Environmental Impact Statement for the

Construction of an urban wastewater treatment plant at Ta' Barkat, l/o Xgħajra

PA 06974/06

Non-technical Summary/
Ġabra fil-qosor mhux teknika

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NON-TECHNICAL SUMMARY

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1. INTRODUCTION AND JUSTIFICATION FOR THE DEVELOPMENT

The objectives of this project stem from a combination of international obligations and regional/local economic needs to improve the environment and thereby protect and enhance the tourism potential of the Maltese Islands through the restoration of the south easterly coastal waters.

Currently, the main outfall for all of the sewage arising from Malta South is located at Wied Ghammieq l/o Kalkara and no treatment is provided for the sewage prior to discharge to the marine environment. Around 17% of the total sewage production undergoes treatment at the Sant' Antnin Treatment Plant (SASTP) and the recently commissioned Gozo STP, with the treated effluent at SASTP being used for irrigation.

In view of EEC Directive 91/271/EEC called Urban Wastewater Treatment, all untreated waste water discharges should be discontinued by 31st March 2007. The Sewerage Master Plan for the Maltese Islands of 1992 specifies the requirement for a minimum of three urban wastewater treatment plants to treat the estimated 25 million cubic metres of raw sewage being discharged into the sea every year.

In order to treat 80% of the total Sewage generated in the Maltese Islands, the Water Services Corporation (WSC) plans to construct a sewage treatment plant for the South of Malta, hereinafter referred to as the South Sewage Treatment Plant (SSTP), an Intake Pumping Station and a new 1.7 km gallery upstream gravitating to the pumping station. The SSTP site, measuring approximately 41,000 m^2, is to be situated on the South Easterly coast in the area known as Ta' Barkat, limits of Xghajra.

2. PLANNING POLICIES AND LEGISLATION

Local planning policy regarding sewage treatment is set out in the following key documents:

- Structure Plan for the Maltese Islands
- South Malta Local Plan
- Zabbar North Local Plan Maps

Maltese legislation relevant to the proposed sewage treatment works development can be summarised as follows:

- *The Development Planning Act, 1992* which requires that the implementation of development be subject to a permitting system.
- *The Environmental Protection Act, 1991* which is concerned with environmental quality and its protection.
- *Legal Notice 8 of 1983* which establishes sewer discharge control regulations.
- *Legal Notice 311 of 2006*, this legislation sets up 'The National Ecological Network' and includes the protected areas and protected species in the Maltese Islands.
- *Rubble Wall and Rural Structure (Conservation and Maintenance) Regulations 1997* concerned to the protection of rubble walls and non habitable rural structures.

International policies include:

1. *The Barcelona convention* which resulted in the adoption of the Mediterranean Action Plan (MAP).
2. *The Genoa Declaration* in which ten target areas were identified.

The European Community has initiated a number of environmental programmes. Other European Community Directives include:

- Directive 160/76 EEC concerning the quality of bathing water
- Directive 464/76 EEC on pollution caused by certain dangerous substances discharged into the aquatic environment.
- Directive on limit values and quality objectives for discharges of certain dangerous substances included in the Annex to Directive 464/76 EEC. (Directives 280/86 EEC, 347/888 EEC and 415/90 EEC).
- Directive on the quality required of shellfish waters (Directive 923/79 EEC).
- Directive on the protection of the environment, and in particular of the soil when sewage sludge is used in agriculture (Directive 278/86 EEC).
- Directive concerning urban wastewater treatment (Directive 91/271/EEC).
- Directive concerning the protection of water against pollution from nitrates from agricultural sources (Directive 676/91 EEC)
- Directive concerning waste disposal (Directive 442/75 EEC amended by 156/91).

3. LAND USE

The proposed site at Ta' Barkat can be reached from an access path which runs along the coast of Xghajra extending from Triq Dawret ix-Xatt. The path area consists of mainly wasteland and degraded coastal garigue and shifts to coastal garigue on a mainly rocky shore to the east side of the path. The Ta' Barkat area is situated inland of this path and consists mostly of agricultural land, of which a proportion has been abandoned and/or is being used for hunting/trapping purposes. Agricultural activity is not intense in this area and all fields have rubble wall boundaries besides vegetation cover in their proximity including various trees. Another access path, which runs to the east of the proposed area, links the coastal path to Triq San Leonardu on the side of a derelict convent of historical value.

4. GEOLOGY, GEOMORPHOLOGY & HYDROLOGY

A detailed investigation of the site has been undertaken. The results have been used as a basis for the designs of the proposed development. The area being proposed for the development is not recognised as a source for good Franka stone. Thus a major impact will be on the waste stone material produced by the excavation, the quantity of which will depend on the extent of excavation required for the proposed sewage treatment plant.

The coastal zone close to the proposed development is in an almost pristine condition and has a high landscape value as a result of its geology and geomorphology. It enjoys an

uninterrupted view from Zonqor point to Xghajra. The coastal waters are degraded by the sewage discharge off Wied Ghammieq to the North West of the site.

The face of the excavation needs to be monitored during excavation for the appearance of fissures that produce failure of the rock faces since this may cause rock face collapse.

Periodic checks of the sewage effluents and other waste disposal systems would ensure that no harmful substances are leaked to the ground. Groundwater analysis as part of the baseline study would produce a baseline water quality which would serve as a base for future monitoring of the water quality in case second class water generated at the plant will be utilised for irrigation purposes.

Although a development site might be considered to have little impact on some of the components of the geo-environment: geology including mineral resources, geomorphology, palaeontology, geomorphology, soils, hydrology and hydrogeology, water quality – the residual impact is always present.

5. VISUAL AND LANDSCAPE ASSESSMENT

A landscape and visual assessment has been carried out in order to determine the potential landscape and visual impacts of the proposed development upon the site and surrounding area. The overall significance of visual impacts for the initial site development has been assessed, as has the sensitivity of the landscape to the type of development proposed.

The landscape character assessment concludes that overall the proposed development would have a substantial impact on landscape character in comparison with the existing situation. This reflects the change in landscape character that will result from the proposed development in comparison with the existing site usage.

The visual assessment confirms the proposed site as being visible from mostly areas downhill of the Ta' Barkat area to the north and north east, whereas being generally screened by rubble walls, trees and other structures in the vicinity, uphill of Ta' Barkat. As a result the visual impact of the development is expected to be moderate. This has been demonstrated through the use of photomontages with respect to principal viewpoints.

Considering that, this application presents a change of use from agricultural land to a sewage treatment plant, the generally sloping topography of the Ta' Barkat area and, that some parts of the proposed structures will be visually screened from some selected viewpoints, the proposed development represents a moderate visual impact on the surroundings. The proposed soft landscaping measures should minimise the contrasting features of the development and reduce significantly the zone of visual influence of the proposed sewage treatment plant.

6. AIR QUALITY

The relatively low levels of emission of gaseous parameters do not present potentially cumulative impacts. The combustion of methane would certainly increase the overall national emissions of combustion gases. However this should be weighed against the mitigation of further production of methane from the separated solid sludge which otherwise would have been converted to methane and other gases. Accidental excessive dust emissions may occur due to vehicle collisions however the impact would be isolated to a controllable area which could be rectified. The probability of an increased negative effect from vehicle fuel combustion is negligible compared to the existing volumes of traffic.

7. NOISE AND VIBRATION

There are no other residential or commercial buildings close enough to the proposed development that merits a vibration survey. It is envisaged that regular close monitoring will only be required along the north-west, south and east boundaries of the whole Sewage Treatment Plant.

Due to the heavy trucks transferring materials off and on site, complemented with building activity, the present country roads will eventually not only get dirty, but also possibly subside under the heavy continuous pressure, especially in wet conditions, also increasing noise levels. Heavy trucks should therefore be limited to certain roads only and their claimed weight checked.

8. AGRICULTURE

The project area, where the proposed urban sewage treatment plant is to be situated, measured approximately 41,000 m^2, and was situated on the South Easterly coast in the area known as Ta' Barkat, limits of Xghajra. The entire agricultural study area consisted of approximately 232,000 m^2, and covered the locations known as Ta' Barkat, and San Leonardu.

The agricultural study area had scenic features and significant landscape value. It was largely characterised by small sized, steeply terraced abandoned agricultural land on Globigerina limestone. Large parts of the study area were not in agricultural use and some featured semi-natural habitats. Some of the field parcels were used for bird trapping. In general, the area was characterised by moderate soil cover, dense vegetation and some trees especially within the field boundaries. The topography of the area was complex and terraced, and most of the fields were demarcated by soil-retaining rubble walls.

Out of a total of 101 land units included in the field-by-field survey, 78 consisted of agricultural land parcels. Of these, 37 fields were abandoned, and 42 parcels were cultivated. 23 of the land units were devoted to non-agricultural uses, including semi-natural habitats, bird trapping activities, and some built-up structures. The main agricultural system, typified by the few fields that were cultivated at the time of the baseline survey, was that of low

intensity traditional agricultural farming. Most of the parcels had fair accessibility and fairly well-maintained retaining or boundary stone walls.

The soil landscape unit in the study area consisted of steep terraces on Globigerina Limestone. Most soils were less than 50 cm deep, though pockets of deeper brown soils could be common. The most common types of soils were Calcari-Lithic-Leptosols and Epileptic or Endoleptic Calcisols. According to Lang's (1960) map, the soils in the study area had been categorised mostly as L'Inglin complex.

In general, the study area consisted of agricultural land of low value. This is the result of several factors, including the small size of most of the parcels, poor accessibility, shallow soils or rock outcrops, and severe limitations to crop production as a result of coastal exposure. According to the FAO land suitability evaluation system (FAO, 1976), agricultural land in the study area would be classified as S3srm, meaning that the land is marginally suitable for agricultural production and that the main limitations are the salinity, rock outcrops, and moisture deficit.

The proposed development of the South sewage treatment plant at Ta' Barkat L/O Xghajra would result in a number of impacts on the agricultural landscape. The anticipated impacts during the construction phase of the plant are likely to be of a different nature to those impacts that are likely to occur during the operational period. The major impacts on agricultural land and soils are the change in the rural and landscape value of the area, the direct loss of agricultural land and associated soil disturbance as a result of the change of use of land from predominantly rural to a built up area, as well as the expected change in agricultural systems in areas in the vicinity of the plant that are likely to make use of the treated sewage effluent for irrigation.

