



## **Xemxija Bay - Proposed Beach Replenishment Project**

### **PROJECT DESCRIPTION STATEMENT**



**Version I: October 2011**



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### Xemxija Bay - Proposed Beach Replenishment Project Project Description Statement October 2011

Report for: Malta Tourism Authority

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# XEMXIJA BAY - BEACH REPLENISHMENT PROJECT

## INTRODUCTION

1. This Project Description Statement (PDS) describes a proposal to replenish the heavily eroded sandy beach at Xemxija (St Paul's Bay) (see **Figure I**). The project (hereafter referred to as the “Scheme”) is proposed by the Malta Tourism Authority (MTA) as a further effort to improve the beach offer in the Maltese Islands following the success of the replenishment at St George's Bay and the creation of the perched beach at Bugibba; both of which have since been awarded the Blue Flag by FEE International.

**Figure I: Site Location**



## BACKGROUND TO THE PROJECT

2. Despite the efforts towards continually diversifying the tourism product, the sun, sand, and sea offer remains an important one for the Maltese Islands, and one that is well sought by the visiting tourists; not to mention the recreational value of these assets to the local population.
3. Sandy beaches are a scarce resource due to the Islands' geomorphology; sandy beaches comprise less than 3% of the entire coastline. Unfortunately this resource



has been allowed to degrade over the years through ill-conceived and inappropriate construction works and coastal developments that have seriously impacted the dynamics at affected beaches. The biggest scourge were roads that were built over beaches or their sand dunes located in their immediate hinterland. Several such examples exist, including Balluta Bay, Mellieha Bay, St George's Bay, Qalet Marku Bay, and Xemxija itself.

4. Most of these beaches are now greatly diminished from their original extent and, because of inland development, are unable to be replenished naturally. Xemxija itself is skirted on three sides by local and arterial roads so that any hope of replenishing the sandy beach is to extend it seaward.

### **Potential for Beach Replenishment in Malta**

5. In order to address this situation and to try to reverse this trend, in 2003, the MTA embarked on a national strategy that aims to study the possibility of and eventually replenish existing or former beaches in a number of tourism strategic localities. To this end, in 2003, it commissioned an evaluation report on the potential for beach nourishment in the Maltese Islands<sup>1</sup>.
6. As part of this national strategy, a number of locations in Malta and Gozo were assessed in order to determine their suitability and preliminary feasibility for beach replenishment.
7. At the same time, a report assessing the potential for beach replenishment along the St Paul's Bay-Bugibba-Qawra coastline was also prepared<sup>2</sup> in response to requests from tourism operators for the creation of a beach in the area to support the existing tourism product. Indeed, though benefitting from an extensive coastline, this important tourism area lacks a proper sandy beach, following the erosion of Xemxija over the years.
8. This latter Report evaluated the coastline between Xemxija and Salini to determine the feasibility of replenishing former beaches or creating new beach facilities to meet the aspirations of the tourism industry in this area. The report identified five potential locations where such projects could be considered. A total of seven different alternatives / interventions were proposed, subject to further studies on the feasibility of each location.

### **Alternatives for beach replenishment in the St Paul's Bay-Bugibba-Qawra area**

9. The five locations identified for further assessment in the St Paul's Bay-Bugibba-

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<sup>1</sup> Adi Associates and Ing. Joseph Sciortino, 2003. *Assessment of the Potential for Beach Nourishment in the Maltese Islands*. Report prepared for the Malta Tourism Authority; July 2003; i + 21 pp.

<sup>2</sup> Adi Associates and Ing. Joseph Sciortino, 2003. *Assessment of the Potential for Beach Replenishment along the St Paul's Bay-Bugibba-Qawra coastline*. Report prepared for the Malta Tourism Authority; July 2003; ii + 37pp

Qawra area were:

- Xemxija;
- Tal-Ghasselin, St Paul's Bay;
- Bugibba Square;
- Ix-Xtajta ta' Bugibba (Dolmen Beach Club area); and
- Qawra Point.

10. The interventions considered for these five locations ranged from replenishment of beaches ranging from 1,000 m<sup>2</sup> (at Qawra Point) to 6,000m<sup>2</sup> to creation of artificial beach facilities (pocket beaches and perched beaches). **Table I** gives a summary of the five locations and the seven options identified for further studies.

**Table 1: Summary of proposed coastal developments for the St Paul's Bay-Bugibba-Qawra area**

<b>PARAMETER</b>	<b>XEMXIJA</b>	<b>ST PAUL'S BAY</b>	<b>BUGIBBA SQUARE</b>	<b>DOLMEN CLUB AREA</b>	<b>QAWRA POINT</b>
Type of proposed amenity	Beach replenishment	Beach replenishment	[1] Artificial pocket beach [2] Artificial perched beach	Artificial perched beach	Beach replenishment
Potential size of amenity (dry beach)	6,000 m <sup>2</sup>	1,200 m <sup>2</sup>	[1] 1,300 m <sup>2</sup> [2] 1,600 m <sup>2</sup>	4,200 m <sup>2</sup>	1,000 m <sup>2</sup>
Type of beach material recommended	Coarse sand	Coarse sand	[1] Medium sand [2] Shingle	Shingle	Shingle
Pedestrian access to water line	Beach	Beach	[1] Beach [2] Stairs	Stairs	Beach
Environmental Impact Studies (subject to MEPA agreement)	Full/Limited	Limited	[1] Full [2] Limited	Limited	Full

<b>PARAMETER</b>	<b>XEMXIJA</b>	<b>ST PAUL'S BAY</b>	<b>BUGIBBA SQUARE</b>	<b>DOLMEN CLUB AREA</b>	<b>QAWRA POINT</b>
Major technical drawbacks or additional risks	None	More seaweed may come ashore	[1] May be dangerous for swimming in rough weather [2] None	None	None
Parking facilities	Reclaimed with beach <sup>3</sup>	Already exists nearby	[1] No area available [2] No area available	No area available	Already exists
Risk of failure	Very low	Low	[1] High	Very low	Low

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<sup>3</sup> The original idea was to consider adding parking facilities through part reclamation. This idea has since been shelved following discussions with MEPA and Transport Malta in view of restrictions related to the TEN-T road network.

<b>PARAMETER</b>	<b>XEMXIJA</b>	<b>ST PAUL'S BAY</b>	<b>BUGIBBA SQUARE</b>	<b>DOLMEN CLUB AREA</b>	<b>QAWRA POINT</b>
			[2] Very low		

11. As can be seen from the above, the proposal for Xemxija is a beach replenishment project to recreate the former beach in this bay. The replenished beach, which will most likely require the use of coarse sand<sup>4</sup>, will have a potential area of 6,000 m<sup>2</sup> (a 25m wide dry beach across the width of the bay) with direct access to the water.
12. Of the other alternatives considered, the perched beach at Ix-Xtajta ta' Bugibba (Dolmen Beach Club area) was implemented and the beach facility created in 2006; the proposed intervention at Qawra Point was studied between 2009 and 2010 but was found not to be feasible; while the Tal-Ghasselin, St Paul's Bay was deemed to be too small a project and would require addressing several conflicting uses / existing uses. The final location - that on the coast below Bay Square, Bugibba, has also not been considered further at this stage due to the higher risk involved.
13. Hence, the replenishment of Xemxija, though the costliest of the seven options, was identified as being the project that provides the highest value from a tourism and recreation potential. The replenishment of Xemxija would create a national facility at a par with Golden Bay and Mellieha Bay.

