



Republic of Tunisia

Environmental and Social Management Plan

Project to relocate a 237 MWp photovoltaic power plant in El Khobna – Sidi Bouzid



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ASF Consulting
Your Sustainability Partner

8 Essafa Ennasr Residence 2 2001
Ariana Tunisia
Awatef.siala.fourati@asfconsulting.org
www.asfconsulting.org
(+216) 77 299 554

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List of abbreviations

Abbreviation	Meaning
ESIA	Environmental and Social Impact Assessment
EIS	Environmental Impact Assessment
ESMP	Environmental and Social Management Plan
PEPP	Stakeholder Engagement Plan
STEG	Tunisian Electricity and Gas Company
SONEDE	National Water Distribution Company
ONAS	National Sanitation Office
ANME	National Energy Management Agency
ANPE	National Agency for Environmental Protection
CRDA	Regional Commissions for Agricultural Development (CRDA)
CPG	Gafsa Phosphate Company
GCT	Tunisian Chemical Group
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
SFI	International Finance Corporation (IFC)
IPP	Independent Power Producer

PV	Photovoltaic
PST	Tunisian Solar Plan
SCADA	Supervisory Control and Data Acquisition (SCADA)
STS	Transformer Station (TS) – (used for transformers)
HSE	Health, Safety, and Environment (HSE)
ESHS	Environment, Health, and Safety (ESHS)
HV	High Voltage
kV	kilovolts (voltage unit)
EMF	Electromagnetic fields
PM2.5 / PM10	Particulate matter (PM2.5 / PM10)
IUCN	International Union for Conservation of Nature (IUCN)
INP	National Heritage Institute (INP) – mentioned
EMF	Exposure to electromagnetic fields

1 Environmental and Social Management Plan

1.1 Objective of the ESMP

The main objective of the Environmental and Social Management Plan (ESMP) is to integrate, into all phases of the El Khobna solar power plant project, the measures necessary to avoid, mitigate, or compensate for the negative environmental and social impacts identified in the Environmental and Social Impact Assessment (ESIA), while maximizing the positive impacts. The ESMP aims to ensure strict compliance with Tunisian national regulations and international standards (IFC - International Finance Corporation, EIB - European Investment Bank, EBRD - European Bank for Reconstruction and Development), specifying the measures to be implemented, institutional responsibilities, implementation schedules, necessary resources, and monitoring indicators. It is a dynamic tool for environmental and social management throughout the project life cycle.

1.2 subsidy program

1.2.1 Environmental

Positive impact	Measures to amplify or maintain impact	Indicators	DT cost
Contribution to energy transition	1. Effective production monitoring and preventive maintenance. 2. Communication and public awareness. 3. Integration into regional renewable energy plans.	4. Monitoring system, preventive maintenance, communication campaigns, coordination with regional authorities	15,000
Reduction in GHG emissions (CO ₂)	5. Control of avoided emissions. 6. Annual report published. 7. Optimization of solar panel efficiency.	8. Emissions tracking software, data analysis, report writing, maintenance optimization training	10,000
Reduction in air pollution	9. Installation of dust-proof plant barriers. 10. Local air quality monitoring. 11. Raising awareness among local residents.	12. Purchase of plants and barriers, air quality measurement equipment, local awareness campaigns	8,000
Ecological rehabilitation and restoration	13. Ecological restoration plan. 14. Planting of endemic trees and shrubs. 15. Biodiversity monitoring during project implementation.	16. Restoration plan study, purchase of plants, planting labor, ecological monitoring	18,000
Reduction in dependence on fossil fuels	17. Integration of the project into national energy policies. 18. Promotion of renewable investments. 19. Monitoring of economic and energy impact.	20. Institutional communication, economic impact studies, reports, promotional events	10,000
Promotion of archaeological heritage discoveries	21. Collaboration with the INP for protection, documentation, and local awareness (educational panels, guided tours).	22. Number of awareness-raising activities / agreement signed with the INP	5,000
23. Estimated total			66,000