Since mitigation measures are not always adequate to reduce the impact of agricultural land consumption, compensation should be provided for any loss of productivity and profitability as a result of the direct loss of land that is anticipated in the project area. The loss of rural characteristics and landscape features as a result of the change in land use cannot be mitigated. The proposed project shall not have any residual impacts on agriculture.

Given that the impact on agricultural land quality is minimal, of low significance and wherever relevant, of a permanent, irreversible nature, there exists little justification to implement a monitoring programme. A soil quality monitoring programme should however be implemented in the agricultural areas that are to be provided with treated sewage effluent if this shall be the case. This programme shall focus on soil quality indicator chemical parameters, including soluble salts, and heavy metals.

9. ARCHAEOLOGY

The area of Ta' Barkat, lies on the undeveloped coastal area between Xghajra and Marsascala. It is mainly used for agricultural purposes, while there is also the San Leonardu rural hamlet together with a number farms in the vicinity. The area in question is not very well documented, except for the defense heritage of the area.

The topography of the area encouraged a dual military/agriculture use: the terraced fields were ideal for cultivation, while the exposed coastal area that was relatively close to the Grand Harbour had to be fortified in order to enhance local defences.

The rural structures within the study area included a two-storey field room, a cluster of field rooms forming a farmhouse complex, a small field room built in the dry stone technique that is incorporated in the boundary wall forming country track BRK06/009. Another field room within the Application Site has been considerably altered to suit the needs of its present with a cement-covered wall and a columned portico. A number of rural structures are being utilized as trapping huts, rural storage facilities and associated rural activities.

Rubble walls are considerable in the area, given that the slope has been terraced in order to retain the soil and build fields on these terraces. These are very homogenous in regards to types of stone used, thickness and height, and are mostly well-maintained by the farmers and hunters. Accordingly, it is difficult to identify any type of phases in the construction of these walls. In principle these should be preserved and well-maintained.

The military use of the area formed part of the line of fortifications along the south-east coast of the Maltese Islands that stretched from the Grand Harbour to Marsascala and Marsaxlokk. Military defence was provided by the Knights' entrenchment works that stretch from Ricasoli to Ras iz-Zonqor, the Delle Grazie Battery and Fort San Leonardo, as well as numerous pillboxes that dot the area. The Knights' entrenchment works are visible just outside the Area of Influence as shown in Drawing 10.3.

Other structures within the study area associated with the history of military use include a Beach Defence Light Emplacement, a Beach Defence Post (pillbox) both associated with Fort St. Leonard above the slope of Ta' Barkat. The Xghajra coastline is dotted with such features which should be considered as whole rather than singular units. None of the pillboxes occur within the Application Site and these will not be affected by the proposed development.

Another feature related to Fort St Leonard was the San Leonardu Position Finding Station, which function was to increase fire control at distant and fast-moving targets. The military character of the area should be taken into account when considering this proposed development. The features mentioned above are all linked together and until now, each feature remains visible from the other. This situation should be preserved, since their location in the landscape is an essential attribute to the cultural value of the features and the landscape as a whole.

Within the Area of Influence lies Il-Kunvent, also known as "Id-Dar tal-Barunessa". This has been scheduled as Grade 2 by GN492/2006 and consists of The Chapel of San Leonardu and an adjacent country villa and garden, representing a villa typically built by Maltese nobles outside the walled cities of Mdina, Valletta and Birgu as country estates. While the façade is relatively plain, the arches and apertures are all intricately ornate, and the whole complex forms a rugged skyline that is hardly visible from the foot of the slope near the sea.

10. ECOLOGY

An assessment of the potential impacts of the proposed development upon the ecological value of the site has demonstrated that the proposed development will result in the removal of some natural vegetation and alteration of habitats within the area, and also possibly its surroundings if proper mitigation measures and careful construction activities are not adopted.

The site at Ta' Barkat has been in use for agricultural purposes for many years, and the natural habitats occurring within the area are mostly located within areas which have not been cultivated or have been abandoned over the years. These thus constitute various rubble walls and abandoned fields within the footprint itself. Nonetheless, the coastal garigue and associated coastal areas present sensitive ecological receptors which although not falling within the footprint of the development, host some rare and important species that may be affected by construction and operational activities uphill. Various measures should thus be adopted to limit the impact of the development to as little an area as possible.

If adopted, proposals for boundary and on-site landscaping in order to visually screen the development will create additional habitat at the site thus mitigating the loss of habitats from the footprint. The plant will be designed and operated to modern standards and consequently off site impacts should be very limited. The development is not considered likely therefore to have any adverse impacts on the integrity of the surrounding habitats during its operation and during the construction period if the suggested mitigation measures are adopted.

11. PUBLIC HEALTH

An estimated 25 million m^3 of raw sewage produced in Malta is discharged per year into the sea. According to the State of the Environment Report 2005 only approximately 6.4% of sewage was treated in 2004, the rest being discharged untreated into the marine environment. The only wastewater treatment plant in Malta is the Sant' Antnin Wastewater Treatment Plant (SASTP). The Sant' Antnin Plant has been in operation since 1983. The plant was originally designed for a capacity of 12,000m^3/day but until the early 90s was treating only 7,000m^3/day, a figure which at that time equated to less than 10% of the sewage production total in Malta and Gozo. The plant currently treats about 5,200 m^3/day of sewage a day which is used for the irrigation of arable agricultural land, situated in the vicinity of the plant.

Waste water contains heavy metals from the many industries located along the catchments area. However, the heavy metal content is generally low due to dilution of industrial wastewater by other wastewaters. The by-product of sewage treatment (i.e. sludge), also potentially containing heavy metals and other contaminants, is discharged, untreated, and its exact composition is unknown.

Solids and chemical substances make up only 0.1% of the pollutants in municipal sewage, organic matter accounts for close to 70% of these pollutants, and inorganic matter 30%. The concentration of suspended solids, both organic and inorganic, generally varies from 100 to 400 mg/L, while the Biological Oxygen Demand (BOD), which is a measure of organic matter and provides an accurate indicator of water quality, also varies from 100 to 400 mg/L.

The concentration of phosphorus can reach 15 mg/L. In addition to these pollutants, municipal sewage contains varying amounts of synthetic chemicals (solvents, PCBs, acids, etc.) from industrial and commercial sources, as well as many groups of micro organisms, particularly coliforms, viruses, and certain parasites, including protozoans and helminths. A large part of these pollutants are ultimately found in wastewater treatment sludge.

Employment opportunities for this plant will include around 80 full time equivalents during its construction and implementation (of around 12 months) and 20 during the operational phase.

The construction of the South Sewage Treatment Plant (SSTP) at Ta' Barkat will:

- Restore bathing water quality to the 4km coast between Ricasoli & Marsascala,
- Eliminate all raw sewage to the sea, together with the unsightly sewage plume slicks and associated health risks,
- Eliminate all odour emissions,
- Increase residential & recreational value of the South East coastal area,
- Improve tourist potential of the South East coastal area,
- Generate treated effluent for reuse.

While treatment facilities certainly improve the quality of sewage discharged into the marine environment by reducing its pollutant concentration, it is important to bear in mind that the water discharged is not pure and can have potential effects, particularly in the plume – i.e. the area in and downstream from the discharge zone.

The proposed plant will incorporate a fully automated secondary or biological process (Biological Aerated Filter – BAF) with tertiary treatment of wastewater (Treated Effluent Polishing) which is designed to produce highly polished non-potable, water. Tertiary treatment will take the form of sand filtration with the elimination of particles and micro-organisms, organic matter and UV disinfection.

12. RISK ASSESSMENT

A Nuisance and Health Risk Assessment (NHRA) was prepared in support of the development of a new urban waste water treatment works. Potential nuisance and health risks arising from the disturbance and development of the former abandoned area were considered. A Risk screening exercise was conducted consisting of four main elements to identify the existence of potential hazards and receptors. These are:

1. Risk Identification Matrix
2. Hazard List
3. Receptor List
4. Receptor Assessment

No account was taken of the existence or non-existence of pathways or mitigation measures and the probability of consequences are assumed to be absolute.

The Risk Identification Matrix Table identified the risks associated with the construction and operation of the SSTP. The matrix identifies all potential source-pathway-receptor linkages. Within the matrix, generic receptors were identified within 500m of the installation boundary. These include large warehouses nearby, an abandoned convent and residential dwellings amongst others.

Having identified the generic hazards, the existence of a pathway between the hazard and receptors was considered. For these hazards the pathway is normally airborne and therefore the pathway will always exist.

A Hazard List for construction and operational phases lists the hazards that the installation presents and where there is a source-pathway-receptor linkage as identified in the Risk Assessment Matrix.

The hazards that have been identified include inert dusts and bioaerosols generated from excavations, vehicles and engineering works during the construction phase; and inert dusts and bioaerosols generated from the waste treatment process, maintenance works, and biogas generation during the operational phase.

Vehicles and excavation activities are the likely causes of noise hazards during construction works, whereas the operational phase of the project is expected to generate occasional and infrequent noises mainly arising from the waste treatment process and activities related to maintenance, repair and cleaning of the STP. Noise from the operation of boilers, generators etc. are also expected.

Odours are expected to be contained within the plant itself during the operational phase of the project except for occasional emissions in the eventuality of breakdown or plant maintenance. Malodorous sources will include diffuse releases of methane during combustion, biogas generation and waste storage.

Litter hazards will mainly result from the construction phase of the project, mainly arising from construction and excavation wastes. A potential for wind blown wastes from the STP is also possible during the operational phase.

Any hazards that may be posed from vermin will materialise only in the eventuality that a breakdown of the STP occurs or from exposed organic waste, receipt pits and pipelines during the operational phase.

Any hazards arising from muds on road surfaces were also assessed. These will only pose a risk during the excavation and construction phase of the project and during occasional maintenance repair and cleaning activities.

A number of receptors were identified, the location of which is given in the respective drawings. The sensitivity of a receptor was based on the receptor type and characteristics, its location and the pathway between the receptor and the identified hazards. Past complaints and incidents were also considered.

A qualitative assessment on the sensitivity of the receptor was made with reference to information from proposed site construction activities and future operational phase activities

of the site being taken into account. All of the receptors were assessed as having low to medium sensitivity. No complaints have been received with relation to health concerns or nuisance due to wastes originating from the activities at the site.

In conclusion, overall, the risks posed to 18 receptors were assessed as being from medium to low, therefore no further study or assessment is required.