#### **Background to the planning of the replenishment of Xemxija Bay**

14. Following the initial appraisal undertaken in 2003, the MTA changed its focus to the replenishment of St George's Bay in St Julians, since the necessary environmental and planning studies had already been undertaken for this project and the then Planning Authority had approved its replenishment. St George's Bay was replenished in June 2004 (see **Figure 2**) and widened in 2005.
15. Following the successful replenishment of St George's Bay and the positive experience with the management of the beach and its behaviour under different weather and storm conditions, the MTA turned its attention to the creation of a new beach in the Bugibba / Qawra area. In 2006, a new concept for beach development in the Maltese Islands was developed with the creation of the perched beach at Ix-Xtajta ta' Bugibba (**Figure 3**).
16. Despite the initial hiccups related to changes to the original design of the containment ridge and the over-filling with imported sand that led to the loss of some of the sand in the initial weeks, the new facility at Bugibba was well received in general; especially by tourists. The beach is managed every summer and was awarded the Blue Flag Beach of Quality in 2007 and the Blue Flag in 2010.
17. The success of these two projects further encouraged the MTA to pursue other beach replenishment projects. Locations considered included Xlendi Bay in Gozo, Balluta Bay in St Julians, and Qawra Point in St Paul's Bay. The latter location was identified as a possible site for the creation of a new beach through the construction of a groyne to keep the replenished sand. This was the subject of a number of

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<sup>4</sup> This will be determined through a mathematical modelling study.

studies between 2006 and 2009 to determine the feasibility of such an approach. However, following detailed mathematical hydrodynamic studies of the proposal it transpired that the structures required to retain the beach in place would be so large as to radically alter the aesthetics of the embayment.

**Figure 2: Beach replenishment work at St George's Bay (2004)**



**Figure 3: The Bugibba Perched Beach**



18. In December 2009, the Qawra Point project was shelved and instead the possibility

of replenishing Xemxija Bay was reconsidered; also in view of the change in the North West Local Plan policy for Xemxija (NWSP 22), which includes favourable consideration for the replenishment of the beach.

*Policy NWSP 22*

*Xemxija Yacht Marina*

*The area indicated in Map 43 is being safeguarded for the development of a yacht marina. Developments, both on land and the sea, which are likely to compromise the implementation of a yacht marina project in the area, will not be allowed.*

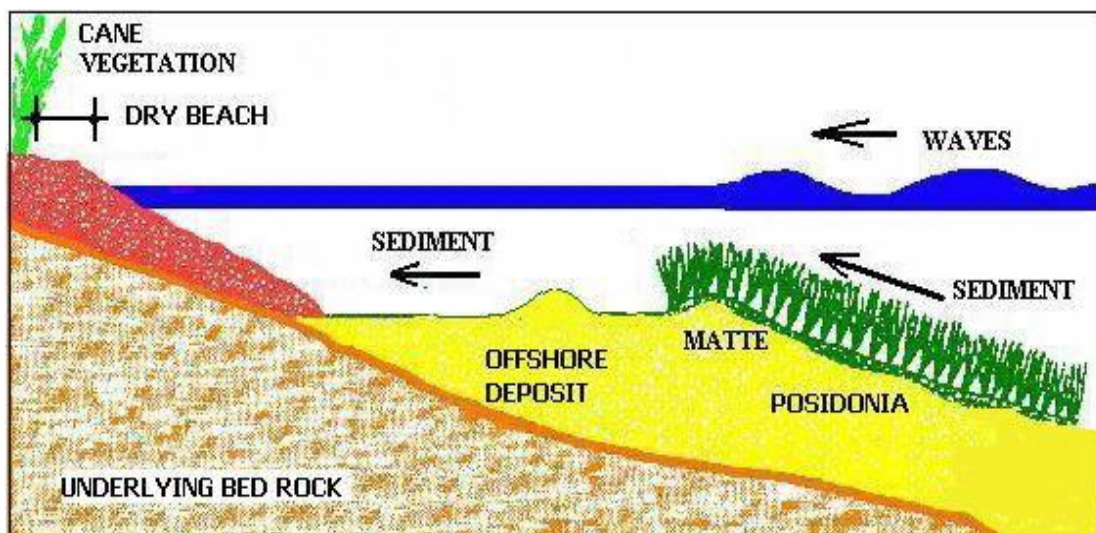
*MEPA will also favourably consider beach replenishment schemes provided such proposals are backed up by all the necessary environmental studies and any appropriate mitigation measures recommended by the studies are introduced to ensure that there is no demonstrable harm to the environment, and most importantly to the ecology of the bay and its sphere of influence.*

19. The Local Plan highlights the need for detailed studies to assess the environmental impact of the beach replenishment project, in particular on the *Posidonia oceanica* meadows - a Priority Habitat under the EU Habitats Directive.

**XEMXIJA BEACH SYSTEM**

20. The entire Xemxija Bay beach system originally extended from Pwales Valley all the way to the *Posidonia oceanica* meadows, as shown schematically in **Figure 4**.

**Figure 4: Schematic representation of Maltese beach system**



21. The beach at Xemxija Bay is backed by a valley of considerable size - Il-Wied tal-Pwales. The extent of the water catchment area of this valley system is such that a considerable volume of water is discharged into the bay during the wet season. The bay also receives run-off water from Xemxija Heights and the St Paul's Bay by-pass /



