Preliminary Report
Mazara del Vallo and Favignana
AWA500 - AIR TO WATER to supply
3.000mc Water Daily average

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INTRODUCTION

This preliminary report is the result of the need to create a system using air to water technology for the production of 3,000,000 daily average/ liters of water for 345 days / year. The installation will be placed in the area of Trasmazzano di Mazara del Vallo near the wells of Ramisella and on the island of Favignana.

At this stage it has not been possible to evaluate in the context of the analysis: Site of settlement - Area to be evaluated:

- Environmental aspects of the site (regarding morphology, geology, hydrogeology exposure).
- Public areas (identification of public areas to be used for project, roads, walkways, parking areas, green areas, elements of urban furniture).
- Urban planning area (indications and characteristics of the urban planning area in which the project is located; characteristics of the urban context, pedestrian and vehicular road system, public services, facilities, accessibility, and the existence of architectural assets).

Urban planning characteristics of the project and constraints, requirements, conditions of operation - to be verified and evaluated:

- Landscape characteristics and scenic values (impact of the work on the context with regard to landscape characteristics and scenic values, profile modifications at urban scale, emergence compared to the urban planning environment, visual perceptions of the long and short field); Inclusion of the project in the territorial context (checking the necessity of geological surveys, verification of the necessary arrangements of the ground, changes in the acclivity, interruption of the continuity of the soil, permeability of the soil; checking regarding the sources of pollution (air, soil, noise, ...), disposal of rainwater)
- Urbanization works (Suitability of infrastructures and urbanization for the urban development caused by the intervention referred to the following grids: liquid waste disposal, public lighting, water distribution, cable and wireless telecommunications, electricity distribution, gas distribution, district heating, ...)
- Constraints (compliance with regulations regarding the constraints, requirements, conditions, servitudes,)
- Accessibility (accessibility to the site by public transport and rescue operations, accessibility to private vehicles, works and measures for the elimination of external and internal architectural barriers)
- Physical pre-existence (elimination and displacement of existing elements demolition of artifacts, elimination trees, modification of routes of roads, network infrastructure, detour of waterways)

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PRELIMINARY PROJECT HYPOTHESIS

In order to build the system with the required characteristics, we propose to use water production units gathered in groups of 4 units and placed on parallel lines, as shown in the attached lay-out *(Attached machine layout).*

The attached lay-out also shows the distances between machines in a group, between groups in a line and between parallel lines. These distances have been calculated in order to avoid that the impact of the masses of hot air at 50 °C expelled from each individual machine, disturb the hygrometric level and temperature of the air drawn from the machines, therefore consequently changing the production of water. In addition, these distances also allow the movement of the machines in case of maintenance and/or replacement of components.

Intake ducting should be foreseen that directs the hot air from each individual machine into a duct to ensure that the air is directed upwards and that natural air is not mixed with cooling air. Accurate airflow calculations will be required to ensure the above during the executive phase of the project.

The output air thermal power to be dissipated for each machine is 200 kW thermal.
In the solution A, the attached lay-out, a total of 1320 machines type AWA 500 placed on one floor/level on a total surface of about 90.800 m2 have been taken into consideration.

In Mazara del Vallo the average daily production of each machine is about 3,800 liters of water (see attached chart), calculated based on the annual average. Data calculated by our software/algorithms certified by international geometrical society with hourly analysis of the last five years, calculated using the technological algorithms of AWA MODULA

The installed power required by the system is about 168 MW.
The consumption for each AWA 500 machine in the specific application is about 700 MWh/year.

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PRELIMINARY PROJECT HYPOTHESIS

The calculations took into consideration the annual average of production, taking into consideration the efficiency, the ordinary and extraordinary maintenance cycles, technical and unexpected operations for 20%, possible losses in the system itself for evaporation, adduction and distribution in addition to those possible in the maintenance area estimated in a preliminary analysis for a further 20%.

The actual verification, in the final design, can lead to installation savings in number of machines, consumption and power required, with a significant value ≥ 20%.
In order to reduce the area covered by the installation, solution B was chosen, with the AWA 500 machines placed on several floors/levels.

Actually, according to the distances previously mentioned in the lay-out and to the calculated surfaces, the machines will be placed on a three-storey multilevel structure with a central empty space, where the water can be conveyed through collection pipes by fall into a semi-enclosed underground reservoir at floor/level -1 of the building. The reservoir will contain the water produced by AWA 500 machines and then will be conveyed through a pumping station, appropriately sized, to a reservoir for treatment and mixing or mineralization in function of technical and functional needs.

The building will be designed following defined technical specifications, taking into consideration technical and logistical elements such as distance for air flow machines AWA 500, accessibility for staff and vehicles for loading and unloading as well as subsequent maintenance and eventually rendered environmentally friendly green aesthetic.