1.2.2 Social

Positive impact	Measures to amplify or maintain impact	Indicators	Cost DT
Creation of direct and indirect jobs	24. Prioritize local hiring. 25. Favor local subcontractors. 26. Ensure decent working conditions.	27. HR department, local communication, contract management, integration logistics	12,000
Creation of temporary jobs	28. Inform the population of opportunities. 29. Facilitate access to local recruitment.	30. Information campaigns, HR administrative follow-up, documentation	7,000
Indirect economic benefits	31. Encourage purchasing from local cooperatives and artisans. 32. Promote short supply chains.	33. Local supplier coordination, awareness-raising, support logistics	6,000
Local economic development	34. Encourage local purchasing (catering, accommodation, supplies). 35. Support local SMEs.	36. Organization of calls for tenders, supplier visits, SME awareness	8,000
Enhanced local energy security	37. Communicate about the reliability of the network. 38. Support local electricity access programs.	39. Communication materials, meetings, awareness campaigns	5,000
Strengthening local capacities	40. Organize training in safety, hygiene, and the environment 41. Provide recognized certifications.	42. Trainer fees, teaching materials, room rental, equipment, certifications	10,000
Development of technical skills	43. Offer specific technical training in solar energy and maintenance. 44. Ensure post-training follow-up.	45. Specialized trainers, teaching materials, practical sessions	9,000
Improvement of access infrastructure	46. Rehabilitate the runway with local materials. 47. Ensure regular maintenance after the project.	48. Purchase of materials (gravel, sand), equipment rental, labor, maintenance	10,000
Improvement of local infrastructure	49. Carry out useful improvements for local residents (drainage, fencing) 50. Integrate these improvements into the local plan.	51. Equipment, labor, coordination with local authorities	6,000
Contribution to the conservation of Bouhedma National	52. Support for park awareness-raising activities, funding for small local educational projects (signs, brochures).	53. Number of materials funded / number of educational sessions.	7,000

Park		
Estimated total		80,000

1.3 Mitigation program

1.3.1 construction phase

Designation	Potential impact	Proposed measure	Timeline	Responsible	Budget estimate (DT)
Soil	<p>Traffic frequency on the TRACK can damage the soil, causing erosion and potentially leading to pollution in the event of pollutant runoff. At the SITE, stripping, leveling, foundation laying, and cable laying operations expose the soil to risks of compaction, erosion, and pollution.</p> <p>During the installation of the PYLONS, excavation, assembly, and cable pulling operations may alter the structure of the soil, particularly in the agricultural areas crossed, especially since a central section is located approximately 1 km from Sebkhet Noual, while the upper section of the line runs along the boundaries of Bouhedma National Park. Near the site, in the southern section of the high-voltage line, an archaeological site was discovered and the route was moved to avoid it. Any subsequent discoveries must trigger the application of the accidental discovery protocol in coordination with the INP (immediate cessation of work, securing of the area, notification of the INP).</p>	<ul style="list-style-type: none"> Limit traffic to essential needs, favor stabilized routes, and water the track regularly. Equip vehicles with anti-leak kits and carry out regular inspections. Quickly repair ruts by filling them in. Store and handle polluting substances on impermeable surfaces with retention tanks. Perform emergency maintenance on vehicles on impermeable areas. Optimize controlled leveling operations to minimize earth movements and keep soil in place. Store and preserve topsoil for reuse at the end of the work. Restore, as far as possible, surfaces disturbed by construction work to their original condition, or even to an improved condition. Avoid excavation work in adverse weather conditions (heavy rain, strong winds, flooding, etc.). Avoid any concrete spillage on the ground by implementing strict procedures. Regularly monitor sensitive areas to correct any damage. Limit the cleared area to the bare minimum. 	Start of construction	EPC contractor / Environmental supervision	55,000
Air quality	Increased traffic on the runway during the construction phase will expose local residents	<ul style="list-style-type: none"> Prohibit prolonged idling of vehicles to limit fuel consumption and atmospheric emissions. 	As soon as the track is	EPC contractor	25,000