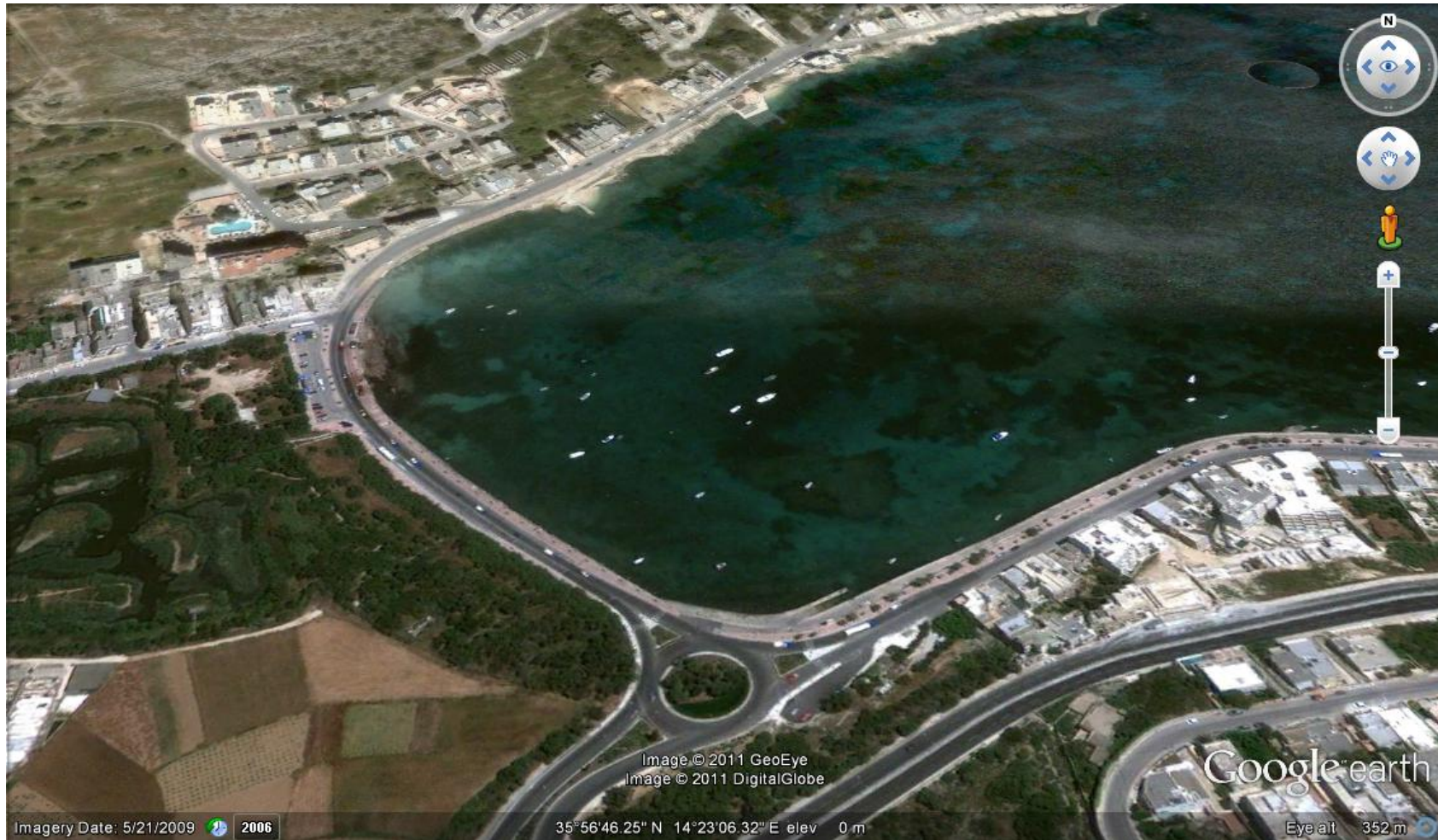
- Tal-Fjuri area. A significant amount of rock, soil, and other sediment is regularly discharged into the sea with this water. Such material would have played an important part in the maintenance of the beach, especially before the construction of the roads that currently skirt the bay.
22. Under natural conditions, sediment from the surrounding terrain and the valley backing the beach would be discharged into the water and, over a period of time re-worked by wave action into sand particles. This sand would move along the long axis of the system, being deposited in the offshore sand reservoir / *Posidonia* matte or transported back onto the beach and eventually blown inland into the sand dunes / cane fields / tamarisk groves at the back of the beach. This movement of sand from land to sea and vice versa is a dynamic process that happens repeatedly and that serves to maintain the beach and its dunes. With the construction of hard structures, and in particular, the construction of roads across the back-beach, this movement of sediment is greatly reduced if not eliminated completely, resulting in the beach getting starved of its sediment input. Over time, this would result in beach erosion.
  23. Over the years, the beach at Xemxija Bay receded to its greatly eroded state it is found in today. It is not clear when the beach started to erode, but the main likely cause is the construction of the road across the back of the bay (which may have been built over the beach itself), possibly coupled with changes in circulation patterns from the construction of maritime infrastructure in a number of locations around the bay.
  24. **Figure 5** shows the state of Xemxija beach in 1957, whereas **Figure 6** shows the bay in 2009. As can be seen, the beach in 1957 was already greatly eroded, though sand was still present across the width of the bay. The situation in 2009 is such that only a small pocket of sand in the northwest corner of the bay still exists.
  25. The proposed beach replenishment project aims to give back Xemxija Bay its sandy beach. Beach replenishment projects are very sensitive and scientific interventions requiring detailed studies to ensure that the interventions will create and maintain the beach, and that the extant environmental features are protected. For this reason, since 2006, the MTA has been undertaking a number of studies in the Xemxija Bay area in preparation for the environmental assessment and design work for the replenishment of the beach.

**Figure 5: Xemxija Bay 1957**



Source: MEPA

**Figure 6: Xemxija Bay 2009**



Source: Google Earth

## **SITE INVESTIGATION WORKS**

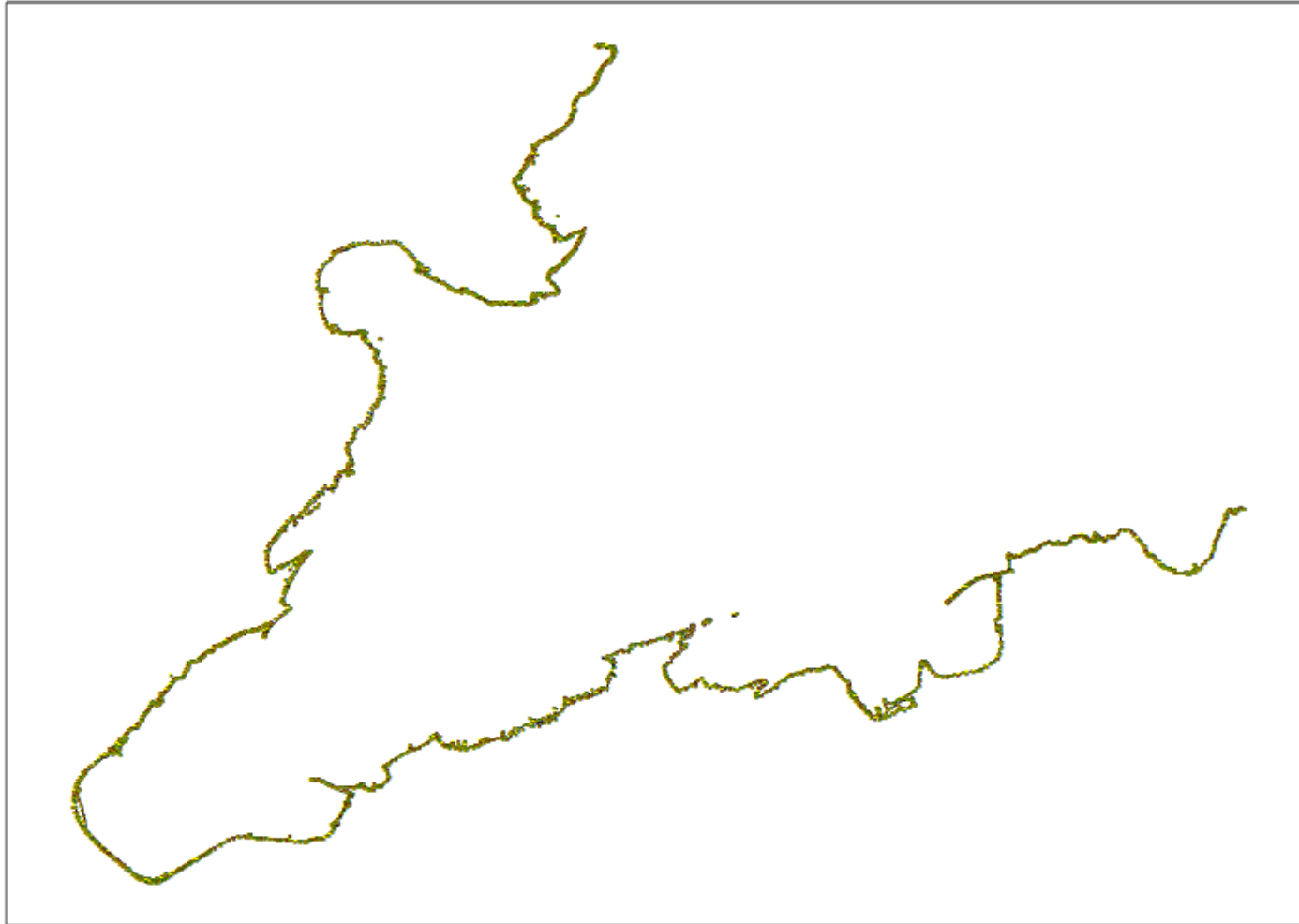
26. In 2006, the MTA undertook preliminary studies to determine the feasibility of beach replenishment in Xemxija. The initial studies focused on collecting information on the bay itself, notably the topographic and bathymetric conditions, as well as investigative work to determine whether enough sand existed in the system that would allow replenishment using *in situ* sand.
27. The following initial surveys were carried out:
  - Topographic survey;
  - Bathymetric survey;
  - Investigations on the depth of sand present in the bay;
  - Geo-technical investigations on land and in the sea.
28. The topographic survey was undertaken by the Mapping Unit of MEPA using orthophotogrammatic techniques (**Figure 7**). The bathymetric survey (**Figure 8**), on the other hand, was carried out by the hydrographic office of the then Malta Maritime Authority (now Transport Malta).
29. The sand depth investigations were carried out under the supervision of Ing. Anthony Cassar whereas the geo-technical investigations were commissioned by the Malta Maritime Authority and carried out by Terracore geo-services on behalf of Colin Toms and Partners (UK).