13. WASTE MANAGEMENT

The developer is committed to adopt and apply best practices for the separation, collection and disposal of waste. The potential sources of liquid and solid wastes generated from the development include:

A) Excavation and Construction Waste: The project will generate an estimated of 385,000m^3 of excavated material, 257,000m^3 of which are to be reutilised and 128,000 m^3 to be disposed of at sea or in an authorised facility. Two Barge Berthing Locations, one at Rinella and the other at Xghajra have been proposed.

For the Xghajra option, a ramp and a quay will however need to be constructed using excavated material. The waste will then be disposed of in an offshore spoil ground located at latitude 33 DEG 55.1 N' and longitude 14 DEG 34'E. A number of routes for the ca. 120 trucks per day have also been proposed.

As for the Rinella option further away, this option will generate traffic towards that area. Yet this location does not need the construction of a quay.

An alternative option is to dispose of excavated waste at an authorised inert facility such as a quarry. This is however up to the contractor to decide which authorised facility will be used.

B) Domestic waste: Produced mainly from daily administration activities and will be separated at origin into 3 main categories: Paper, Recyclable Plastic and Municipal waste, with a closed bin for each on site. Municipal waste will be disposed of at an authorised facility.

C) Stabilised and de-watered sludge: The plant will generate about 100m^3 of stabilised and dewatered sludge equivalent to about 6 to 7 truck loads a day. It is anticipated that an additional 1 to 2 truck loads of washed screenings will be transported away from the SSTP per day. The sludge and washed screenings will be transported in sealed containers to landfill as formerly agreed and recently confirmed with WasteServ.

The Water Services Corporation will employ a procedure of informing employees, personnel and contractors on the types of waste streams, their labelling, packaging and waste minimisation requirements and practices.

14. ENERGY ASSESSMENT

The prepared energy assessment presents details on a) the energy supply to the proposed development; b) an estimate of the energy requirements needed; and c) recommendations relating to alternative technologies aimed at minimizing the use of energy throughout all utilities and uses.

Considering a power factor of 0.8, the maximum power demand of the plant is estimated to be 4014 kW, 38% of which will be consumed in the mechanical treatment process, 57.2% for the biological treatment process, 2.3% for the sludge treatment process, and the remaining 2.5% for lighting and socket outlets. It should be noted that the percentage of energy recovery and power consumption will be subject to the awarded contract design specifications and actual figures will only be known with certainty during operation. It is however estimated that the plant will produce 900kW of electrical power, generated through the utilization of produced biogas and 1400kW of heat power through the burning of biogas which shall be utilized to heat the digestion plant and other facilities.

These shall be provided through an energy recovery plant which function is to minimise the consumption of electricity. This plant is a cogeneration plant running on biogas in order to produce both electrical and thermal energy. The anaerobic sludge digestion will generate biogas (mostly methane) as a byproduct, which on combustion may supply 32% of the plant's electrical energy demands. The power recovery through the biogas power plant, is however dependent on the quality and quantity of sewage arriving at the sewage treatment plant. The power plant will also generate heat energy which can be directed towards the various processes where it is required.

Recommendations are being made for the setup of the external lighting system in various areas which aims are the reduction of energy wastage, glare, light trespass and sky glow. These are also of concern in terms of light pollution and the environmental impact, and include the use of light level sensors, long-lasting compact fluorescent bulbs, careful selection of appropriate luminary power, solar-powered lighting, motion sensitive lighting at entrances, the use of occupancy sensors, reflectors. Lighting poles should also be properly localized and shielded.

15. SOCIAL IMPACT ASSESSMENT

This report presents an evaluation of a phone survey of the resident and visiting population mostly affected by the proposed wastewater treatment plant at Ta' Barkat. It is meant to gauge the perceived social costs and benefits as viewed by the same population.

The Report finds that the sampled population is generally not well informed of the project, and therefore is not very well prepared to give a well-informed opinion about how the project is likely to affect them.

In spite of this noted shortcoming, the population has indeed offered to voice an opinion. The majority of the respondents were in favour of the project, in view that they believe that the

benefits would exceed the costs. This eagerness in favour of the project is less strong in the well-informed than the rest of the population.

This notwithstanding, the population generally has various fears and concerns about the proposed plant, most related to bad odours, noise, aesthetics, risks of accidents, and other risks such as health related ones.

The majority of respondents consider their property prices will be affected either negatively or not at all as a result of the plant.

16. CONSTRUCTION OF SEWAGE INTAKE PUMPING STATION AND SEWAGE GALLERY

A sewage intake pumping station (PS) is required to lift all incoming sewage to the treatment plant's primary stage. The new gallery conveying the sewage by gravity to the plant will terminate at an invert 2m above sea level. The further inland the SSTP the larger the static head the PS will require, hence its coastal location is inevitable from all standpoints, being technical, financial and operation and maintenance related.

SEWAGE INTAKE PUMPING STATION

The Sewage Intake Pumping Station is required adjacent to Il-Golf tal-Blata l-Bajda, off the existing coast road, in view of the following constraints:

- The distance of the pumping station from Kalkara is tied down by the gradient of the gallery running from Paola. Locating the intake pumping station further away from its position would require a structure below sea level which is unacceptable.

- The PS is currently located at an elevation of about 15m which will result in a 15m deep pumping station down to the mean sea level sump invert. A deeper pumping station will render it inaccessible for safe maintenance by WSC personnel.

- A 5m wide access road will have to be constructed between the lower end of the STP site and the intake PS area for
  - Routine maintenance, loading of screenings and inspection of the pumping station by STP personnel, the pumping station being an integral part of the STP set up.
  - To house a dual DN 700 pressure main and a DN 800 gravity main acting as an excess Treated Sewage Overflow from the STP to the sea.

SEWAGE GALLERY

Site investigation along a segment of the proposed gallery from Zabbar to Blata il-Bajda revealed that the rock may be described as a limestone moderately weak to moderately strong. The tunnel route appears to lie entirely in Lower Coralline Limestone and an estimate 70% of the rock to be cut during the tunnel construction would make a very poor quality aggregate.

Stability problems might arise due to bedding observed in the rock especially when it is thin and weak rock. No cavernosity, faults and fractured rock associated with fault zones have been noted during the survey

DESCRIPTION OF IMPACTS

Impacts on Land use of the PS and the sewage gallery, their significance and mitigation measures will be similar to the remaining project area. The PS will be situated on Globigerina Limestone as the remaining project area, hence impacts and mitigation measures will be similar to those assessed for the latter. The gallery will lie entirely in Lower Coralline Limestone.

The PS and the gallery will be situated underground. The PS will also have a first storey building, which will not pose any considerable affect on the visual or landscape integrity of the site. Additionally the scar in the ground resulting from the respective pipelines will be screened by the proposed soft landscaping measures.

Considering the small scale of this area with respect to the project area, no significant increase in dust emissions are anticipated from construction. The PS shall constitute a sealed environment from which no leakages or emissions of gases are expected. The noise and vibration generation from the pumping station is assessed in the Noise and Vibration Impact Assessment since the project was considered holistically for such an assessment.

The proposed location for the proposed PS and sewage gallery shall present no impact on agricultural land use, since the land that shall be taken does not constitute any land of agricultural value. The site for the PS and gallery presents no features of archaeological or cultural importance. It is mainly constituted by grassland which is a common feature in the Ta' Barkat area. The ecological impact associated with such is the loss of a part of such habitat. The proposed development lies outside Areas of Ecological Importance and Sites of Scientific Importance.

During construction and operation, the impacts of the gallery on geology and palaeontology which might arise due to the removal of rock strata are deemed insignificant. The lining of the gallery with an impermeable layer will avoid all impacts on hydrogeology. No fuels or other potential contaminants will be stored in the gallery during construction. Any potential instability of the gallery which might arise due to rock wedge failure in connection with fractures could be controlled by rock bolting and/or shotcrete.

17. SECONDARY AND CUMULATIVE IMPACTS

Secondary (or indirect) effects are consequences brought about by a given development and which either become apparent later in time or are at a considerable distance away. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and on the natural systems, including ecosystems.

Cumulative impacts are impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The Smart City Development some 1.3km to the north west of the proposed sewage treatment plant will present a scenario where the village of Xghajra shall be exposed to impacts associated with construction activities to its north west and south east simultaneously. Of consideration is also the rapid sprawl of residential development that Xghajra is experiencing at the present day.

It is expected that there will be significant secondary (indirect) or cumulative impacts on the environment as a result of the proposed development in view of other developments proposed in the vicinities. Most of these significant impacts to the environment are long-term and/or dependant on the potential occurrence of an unlikely accident, the timeframes of construction activities and the related amenity uses of the area and its surroundings as a result of the named developments.

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1. INTRODUZZJONI U ĠUSTIFIKAZZJONI TA' L-IŻVILUPP

L-għanijiet ta' dan il-proġett ġejjin minn taħlita ta' obbligi internazzjonali u bżonnijiet ekonomiċi reġjonali/lokali li jitjieb l-ambjent u b'hekk il-potenzjal turistiku tal-Gżejjer Maltin jitħares u jiżdied, bit-titjieb tal-kwalita' tal-ilma mal-kosta tal-lvant ta' Malta.

Bħalissa d-drenaġġ kważi kollu tan-Nofsinhar ta' Malta jiżbokka f'Wied Għammieq fil-limiti tal-Kalkara u ma jiġix trattat qabel ma jispiċċa fil-baħar. Madwar 17% tad-drenaġġ kollu jiġi trattat fl-Impjant għat-Trattament ta' Sant'Antnin (ITSA), u l-Impjant għat-Trattament tad-Drenaġġ f'Għawdex riċentament ikkommisjonat, bl-ilma trattat li joħroġ mill-ITSA jintuża' għat-tisqija.

Fid-dawl tad-Direttiva 91/271/EEC tal-KEE msejħa Trattament tad-Drenaġġ Urban, sal-31 ta' Marzu 2007 r-rimi ta' drenaġġ mhux trattat irid jispiċċa għal kollox. Il-*Master Plan* għad-Drenaġġ tal-Gżejjer Maltin ta' l-1992 jispeċifika li hemm bżonn għallinqas tliet impjanti għat-trattament tad-drenaġġ biex jittrattaw il-madwar 25 miljun metru kubu ta' drenaġġ li jintefa' fil-baħar kull sena.

