

Summary Environmental and Social Management Plan

Project Name : Treated Wastewater Quality Improvement Project
Project Number : P-TN-EBA-001
Country : Republic of Tunisia
Department : OWAS **Division** : OWAS.2

1. Brief Description of the Project and Key Environmental and Social Components

1.1 This project benefitting about 3963 419 people, will help to improve the performance of sanitation services and the quality of treated wastewater (TWW) through 30 wastewater treatment plants (WWTPs) distributed in 17 Governorates. The project will be implemented from 2012 to 2016, comprising a series of operations under two components (A and B) aimed respectively at: (i) upgrading sanitation facilities by overhauling the water and sludge systems and transfer networks, and establishing remote monitoring and management systems; (ii) building the capacity of the National Sanitation Agency (ONAS) through assistance for studies, works monitoring and control, participation in training, procurement of operating equipment and project management. These operations will be implemented at a total cost of UA 33.30 million or TND 73.67 million, financed to the tune of 88% by the Bank and 12% by the Tunisian Government.

1.2 The project, which includes social, environmental and economic dimensions and is classified under the Bank's Environmental and Social Category 2, fits in perfectly with the country's 12th Economic and Social Development Plan covering the 2010-2014 period as well as the comprehensive approach adopted by Tunisia for promoting integrated water resources management as part of the 2030-2050 long-term strategy. It will contribute to achieving one of ONAS' strategic objectives, which is attaining a 50% TWW reuse rate by 2016. The project will, through actions designed to promote TWW reuse, effectively contribute to reducing water stress in the country as well as addressing users' grievances, which are increasingly being taken into consideration since the 14 January revolution in terms of access to a regular supply of sufficient quantity and quality of TWW for irrigation.

2. Key Environmental and Social Impacts

2.1 Positive Impacts

The Project will have very significant positive physical and natural environmental impacts and substantial socio-economic benefits. Project impacts will be essentially at four distinct levels:

2.1.1 Develop the sanitation sub-sector by building ONAS' capacity in WWTP management, network monitoring and works control (100 senior officers to be trained) and modernize technical operating facilities by procuring required equipment and establishing remote management and monitoring systems for a total cost of UA 2.4 million equivalent to TND 5.31 million.

2.1.2 Concerning the environment, help to protect sensitive receiving environments (Gulf of Tunis, Oued Medjerda, etc.) by reducing the negative impact of the disposal of unconventionally treated nutrient-rich wastewater and subsequent ecological adjustment in these environments. It will, through the reuse of TWW, contribute to preserving wetlands facing water scarcity, reducing saltwater intrusion in water tables and providing nutrients (nitrogen, phosphorus, trace elements, etc.) which may significantly decrease the quantity of chemical fertilizers used.

2.1.3 From the social standpoint, the project aims at enhancing the performance of sanitation services and will have undeniable positive spillovers in terms of the quality of treated wastewater. Thus, it will contribute to: improving the health conditions and living environment of more than 3 963 419 people; improving the quality of bathing water; increasing the potential of unconventional water resources intended for reuse (70 million m³ by 2014); saving conventional water resources that can be used in other sectors that are more demanding in terms of quality, providing farmers with quality TWW consistent with their requirements; contributing to development of irrigated agriculture and agricultural yields by creating new irrigated blocks (4 190 ha).

2.1.4 On the economic front, the project will help to: postpone mobilization of other more costly water resources; improve agricultural productivity of irrigated areas (IA), improve food security; increase the value of irrigated land; revitalize agricultural employment and encourage the settlement of rural and peri-urban populations (about 4 000 farmers will benefit from TWW); encourage the development of other local income-generating activities (notably animal husbandry); promote domestic and international tourism (about 165 000 people will avoid travelling long distances to swim at beaches in Tunis and Sfax); and develop the coastal fishing sector in regions of Grand Tunis, Sfax, Kélibia, Zarzis and Hammamet.