### **Findings from initial surveys**

#### ***Topography & Bathymetry***

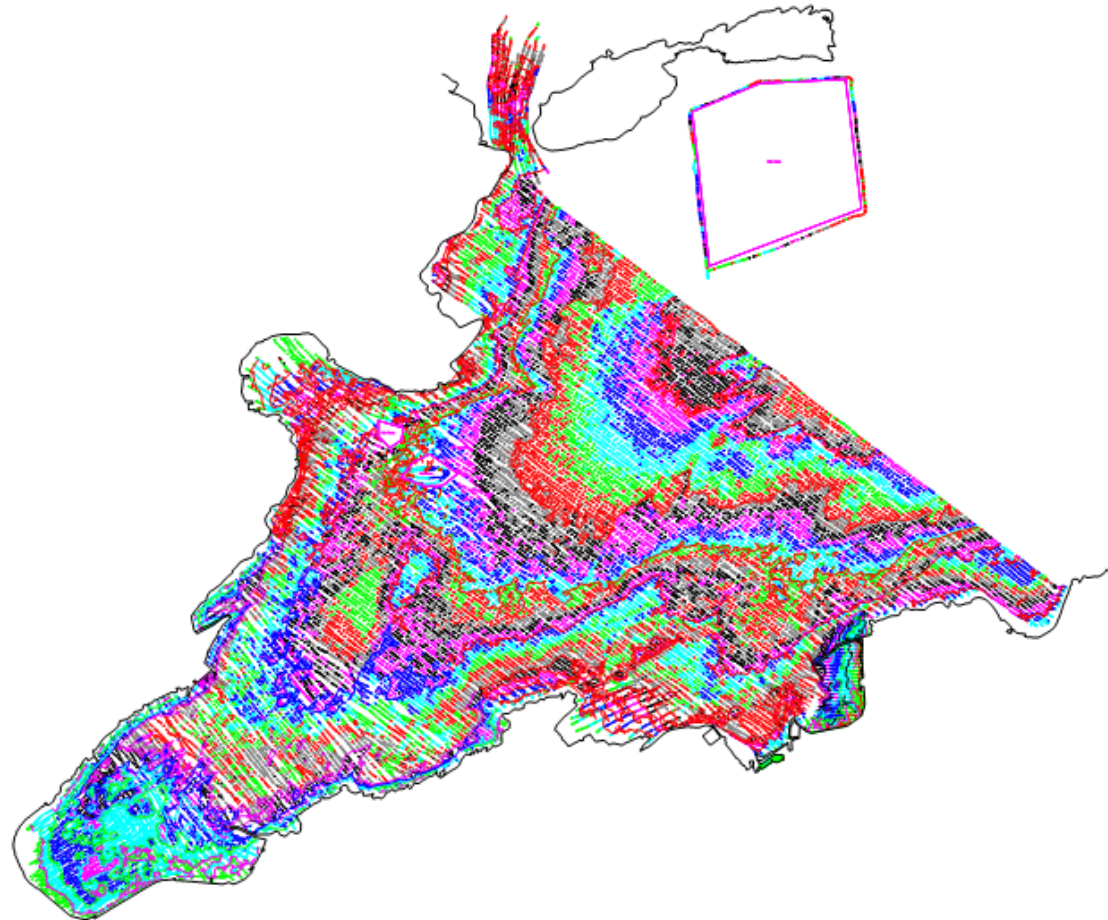
30. These initial surveys provided crucial information for the decisions required in determining the feasibility of the initial ideas for the project. The topographic and bathymetric information confirmed the initial views that the location was ideal for beach replenishment work in that the ratio between the width and the depth of the bay coupled with the shallow depth of the embayment, especially in the inner part of the bay would ensure that the incoming waves would lose their energy well before they reach the beach. Indeed, the situation is similar to that obtaining in St George's Bay, St Julians, except that the bay is wider and longer and has a more extensive shallow area.

**Figure 7: Topography of Xemxija Bay**



Source: MEPA, 2006

**Figure 8: Bathymetric survey of Xemxija Bay**

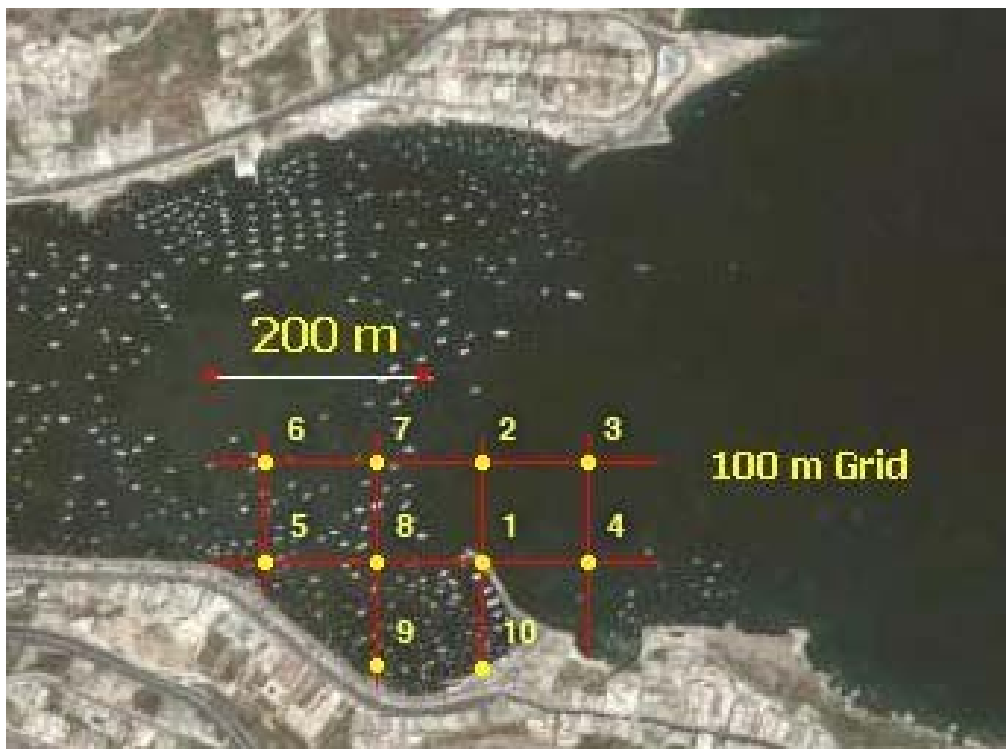


Source: Transport Malta, 2006

### **Sand depth investigations**

31. The investigation of the depth of sand was concentrated in Il-Veccja area since it was postulated that this area may contain enough sand to allow for the replenishment of the beach without importation from elsewhere and the rest of the bay is known to contain extensive meadows of *Posidonia oceanica*.
32. The survey consisted of a grid of sampling points split into two areas (**Figure 9**):
  - Area 1 consisted of a 100m square grid on the eastern flank of the Ghar il-Veccja lighthouse; and
  - Area 2 consisted of a 100m square grid on the western flank of Ghar il-Veccja lighthouse and two stations along the shoreline to the south of the same grid.