Sabiex jitratta 80% tad-drenaġġ kollu ġenerat fil-Gżejjer Maltin, il-Korporazzjoni għas-Servizzi ta' l-Ilma (WSC) qed tippjana li tibni impjant għat-trattament tad-drenaġġ għan-Nofsinhar ta' Malta, li se nibdew insejħu l-Impjant għat-Trattament tad-Drenaġġ tan-Nofsinhar (ITDN), pompa tad-drenaġġ u mina ġdida twila 1.7km li twassal id-drenaġġ bil-gravità sal-pompa tad-drenaġġ. Is-sit għall-ITDN, li fih madwar 41,000m^2, se jkun fil-kosta tax-Xlokk fl-inħawi magħrufa bħala Ta' Barkat, fil-limiti tax-Xgħajra.

2. IL-POLITIKA TA' L-IPPJANAR U L-LEĠISLAZZJONI

Il-politika dwar l-ippjanar lokali li tirrigwarda t-trattament tad-drenaġġ tinstab fid-dokumenti ewlenin li ġejjin:

- Il-Pjan ta' Struttura għall-Gżejjer Maltin
- Il-Pjan Lokali għan-Nofsinhar ta Malta
- Il-Mapep fil-Pjan Lokali għat-Tramuntana ta' Ħaż-Żabbar

Il-leġislazzjoni Maltija li għandha x'taqsam ma' l-iżvilupp ta' l-impjant tad-drenaġġ propost fil-qosor hija din:

- *L-Att ta' l-Ippjanar ta' l-Iżvilupp, 1992* li jitlob li l-implimentazzjoni ta' l-iżvilupp tkun ikkontrollata minn sistema ta' permessi.
- *L-Att dwar il-Ħarsien ta' l-Ambjent, 1991* li għandu x'jaqsam mal-kwalità ta' l-ambjent u l-protezzjoni tiegħu.
- *Avviż Legali 8 ta' l-1983* li jistabbilixxi r-regolamenti dwar il-kontroll ta' l-iżbokk tad-drenaġġ.
- *Avviż Legali 311 ta' l-2006*. Din il-leġislazzjoni twaqqaf il-'Qafas Ekoloġiku Nazzjonali' u tinkludi l-inħawi u l-ispeċi protetti fil-Gżejjer Maltin.

- *Ir-Regolamenti ta' l-1997 dwar il-Ħitan tas-Sejjieħ u Strutturi Rurali (Konservazzjoni u Manutenzjoni)* li għandhom x'jaqsmu mal-ħarsien tal-ħitan tas-sejjieħ u strutturi rurali oħra mhux abitabbli.

Il-*policies* internazzjonali jinkludu:

1. *Il-konvenzjoni ta' Barċelona* li wasslet għall-addozzjoni tal-Pjan t'Azzjoni għàll-Mediterran (PAM).
2. *Id-Dikjarazzjoni ta' Ġenova* li identifikat għaxar inħawi ta' ħidma.

Il-Komunità Ewropeja waqqfet numru ta' programmi ambjentali. Direttivi oħra tal-Komunità Ewropeja jinkludu:

- Direttiva 160/76 KEE li għandha x'taqsam mal-kwalità ta' l-ilma għall-għawm.
- Direttiva 464/76 KEE dwar it-tniġġiż ikkawżat minn ċerti sustanzi perikoluži li jintefgħu fl-ambjent akwatiku.
- Direttiva li tillimita l-ammont u tagħti għanijiet dwar il-kwalità ta' ċerti sustanzi perikoluži inkluži fl-Anness għal Direttiva 464/76 KEE. (Direttivi 280/86 KEE, 347/888 KEE u 415/90 KEE).
- Direttiva dwar il-kwalità meħtieġa mill-frott tal-baħar (Direttiva 923/79 KEE).
- Direttiva dwar il-ħarsien ta' l-ilma mit-tniġġis minn nitrati ġejjin mill-agrikoltura (Direttiva 676/91 KEE).
- Direttiva dwar l-iskart (Direttiva 442/75 KEE emendata minn 156/91).

3. L-UŻU TA' L-ART

Is-sit propost f'Ta' Barkat jista' jintlaħaq minn mogħdija li tgħaddi mal-kosta tax-Xgħajra minn Triq Dawret ix-Xatt. L-inħawi tal-mogħdija jikkonsistu l-aktar f'art mitluqa u xagħri kostali degradat li jgħaddi għal xagħri kostali fuq xatt mimli blat lejn il-lvant tal-passaġġ. L-inħawi Ta' Barkat jinsabu 'l ġewwa minn din il-mogħdija u jikkonsistu l-aktar f'art agrikola, li biċċa minnha ġiet abbandunata u/jew qed tintuża għàll-kaċċa jew insib. L-attività agrikola mhix intensa fl-inħawi u l-għelieqi kollha huma mdawra bil-ħitan tas-sejjieħ minbarra veġetazzjoni ħdejhom li tinkludi diversi siġar. Mogħdija oħra, li tgħaddi mil-lvant ta' l-inħawi proposti, tgħaqqad il-mogħdija ta' max-xatt ma' Triq Leonardu fuq in-naħa ta' kunvent abbandunat li għandu valur storiku.

4. IL-ĠEOLOĠIJA, IL-ĠEOMORFOLOĠIJA U L-IDROLOĠIJA

Saret investigazzjoni ddettaljata tas-sit. Ir-riżultati ntużaw bħala bażi għad-disinji ta' l-iżvilupp propost. L-inħawi proposti għall-iżvilupp m'humiex rikonoxxuti bħala sors ta' franka tajba. Għalhekk, impatt kbir se jkun il-materjal ta' ġebel li se jiġi skavat. Kemm se jkun l-ammont jiddependi minn kemm se jkun hemm bżonn tħaffir għall-impjant tat-trattament tad-drenaġġ propost.

Iż-żona tal-kosta qrib l-iżvilupp propost tinsab f'kundizzjoni kważi naturali u għandha valur pasjaġġistiku kbir minħabba l-ġeoloġija u l-ġeomorfoloġija tagħha. Tgawdi veduta mhix interrotta minn Ras iż-Żonqor sax-Xgħajra. L-ilmijiet tal-kosta huma degradati mit-tisfija tad-drenaġġ lilhinn minn Wied Għammieq fil-punent tas-sit.

Il-wiċċ fejn se ssir l-iskavazzjoni jrid jiġi moniterat matul l-iskavazzjoni għal xi konsenturi li jistgħu jidhru li mbagħad iwasslu l-blat biex iċedi u għandu mnejn jaqa'. Inċidenti bħal dawn jistgħu jweġġgħu lin-nies u jipperikolaw il-propjetà ta' terzi persuni.

Eżamijiet perjodiċi ta' l-ilma tad-drenaġġ u sistemi oħra ta' dispożizzjoni ta' l-iskart għandhom jassiguraw li ma jkunx hemm sustanzi li jagħmlu ħsara li jispiċċaw fl-art. L-analiżi ta' l-ilma ta' l-art bħala parti mill-istudju bażi għandu jipproduċi l-kejl ta' l-ilma bażi li mbagħad iservi ta' bażi għall-moniteraġġ tal-kwalità ta' l-ilma fil-futur f'każ li l-ilma tat-tieni klassi mill-impjant jintuża għat-tisqija.

Minkejja li sit ta' l-iżvilupp jista' jiġi kkunsidrat li ftit ikollu impatt fuq xi komponenti ta' l-ambjent ġeoloġiku: il-ġeoloġija tinkludi riżorsi minerali, ġeomorfoloġija, palaeontoloġija, ħamrija, idroloġija u idroġeoloġija, kwalità ta' l-ilma – dejjem ikun hemm effett li jibqa'.

5. ANALIŻI TAL-VEDUTA U TAL-PAJSAĠĠ

Saret analiżi tal-pajsaġġ u tal-veduta sabiex jiġi determinat l-impatt potenzjali fuq il-pajsaġġ u l-veduta ta' l-iżvilupp propost fuq is-sit u fuq l-inħawi tal-madwar. Tkejjel l-effett ta' l-impatt viżiv waqt l-iżvilupp inizjali tas-sit, kif ukoll is-sensittività tal-pajsaġġ għat-tip ta' żvilupp propost.

L-analiżi tal-karattru tal-pajsaġġ ikkonkludiet li globalment l-iżvilupp propost se jkollu impatt sostanzjali fuq il-karattru tal-pajsaġġ meta mqabbel ma' l-użu eżistenti tas-sit.

L-analiżi tal-veduta kkonferma li s-sit propost jidher l-aktar minn inħawi li jinsabu 'l isfel mill-inħawi Ta' Barkat lejn it-Tramuntana u l-Grigal, waqt li jinsab ġeneralment moħbi minn ħitan tas-sejjieħ, siġar u strutturi oħra fil-qrib, aktar 'il fuq minn Ta' Barkat. B'hekk, l-impatt viżiv ta' l-iżvilupp huwa mistenni li jkun moderat. Dan intwera permezz ta' l-użu ta' ritratti mqegħdin fuq xulxin għal postijiet prinċipali.

Meta tikkunsidra li din l-applikazzjoni qed titlob bidla fl-użu ta' l-art, minn wieħed agrikolu għal impjant tat-trattament tad-drenaġġ, it-topografija mżerżqa ta' l-inħàwi Ta' Barkat u li xi partijiet ta' l-istrutturi proposti se jkunu moħbija minn xi nħawi, l-iżvilupp propost jirrappreżenta impatt viżiv moderat fuq l-inħawi. Il-miżuri ta' *soft landscaping* proposti għandhom jimminimizzaw il-karatteristiċi kuntrastanti ta' l-iżvilupp u jnaqqsu b'mod sinifikanti l-influwenza viżwali ta' l-impjant tat-trattament tad-drenaġġ propost.

6. IL-KWALITÀ TA' L-ARJA

Il-livelli relattivament baxxi ta' l-emissjonijiet ma joħolqux impatti li jistgħu jkunu kumulattivi. Il-ħruq tal-metanu għandu jkabbar l-emissjonijiet totali nazzjonali ta' gassijiet maħruqa. Madankollu, dan għandu jitkejjel mal-fatt li titnaqqas il-produzzjoni tal-metanu mid-drenaġġ solidu separat li kieku kien jispiċċa jinbidel f'aktar metanu u gassijiet oħra. Jista' jkun hemm emissjonijiet eċċessivi ta' trab minħàbba li jaħbtu xi vetturi imma dan l-impatt ikun iżolat għal inħawi kkontrollati u jkunu jistgħu jiġu rettifikati. Il-probabilità li l-effett negattiv mill-emissjonijiet tal-karozzi jiżdied hija negliġibbli meta titqabbel mal-volumi eżistenti ta' traffiku.