	<p>to exhaust fumes in the developed section, as well as dust in the undeveloped section.</p> <p>At the SITE and along the lines: Earthworks and leveling produce fine dust (PM10, PM2.5) and gases (NO_x, SO₂, CO), reducing visibility and exposing workers to respiratory risks.</p> <p>Transmission line: Excavations, the passage of machinery, and the transport of pylons generate dust.</p>	<ul style="list-style-type: none"> • Raise awareness among drivers about good driving practices. • Water the work areas, avoid unnecessary travel and idling. • Limit engine idling time. • Prohibit the burning of solid waste on site. • Implement a regular maintenance program for vehicles and equipment to prevent breakdowns and limit pollutant emissions. • Also ensure that the wheels of vehicles leaving agricultural areas are cleaned regularly 	open		
Noise and vibration	<p>Traffic generates noise from engines, brakes, and horns.</p> <p>Site development work could create constant noise, particularly affecting nearby areas.</p> <p>Operations</p> <p>The installation of lines/pylons (lifting, cable laying, etc.) could cause temporary noise pollution in agricultural areas.</p>	<ul style="list-style-type: none"> • Limit the speed and passage of trucks near sensitive areas • Raise awareness among drivers to reduce unnecessary honking and noise (training sessions). • Restrict the passage of construction vehicles to normal working hours (8 a.m.–6 p.m.) to avoid noise pollution early in the morning or in the evening • Install noise barriers near sensitive areas. • Use well-maintained, quiet machinery. • Inform local residents of the work schedule. • Place generators in soundproof enclosures or move them away from sensitive areas. • Maintain equipment regularly to minimize mechanical noise pollution. • Ensure that workers are equipped with appropriate personal protective equipment (ear defenders). 	Start of construction	EPC contractor	10,000
Water management and wastewater	<p>PISTE: accidental overflow could impact neighboring homes</p> <p>Runoff of water laden with sediment and hydrocarbons toward the shoulders.</p> <p>Wastewater at the SITE may come from:</p> <ul style="list-style-type: none"> • Sanitary wastewater from the living quarters • Water used to wash equipment 	<p>For the site</p> <ul style="list-style-type: none"> • Install watertight septic tanks that are emptied regularly. • Ensure that the natural flow of rainwater is maintained without causing changes to the overall hydrology of the site. • Set up washing and concreting areas with retention tanks. • Prohibit the washing of trucks outside of stabilized areas or on permeable ground. • Clean up any leaks or spills quickly. 	Before the arrival of the contractor's workers	EPC contractor	40,000

	<p>Changes in water flow on site during the leveling and runway preparation operation</p> <p>During the installation of power line pylons, there is a potential risk of concrete residue and pollutants running off onto agricultural land</p>				
Waste management	<p>TRACK: Transport of poorly secured materials that may cause solid waste dispersion and soil pollution through liquid infiltration.</p> <p>SITE: Production of various types of solid waste (industrial waste, municipal waste, etc.) plastics, metals) and hazardous waste in various workstations</p>	<ul style="list-style-type: none"> • Implement systematic cleaning of tracks and access areas to quickly recover fallen waste • Implement selective sorting and install covered bins labeled for this purpose, and ensure their removal by approved channels. • Store hazardous waste in sealed containers and ensure its disposal by approved channels. • Organize regular collection of household waste. • Avoid prolonged storage on agricultural land • Raise awareness among teams to keep areas clean. 	Before transport	EPC contractor	25,000
Transport and logistics	<p>At the SITE, the movement of machinery and trucks, congestion, increases the risk of collisions and accidents.</p> <p>The traffic generated during the erection of the pylons, although short-lived, could impact the area surrounding the pylon site.</p>	<ul style="list-style-type: none"> • Limit speed near sensitive areas. • Restrict the number of vehicle trips to essential needs and organize specific time slots to avoid peak hours. • Organize a traffic plan for the site. • Delimit and stabilize storage areas. • Limit speed and plan deliveries to avoid congestion. • Train drivers and monitor maneuvers. 	Before the arrival of machinery	EPC contractor	25,000
Wildlife	<p>At the SITE level, on-site work alters terrestrial wildlife habitats and disturbs nesting birds, causing them to flee, become injured, or abandon their nesting sites.</p> <p>For the transmission LINE: The installation of pylons and the movement of machinery fragment habitats and disturb local wildlife, which may cause them to move away or lose their resting places.</p> <p>This is particularly important when working</p>	<ul style="list-style-type: none"> • Plan work outside the birds' breeding season (ideally avoiding March to July) to limit disturbance. • Limit clearing and earthworks to what is strictly necessary for the project in order to preserve surrounding habitats. • Install wildlife-friendly fencing. • Restore affected habitats after work by rehabilitating the soil and replanting local plant species if necessary. • Install anti-collision markers on cables in areas with high bird activity. • Mark and cordon off sensitive areas to prevent access by 	Start of work	Contractor EPC, Environmental	28,000