**Figure 9: Sampling points for sediment depth investigations**



33. A total of 10 stations were sampled, with two samples being collected from each station, whenever possible. Samples were collected from the surface and from 10cm depth (where available).
34. Six out of the ten stations sampled contained extensive growths of *Posidonia oceanica* meadows, most with well-developed mat structures. Eight of the 10 stations did not contain any sand.
35. Sand was sampled at:
  - 32m from station 3 at a depth of 7-9m (sediment thickness in excess of 1.5m),

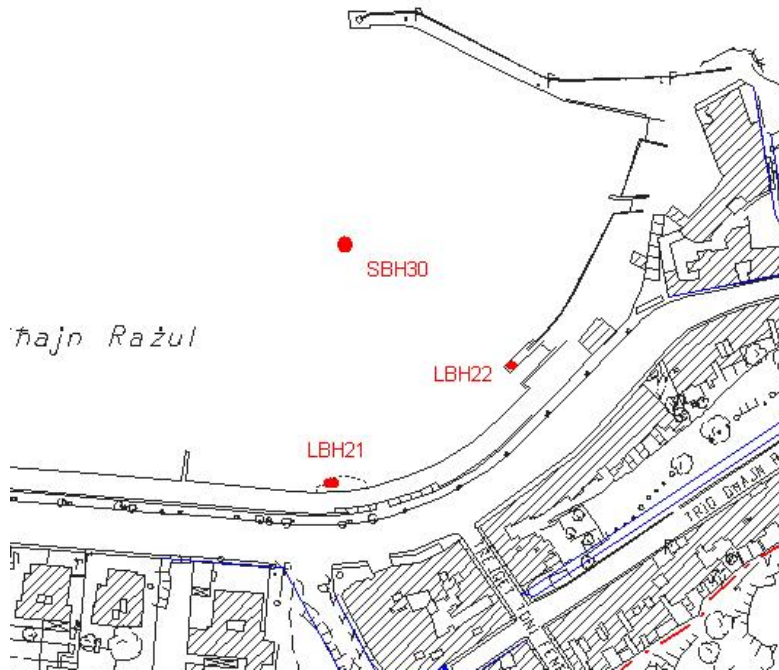
- 3m from station 4 at a depth of 10m (sediment thickness in excess of 1.5m);
  - at station 6 at a depth of 3m (sediment thickness 0.7m); and
  - from a sand patch at 5m from the shoreline at a depth of 0.4m (sediment thickness 0.6m).
36. From these results it was ascertained that the sand present is not enough for the replenishment of Xemxija Bay beach. Thus, for the project to move forward, sand from other locations is required.

### ***Geo-technical investigations***

37. The geo-technical investigations were aimed at determining whether sand deposits existed on land since it was reported that the current road at the head of the bay had been constructed over the original beach. If this was true, then it could also be possible that sand deposits existed behind this road in the Simar nature reserve area.
38. It was therefore decided to investigate this possibility by drilling boreholes in a number of locations complete with core recovery.
39. The geotechnical survey was commissioned by the Malta Maritime Authority as part of a Malta-wide geo-technical survey that was ongoing at the time (2006/7) through which the MMA was investigating maritime structures at various bays. The geo-technical investigations involved drilling of boreholes at Ghajn Razul (Il-Veccja) and Is-Simar. The works at Ghajn Razul included drilling of three holes (**Figure 10**), two from ground level and one at sea with open hole drilling through soil, soil sampling, SPTs and continuous rock core sample recovery for about 4m in rock. The works at Is-Simar included drilling of four holes (**Figure 11**) from ground level with open hole drilling through soil, with continuous soil sampling through the top 5m, and SPTs to bedrock followed by 4m of good quality rock core sample.
40. The scope of the investigation was to determine the amount of good quality sand in the top 5m, to know the bearing strength of the overburden, to locate the top of the bedrock, to recover subsurface rock core samples and to assess the subsurface geological conditions in view of the proposed project.
41. The survey had also to report on any of the following features (if encountered):
- Subsurface solution caverns;
  - Open fissures;
  - Presence of clay-filled fissures;
  - Fault zones; and
  - Clay beds.

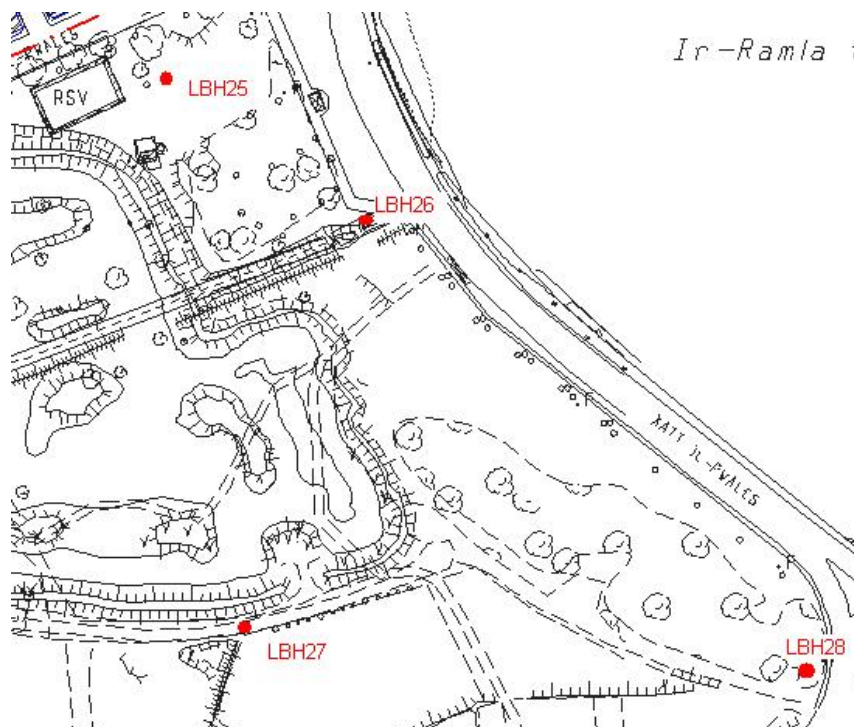


**Figure 10: Map showing location of boreholes drilled at Ghajn Razul (Il-  
Veccja)**



Source: Terracore Geo-services Ltd, 2007

**Figure 11: Map showing location of boreholes drilled at Is-Simar**



Source: Terracore Geo-services Ltd, 2007

42. From these investigations, the following could be concluded:
- The rock sequence at Ghajn Razul is made up of Blue Clay and Upper Globigerina Limestone;
  - The only sand bed was found in the pocket beach at borehole location LBH21. It is about 1m thick but its lateral extent was not measured;
  - A buried valley (predominantly buried by Quaternary conglomerates breccias and red clay) is located at Is-Simar; and
  - A loose very soft clayey sand bed was encountered at borehole location LBH28 at 5.0 – 7.0m below ground level.