Table 1
Assessment of Positive Impacts

Nature of Positive Impacts	Proposed Enhancement Measures	Impact Assessment
Sector Impacts		
Development of Tunisia's sanitation sub-sector.	<ul style="list-style-type: none"> * Build ONAS' capacity in terms of training and upgrading of sanitation infrastructure. * Provide WWTPs with new and modern, energy-saving and environmentally-friendly operating equipment. * Control the illegal discharge of wastewater into the public sanitation network. 	Major, permanent and significant
Develop agricultural sector and irrigated agriculture.	<ul style="list-style-type: none"> * Ensure regular water supply with required quantity as well as quality, through the operation of WWTPs envisaging treated wastewater reuse. * Apply EMPs (operation) in each WWTP and promote reuse of sanitation by-products, including sludge. * Strengthen sensitization and adopt an attractive pricing system. 	Major, permanent and significant
<ul style="list-style-type: none"> * Enhanced potential of unconventional water resources intended for reuse and reduction of water stress in Tunisia. * Judicious use of conventional water resources that can be used in other sectors more demanding in terms of quality (for example, drinking water) are 	<ul style="list-style-type: none"> * Ensure constant quality that meets the existing reuse standards. 	Important; long-term
Domestic and international tourism in the areas of Grand Tunis, Sfax, Kélibia, Zarzis and Hammamet is developed.	<ul style="list-style-type: none"> * Strengthen bacteriological control of TWW directly released into the coastal zone near bathing areas. 	Important; significant in the long-term

* Improvement of near-shore fishing sector.	* Minimize, as much as possible, the suspended solid (SS), nitrate and phosphate content of TWW, particularly near conchological zones.	Important, permanent and significant
---	---	--------------------------------------

Environmental Impacts		
Sensitive receiving environments (Gulf of Tunis, Oued Medjerda, Sabkhet El Hamma, Chott el Fejjej, etc.) are protected.	* Reduce disposal of unconventional wastewater.	Important, permanent and significant.
Improved ecological situation.	* Minimize disposal of raw sewage overflow during periods of high flow by constructing holding reservoirs or separate sewer systems.	Important; long-term
Water tables protected against depletion and causes of degradation (increased salinity, overexploitation, and intrusion of saltwater and nutrient accumulation due to mass use of chemical fertilizers).	* Increase water table recharge areas in zones prone to this problem (the cape and the southern part of Tunisia, particularly the region of Sfax).	Important; long-term
	* Upgrade treatment to tertiary level, as necessary.	

Socio-economic Impacts		
Health conditions and living environment of 3 963 419 people improved.	* As a second phase, support the upgrading of WWTPs and improve quality of treated wastewater by improving the rate of service entrances.	Important, permanent and significant.
Social demand for irrigation water is met.	* Ensure TWW compatible with quality requirements. * Ensure the transfer of TWW to areas in need. * Identify volumes required.	Important, permanent and significant
New irrigation areas created and agricultural productivity and quality of green spaces improved.	* Promote the cultivation of profitable crops. * Encourage intercropping systems.	Important; long-term
Mobilization of other more costly water resources is postponed.	* Adopt an attractive pricing system.	Important; long-term
The value of land irrigated with TWW is increased.	* Ensure proper exploitation of areas irrigated with TWW (drainage, strict quality control, etc.)	Important; long-term
Agricultural employment promoted and incomes improved.	* Encourage integrated projects, particularly those related to livestock breeding.	Important; long-term
The population is encouraged to adopt a sedentary mode of life and rural-to-urban migration is reduced.	* Regional development. * Reduce the poverty index and level of vulnerability.	Important; long-term
Jobs are created during the execution of works.	* Recruit local labour.	Medium-term; temporary
Engineering services.	* Regional competitive bidding; sub-contracting. * Surveillance and monitoring of pollution risks. * Training and technical assistance.	Important; temporary

2.2 Negative Impacts

2.2.1 Negative impacts will mainly concern the works for construction of new facilities, the rehabilitation of transfer systems, the laying of pipes and the pipe connection, assembly and testing of equipment which will produce impacts inherent to worksites. These operations, which are mainly within WWTPs, will have few limited negative impacts such as temporary discomfort and localized pollution caused by worksites (noise, exhaust fumes, dust and vibration, risk of accidents due to increased traffic in the project impact area, the presence of workers, very limited disruption of wildlife and vegetation, poor management of handled products: fuels and lubricants as well as worksite waste, etc.). Where constant drainage is indispensable in a WWTP, some activities will disrupt sanitization efficiency, causing nuisance or the spread of harmful or unpleasant elements, pests and odours due to spillage of large quantities of raw or poorly-treated sewage into the receiving environment.