A photovoltaic system can be foreseen to complete the building in the roof part and in the parts where it will be possible.
Taking into consideration this solution B, the buildings could be two, three floors/levels for a distribution of 660 machines for each single building, which would be necessary to guarantee the production of water required by the client. In this case, the surfaces of each single building are reduced to approximately 45,400 m2 in total and approximately 15,135 m2 for each floor/level.
The height between floors could be 6/8 meters for a total building height of 18/24 meters, these dimensions will be appropriately sized and evaluated in the planning phase.

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It is important the final planning phase with the main contractor; in order to study in depth all the aspects of the executive planning phase that can lead to significant savings in terms of machine value, building, accessories and energy.
The water storage tank will be placed underground with a capacity of at least one month's production, which means 150'000 m3.
For each building 75'000 m3, which is 125m x 125m x 5 m).

SYSTEM UNITS: AWA 500
AWA MODULA 500 are installed solutions with years of operation in several different sites. The technical characteristics of the product are listed in the attached data sheet.
A single unit has a monthly average production in Mazara del Vallo and Favignana approximately 115'000 liters of water and an average electricity consumption of 0.32 kWh/liter.
The life cycle is averagely > 20 years and with ordinary maintenance and scheduled overhauls every five years, it may be extended beyond twice that.
All machines can be monitored remotely with satellite or internet system.

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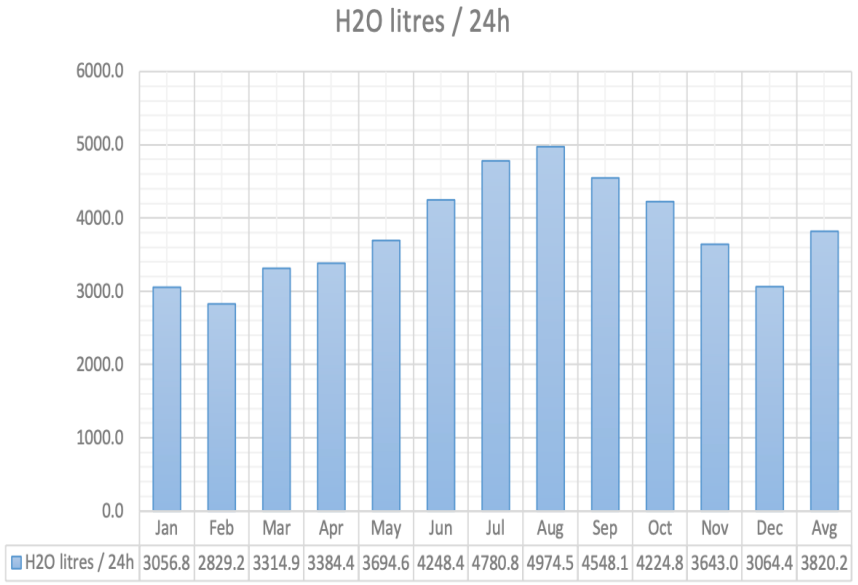
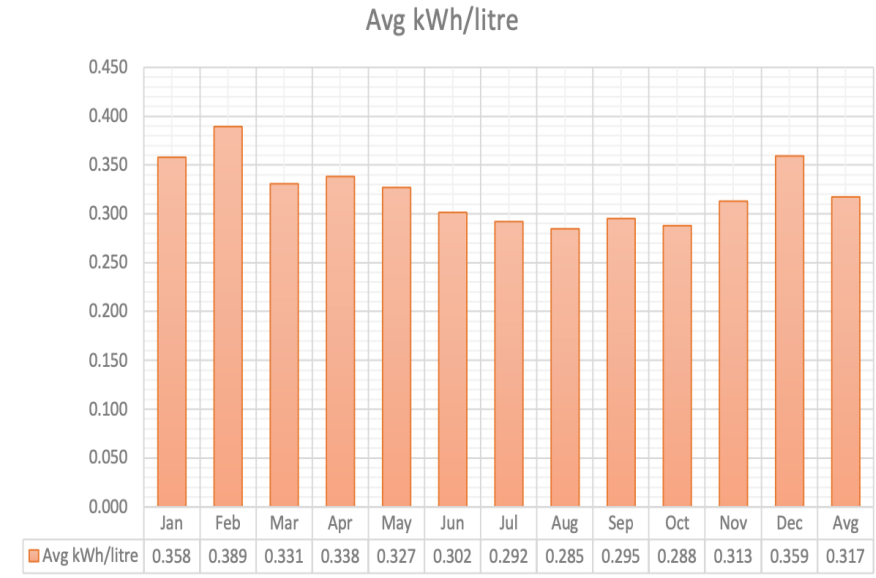
Drinkable Water Emergency – 3.000mc daily average





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Map of positioning AWA500 on site