#### **Other studies carried out**

43. Following the initial studies undertaken in 2006 / 7 (described above), the project was put on hold while the MTA investigated the possibility of creating a beach at Qawra Point. When this project fell through as a result of the mathematical modelling indicating the need for extensive interventions on site to keep the sand in place, the MTA turned its focus for beach replenishment again to Xemxija Bay.
44. In December 2009, a preliminary site survey was carried out to determine the current state of the site, identify the location of storm water outlet and other infrastructure leading to the bay. This survey identified not less than 22 different storm water outlets from the surrounding street, overflows from Is-Simar nature reserve, and surface water run-off directly from the street at the remnant beach.
45. Following a meeting with the Environmental Health Directorate, it was decided to analyse the water and sediments in the bay for their environmental quality since pollution / contamination in the bay could potentially rule out this location for beach replenishment consideration before intensive remediation (if at all possible) is carried out. It was agreed therefore to carry out water and sediment sampling and analysis as part of baseline environmental surveys. Depending on the results of these analyses, a decision on the feasibility of proceeding with this project would then be taken.
46. The environmental surveys on water and sediment quality were undertaken in April 2010 (Ecoserv, 2010).
47. The survey consisted of nine stations (one from the extant beach and eight offshore locations) (**Figure 12**).
48. The parameters for which the water and sediment samples were analysed are listed in **Table 2** and **3** below.

**Figure 12: Map showing location of sampling stations**



Source: Ecoserv Ltd, 2010

**Table 2: List of parameters monitored as part of the water quality studies**

Parameter	Method of analysis
Temperature	In situ measurement
pH	In situ measurement
Salinity	In situ measurement
Dissolved Oxygen	In situ measurement
Colour	In field visual and odour cues
Turbidity	In situ measurement
Mineral Oils	In field visual and odour cues
Surface Active Substances	In field visual and odour cues
Phenols	In field visual and odour cues
Tarry residues and floating material	In field visual and odour cues
Enterococci and E. coli	Laboratory analysis (replicate samples)
Chlorophyll a	Laboratory analysis (replicate samples)
Ammonia	Laboratory analysis (replicate samples)
Nitrates	Laboratory analysis (replicate samples)
Phosphates	Laboratory analysis (replicate samples)
Heavy Metals	Laboratory analysis (replicate samples)
Petroleum Hydrocarbons (Total)	Laboratory analysis (replicate samples)
Polyaromatic Hydrocarbons (Total)	Laboratory analysis (replicate samples)
Polychlorinated Biphenyls	Laboratory analysis (replicate samples)
Pesticides	Laboratory analysis (replicate samples)

**Table 3: List of parameters monitored as part of the sediment quality (characterisation and leachate analysis) studies**

Parameter
<b>Sediment characterisation:</b>
Petroleum Hydrocarbons (Total)
Polychlorinated Biphenyls
Pesticides
Heavy Metals (Al, As, Ba, Cd, Co, Cr, Cu, Hg, Pb, Ni, Sn, V, Zn)
Organotins
Total organic carbon (TOC)
Loss on ignition
BTEX
Mineral Oils (C10 -C40)
Polyaromatic Hydrocarbons (PAH)
pH
Acid neutralisation capacity
Sediment granulometry
<b>Leachate analysis:</b>
Heavy Metals (As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, Zn)
Fluoride
Dissolved Organic Carbon (DOC)
Total Dissolved Solids (TDS)
Phenol Index

49. The results from the analysis of these samples indicate the following:
- Some marine plant (mainly seagrass) debris were present at the surface at Stations B, C and E, but no abnormal physical features were noted during the surveys;
  - Nitrates, phosphates & chlorophyll a levels were all below pollution threshold levels for local coastal waters;
  - Enterococci & E. coli counts were both well below guideline and mandatory values;
  - Levels of metals and organic compounds in the water were below the values of national and EU quality objectives;
  - Levels of Aluminium were found to be elevated in all stations;
  - Levels of pesticides, mercury and organotins in the sediments were all found to be below the reporting limits;
  - As regards granulometry, results indicate that the sediment is composed of gravelly muddy sands with a mean grain size varying from 0.08 to 0.65mm; and

- Leachability tests (Decision 2003/33/EC) showed that the levels for individual parameters are lower than the limit values for inert and hazardous wastes.
50. In summary, therefore, the chemical analysis results indicate that the quality of the water and the sediments in Xemxija Bay are very good and the water meets the bathing water quality criteria. Hence, there is no impediment to the site's re-use as a bathing area.
  51. In view of this positive result it was next decided to assess the feasibility of the proposed replenishment through a mathematical hydrodynamic model. Information required for the modelling included the topography and bathymetry data already collected, as well as details on the habitats present on the seabed. For this reason, a benthic survey of Xemxija Bay was commissioned in 2011. The survey, which was undertaken by AIS Environmental Ltd, mapped the benthic habitats within the inner part of Xemxija Bay (up to Il-Veccja breakwater) (**Figure 13**).
  52. The benthic survey confirmed the presence of extensive meadows of *Posidonia oceanica* at the centre of the bay (ranging from reticulate meadows to extensive meadows settled on matte), which grade into associations with *Cymodocea nodosa* and associations of *Cymodocea nodosa* on superficially muddy sands in the shallower and sheltered waters.
  53. These results will be fed into the hydrodynamic modelling study once this is commissioned.

**Figure 13: Map of the benthic habitats at Xemxija Bay**



Source: AIS Environmental Ltd, 2011

## **OBJECTIVES OF THE SCHEME**

54. The objectives of the Scheme are to:
- Replenish the former sandy beach at Xemxija Bay;
  - Create a sandy beach in St Paul's Bay within easy reach of the hotels in the important tourist area of St Paul's Bay-Bugibba-Qawra;
  - Provide further quality beach space for Malta;
  - Create a national beach facility to relieve some of the pressure off Mellieha Bay and Golden Bay;
  - Upgrade the Xemxija Bay area through the elimination of existing environmental impacts, reversing negative trends, providing much needed services, and generally embellishing the area.

## **BENEFITS OF THE SCHEME**

55. Re-instating the beach at Xemxija Bay will:
- Create much needed additional beach space in Malta;
  - Improve the visual amenity of the area;
  - Increase income for tourist establishments in the St Paul's Bay area; and
  - Provide an upgraded amenity for the local residents and local tourists.

## **CHARACTERISTICS OF THE APPLICATION SITE**

### **Site Description**

56. Xemxija Bay is one of the larger embayments in the north of the island. It is located at the mouth of an important valley (Wied il-Pwales), which is a wide valley predominantly given to agriculture.
57. The bay is 330m wide at its head and has a long axis of approximately 3.3km.
58. Apart from the boulder scree at Ghar Ghasfur on the southern shore and the Ghar Fekruna - Mistra boulder scree, the inner part of Xemxija Bay is completely built up, with local and arterial roads skirting the bay linking St Paul's Bay to Xemxija Heights, Mistra, and beyond to village of Mellieha.
59. Of the original beach only a small pocket at the northwestern corner still exists. Though varying in extent throughout the year, this small sandy pocket rarely covers more than 50m of the shoreline and typically has a width of around 8m.
60. The predominant use of Xemxija Bay today is for the mooring of small boats. Indeed,

the site has been identified in past studies as a possible location for the creation of a 500-600 berth marina. The North West Local Plan (2006) also endorses this idea, which was also identified as a possibility on the yachting Subject Study (1996), but the Local Plan also opens up to the possibility of a beach replenishment project (see earlier).