	near wetlands such as Sebkhat Noual and Bouhedma.	<p>machinery in areas with high densities of reeds or nesting birds.</p> <ul style="list-style-type: none"> • Use light, suitable machinery to limit soil compaction and destruction of vegetation cover. • Implement ecological monitoring during the work, carried out by an ecologist specializing in birdlife, to adjust actions if necessary, with a specific focus on observation points 5 and 7 discussed in the environmental sensitivities section of the report. • For the northern section along Bouhedma National Park, work will be limited to daytime hours, with enhanced ecological monitoring and a ban on encroachment outside the authorized right-of-way. 			
Flora	<p>At the site, earthworks will result in the almost total destruction of natural vegetation, increasing the risk of soil erosion. In addition, the installation of panels will cover the ground to a greater or lesser extent, limiting photosynthesis.</p> <p>For the transmission line, the installation of pylons, the pulling of cables, and the opening of tracks could potentially cause localized land clearing, including on agricultural land.</p>	<ul style="list-style-type: none"> • Limit stripping and earthworks to what is strictly necessary in order to preserve as much of the existing natural vegetation as possible. • Implement a post-construction revegetation program using local species adapted to the arid climate. • Avoid driving machinery off designated tracks to preserve the remaining flora. • Raise awareness among teams about respecting vegetated areas and prohibit any storage of materials or traffic outside the defined routes. 	Start of work	EPC contractor	15,000
Social	<p>At the SITE level, local operations (wells, crops, huts) may be disrupted, which could lead to tensions without communication or compensation.</p> <p>In addition, the sudden arrival of workers may raise cultural concerns and be perceived as a disruption without appropriate awareness.</p> <p>For the TRANSMISSION LINE, crossing agricultural land temporarily limits access and may cause social tensions without prior information.</p>	<ul style="list-style-type: none"> • Enforce strict rules at the base camp that respect local social norms and set up a mediation system to manage conflicts. • Engage in prior dialogue with the residents concerned, particularly the six informal farmers identified, to explain the project and agree on possible compensation. • Establish a mechanism for managing complaints and compensating for any damage. • Inform, consult, and coordinate with farmers to ensure safe access and prevent conflicts, with compensation if necessary. • Clearly inform farmers in advance of the periods and 	Before and during work	EPC contractor, Social agent	10,000+ (Compensation in the CPR)

		areas of intervention to anticipate any inconvenience.			
Economic	Although construction creates temporary jobs, it can cause agricultural losses and reduce local income in the short term (agricultural activity), limiting sustainable economic benefits.	<ul style="list-style-type: none"> • Inform and compensate farmers quickly for loss of access and income; • Promote local hiring and purchasing to maximize economic benefits in the region; • Plan work in consultation with farm owners to minimize losses and ensure access to land; • Ensure transparent dialogue with communities and establish a mechanism for complaints and monitoring of economic impacts. 	During construction	EPC Contractor, Project Management	CPR
Gender and vulnerability	<p>At the ACCESS ROAD level, frequent vehicle traffic on the road crossing a residential area and a primary school increases the risk of accidents for children and their parents.</p> <p>At the main SITE, the presence of male and female workers may disrupt social norms and expose women to the risk of gender-based violence.</p> <p>TRANSMISSION LINE: Crossing agricultural land exposes families, particularly rural women, to direct impacts without consultation or appropriate support.</p>	<ul style="list-style-type: none"> • Encourage the hiring and participation of local women in the project. • Raise awareness among workers about respecting local social and cultural norms. • Establish a confidential complaint management mechanism that is accessible to all, especially women and vulnerable people. • Provide social and economic support for vulnerable people who are affected. • Install safe signage near schools and pedestrian areas. • Organize truck traffic to avoid school arrival and departure times. • Provide support and supervision for unaccompanied children. • Identify, consult, and support vulnerable people (those without land titles, widows, the elderly, isolated herders). • Communicate clearly about the work and its impacts, with appropriate solutions. • Provide compensation for those affected. 	Before the works	Contractor EPC	CPR
Health and safety	Workers: Workers are exposed to major physical risks (falls, crushing, electrocution, bites) exacerbated by extreme weather conditions, dust, noise, and the lack of adequate sanitary facilities and protective	<ul style="list-style-type: none"> • Secure the access road with signage, speed limits, and passing areas to reduce the risk of accidents. • Implement dust control measures (watering, limiting movement). • Provide workers with appropriate personal protective 	Before work	Contractor EPC, HSE and health, HR	20,000