2.2.2 During the operation phase, environmental and health risks will depend essentially on purification efficiency relating to the standard of operation of the sewerage system and WWTPs, the procedure adopted for managing unconventional industrial waste and illegal discharges into the public sewerage system, as well as hydraulic and organic overload during peak event periods and impacts associated with TWW reuse in agriculture and watering of green spaces. These risks and impacts relate to the contamination of water and soil resources, health risks to which users would be exposed and bad odours that may be due to poor quality.

From the socio-economic viewpoint, the negative impacts will relate to TWW acceptability by the target beneficiaries (where they are not adequately informed and sensitized) and a drop in the market value of products irrigated with TWW compared to the market price, due to consumer resistance.

3. Enhancement and Mitigation Programme

The major negative impacts presented above will be mitigated by implementing a programme comprising several components under each phase:

3.1 The following measures should be taken during works execution:

- (i) Inform the people living near WWTPs and the communities concerned, prior to the commencement of works, about the duration of operations, particularly linear works (rehabilitation and laying of pipes, diversion and remote waste disposal) which could disrupt their activities.
- (ii) Implement measures involving compliance with good practices and professional standards in the execution of civil engineering works in terms of the physical demarcation of the work areas and project impact areas, removal of all temporary equipment and restoration of sites after the completion of works.
- (iii) Manage and prevent nuisances caused by construction work (dust, noise and vibration, exhaust fumes, waste and effluents, etc.) requiring specific mitigative measures such as watering of tracks or work areas; use of noiseless equipment and embedding of generators; use of construction equipment meeting manufacturers' standards and stipulated specifications; and adoption of ad hoc measures to avoid any risk of pollution that may be caused by worksite effluents, solid waste and scrap.

- (iv) Manage risks and hygiene at the worksite through compliance with Labour Code provisions concerning site personnel; organization of transportation of materials and major work during working hours only to minimize traffic congestion and the risk of accidents; demarcation of work areas; signposting of worksites and hazard-prone areas.
- (v) The management of raw wastewater during works in key WWTPs requires the initial programming outside peak event periods, after all technical options to manage the flow and reduce pollution have been tried.

All these measures will be included in the specifications of selected contractors and their costs included in the overall cost of works.

3.2. To guarantee adequate purification efficiency and constant quality consistent with applicable standards and reuse requirements, the operation of rehabilitated WWTPs and facilities built must be backed by the following measures:

- (i) Implement the Environmental Management Plans (EMP-operation) for the WWTPs of Charguia, Choutrana 1, Sud Méliane 1, Kélibia, SE3 in Hammamet, Hammamet Sud, Sousse Nord 1, Frina in Monastir, Sfax Sud, Sidi Mehrez and Houmet Essouk in Mednine, considering the scale of operations and related impacts.
- (ii) Control industrial waste disposal and illegal disposal of sewage into the public sewerage system through improved system monitoring and close coordination with the control services of the National Environmental Protection Agency (ANPE), pending the construction of planned cluster plants.
- (iii) Ensure compliance with the regulatory environmental framework in force.
- (iv) Step up information and sensitization campaigns among beneficiaries to restore confidence and boost the use of TWW.
- (v) Strengthen coordination and channels of information between ONAS staff in charge of operating WWTPs and the Regional Agricultural Development Commission (CRDA) services concerned with TWW reuse, to ensure the supply of quality TWW and prevent dysfunctions and overload.
- (vi) Consolidate existing claim recording, processing and monitoring procedures established within ONAS through its Public Relations Bureau, and certified in accordance with the Tunisian repository, Marhaba.