61. The bay contains coastal infrastructure of a maritime nature along its northern and southern shores (**Figure I4**). These include:
- A quay and slip way at Il-Fekruna;
  - A floating jetty and moorings at the Beachhaven restaurant;
  - A further jetty and slipway along the north shore;
  - A slipway and jetties for larger boats along the southern shore;
  - Quays running the length of the entire southern shore towards Il-Veccja;
  - A further small jetty along the southern shore; and
  - Il-Veccja mooring area, which includes two slipways, jetties, hardstanding areas for boats, and a breakwater.

### **Access**

62. Access to the sea is currently possible from the pocket of sand in the north-western corner and via the ramp leading to the slip way in the southwest corner.
63. Access is also available from the small jetty and slip way on the north shore and from the Fekruna area in the north and the Veccja area to the south.
64. A number of staircases provide access from Triq San Pawl to the quayside on the southern shore and from Xatt il-Pwales to the concrete pathway at sea level beneath the road's retaining wall.



**Figure 14: Coastal maritime infrastructure in Xemxija Bay**



INDICATIVE ONLY - Not to be used for direct interpretation

Source: MEPA, 2004

### **Surrounding Land and Sea Uses**

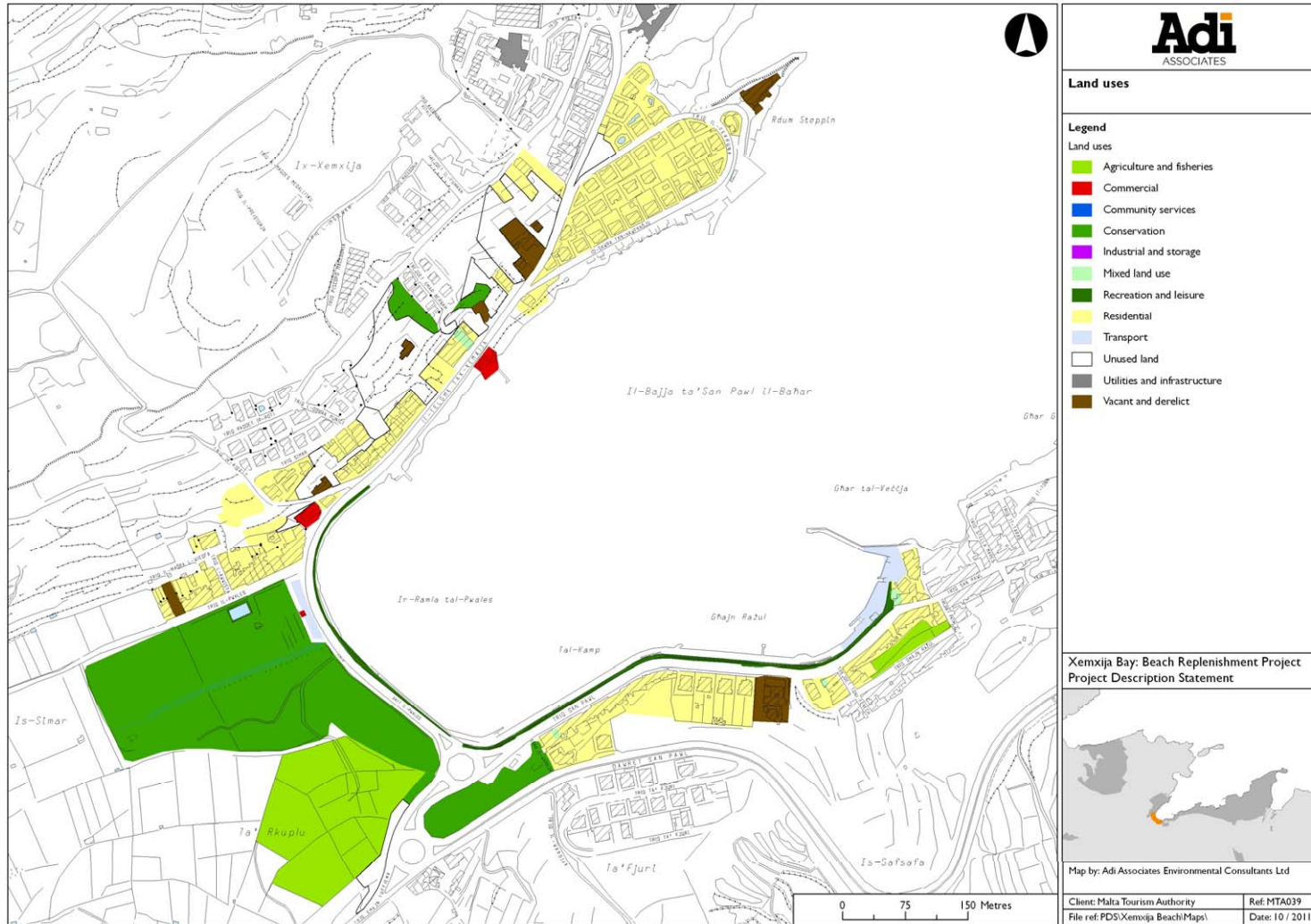
65. The southern shore of Xemxija Bay from Qawra Point to the southwest corner is developed, with the exception of the boulder scree at Ghar Ghasfur. While the Bugibba-Qawra headland is heavily developed, the inner parts of Xemxija Bay are only sparsely developed, mainly along the waterfront as the terrain rises sharply thereafter towards the St Paul's Bay by-pass and beyond towards Wardija ridge.
66. On the northern shore, development is mainly confined to Xemxija Hill, with two main settlements located at the Fekruna and Xemxija Heights areas.
67. Xemxija Bay is located at the mouth of Wied il-Pwales, a wide valley formed in the graben between Wardija and Bajda ridges.
68. At the distal end of the valley is the internationally important Is-Simar wetland, a restored and enlarged saline marshland that was re-created in the early 1990s and is now managed by Birdlife Malta as a bird sanctuary.
69. Is-Simar is now a mosaic of habitats including reed beds, open pools and canals, an olive grove and hundreds of trees planted by volunteers over the years. These habitats attract and support several forms of native wildlife, not least birds. The reeds and pools are especially attractive to secretive aquatic species like herons, grebes, rails and kingfisher, and a number of birds also breed at Is-Simar, including reed warbler and moorhen (Birdlife, 2011<sup>5</sup>).
70. Xemxija heights includes areas and features of archaeological importance, including ancient cave dwellings, tombs, and apiaries. A Neolithic temple is also found further towards Mizieb (GN 763/98).
71. Other protected features in the vicinity of the site include the underground flour mills at Xemxija Hill (scheduled as a Grade 1 Historic building - GN 492/06), Mistra Gate at Xemxija Hill (scheduled as a Grade 1 Historic building - GN 763/98) and the Monte della redenzione property marker (scheduled as a Grade 2 historic structure - GN 763/98); an ancient road (scheduled as a Grade 2 engineering structure - GN 763/98) and Is-Simar wetland, garigue areas and pine woodland scheduled as Areas of Ecological Importance and Sites of Scientific Importance (GN 371/08).
72. The land and sea uses around the site are shown in **Figure 15**.

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<sup>5</sup> Birdlife Malta website: [http://www.birdlifemalta.org/conservation/nature\\_reserves/simar/](http://www.birdlifemalta.org/conservation/nature_reserves/simar/). Last accessed on 9 October 2011.



