other studies, as relevant, and the views of the Environmental Health Directorate should be sought.

4.5 Other Environmental Effects

Any other environmental effects deemed relevant to the project but not fitting within any of the above sections should also be identified and assessed.

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

5.1 Mitigation Measures

*A clear identification and explanation of the measures envisaged to prevent, eliminate, reduce or offset (as relevant) the identified significant adverse effects of the project during all relevant phases including construction, operation and decommissioning [see **Section 1.2.3** above].*

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.

5.4 Decommissioning Plan

A decommissioning plan (DP) should also be proposed to address the following circumstances, as relevant:

- 1. Removal of any temporary or defined-lifetime development (or of any structures, infrastructure or land use required temporarily in connection with it) upon the expiry of their permitted duration; and*
- 2. Removal of the development (or of any secondary developments, infrastructure or land use ancillary to it) in the event of redundancy, cessation of operations, serious default from critical mitigation measures, or other overriding situations that may emerge in future.*

The DP should also include, as relevant, a phasing-out plan, proposals for site remediation or decontamination, and methodological guidance on site reinstatement or appropriate after-use.

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 non-compliances 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.

APPENDIX 2

LARGE-SCALE MAPS

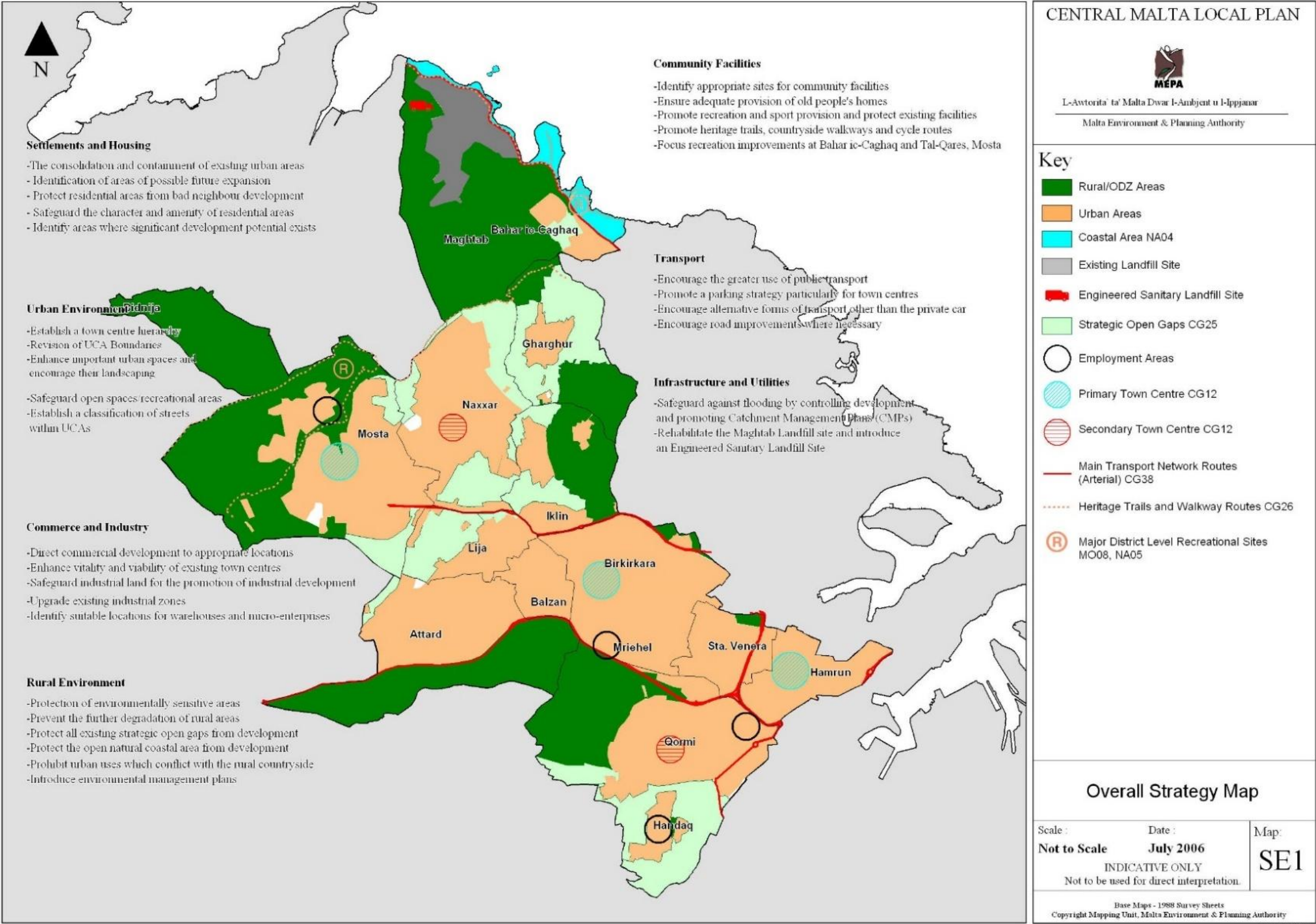


Figure 20: Large-Scale Central Malta Local Plan Strategy Map (Source: CMLP,2006)

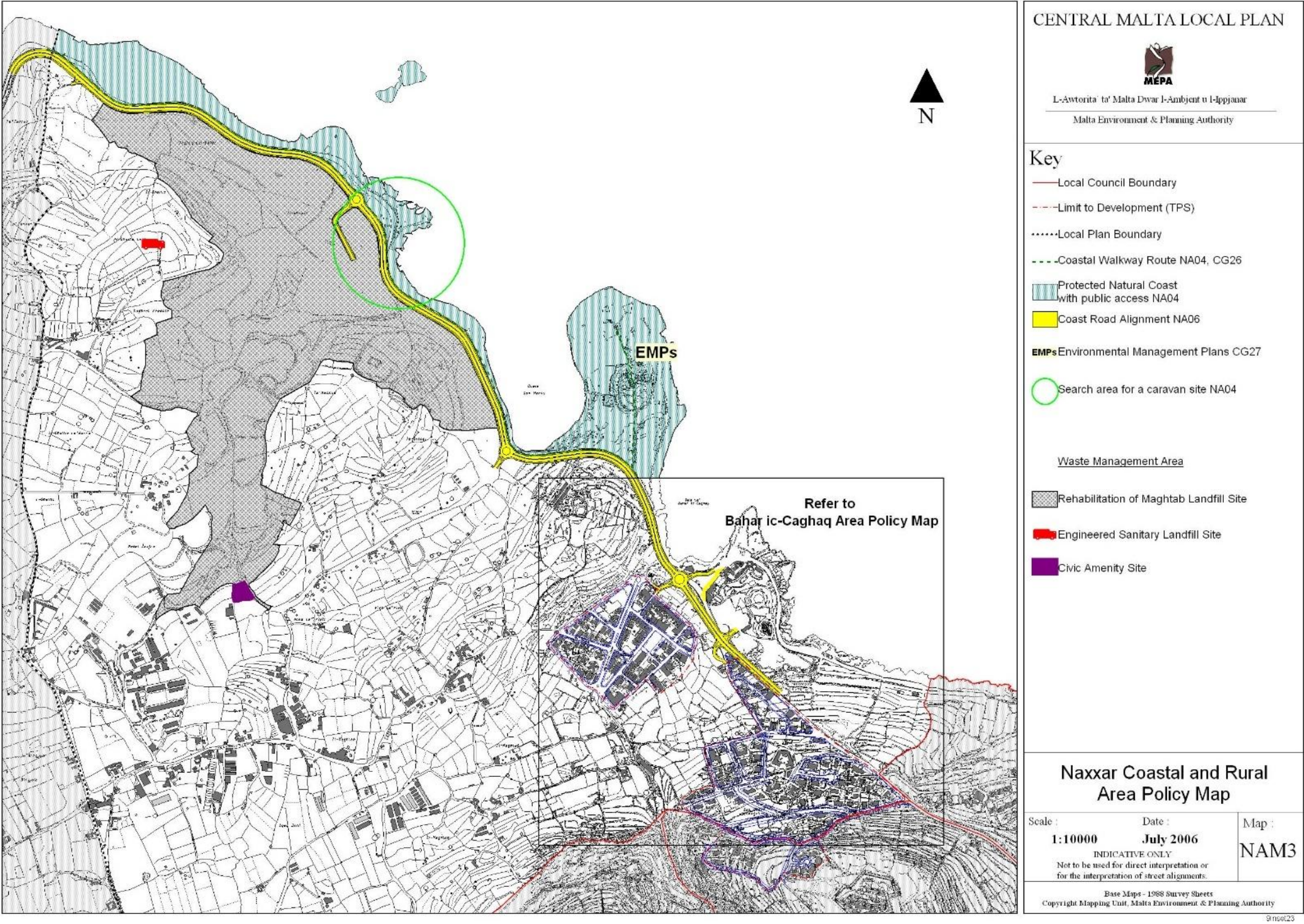


Figure 21: Large-Scale Policy Map of Naxxar Coastal and Rural Area (source: CMLP, 2006)