	<p>equipment.</p> <p>Local population: Frequent passage of heavy machinery and nuisances (dust, noise, vibrations) expose local residents to accident risks and health problems, while product leaks can contaminate water resources.</p> <p>Working conditions: Temporary or migrant workers endure difficult conditions, with a lack of protections, training, union representation, and adequate facilities, which increases the risk of accidents, occupational illnesses, and harassment.</p>	<p>equipment (PPE): helmets, gloves, goggles, dust masks, and hearing protection.</p> <ul style="list-style-type: none"> • Organize regular training in safety and risk prevention (falls, electrocution, handling). • Ensure rigorous management of hazardous products (fuel, oil) and provide secure storage areas. • Install drinking water points and shaded areas, and schedule breaks to limit the risk of dehydration and heatstroke. • Implement a rigorous health management system in the base camp: drinking water, sanitation, waste and wastewater management. • Define emergency procedures and first aid measures on site. • Raise awareness and inform local populations about the risks associated with the construction site by installing clear signage and providing protected areas for pedestrians, particularly near schools. • Coordinate work with farmers to avoid conflicts of use and ensure the safety of workers and farmers. • Set up a social dialogue committee or mediator to ensure that workers, particularly temporary or migrant workers, have a voice. • Ensure equal treatment, non-discrimination, and respect for workers' rights, with formal contracts and recourse mechanisms. • Establish a strict policy against harassment and abuse, with a confidential reporting system. • Regularly monitor working conditions and adjust measures based on worker feedback and reported incidents. 			
Total estimated					253,000

1.3.2 Operational phase

Designation	Potential impact	Proposed measure	Deadlines	Responsible	Budget estimate (DT) over 20 years
Soil	The operation of the power plant may cause soil compaction due to maintenance vehicle traffic, as well as a risk of contamination in the event of oil or chemical spills, exacerbated by increased infiltration due to permeable surfaces.	<ul style="list-style-type: none"> Limit traffic to paved and stabilized roads to avoid excessive soil compaction outside the designated routes. Store oils and maintenance products on sealed platforms with retention tanks to prevent accidental leaks into the soil. Install a controlled drainage system to channel cleaning water and prevent soil erosion or saturation. 	As soon as the plant is commissioned	Project operator, Environmental manager	60000
Air quality	During operation, dust and exhaust emissions may occur during dry periods, mainly due to the movement of maintenance vehicles, generators, and dry cleaning of panels, raising fine particles in an arid environment.	<ul style="list-style-type: none"> Limit vehicle speed Regularly maintain generators to ensure clean combustion and limit pollutant emissions. Prefer wet or semi-wet panel cleaning when weather conditions permit, in order to limit the resuspension of particles. 	During dry periods and maintenance	Project operator, Environmental manager	30,000
Noise and vibration	During operation, noise remains moderate and localized, emitted mainly by maintenance vehicles, panel cleaning, and the intermittent operation of technical equipment (transformers, inverters, generators).	<ul style="list-style-type: none"> Schedule noisy operations (maintenance, cleaning) outside of sensitive hours to minimize disturbance to local residents or staff. Maintain technical equipment to avoid abnormal noise due to malfunction (e.g., worn bearings, unbalanced motors). Install soundproofing covers or acoustic insulation devices on generators or fixed transformers if noise levels exceed locally acceptable thresholds. 	Before and during each maintenance operation	Project operator, Technical manager	20,000
Water and wastewater management	During the operational phase, the use of water for cleaning panels and sanitary needs can generate wastewater discharges, which can seep into permeable soil, leading to a risk of soil and groundwater pollution.	<ul style="list-style-type: none"> Install a controlled drainage system to collect cleaning water and prevent uncontrolled runoff. Use non-toxic and biodegradable cleaning products to reduce the risk of chemical contamination. Train staff in good water management practices. Regularly monitor the quality of discharged water. 	From the very first panel cleaning operations	Project operator, Environmental manager	40,000
Waste management	During operation, the production of ordinary and hazardous waste from maintenance and cleaning operations can lead to pollution risks, particularly if storage	<ul style="list-style-type: none"> Implement a rigorous waste sorting system on site. Install secure temporary storage areas suitable for hazardous waste. Ensure regular waste disposal to approved treatment or 	From the very first maintenance operations	Project operator, HSE manager	80,000