7. IL-ĦSEJJES U L-VIBRAZZJONIJIET

M'hemm ebda bini residenzjali jew kummerċjali qrib biżżjed lejn l-iżvilupp propost li jistħoqqlu studju tal-vibrazzjonijiet. Huwa previst li monitoraġġ regolari mill-qrib ikun meħtieġ biss fil-konfini lejn il-majjistral, nofsinhar u lvant ta' l-Impjant kollu Tat-Trattament tad-Drenaġġ.

Minħabba t-trakkijiet kbar li jitrasferixxu l-materjal lejn u mis-sit, flimkien ma' l-attività tal-bini, it-toroq tal-kampanja li hemm bħalissa mhux biss jitħammġu, imma probabilment iċedu bil-pressjoni kontinwa fuqhom, speċjalment meta jkunu mxarrba, u jiżdied ukoll il-livell tal-ħoss. It-trakkijiet tqal għandhom għalhekk jiġu limitati għal ċerti toroq biss u l-piż li jiddikjaraw jiġi ċċekkjat.

8. L-AGRIKOLTURA

L-istudju agrikolu kien ikkaratterizzat l-aktar minn art agrikola mtarrġa u wieqfa abbandunata fuq art tal-franka. Partijiet kbar mill-inħawi ta' l-istudju ma kienux qed jintużaw għall-agrikoltura u xi whud kellhom ħabitat semi-naturali. B'mod ġenerali, l-inħawi kienu kkaratterizzati minn fond moderat ta' ħamrija, veġetazzjoni folta u xi siġar speċjalment fil-konfini ta' l-għelieqi. It-topografija ta' l-inħawi kienet kumplessa u mtarrġa, u l-biċċa l-kbira ta' l-għelieqi kienu mmarkati minn ħitan tas-sejjieħ li jżommu l-ħamrija. Minkejja li l-għelieqi jidhru sbieħ ħafna ma' l-ambjent kostali, il-pożizzjoni kostali tagħhom tagħmilha diffiċli li jitkabbru l-ħxejjex minħabba l-konċentrazzjoni għolja ta' melħ.

Minn total ta' 101 għalqa li ġew studjati, 78 minnhom kienu jikklassifikaw bħala art agrikola. Minn dawn, 37 kienu għelieqi abbandunati, filwaqt li t-42 l-oħra kienu maħduma. 23 għalqa m'humiex jintużaw ghall-agrikoltura imma qed jintużaw għall-insib, duri u kmamar jew jinstabu maħkuma minn veġetazzjoni semi-naturali. Ftit għelieqi kienu maħduma fiż-żmien li sar dan l-istudju, minħabba l-fatt li l-attivita' agrikola f'dawn l-inħawi m'hijiex intensiva. Il-bicca l-kbira tal-għelieqi jistgħu jiġu milħuqa minn diversi nħawi, u l-ħitan tas-sejjieħ li jdawwru kull għalqa f'dawn l-inħawi huma mizmuma tajjeb.

Il-ħamrija fl-inħawi hija ġeneralment fonda madwar nofs metru, b'xi partijiet iżolati iktar fondi minn hekk, u tinsab fuq megħded mtarrġa ta' Franka. It-tipi ta' ħamrija li jinsabu hawnhekk huma dawk li jissejħu *Calcari-Lithic-Leptosols* u *Epileptic* jew *Endoleptic Calcisols*. Skond mappa ta' Lang ippublikata fl-1960, l-ħamrija fl-inħawi ta' l-istudju hija dik magħrufa bħala *L'Inglin complex*.

Il-valur ta' l-art agrikola fl-inħawi li ġew studjati huwa kkunsidrat baxx, minħabba li l-għelieqi huma żgħar, mhumiex milħuqin sew, m'għandomx ħamrija fonda, u huma esposti għall-ambjent marittimu. Skond sistema ta' valutazzjoni tal-FAO (FAO, 1976) l-art agrikola ta' dawn l-inħawi hija kklassifikata bħala S3srm, li jfisser li din l-art mhix wisq adattata għall-produzzjoni agrikola minħabba l-imluħa, diversi rqajja' ta' blat u nuqqas ta' ilma.

L-impatti fuq l-art agrikola u fuq il-ħamrija huma li l-valur tal-pajsaġġ fl-inħawi se jinbidel. It-telf ta' art agrikola u l-ħamrija li tiġi mirduma (jew f'dal-każ tneħħija ta' ħamrija) bħala konsegwenza ta' l-urbanizzazzjoni ġie identifikat bħala waħda mit-theddidiet kbar għall-agrikoltura u l-ħamrija. F'dan il-każ, fl-użu ta' l-art u t-telf ta' art agrikola u ħamrija marbuta magħha hija ta' sinifikat żgħir minħabba li l-inħawi fejn se jsir il-proġett hija primarjament non-produttiva u għandha diversi limitazzjonijiet għall-produttività. Dan jgħodd l-aktar għall-għelieqi li jinsabu jmissu mal-baħar. Dan ifisser li t-telf mistenni mill-produzzjoni agrikola u l-produzzjoni għas-suq se jkun minimu u ta' ebda valur sinifikattiv. Bidliet ohra huma marbutin mal-possibilta' ta' l-użu ta' ilma trattat, li ha jiġi prodott mil-impjant.

L-iżvilupp ta' l-impant tat-trattament tad-drenaġġ aktarx iwassal biex karatteristiċi rurali bħall-ħitan tas-sejjieħ u mogħdijiet tal-ġebel jintilfu għal dejjem, partikolarment fl-inħawi tal-proġett, imma jista' jkun ukoll fl-inħawi affettwati, minħabba żviluppi infrastrutturali anċillari, bħat-twessigħ tat-triq li twassal għas-sit u l-provvista tas-servizzi (trinek għall-*cables*, katusi, eċċ.) matul il-fażi tal-kostruzzjoni. It-telf ta' dawn il-karatteristici ma jistax jitpatta b'mod ieħor.

Minħabba li l-biċċa l-kbira ta' l-art agrikola fis-sit għandha valur agrikolu u sinifikat baxx, u minkejja li t-telf tal-art agrikola ħa jkun permanenti u rriversibli, m'hemmx skop għal programm ta' monitoraġġ. Fil-kaz li ilma trattat ħa jibda jintuża għas-saqwi fuq l-uċuh tar-raba' tal-inħawi, l-kwalita' tal-ħamrija għanda tiġi valutata perjodikament. Dawn l-istudji għandhom jiffukaw fuq kimiki li jindikaw il-kwalita' tal-ħamrija bħal nutrijenti u metalli.

9. L-ARKEOLOĠIJA

L-inħawi Ta' Barkat jinsabu fuq il-kosta mhix żviluppata bejn ix-Xgħajra u Wied il-Għajn. Jintużaw l-aktar għal skopijiet agrikoli, waqt li hemm ukoll ir-raħal żgħir ta' San Leonardu flimkien ma' numru ta' rziezet fil-qrib. L-inħawi involuti m'humiex dokumentati tajjeb, ħlief għall-wirt marbut mad-difiża li hemm fl-inħawi.
It-topografija fl-inħawi ta' l-istudju wassal għal użu doppju, militari u agrikolu; l-għelieqi mtarrġa kienu ideali għall-kultivazzjoni, waqt li l-iħawi kostali mikxufa li huma relattivament qrib il-Port il-Kbir kellhom jiġu fortifikati biex titjieb id-difiża lokali.

L-istrutturi rurali fl-inħawi ta' l-istudju kienu jinkludu kamra b'żewġ sulari f'għalqa, ġemgħa ta' għelieqi f'għalqa biex jiffurmaw razzett, kamra żgħira f'għalqa mibnija bis-sejjieħ bħal dak li hemm fil-mogħdija BRKo6/009. Kamra oħra f'għalqa fis-sit inbidlet ħafna biex taqdi l-bżonnijiet ta' min jużaha bħalissa b'ħajt miksi bil-konkos u parapett bil-kolonni. Numru ta' strutturi rurali qed jintużaw bħala għerejjex għall-insib, faċilitajiet għall-ħażna u attivitajiet oħra rurali.

Hemm ħafna ħitan tas-sejjieħ fis-sit, minħabba li l-għolja ttarrġet sabiex iżżomm il-ħamrija u jinbnew għelieqi fuqha. Dawn huma omoġenji ħafna rigward l-użu tal-ġebla, kemm fit-tip, ħxuna u għoli, u jinżammu fi stat tajjeb mill-bdiewa u l-kaċċaturi. Għalhekk huwa diffiċli li tidentifika xi tipi ta' fażijiet fil-bini ta' dawn il-ħitan. Bħala prinċipju għandhom jiġu ppriservati u miżmuma tajjeb.

L-użu militari ta' l-inħawi kien parti mil-linja ta' fortifikazzjonijiet tul il-kosta tax-xlokk tal-Gżejjer Maltin li jieħdu mill-Port il-Kbir sa Wied il-għajn u Marsaxlokk. Id-difiża militari kienet ġejja mix-xogħlijiet ta' trunċieri tal-Kavallieri li jwasslu mir-Rikażli sa' Ras iż-Żonqor, il-Batterija Delle Grazie u Forti San Leonardu, kif ukoll għadd ta' pożizzjonijiet għall-ixkubetti li jimlew l-inħawi. It-trunċieri tal-Kavallieri jidhru eżatt kif toħroġ mill-inħawi milquta kif jidher minn Tpinġija 10.3.

Strutturi oħrajn fl-inħawi ta' l-istudju marbutin ma' l-istorja militari jinkludu pjattaforma għal kanun żgħir bix jiddefendi x-xatt u pożizzjoni għall-ixkubetta biex tiddefendi x-xatt, it-tnejn marbutin ma' Forti San Leonardu 'il fuq mill-għolja Ta' Barkat. Il-kosta tax-Xgħajra hija miżgħuda b'karatteristiċi bħal dawn li għandhom jiġu kkunsidrati flimkien u mhux separatament. Ebda minn dawn imsemmija ma jinsabu fis-sit ta' l-applikazzjoni u mhux ser jiġu affetwati bl-iżvillup propost.