Table 2
Assessment of Negative Impacts and Description of Proposed Mitigative Measures

Nature of Negative Impacts	Impact Assessment	Recommended Mitigative Measures	Body Charge	in Time frame
PREPARATORY PHASE				
Impacts on the Natural Environment				
Installation of worksites and construction of access roads: cutting, clearing and destruction of vegetation cover and temporary occupation of sites.	Moderate and temporary	Restore sites at the end of the works and remove all temporary facilities. ----- Sensitize workers on good worksite practices concerning natural and human environmental protection.	Contractor	End of preparatory works ----- Start-up of works
WORKS IMPLEMENTATION PHASE				
Impacts on the Natural Environment				
Neutralization of small portions of land needed for the construction of new facilities.	Low; permanent and insignificant	Residual impact	Executing Agency(ONAS)	Start-up of works
Disruption of wildlife.	Insignificant; temporary, highly localized in view of the nature and size of work areas.	--	Contractor	During works
Damage due to soil stripping and loss of vegetation cover, trenches, rubble, construction waste.	Insignificant; temporary and manageable	Soil restoration; revegetation as needed, regular waste disposal.	Contractor	During works
Impacts on the Human Environment				
Increased traffic and risk of personal injury due to the movement of machines and work-related accidents.	Major; temporary and manageable	Inform and sensitize the public and local residents about these risks; demarcate the work area and put up visible standard work zone signs. ----- Sensitize workers on good practices, comply with the Labour Code provisions concerning site personnel, site supervision; use of machinery in compliance with safety specifications; provision of a first-aid kit and availability of a vehicle on site for emergencies.	Contractor	Before the start-up of works ----- During works
Noise and vibration nuisances.	Insignificant; temporary, highly localized given the nature of works, the work areas and the situation.	Compliance of construction machinery with required technical specifications; use of less noisy equipment and embedding of generators, scheduling of work only during working hours.	Contractor	During works
Degradation of air quality due to the spread of dust and release of exhaust fumes.	Insignificant and temporary	Watering of tracks and work areas whenever necessary (during the dry season, in absence of rainfall, etc.).	Contractor	During works

		Ensure compliance of construction machinery with fuel combustion conditions.		
Risk of pollution of water resources due to poor management of waste and effluents produced on the worksite	Significant, irreversible	Organization of ad hoc measures to avoid any risk of pollution by effluents or solid waste (worksite hygiene, proper management of residual and hazardous waste, and regular disposal, etc.).	Contractor	During works
Impacts on the Physical Environment				
Excavation, earthworks and land occupation.	Low to significant; temporary and manageable	Soil restoration after works; management of borrow pits.	Contractor	During and after the completion of works.
Risks in the Event of Maintaining Drainage in WWTPs				
Disruption of purification efficiency.	Low to moderate; temporary and manageable.	* Transfer raw wastewater to another nearby WWTP, where technically possible. * Programme works outside peak hydraulic and event periods.	Contractor	Before the start-up of works
Pollution of water resources by raw or poorly-treated waste water.	moderate to Important ; temporary and irreversible	* Optimize operation of facilities as much as possible, by using all possible technical options. * Ensure partial treatment.	Operator	During works
Spread of pests, bacteria and odours near WWTPs and at suction mouths.	Moderate to Significant , temporary	* Carry out liming before disposal, where necessary.	Operator	During works
OPERATION PHASE				
Impacts on the Physical, Natural and Human Environments (in general)				
Pollution and nuisance caused by the degradation of the quality of TWW owing to: odours and health hazards due to the absence of safe sanitation.				
Disruption of treatment efficiency and performance of sanitation works of WWTPs.	Significant, temporary and manageable	* Ensure regular maintenance and/or programmed replacement of equipment as specified by the manufacturer. * Apply an EMP-operation to help to implement a control-monitoring protocol for various WWTP works and real-time repairs. * Build the capacity of ONAS in terms of trained personnel to ensure better operation and effective control of private operators.	Operator ONAS ONAS	Permanent
Reception of a very high pollution load at the headend due to industrial waste.	Significant, temporary and unmanageable	* Control the disposal of illegal and unconventional waste into the sewerage system, in collaboration with ANPE, and take coercive legal measures in the event of violation.	ONAS/ANPE	According to programmed campaigns