	or disposal is poorly managed, which could affect the soil and groundwater	<p>recycling facilities.</p> <ul style="list-style-type: none"> • Train staff in good waste management and handling practices. • Establish periodic monitoring and control of waste management on site. • Establish emergency procedures in case of accidental spills of hazardous substances. 			
Transport and logistics	During operations, regular vehicle traffic for maintenance, supply, and deliveries can cause local nuisances such as dust emissions and soil compaction, especially during dry periods.	<ul style="list-style-type: none"> • Develop and implement a clear internal traffic plan to organize vehicle movements. • Strictly delimit parking and storage areas to avoid congestion. • Limit vehicle speeds on site to reduce dust resuspension. • Raise staff awareness of good driving practices and traffic flow management. 	As soon as vehicles are put into service	Project Operator, Technical Manager	40,000
Landscape	During the operational phase, the stark visual contrast between the industrial facilities (signs, fences, buildings) and the surrounding natural steppe landscape may be perceived as a degradation of the landscape, especially in a rural, sparsely urbanized context.	<ul style="list-style-type: none"> • Install vegetation around the site boundaries to mitigate the visual disruption and break up the continuity of shiny surfaces. • Use anti-reflective materials on metal structures and panels whenever possible. • Limit nighttime lighting to areas where it is strictly necessary to reduce light pollution. • Communicate with local communities to explain the benefits of the project and mitigate negative perceptions. 	Before opening the site to the public/visitors	Project operator, Environmental manager	25,000
Wildlife	During the operational phase, site structures and maintenance activities may disturb certain bird species and migratory birds that are sensitive to light reflections and transmission lines. Maintenance of the pylons, due to human presence and noise, may disturb water birds and migratory birds nesting or resting in the reed beds, especially during the breeding season.	<ul style="list-style-type: none"> • Install artificial perches away from active areas to reduce disturbance to birds of prey. • Limit vegetation maintenance outside nesting periods to encourage the re-establishment of ground-nesting species. • Install anti-collision devices on transmission lines (visual spirals, beacons) to reduce risks to migratory birds. 	Before and during peaks of biological activity (nesting, migration)	Project operator, Environmental manager	20,000
Flora	During the operational phase, the regrowth of xerophilic vegetation stabilizes the soil,	<ul style="list-style-type: none"> • Encourage the controlled development of local vegetation adapted to arid conditions under the panels to 	Annually, from the start	Project operator, Environmental	20,000

	but excessive maintenance can limit this natural regeneration, leading to a local loss of vegetation cover.	<p>limit erosion.</p> <ul style="list-style-type: none"> • Avoid excessive use of herbicides or aggressive mechanical methods when weeding. • Define strict traffic zones to limit trampling and degradation of vegetated areas. • Implement regular vegetation monitoring to adapt maintenance practices to the natural evolution of the vegetation cover. • Raise awareness among operating personnel of the importance of preserving spontaneous vegetation as a factor in soil protection. 	of operations	manager	
Social	During the operational phase, the low number of staff limits social interaction, but the lack of ongoing dialogue with local residents can foster a feeling of exclusion, especially among households that have lost access or experienced disruption.	<ul style="list-style-type: none"> • Maintain an active communication mechanism with local communities to inform them and listen to their concerns. • Involve local stakeholders (businesses, labor, services) in maintenance activities on an ad hoc basis to strengthen ties with the population. 	From the start of operations and on an ongoing basis	Project operator, Social manager	CPR
Economic	During the operational phase, the automated power plant generates few permanent local jobs, and the exclusion of agricultural land causes economic loss for residents, with limited benefits for local businesses.	<ul style="list-style-type: none"> • Promote local hiring for maintenance, monitoring, and security positions. • Encourage sourcing from regional suppliers to maximize economic benefits. • Establish partnerships with local economic actors (businesses, cooperatives). • Regularly monitor economic impacts and adjust local development strategies accordingly. 	From the start of operations	Project operator, HR, Project management	30,000
Health and safety	During the operational phase, staff are exposed to electrical hazards, the effects of hot weather (heatstroke, dehydration), respiratory irritation due to dust, and health risks associated with poor waste and sanitation management.	<ul style="list-style-type: none"> • Implement regular training in electrical safety and working at height for staff. • Provide and enforce the use of appropriate personal protective equipment (PPE) (helmets, insulated gloves, harnesses, dust masks). • Organize regular breaks, shaded areas, and a reliable supply of drinking water to prevent heat-related risks. • Ensure proper management and maintenance of sanitary facilities and waste disposal to avoid health risks. 	Continuously throughout the entire operation	Project operator, HSE and health manager	70,000

		<ul style="list-style-type: none"> Establish an emergency plan with rapid emergency response measures in case of accident or illness. Provide regular medical check-ups for exposed workers. 			
Estimated total					455,000