**Figure 15: Land and sea uses**



## DESCRIPTION OF THE SCHEME

73. The Scheme involves the replenishment of the former beach at Xemxija Bay using imported sand. The possibility of using *in situ* sand was discarded since investigations showed that not enough sand was available and the use of sand from other bays in Malta or Gozo is not feasible since not a large enough sand reservoir exists or else the interference with the beach systems in other locations would be detrimental to their own survival. The use of offshore sand reservoirs was also discarded since analysis of offshore sand samples from a number of locations (e.g. Xlendi Bay, Balluta Bay, etc) over the years has indicated that sand that has been submerged for a number of years would have eroded such that the mean grain size is very low. Hence, the only feasible option for beach replenishment work would be the importation of foreign sand.
74. The specifications of the sand to be used (mean grain size, minimum and maximum size limit, specific gravity, etc.), will be determined following the hydrodynamic modelling studies that are still to be carried out. These will identify the type of sand that will provide a stable beach under varying storm conditions. However, current estimates indicate that the mean sediment grain size will likely be lower than that used for the replenishment of St George's Bay and the creation of the Perched Beach at Bugibba and may open the possibility for the utilisation of silica sand rather than granite.
75. The amount of sand required for the replenishment of the beach is estimated at 20 - 25,000m<sup>3</sup>.
76. Apart from the placement of sand, the Scheme will involve the construction of a culvert system to collect and channel surface water run-off away from the beach. This water will be discharged at the sides of the beach beyond the replenished sand.
77. The existing promenade will not be removed but will be upgraded with new paving and street furniture. Stairs providing access from the promenade to the beach will be introduced and beach management infrastructure in the form of a lifeguard tower and first aid clinic will be built at promenade level and a beach store and possibly also toilets constructed at beach level beneath the promenade.
78. The possibility of building a kiosk / cafeteria (including hiring of umbrellas and sun beds), to service the beach users will also be explored. The preference is for all such structures to be built exclusively beneath the promenade and no structures will be allowed to be built (permanently or temporarily) on the sand; however, the final decision will depend on the feasibility of doing this in view of potential conflicts with underground infrastructure in the area.
79. Other interventions will include landscaping works along the promenade and a new concept in Malta will also be explored - that of beach art. The possibility of including a section reserved for a play structure for small children will also be considered.

### **Access and transportation**

80. As explained, access to the beach will be via stairs leading from the promenade. No vehicular access will be possible, except for beach cleaner vehicles under strict supervision. Access for these vehicles will be from the north-western corner of the beach (where there is the small pocket beach today).
81. No additional parking facilities will be provided. Instead, the management of the beach will promote the use of public transport and alternative modes of transportation (e.g. walking, cycling, etc) to reach this beach. The possibility of providing a bus link with a park and ride facility at Bugibba / Qawra will also be explored. The only facilities to be provided at Xemxija will be a few drop-off points (lay bys), bus stops for public transport / park and ride links, bicycle parks, and a couple of parking bays for disabled persons.
82. The new beach will also be accessible to all - not only through the provision of the parking bays mentioned above, but through access friendly ramps and pathways, providing access to all to the beach and floating beach wheelchairs providing access to the water, as are already used at St George's Bay, Golden Bay, and Mellieha Bay.

### **Waste**

83. The construction of the Scheme will generate general construction waste (such as brick off-cuts, concrete slurry, packaging waste (plastic, carton, paper) from finishing works, wood (from shuttering), off-cuts of waterproofing membrane, oily rags, etc.
84. The replenishment works will mainly generate jumbo bags used to import the sand (unless this is transported on barges and pumped directly to the replenishment site.
85. Waste generation during operation will be similar to those generated currently on other beaches except that through the beach management plan to be implemented on site (on the lines of that implemented at St George's Bay, Bugibba, Golden Bay, and Mellieha Bay), good management of wastes will be achieved.

### **Raw materials to be used**

86. The main raw material to be used in this project will undoubtedly be the imported sand itself. Other materials include: (i) concrete blocks and mortar for the construction of the retaining wall, culverts, and beach infrastructure, (ii) paving blocks and cement for the promenade, (iii) steel and wood for the street furniture, and (iv) trees, shrubs, and plants for landscaping works.

### **Employment**

87. Depending on the level of management to be applied at the beach, it is envisaged that the operation of the Scheme would employ between 5 and 10 full time staff and 1-3 part-timers during summer.

### **Timing**

88. The timing of replenishment works is dependent on when the full development permit is issued, which will also be subject to the conclusion of the environmental impact studies, and the procurement of the sand. However, it is currently planned that the beach will be replenished by Summer 2013.

### **PRELIMINARY POTENTIAL ENVIRONMENTAL IMPACTS**

89. Environmental impacts can be both negative as well as positive and their assessment in an EIA is important so as to better define the effects that a proposal may have on its receiving environment. In order for the environmental impacts of a project to be properly defined and analysed, an EIA process needs to be performed, complete with an identification of impacts, the determination of their significance, a comparison with the baseline conditions, and consideration of alternatives.
90. The environmental impacts of the Scheme and their significance will be determined in an eventual EIA; however, a list of preliminary potential environmental impacts is outlined below. It must be emphasised that this list does not purport to identify all possible impacts but only those that may be considered to be significant. Nonetheless, not all of these will be of major significance; significance will be determined in the EIA proper.
91. The potential significant impacts of the Scheme are considered to be:
- Burying of the inner parts of the bay with alien imported geological material;
  - Potential loss of replenishment material that may impact benthic habitats outside the footprint of the beach;
  - Upgrading of storm water infrastructure and management of same flows into the sea (positive);
  - Upgrading of sewage infrastructure, especially along Triq il-Pwales (if required);
  - Improved tourism / recreation product (positive);
  - Increased job and revenue (positive);
  - The newly replenished beach may attract more people to the area, leading to increased pressures (carrying capacity and traffic);
  - This new beach may relieve pressures on other beaches, notably Golden Bay and Mellieha Bay (positive);
  - Establishment of a public transportation system for the area to link with other hubs to facilitate sustainable modes of transportation for beach users;
  - The construction of the water culvert will necessitate proper planning to minimise negative effects on this tourist area. Construction works will have to

follow best practice to minimise impacts on the marine environment. Supervision is imperative;

- Improved beach management measures (positive); and
- Environmental upgrading of the Xemxija Bay area.

92. The Scheme is unlikely to generate impacts that would act cumulatively with impacts from other projects in the vicinity. The replenishment phase will be very short (typically a few of days) and the “operational” phase impacts will likely be positive from a recreational and economic point of view. Negative impacts could be the added influx of cars as the number of beach users increases, unless a transport plan to the area is implemented as described above.

### **MITIGATION PROPOSALS**

93. The infrastructure on the site, especially the sewerage system will need to be checked for potential leakages and upgraded or replaced accordingly. The existing culverts that collect storm water run-off also need to be checked and repaired or cleaned. The size of this latter infrastructure will also need to be re-assessed to confirm that it is adequate to deal with the expected storm water flow in the area. If necessary, additional / larger infrastructure would need to be installed.
94. A sustainable transport plan serving the new beach will be set up to minimise the need for parking facilities in the area and to reduce car congestion.
95. The pre-replenishment works will be supervised to ensure that the impacts from the coastal construction works do not spill into the marine environment.
96. The replenishment works will be supervised to ensure that the area of seabed to be buried is contained to the area established through the hydrodynamic model.
97. A Monitoring Plan will be formulated and implemented to study the behaviour of the new beach system. The Monitoring Plan will include proposals for actions to be taken based on the results of the foregoing investigations.