The intrusion of large amounts of saline water into the sanitation system.	Significant, temporary and manageable	* Rehabilitate the sewerage system in zones prone to this problem: Sfax, Zarzis, Gabès, Jerba, etc., and for which the reuse of TWW has been planned.	ONAS	Before the introduction of reuse
Impacts on the Physical and Natural Environments (in case of TWW reuse)				
Risk of contamination of water and soil resources.	Moderate and temporary	* Ensure compliance of TWW with standard NT.106.03 for wastewater reuse in agriculture. * Strengthen coordination and information channels between the operator of WWTPs and CRDA services concerned.	ONAS/CRDA	Permanent
Stagnation of TWW and risk of spread of harmful elements and pests and unpleasant odours.	Significant, temporary and manageable	* Use appropriate irrigation techniques. * Ensure proper drainage of IA * Limit use to the quantity required.	CRDA GDA	Permanent
Impacts on the Human Environment (in case of TWW reuse)				
TWW acceptability by target beneficiaries.	Significant, temporary and manageable.	* Step up campaigns to inform and sensitize beneficiaries to boost TWW use.	CRDA	After completing the upgrading of WWTPs
Health risks linked with TWW reuse and illegal irrigation (disease outbreak, degradation of quality of some crops, etc.)	Significant, temporary and manageable	* Ensure compliance with legal provisions and technical and health measures stipulated in the specifications. * Apply coercive legal measures in event of offence. * Step up chemical and bacteriological quality control and monitoring.	CRDA DHMPE (MSP)	Permanent Quarterly
Drop in market value of products irrigated with TWW compared to their usual market price.	Insignificant, temporary and localized	* Ensure regular sanitary control of products to reassure consumers. * Disseminate information through statutory channels.	ANCSEP (MSP)	Permanent

4. Monitoring Programme and Complementary Initiatives

ONAS is mandated to manage about 80% of the sanitation sector in urban and peri-urban areas. Given its areas of intervention, which include studies, works, operation and maintenance of sanitation facilities, it is the central player in the implementation of all activities under the project. To implement its activities (works execution), it is obliged to comply with laws, regulations, codes and other provisions in force concerning prevention, control and protection in respect of the physical, natural and human environments. Contractors will be responsible for implementing the mitigative and improvement measures contained in the ESMP, while ONAS will conduct control, monitoring and evaluation. Work contracts will include a description of deterrent measures to be imposed on contractors in the event of non-compliance with specific technical requirements for the environmental and social aspects. Furthermore, in its capacity as the treated water producer, ONAS must regularly monitor the physical and chemical quality of inputs and outputs which must be found compatible with the NT 106.02 standard before being discharged into the natural environment through disposal or reuse. ONAS will submit to the Bank half-yearly environmental and social monitoring reports

concerning implementation of measures adopted within the framework of the ESMP and the environmental and social problems encountered.

ONAS' environmental monitoring capacity will be strengthened under project component B. Under this component, the Bank will: (i) assist ONAS in the conduct of studies and works monitoring and control; (ii) participate in its training plan; (iii) finance the procurement of operating equipment; and (iv) assist in project management, including technical, financial and environmental monitoring.

During the conduct of the study on TWW reuse to be launched by the Government, the institutions managing TWW, namely CRDA and AFT, will first provide all relevant information to the targeted beneficiaries within the framework of their sensitization studies. These institutions must regularly monitor the bacteriological and physicochemical quality of TWW before reuse. ANPE will also carry out regular monitoring and control, with the support of units of all project stakeholders (MSP, MAE, MT), as specified in Table 3.