Karatteristika oħra marbuta ma' Forti San Leonardu kienet is-San Leonardu Position Finding Station, li xogħolha kien li titjieb il-mira għall-isparar lejn bersalli mbiegħda u jimxu jgħaġġlu. Il-karattru militari ta' l-inħawi għandu jiġi kkunsidrat meta jiġi kkunsidrat l-iżvilupp propost. Il-karatteristiċi msemmijin hawn fuq huma lkoll marbutin flimkien u sa issa, kull waħda minnhom kienet tidher mill-oħra. Din is-sitwazzjoni għandha tiġi ppriservata, billi posthom fil-pajsaġġ huwa attribut essenzjali tal-valur kulturali tal-karatteristiċi nfushom u tal-pajsaġġ kollu.

Fl-inħawi milquta mill-proġett hemm Il-Kunvent, magħruf ukoll bħala "Id-Dar tal-Barunissa". Dan huwa skedat Grad 2 b'GN492/2006 u jikkonsisti fil-Kappella ta' San Leonardu u villa tal-kampanja li tmiss magħha, bi ġnien, li tirrappreżenta villa li tipikament kienet tinbena min-nobbli Maltin 'il barra mis-swar ta' l-Imdina, il-Belt u l-Birgu bħala djar tal-kampanja. Waqt li l-faċċata hija pjuttost sempliċi, il-ħnejjiet u l-aperturi huma mżejnin ħafna, u l-binja kollha tifforma xena li bil-kemm tisher mill-qiegħ ta' l-għolja ħdejn il-baħar.

10. L-EKOLOĠIJA

Analiżi ta' l-impatti li jista' jkun hemm mill-iżvilupp propost fuq il-valur ekoloġiku tas-sit uriet li l-iżvilupp propost se jwassal biex xi veġetazzjoni naturali titneħħa u l-

ħabitat jinbidel fis-sit, u possibilment ukoll fl-inħawi tal-madwar jekk ma jkunx hemm miżuri xierqa biex inaqqsu l-ħsara u jekk il-bini ma jsirx bl-attenzjoni.

Is-sit Ta' Barkat ilu jintuża għall-agrikoltura għal ħafna snin, u l-ħabitat naturali li ssib fl-inħawi ssibu l-aktar fl-inħawi li ma ġewx ikkultivati jew li ġew abbandunati matul is-snin. Dawn għalhekk jikkonsistu f'ħitan tas-sejjieħ u għelieqi abbandunati fis-sit innifsu. Madankollu, ix-xagħri kostali u l-inħawi kostali marbuta miegħu huma riċetturi ekoloġiċi sensittivi li għalkemm m'humiex fis-sit ta' l-iżvilupp, jilqgħu xi speċi rari u importanti li jistgħu jiġu affettwati mill-bini u mill-attivitajiet li jsiru 'l fuq minnhom. Għalhekk għandhom jittieħdu diversi miżuri biex jillimitaw l-impatt ta' l-iżvilupp għal post żgħir kemm jista' jkun.

Jekk jiġu addottatti, il-proposti biex issir *landscaping* fis-sit u mal-ġnub tiegħu biex l-iżvilupp ma jkunx jidher, għandu jinħoloq ħabitat fis-sit li jtaffi għat-telf ta' ħabitat ieħor. L-impjant se jkun iddisinjat u mħaddem bi standards moderni u għalhekk l-impatti 'l barra mis-sit għandhom ikunu limitati ħafna. Għalhekk mhux maħsub li l-iżvilupp ikollu impatt ħażin fuq l-integrità tal-ħabitat tal-madwar waqt it-tħaddim u waqt il-bini jekk jiġu addottati l-miżuri ta' mitigazzjoni ssuġġeriti.

11. IS-SAĦĦA PUBBLIKA

Madwar 25 miljun m^3 ta' drenaġġ mhux trattat prodott f'Malta jintefa' l-baħar kull sena. Wied Għammieq, madwar kilometru fil-punent tar-raħal kostali żgħir tax-Xgħajra, huwa l-post ewlieni fejn jiżbokka d-drenaġġ fil-baħar. Hawn jiżbokka 80% tad-drenaġ kollu mhux trattat prodott f'Malta (madwar 58,000m^3 ta' likwidu kuljum) 716-il metru mill-kosta. Ħsarat spissi fil-pompi jew katusi mirduma li jinqasmu jwasslu biex drenaġġ li ma jkunx trattat jiżbokka ħafna eqreb lejn ix-xatt b'irqajja' ta' drenaġġ li jidhru mal-kosta.

Id-drenaġġ ikun fih metalli tqal li jiġu minn ħafna industriji li jarmu fis-sistema. Madankollu, il-kontenut ta' metalli tqal ikun ġeneralment baxx minħabba li d-drenaġġ mill-industriji jitħallat ma' drenaġġ ieħor. Il-prodott sekondarju tat-trattament tad-drenaġġ (tajn), li jista' jkun fih metalli tqal u kontaminanti oħra, jintrema' fl-ilma, mingħajr ma jiġi trattat, u l-kompożizzjoni preċiża tiegħu mhix magħrufa.

Is-solidi u s-sustanzi kimiċi jiffurmaw biss 0.1% tas-sustanzi li jniġġsu fid-drenaġġ muniċipali, 70% ta' dan huwa materjal organiku, u 30% huwa materjal inorganiku. Il-konċentrazzjoni ta' solidi sospiżi, kemm organiċi kif ukoll inorganiċi, ġeneralment tvarja minn 100 sa 400 mg/L, waqt li t-Talba għall-Ossiġnu Bioloġiku (Bioloġical Oxygen Demand, BOD), li huwa kejl għall-materjal organiku u jipprovdi indikatur preċiż tal-kwalità ta' l-ilma, ivarja wkoll bejn 100 u 400 mg/L.

Il-konċentrazzjoni tal-fosfru tista' tasal sa 15-il mg/L. Minbarra dawn il-materjali li jniġġsu, id-drenaġġ muniċipali fih ammonti li jvarjaw ta' kimiċi sintetiċi (solventi, PCBs, aċti, eċċ.) minn sorsi industrijali u kummerċjali, kif ukoll ħafna gruppi ta' mikro-organiżmi, b'mod partikulari batteri, viri, u ċerti parassiti, per eżempju *protozoans* u *helminths*. Ħafna minn dawn il-ħlejjaq li jniġġsu fl-aħħar issibhom fit-tajn tad-drenaġġ trattat.

L-opportunitajiet ta' xogħol f'dan l-impjant għandhom jinkludu madwar l-ekwivalenti ta' 80 impjiegi *full-time* matul il-fażi tal-bini u l-implimentazzjoni (għal madwar 12-il xahar) u għoxrin matul il-fażi tat-tħaddim.

Il-bini ta' l-Impjant għat-Trattament tad-Drenaġġ tan-Nofsinhar (ITDN) f'Ta' Barkat se:

- Jirrestawra l-kwalità ta' l-ilma għall-għawm għall-erba' kilometri ta' kosta bejn ir-Rikażli u Wied il-Għajn,
- Jelimina d-drenaġġ kollu mhux trattat fil-baħar, kif ukoll l-irqajja' koroh ta' drenaġġ u r-riskji għas-saħħa assoċjati miegħu,
- Jelimina l-irwejjaħ kollha,
- Iżid il-valur residenzjali u rikreazzjonali ta' l-inħawi tal-kosta tax-Xlokk,
- Itejjeb il-potenzjal turistiku ta' l-inħawi tal-kosta tax-Xlokk,
- Jiġġenera likwidu trattat biex jerġa' jintuża.

Waqt li l-faċilitajiet għat-trattament bla dubju jtejbu l-kwalità tad-drenaġġ li jiżbokka fl-ambjent tal-baħar billi jitnaqqas il-konċentrament ta' sustanzi li jniġġsu, huwa mportanti li nżommu f'moħħna li l-ilma mormi mhux pur u jista' jkollu effetti, b'mod partikulari fl-irqajja' tad-drenaġġ – jiġifieri fiż-żona fejn jiżbokka 'l isfel minnha.

L-impjant propost sa jinkorpora proċess awtomatizzat kompletament sekondarju jew bijoloġiku (*Biological Aerated Filter –BAF*) li jneħħi l-materjal organiku li ma jinżilx fil-qiegħ, u li ma jkunx tneħħa mit-trattament primarju, u ġeneralment jeqred il-mikro-organiżmi patoġeniċi (batteri, viri, fungi u protozoa). It-trattament terzjarju ta' l-ilma tad-drenaġġ (*treated Effluent Polishing*) huwa ddisinjat biex jipproduċi ilma kważi pur, imma mhux tajjeb għax-xorb. Il-proċess jikkonsisti f'filtrazzjoni bir-ramel bl-eliminazzjoni ta' partiċelli u mikro-organiżmi, faħam attivat (li jassorbi materjal organiku li jiċċaqlaq u jneħħi t-tossini), u jiddisinfetta bid-dawl ultra-vjola.

12. EŻAMI TAR-RISKJI

Sar Eżami tar-Riskji u ta' l-Iskomdu bħala parti mill-Iżvilupp ta' Impjant ġdid għat-trattament tad-drenaġġ. Ġew ikkonsidrati l-iskomdi u r-riskji għas-saħħa li jistgħu jinqalgħu minħabba li art li qabel kienet abbandunata se tiġi ddisturbata u żviluppata. Sar eżerċizzju ta' moniteraġġ tar-riskji li kien jikkonsisti f'erba' elementi prinċipali biex jiġu identifikati l-perikli li jista' jkun hemm u r-reċetturi. Dawn huma:

1. Matriċi għall-Identifikazzjoni tar-Riskji
2. Lista tal-Perikli
3. Lista tar-reċetturi
4. Analiżi tar-reċetturi

Ma ngħata l-ebda każ ta' l-eżistenza jew le ta' mogħdijiet jew miżuri ta' mitigazzjoni u l-probabiltà tal-konsegwenzi qed titqies bħala assoluta.

It-Tabella Matriċi għall-Identifikazzjoni tar-Riskji identifikat ir-riskji marbuta mal-bini u t-tħaddim ta' l-ITDN. Il-matriċi tidentifika ir-rabtiet kollha potenzjali bejn is-sorsi, il-mogħdijiet, u r-riċetturi. Fil-matriċi, reċetturi ġeneriċi ġew identifikati f'500m mill-konfini ta' l-istallazzjoni. Dawn jinkludu mħażen kbar fil-qrib, kunvent abbandunat u djar residenzjali fost l-oħrajn.