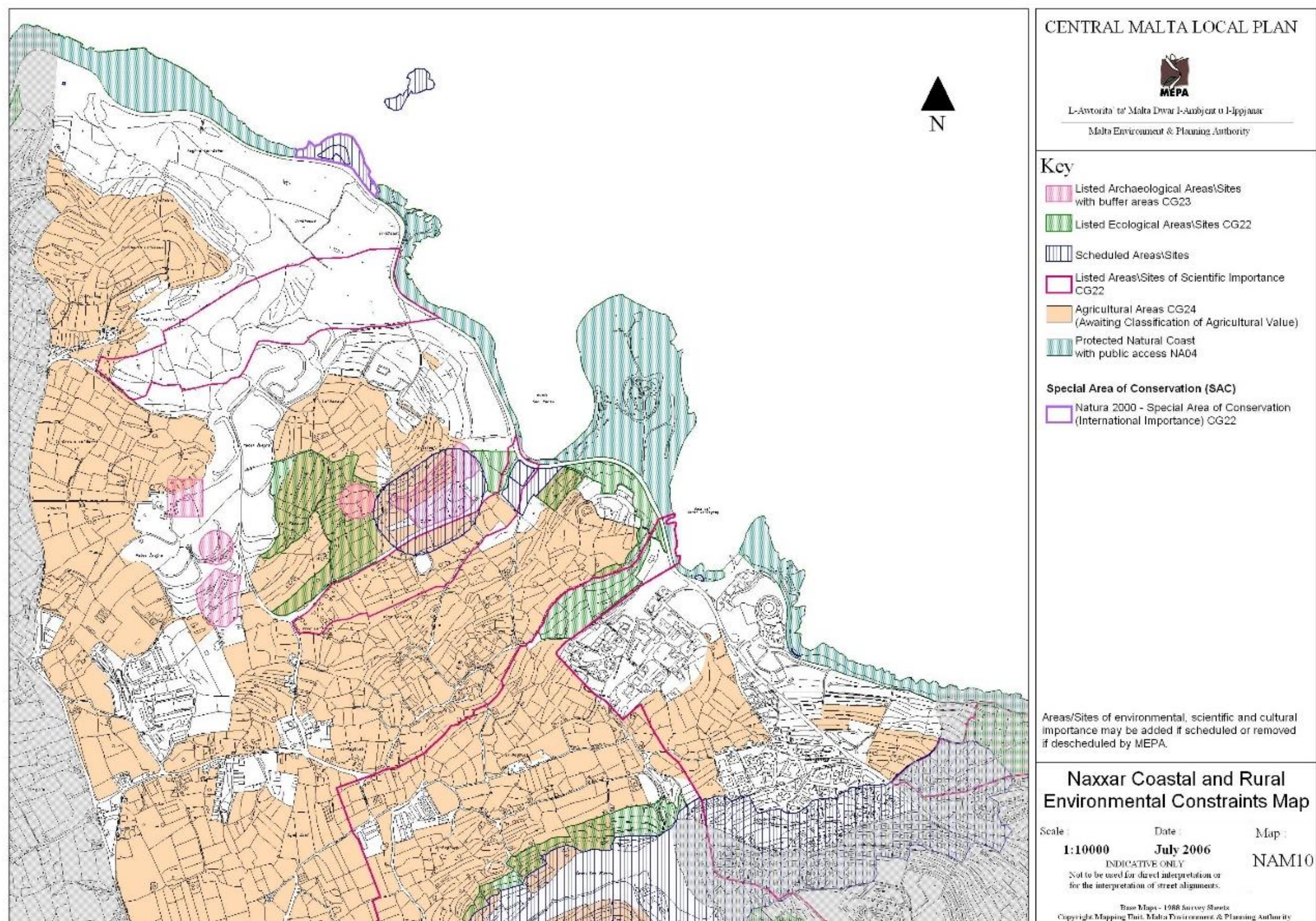


Figure 22: Large-Scale Coastal and Rural policy Map for Bahar ic-Cagħaq, Naxxar (Source: CMLP, 2006)



Figure 23: Large-scale Land-use map