Table 3
Supervision and Monitoring Programme

Supervision Programme	Party Responsible	Monitoring Parameters	Party Responsible	Costs
PREPARATORY PHASE				
Participatory approach and involvement of key stakeholders in planned activities.	ONAS	<ul style="list-style-type: none"> * Disseminate information among the target population through local representatives before project start-up (content of activities, impacts and risks faced). * Sensitize workers on good practices and compliance with environmental components. * Ensure that the site signage is placed not more than 50 metres from works areas. 	ONAS Contractor Contractor	Included in the cost of works
Selection of appropriate locations for the installation of worksites and storage of equipment.	Contractor	* Ensure acceptance of works installation sites, in consultation with stakeholders.	ONAS	
CONSTRUCTION PHASE				
Public safety	Contractor	Safe management of fuels and inflammable materials on the construction site and in the work areas.	ONAS	Included in the cost of works
		Safe storage of equipment on site.		
		Proper demarcation of the project right-of-way and prohibition of access to it.		
Personal safety at the worksite	Contractor	Wearing of work and personal protective gear.	ONAS	
		Availability of a first-aid kit at the works site.		
Worksite hygiene	Contractor	Existence of toilets and lavatories at workplaces.		
		Presence of garbage cans for general waste		
Noise and air pollution and vibration	Contractor	Humidification and watering of tracks and rights-of- way whenever necessary.		

		Checking the condition of machinery and equipment used on the construction site and ensuring their compliance with specifications.		
Pollution of water and soil resources due to poor management of waste and effluents generated on the construction site.	Contractor	Existence on the worksite platform of oil or fuel leaks, or spills of any type of pollutant. Proper management of effluents, hazardous and toxic waste (existence of a temporary storage area and appropriate containers, regular disposal, safe management of fuels and inflammable materials on the worksite and in work areas).		
Site restoration	Contractor	Waste disposal, restoration of affected areas, removal of equipment and worksite scrap, etc.		

RISK MANAGEMENT

WWTP performance	WWTP operator	* Quality of TWW: SS, BOD5, COD * Purification efficiency * Technical measures implemented	ONAS	N/A
Degradation of the living environment (proliferation of harmful elements and pests, destruction of the natural environment, etc.)	ONAS	* Unpleasant odours. * Management of complaints and possible nuisances.		

Monitoring Programme	Party Responsible	Monitoring Parameters	Party Responsible	Costs
OPERATION PHASE				
Implementation of the EMP-operation phase for the WWTPs mentioned in § 3.2	ONAS/ Operator	All the parameters indicated in the EMP relating to the operation of an urban wastewater treatment plant adapted to the context of the WWTP in question.	ONAS	Operating budget
Monitoring of the physical and chemical quality of raw and treated wastewater.	ONAS/ Operator /ANPE	* Monthly monitoring of the following parameters: pH, BOD5, COD, salinity, SS. * Semi-monthly monitoring of the following parameters: N-Kj, Ptotal, oils and fats. * Half-yearly monitoring of heavy metal content.		
Monitoring of bacteriological quality of TWW.	ONAS	* Half-yearly monitoring of faecal coliforms, total coliform counts, helminth eggs and faecal streptococci.		
Improvement of the living conditions of the population.	ONAS	* Degree of satisfaction of the target population measured by the number of claims received in the project area.	ONAS	
Preservation of the environmental situation of sensitive receiving environments.	ONAS	* Chemical and bacteriological analysis of marine waters and sediments. * Changes in the status of wildlife and flora. * Changes in the quality of beaches. * Development of the tourism sector.	MAE/ MSP MAE APAL, INSTM MT	

Monitoring Programme	Party Responsible	Monitoring Parameters	Party Responsible	Costs
IN THE EVENT OF TWW REUSE				