1.3.3 Decommissioning phase

Designation	Potential impact	Proposed measure	Deadlines	Responsible	Budget estimate (DT)
Soil	Dismantling disturbs the soil through digging, removal of structures, and vehicle traffic, causing excessive turning and aeration. The handling and removal of waste, including potential pollutants, presents a risk of contamination through accidental leaks. The dust generated can also degrade soil quality.	<ul style="list-style-type: none"> Avoid earthworks during periods of heavy rainfall to limit soil leaching. Clearly demarcate the areas of intervention to limit soil disturbance to specific areas. Temporarily store materials (waste, rubble) on waterproof tarpaulins and in secure areas. Provide retention tanks for potentially polluting liquids (oils, solvents) to prevent spills. Regularly water dusty areas to limit the dispersion of particles. Backfill and re-profile trench areas or areas where structures have been removed correctly in order to stabilize the soil. Check for pollution at the end of the project and, if necessary, treat any contaminated areas. 	From the start of dismantling	Project operator, Environmental manager	6000
Air quality	Removal, excavation, and evacuation operations generate temporary dust and exhaust emissions, affecting local air quality, especially in dry and windy weather.	<ul style="list-style-type: none"> Regularly moisten work areas and internal tracks to limit dust dispersion. Reduce the speed of vehicles and limit unnecessary travel. Use well-maintained vehicles to reduce exhaust emissions. Avoid dust-generating work during periods of high wind. 	Throughout the duration of the work	Project operator, Environmental manager	4000

		<ul style="list-style-type: none"> • Install a filtration system (if applicable) or locate storage areas in sheltered areas. • Provide protective masks for workers directly exposed to dust. • Limit the operating time of generators or combustion engines to what is strictly necessary. 			
Noise and vibration	Dismantling, excavation, and restoration activities generate intermittent noise and localized vibrations, which may disturb local residents, wildlife, and soil stability.	<ul style="list-style-type: none"> • Limit noisy work to regular working hours (no work at night or early in the morning). • Maintain mechanical equipment in good condition to reduce noise levels. • Use machinery equipped with high-performance silencers. • Inform the local population in advance of the dismantling schedule. • Temporarily halt work in the event of excessive nuisance reported by local residents. • Reduce the speed of machinery to limit ground vibrations. 	From the start of dismantling	Project operator, Technical manager	3000
Water and wastewater management	Excavation, backfilling, and earthmoving work could disrupt water flow, increase erosion and runoff, while the handling and storage of materials, including oils and greases, could contaminate soil and groundwater.	<ul style="list-style-type: none"> • Provide collection or drainage systems to channel runoff water. • Stabilize slopes or reworked areas to limit erosion. • Use retention tanks for any temporary storage of oils or hazardous substances. • Equip the site with spill kits to respond quickly in the event of an accidental leak. • Ensure the regulated disposal of wastewater produced by staff (portable toilets, watertight containers). • Prohibit any direct discharge into the environment without prior treatment. 	From the start of dismantling	Project operator, Environmental manager	5000
Waste management	During decommissioning, a large amount of solid waste will be generated, including metals, used panels, concrete, cables, and hazardous waste (oil residues). Inadequate management of this waste can contaminate	<ul style="list-style-type: none"> • Implement rigorous waste sorting at source, with clearly identified and secure storage areas. • Store hazardous waste in leak-proof containers that comply with standards, away from sensitive areas. • Organize regular waste disposal to approved 	From the start of work	Project operator, Environmental manager	8000