Wara li ġew identifikati l-perikli ġeneriċi, ġiet ikkunsidrata l-eżistenza jew le ta' mogħdija bejn il-periklu u r-reċettur. Għal dawn il-perikli l-mogħdija hija s-soltu fl-arja u għalhekk il-passaġġ dejjem se jkun hemm.

Lista tal-perikli għall-fażijiet tal-bini u t-tħaddim tniżżel il-perikli li tippreżenta l-istallazzjoni u meta jkun hemm rabta bejn is-sorsi, il-mogħdijiet, u r-riċetturi kif identifikat mill-Matriċi għall-Identifikazzjoni tar-Riskji.

Il-perikli li ġew identifikati jinkludu trabijiet tqal u biogassijiet iġġenerati mit-tħaffir, vetturi u xogħlijiet ta' inġinerija waqt ix-xogħol ta' kostruzzjoni; u trabijiet tqal u biogassijiet iġġenerati mill-proċess tat-trattament tad-drenaġġ, xogħol ta' manutenzjoni, u l-produzzjoni tal-biogass matul it-tħaddim.

Il-vetturi u l-attivitajiet ta' tħaffir huma l-kawżi l-aktar probabbli ta' perikli mill-ħsejjes matul ix-xogħol tal-bini, waqt li l-fażi tat-tħaddim hija mistennija li tiġġenera ħsejjes ta' kuntant l-aktar mill-proċess tat-trattament tad-drenaġġ u attivitajiet marbuta mal-manteniment, it-tiswija u t-tindif ta' l-ITD. Il-*boilers*, *generators* eċċ. wkoll joħolqu l-ħsejjes.

L-irwejjaħ huma mistennija li jinżammu fl-impjant innifsu waqt il-fażi tat-tħaddim tal-proġett ħlief għal emissjonijiet ta' kultant f'każ ta' ħsarat jew manutenzjoni ta' l-impjant. Il-ħruġ ikkontrollat ta' metanu waqt il-ħruq, il-ġenerazzjoni tal-biogass u l-ħażna taż-żibel ilkoll huma sorsi ta' ntejjen.

Waqt il-fażi tal-bini, l-aktar minħabba l-fdalijiet tal-bini u tat-tħaffir, ikun hemm perikli miż-żibel. Waqt il-fażi tat-tħaddim jista' jkun hemm żibel li jtajjar ir-riħ mill-ITD.

Kull periklu marbut mal-ġrieden jista' jseħħ biss f'każ li l-ITD jieqaf jaħdem jew jekk jitħalla materjal organiku, tankijiet jew katusi mikxufin waqt il-fażi tat-tħaddim.

Kull periklu marbut mat-tajn fit-toroq ġie wkoll eżaminat. Dan joħloq riskju biss matul il-fażijiet tat-tħaffir u tal-bini tal-proġett u matul attivitajiet okkażjonali ta' manutenzjoni, tiswija u tindif.

Ġew identifikati numru ta' riċetturi, li kollha ġew mmarkati fejn jinstabu fit-tpinġijiet rispettivi. Is-sensittività tar-riċetturi kienet ibbażata fuq it-tip u l-karatteristiċi tar-riċettur, fejn jinsab u l-mogħdija bejn ir-riċettur u l-periklu identifikat. Ġew ikkunsidrati wkoll inċidenti u rapporti tal-passat.

Saret analiżi tas-sensittività tar-riċettur b'referenza għall-informazzjoni mill-attivitajiet ta' bini fuq is-sit u l-attivitajiet waqt il-fażi tat-tħaddim. Ir-riċetturi kollha ġew iddikjarati li għandhom sensittività baxxa jew medja. Ma kien hemm ebda

rapporti li għandhom x'jaqsmu ma' perikli għas-saħħa jew skomdu minħabba ż-żibel li jinħoloq mill-attivitajiet fis-sit.

Bħala konklużjoni, kollox ma' kollox, ir-riskji għat-18-il riċettur eżaminat kienu ddikjarati bejn medji u baxxi, għalhekk ma jinħtieġ li jsir ebda studju jew eżami ieħor.

13. L-IMMANIĠĠJAR TA' L-ISKART

L-iżviluppatur huwa kommess li jaddotta u juża l-aħjar prattiċi għas-separazzjoni, il-ġbir u d-dispożizzjoni ta' l-iskart. Is-sorsi ta' żibel solidu jew likwidu ġġenerati mill-iżvilupp jistgħu jkunu:

A) Skart mit-tħaffir u l-bini: Il-proġett se jiġġenera madwar 385,000m^3 ta' materjal skavat, 257,000 m^3 minnhom se jerġgħu jintużaw u 128,000m^3 jintremew fil-baħar jew f'faċilità awtoriżżata. Ġew proposti żewġ postijiet fejn jirmiġġaw il-braken, wieħed fir-rinella u l-ieħor fix-Xgħajra.

Għall-għażla tax-Xgħajra, ikollhom jinbnew rampa u moll bil-materjal skavat. L-iskart imbagħad jintefa' f'post desinjat għaż-żibel f'latitudni 33 DEG 55.1 N' u lonġitudni 14 DEG 34'E. Ġie propost ukoll numru ta' rotot għaċ-ċirka 120 trakk li jinħarġu kuljum.

Jekk tingħażel ir-Rinella, li hija iktar 'il bogħod, din l-għażla tiġġenera t-traffiku lejn dik in-naħa. Biss, dal-post ma jitlobx li jinbena moll.

Għażla oħra tista' tkun li l-iskart skavat jittieħed f'faċilità fuq l-art bħalma hi barriera. Dan, madankollu, jiddependi mill-kuntrattur li jiddeċiedi liema faċilità awtoriżżata se juża.

B) Skart domestiku: Jinħoloq l-aktar mill-attivitajiet amministrattivi ta' kuljum u jiġi separat mill-ewwel fi tliet kategoriji ewlenin: karta, plastik riċiklabbli u skart muniċipali b'tank jingħalaq għal kull wieħed minnhom fis-sit. L-iskart muniċipali jintbagħat f'faċilità awtoriżżata.

Ċ) Tajn stabilizzat u bl-ilma mneħħi minnu: L-impjant għandu jiġġenera madwar 100m^3 ta' tajn stabilizzat u bl-ilma mneħħi minnu li jiġu ekwivalenti għal madwar 6 sa 7 trakkijiet kuljum. Huwa antiċipat li minn trakk sa tnejn żibel maħsul jiġu trasportati mis-sit kuljum. It-tajn u ż-żibel maħsul jiġu trasportati f'kontenituri ssiġillati għal miżbla kif kien ġie maqbul u riċentament ikkonfermat mal-WasteServ.

Il-Korporazzjoni għas-Servizzi ta' l-Ilma se tuża proċedura li biha tinforma lill-impjegati u lill-kuntratturi dwar it-tipi ta' żibel differenti, kif jimmarkawhom, jippakkjawhom u l-ħtiġijiet u l-prattiċi ta' kif inaqqsu ż-żibel kemm jista' jkun.

14. EŻAMI TA' L-ENERĠIJA

L-eżami ta' l-enerġija mħejji jipprovdi dettalji ta' a) il-provvista ta' enerġija għall-iżvilupp propost; b) stima tal-ħtieġa ta' l-enerġija; u ċ) rakkomandazzjonijiet dwar teknoloġiji alternattivi li jimminimiżżaw l-użu ta' l-enerġija fis-servizzi u l-użi kollha.

B'kalkolu ta' fattur ta' enerġija ta' 0.8, l-enerġija massima mitluba mill-impjant hija stmata li tkun 4014kW, b'38% minnha kkunsmata fil-proċess tat-trattament mekkaniku, 57.2% fil-proċess tat-trattament bioloġiku, 2.3% fil-proċess tat-trattament tat-tajn, u t-2.5% li jibqa' għad-dawl u l-plakek. Għandu jiġi nnutat li l-perċentwali ta' rkupru ta' enerġija u konsum ta' enerġija ikun suġġett għall-ispeċifikazzjonijiet tad-disinn tal-kuntratt magħżul u l-figuri preċiżi nkunu nafuhom biss waqt it-tħaddim. Huwa stmat madankollu li l-impjant jipproduċi 900kW ta' enerġija elettrika, li tiġi ġġenerata mill-użu tal-biogass prodott u 1400kW ta' enerġija ta' sħana, iġġenerata mill-ħruq tal-biogass li se jintuża biex isaħħan l-impjant tad-diġestjoni u faċilitajiet oħrajn.

Dawn se jiġu pprovduti permezz ta' impjant li jirkupra l-enerġija li l-funzjoni tiegħu hi li jimminimizza l-konsum ta' l-elettriku. Dan huwa impjant ta' ko-ġenerazzjoni li jaħraq il-biogass biex jipprovdi kemm elettriku kif ukoll sħana. Id-diġestjoni anaerobika tat-tajn se tiġġenera l-biogass (l-aktar metanu) bħala prodott sekondarju, li meta jinħaraq jista' jipprovdi 32% tal-bżonn ta' enerġija elettrika ta' l-impjant. L-irkupru ta' l-enerġija permezz ta' l-impjant tal-biogass, madankollu, jiddependi fuq il-kwalità u l-kwantità tad-drenaġġ li jasal fl-impjant tat-trattament tad-drenaġġ. L-impjant ta' l-enerġija jiġġenera wkoll is-sħana li tista' tintbagħat lejn id-diversi proċessi li jkunu jiħtiġuha.

Qed isiru rakkomandazzjonijiet biex is-sistema ta' dawl estern f'diversi postijiet ikollha l-għanijiet li titnaqqas il-ħela ta' enerġija, ma jkunx hemm dawl żejjed, dawl fuq postijiet li ma jridux jiġu mdawla u smewwiet imdawla. Dawn huma ta' tħassib ukoll minħabba t-tniġġis mid-dawl u l-impatt ambjentali, u jinkludu l-użu ta' *sensors*, bozoz li għandhom ħajja twila, għażla għaqlija ta' qawwa ta' dawl, dwal imħaddma mix-xemx, tidwil li jkun sensittiv għall-movimenti fl-entraturi, l-użu ta' *sensors* li jaraw hemmx nies, u rifletturi. L-arbli tal-lampi għandhom ikunu wkoll imqiegħda tajjeb u mgħottija minn fuq.