Monitoring of TWW physical, chemical and bacteriological quality.	CRDA / AFT	* All the parameters indicated in NT 106.03. * Faecal coliforms, faecal streptococci, salmonella, intestinal enterococci, escherichia coli.	CRDA	Operating budget
Compliance with specifications relating to TWW reuse in agriculture.	GDA	All measures recommended by specifications and commitments made by the farmer (crop type, irrigation technique, type of use, etc.)	CRDA	
Monitoring of the quality of soil irrigated with TWW.	CRDA	Salinity, porosity, organic matter, heavy metal and, pathogenic germ content.		
Monitoring of the quality of groundwater for recharging water tables.	CRDA	* Piezometric level of the underflow water table of recharge areas. * Chemical and bacteriological analyses.	CRDA	
Health control of people exposed to TWW.	MSP	Immunization, wearing of personal protective equipment.	CRDA / AFT	
Monitoring of the quality of products from farms irrigated with TWW.	MSP	Sanitary control of products before marketing.	ANCSEP	

5. Institutional Arrangements and Capacity Building Needs

The project will be implemented by the internal entities of ONAS, under the supervision of the Ministry of Agriculture and the Environment, which is the sole operator in the sanitation domain in areas managed under decree. ONAS is the Executing agency or the treatment plants under this project. Accordingly, it will be the main coordinator of all planned activities through the Central Treatment and Development Department in charge of operating and monitoring WWTPs, as well as regional departments and officials of the WWTPs concerned. To guarantee the satisfactory implementation of activities and enable ONAS to better perform its duties, it is necessary to build its technical resource and training capacity.

As regards TWW reuse, ONAS plays the role of producer while the CRDAs placed under the supervision of MAE and AFT placed under the Ministry of Tourism, play the roles of managers of TWWs, respectively in irrigation and watering of the golf courses. Once set up, the irrigation systems will be closely managed by GDAs which constitute a key element of Tunisia's institutional mechanism for operation of water systems, in accordance with a management contract binding them to CRDAs. For their part, private companies subcontracted by the AFT manage golf course irrigation systems. Laboratories under contract with the CRDAs and the services under ANPE and the Ministry of Public Health (MSP) carry out environmental and health control, and monitor and evaluate the quality of TWW and its compliance with standards.

6. Public Consultation and Information Dissemination Requirements

This project is ONAS' positive response to the nuisances faced by the population due to the degradation of the living conditions in some receiving environments that are sensitive to unconventional wastewater disposal. It will also contribute to Government's efforts to enhance the use of treated wastewater to reduce water stress exacerbated by a social demand for irrigation water that has grown since the revolution. To achieve this objective, ONAS was entrusted with the responsibility of designing and planning all the activities to be carried out under the project using a participatory approach involving various operators to identify all problems and consider the needs and aspirations of

users in terms of quantity, quality and consistency. The same participatory process was used to consolidate the project design by: (i) visiting WWTPs and irrigation areas; (ii) organizing meetings with the different ministries concerned; and (iii) organizing meetings with future managers and beneficiaries, including GDAs.

To ensure sustainability, activities during project implementation will entail: (i) ONAS will, in collaboration with local officials, urban development services, civil society representatives and any populations living around WWTPs, organize information campaigns prior to the commencement of project works during which the project and environmental measures and related constraints will be presented ; (ii) all information relating to e improvement of TWW quality will be disseminated among the populations concerned and potential users.

7. Cost Estimates

Most of the environmental mitigative measures recommended are an integral part of services accompanying civil engineering works. Their costs will be included in the cost of the technical project components indicated in the contractors' specifications. Control, monitoring and evaluation activities will be carried out under the usual operations falling within the competence of the services concerned (ONAS, AFT, ANPE, APAL DHMPE, CRDA, and ANCSEP) which have acquired rich experience in these domains. Thus, they will not incur any specific additional costs. However, the design of EMP-operation for the eleven WWTPs and support for their implementation should cost about **EUR 126 000** to be included in the cost of component B.

8. Implementation and Reporting Schedule

Most of the environmental and social measures contained in the ESMP will be implemented at the same time as works. Regional departments and WWTP officials will be directly involved in the implementation of the ESMP and the control programme. They will submit half-yearly reports on the status of the environmental and social component of the project to the Central Department. ONAS will prepare and submit a half-yearly general environmental and social monitoring report to the Bank.