15. EŻAMI TA' L-IMPATT SOĊJALI

Dan ir-rapport jippreżenta analiżi ta' riċerka li saret bit-telefon mal-popolazzjoni residenti u li tuża l-inħawi li l-aktar se jiġu affettwati mill-impjant tat-trattament tad-drenaġġ f'Ta' Barkat. Huwa maħsub li din l-analiżi tista' tkejjel kif dawn in-nies jaraw il-vantaġġi u l-iżvantaġġi ta' dan il-proġett.

Ir-rapport sab li l-popolazzjoni fil-kampjun ġeneralment mhix infurmata tajjeb fuq il-proġett, u għalhekk mhix imħejjija sew biex tagħti opinjoni infurmata dwar kif il-proġett jista' jolqotha.

Minkejja dan in-nuqqas, il-popolazzjoni riedet tagħti opinjoni. Il-maġġoranza ta' dawk li wieġbu kienu favur il-proġett, minħabba li jemmnu li l-vantaġġi huma akbar mill-iżvantaġġi. Dawk li huma infurmati sew huma anqas entużjasti fuqu mill-oħrajn.

Minkejja dan, il-popolazzjoni ġeneralment għandha beżgħat u tħassib dwar il-proġett propost, l-aktar marbutin ma' l-intejjen, il-ħsejjes, id-dehra, ir-riskji ta' inċidenti u riskji oħra bħal dawk marbutin mas-saħħa.

Il-maġġoranza ta' dawk li rrispondew jaħsbu li l-prezz tal-propjeta tagħhom jinżel jew jibqa' l-istess bħala riżultat ta' l-impjant.

16. IL-BINI TA' POMPA TAD-DRENAĠĠ U MINA TAD-DRENAĠĠ

Hija meħtieġa pompa tad-drenaġġ biex ittella' d-drenaġġ kollu li jidħol fl-ewwel stadju ta' l-impjant tat-trattament. Il-mina l-ġdida li twassal id-drenaġġ bil-gravità sa l-impjant tispiċċa fi qlib ta' 2m 'l fuq mil-livell tal-baħar. Aktar ma jkun 'il ġewwa lejn l-art l-impjant tad-drenaġġ aktar trid tkun kbira l-istatic head tal-pompa tad-drenaġġ, għalhekk huwa inevitabbli li titqiegħed mal-kosta mil-lati kollha, kemm tekniċi, finanzjarji, kif ukoll ta' tħaddim u ta' manutenzjoni.

IL-POMPA TAD-DRENAĠĠ

Il-pompa tad-drenaġġ hija meħtieġa tmiss mal-Golf tal-Blata l-Bajda, lil hinn mit-triq tal-kosta eżistenti, minħabba r-restrizzjonijiet li ġejjin:

- Id-distanza tal-pompa mill-Kalkara hija marbuta mal-pendil tal-mina li ġejja mir-Raħal Ġdid. It-tqegħid tal-pompa aktar 'il bogħod mill-pożizzjoni tagħha jkun jitlob li titqiegd struttura tail-livell tal-baħar, ħaġa li mhix aċċettabbli.

- Il-pompa tad-drenaġġ bħalissa tinsab madwar 15-il metru 'l fuq li jfisser li se jkun hemm pompa 15-il metru 'l isfel mil-livell tal-baħar in-naħa tal-fossa. Pompa aktar fil-fond tkun inaċċessibbli biex il-ħaddiema tal-WSC jagħmlulha l-manutenzjoni bla periklu.

- Trid tinbena triq ta' aċċess wiesgħa 5m bejn in-naħa t'isfel ta' l-impjant tat-trattament tad-drenaġġ u l-post fejn id-drenaġġ jidħol fil-pompa għall-
  - Manutenzjoni ta' rutina, teħid ta' kampjuni u ispezzjonijiet tal-pompa mill-ħaddiema ta' l-impjant tat-trattament tad-drenaġġ, minħabba li l-pompa hija parti integrali mill-impjant tat-tisfija tad-drenaġġ.
  - Biex jitqiegd dual DN 700 pressure main u DN 800 gravity main biex iservi ta' overflow għad-drenaġġ trattat mill-impjant tat-tisfija tad-drenaġġ għall-baħar.

IL-MINA TAD-DRENAĠĠ

Investigazzjoni tas-sit tul medda art fejn hi proposta li ssir il-mina minn Ħaż Żabbar u l-Blata l-Bajda wriet li l-blat jista' jiġi deskritt bħala franka bejn dgħajfa medjament

sa f'saħħitha medjament. Ir-rotta tal-mina tidher li tgħaddi għal kollox mis-saff tal-franka ta' isfel u madwar 70% tal-blat li se jinqata' waqt il-bini tal-mina tkun żrar ta' kwalità ħażina ħafna.
Jistgħu jinqalgħu problemi ta' stabbilità minħabba ċ-ċedimenti li ġew osservati fil-blat speċjalment fejn hemm blat dgħajjef u rqiq. Ma ġew innotati ebda għerien jew ksur fis-saffi tal-blat assoċjati ma' żoni fejn il-vini tal-blat jinqasmu matul l-istudju.

DESKRIZZJONI TA' L-IMPATTI

L-impatti fuq l-użu ta' l-art mill-pompa tad-drenaġġ u l-mina tad-drenaġġ, is-sinifikat tagħhom u l-miżuri biex dawn l-effetti jitnaqqsu se jkunu simili għall-bqija ta' l-inħawi fejn se jsir il-proġett. Il-pompa se tkun fuq il-franka bħall-bqija tal-postijiet fejn se jsir il-proġett, għalhekk l-impatti u l-miżuri biex jitnaqqsu se jkunu simili għal dawk ikkalkulati għall-postijiet l-oħra. Il-mina se tkun kollha fil-franka ta' taħt.

Il-pompa u l-mina se jkunu taħt l-art. Il-pompa se jkollha wkoll bini ta' sular wieħed, li mhux se jkollu ebda effett konsiderevoli fuq l-integrità viżwali jew pajsaġġistika tas-sit. Minbarra dan, il-qtugħ li jkun hemm fl-art biex jitqiegħdu l-katusi jitgħatta bil-miżuri ta' tisbiħ proposti.

Meta tikkunsidra kemm hi fuq skala żgħira din il-biċċa art meta tqabbilha ma' l-art kollha tal-proġett, mhux mali jkun hemm żieda sinifikanti fil-ħruġ ta' trab mill-bini. Il-pompa se tkun f'ambjent issiġillat li mhux mistenni li minnu joħorġu likwidi jew gassijiet. Il-ġenerazzjoni tal-ħsejjes u l-vibrazzjonijiet mill-pompa ġiet ikkalkulata fl-Eżami ta' l-Impatt mill-Ħsejjes u l-Vibrazzjonijiet minħabba li l-prot tqies b'mod ħolistiku għal dan l-eżami.

Il-post propost għall-pompa u l-mina mhux se jkollhom impatt fuq l-użu ta' l-art agrikola minħabba li l-art li se tittied m'għandhiex valur agrikolu. Is-sit għall-pompa u l-mina m'għandhom ebda karatteristika arkeoloġika jew kulturali importanti. Primarjament huwa magħmul minn art bil-ħaxix selvaġġ li hu komuni fl-inħawi Ta' Barkat. L-impatt ekoloġiku assoċjat huwa t-telf ta' parti minn dan il-ħabitat. L-iżvilupp propost jinsab barra mill-Inħawi ta' Importanza Arkeoloġika u Siti ta' Importanza Xjentifika.

Waqt iż-żmien ta' kostruzzjoni u funzjoni, l-impatti tal-mina fuq il-ġeoloġija u l-palaeontoloġija li jistgħu jirriżultaw minħabba t-tneħħija tal-blat huma ikkunsidrati mhux sinifikanti. Il-kisi tal-mina b'saff impermeabbli jevita' impatti fuq l-idroġeoloġija. Ebda tip ta' karburant jew kontaminanti potenzjali oħra ser ikunu merfugħha fil-mina waqt il-kostruzzjoni. Kull instabilita' potenzjali tal-mina li jista' jirriżulta minn qsim fil-blat jista jiġi kkontrollat bl-użu ta' *rockbolting* u/jew *shotcrete*.

17. IMPATTI SEKONDARJI U KUMULATTIVI

Effetti sekondarji (jew indiretti) huma konsegwenzi li jġib żvilupp li jew jibdew jidhru wara ż-żmien jew huma mbiegħdin b'mod konsiderevoli. L-effetti indiretti jistgħu jinkludu effetti li jwasslu li xi ħaġa tikber aktar u effetti oħra relatati ma'

bidliet li jkunu seħħu fil-mod kif tintuża l-art, id-densità tal-popolazzjoni jew ir-rata tat-tkabbir tagħha, u effetti relatati ma' l-arja u l-ilma u s-sistemi naturali, inkluż l-ekosistemi.

L-impatti kumulattivi huma impatti fuq l-ambjent li jirriżultaw minn impatt li jikber meta jingħaqad ma' azzjonijiet oħra li seħħew fil-passat, qed iseħħ jew se jseħħ fil-futur li nistgħu naraw, tkun min tkun il-persuna jew l-entità li tagħmilhom. L-impatti kumulattivi jistgħu jirriżultaw minn azzjonijiet minuri imma li flimkien isiru sinifikanti tul perjodu ta' żmien.

L-iżvilupp ta' Smart City madwar 1.3 km lejn it-tramuntana ta' l-impjant tat-trattament tad-drenaġġ propost se jippreżenta xenarju fejn ir-raħal tax-Xgħajra se jiġi espost għall-impatti marbutin mal-bini fuq in-naħa tal-punent u tal-lvant fl-istess ħin. Ta' min jikkunsidra wkoll l-iżvilupp ta' bini residenzjali li x-Xgħajra għaddejja minnu bħalissa.

Huwa mistenni li se jkun hemm impatti sekondarji (indiretti) u kumulattivi sinifikanti bħala riżultat ta' l-iżvilupp propost u l-iżviluppi l-oħra proposti fil-viċinanzi. Ħafna minn dawn l-impatti sinifikanti għall-ambjent huma fit-tul u/jew huma dipendenti fuq il-possibiltà li jiġri xi inċident improbabbli, iż-żmien li fih isir il-bini u l-użu li jsir mill-faċilitajiet ta' dawn l-inħawi u l-madwar bħala riżultat ta' l-iżviluppi msemmija.