	the soil, pollute the environment, and endanger the health of workers and local residents.	treatment or recycling facilities.			
Transport and logistics	The regular movement of heavy machinery to remove materials, dig and dispose of waste will cause moderate to heavy traffic on the tracks, which may lead to congestion and soil compaction, particularly on site.	<ul style="list-style-type: none"> Plan and organize traffic flows to avoid congestion and limit the number of unnecessary trips. Stabilize trails and reinforce the most heavily used areas to reduce compaction and erosion. Regularly monitor the condition of the trails and carry out repairs quickly in the event of significant damage. 	From the start of dismantling	Project operator	4000
Landscape	The removal of structures, panels, buildings, and fences will temporarily alter the visual appearance of the site, with disturbances related to machinery, storage areas, and bare ground. Gradual restoration will allow for partial restoration of the natural landscape, thereby reducing the long-term visual impact.	<ul style="list-style-type: none"> Limit the storage time of materials and avoid their dispersion over large areas. Implement a gradual restoration and revegetation program using suitable local species. Install temporary visual screens (e.g., hedges or nets) to mitigate the impact on sensitive areas during construction. 	During work and post-dismantling		2000
Wildlife	The dismantling phase may temporarily disturb local birds due to noise, movement of machinery, and removal of structures, which may affect their habitat if the work is poorly managed.	<ul style="list-style-type: none"> Avoid noisy work during the early hours of the day, when certain species are active. Restrict access by machinery to only those areas necessary to limit disturbance to surrounding areas. Remove materials and structures without leaving obstacles that could trap or injure wildlife. Raise awareness among workers about the correct behavior to adopt when encountering animal species. Allow an ecological rest period between construction phases to enable the natural dispersal of disturbed species. 	Before and during dismantling	Project operator, Environmental manager	3000
Flora	Spontaneous vegetation around the facilities could be destroyed by the removal of structures, excavation, and backfilling. Restoration may also disturb vegetation, but the impact remains limited because the area is already highly modified and species-free.	<ul style="list-style-type: none"> Strictly delimit work areas to avoid unnecessary damage to surrounding vegetation. Avoid prolonged parking of machinery on vegetated areas. Carry out dismantling work outside of periods of maximum plant growth (spring). Plan for gradual restoration of the land (gentle leveling, erosion control) to promote natural 	From the start of dismantling and post-dismantling	Project operator, Environmental manager	2000

		<p>regrowth.</p> <ul style="list-style-type: none"> • Leave certain peripheral areas undisturbed to preserve natural seed banks. • Avoid the use of chemicals or weedkillers during the work. 			
Social	The temporary increase in machinery and workers may disturb local residents, particularly in the absence of communication. Site restoration may be beneficial for future reuse, but the end of activities may reduce local jobs and affect social dynamics.	<ul style="list-style-type: none"> • Establish a clear and regular communication plan with local residents to inform them of the phases and schedules of the work. • Organize site restoration in consultation with the local community to consider valuable future uses. • Provide social support or assistance programs for workers affected by the end of the project (retraining, education). 	From the start of dismantling	Project operator, social manager	3000
Economic	During dismantling, the economic impacts are temporary, linked to employment and services generated by the work, bringing a slight boost to the local economy. However, the end of operations causes the loss of regular economic benefits (jobs, local purchases), which can reduce the income and activities of workers and local supplier .	<ul style="list-style-type: none"> • Promote temporary local hiring for decommissioning activities to maximize economic benefits during this phase. • Plan and support the economic transition of workers affected by the end of the project (training, professional reintegration). • Encourage the purchase of local goods and services during the dismantling phase to support the local economy and businesses. 	From the start of dismantling	Project operator, HR manager	2000
Health and safety	During decommissioning, the risks to staff health and safety increase due to intensive operations. Dismantling, cable removal, and the use of heavy machinery expose workers to accidents (falls, cuts, electrocution) and dust inhalation. Noise and vibrations also cause stress and fatigue.	<ul style="list-style-type: none"> • Implement mandatory and regular safety training for all personnel working on the site. • Provide and enforce the wearing of personal protective equipment (helmets, gloves, safety shoes, hearing and respiratory protection). • Establish strict procedures for working at height and handling electrical cables. • Organize regular medical check-ups and appropriate breaks to prevent fatigue and heatstroke. • Ensure effective dust management and control by watering and wearing appropriate masks. • Provide first aid equipment and an accident response protocol. 	From the start of dismantling	Project operator, HSE and health manager	5000

		<ul style="list-style-type: none">• Check that the machinery and equipment used are properly maintained in order to reduce technical risks.			
Estimated total					49,700

1.4 Monitoring and follow-up program i

1.4.1 Construction phase

Component	Follow-up action	Frequency	Indicators	Responsible	Budget estimate (DT)
Soil	Visual inspection of soil and track condition, ruts, erosion, sensitive areas (visual monitoring)	Weekly and after bad weather	Condition of tracks, settling, visible damage	Environment manager	6000
	Technical inspection of equipment (technical monitoring)	Bimonthly	Presence of leaks, compliance of technical areas	HSE Manager / Mechanic	4000
	Monitoring of topsoil storage and cleared areas (visual and documentary monitoring)	At each stage of stripping/earthworks	Stored volume, protection, minimization of affected areas	Site manager / Environment Manager	3000
	Monitoring compliance with appropriate work periods (documentary monitoring)	Before work begins	Compliance with seasonal schedule	Site Manager	2000
Air quality	Measurement of dust concentrations (PM10, PM2.5) using a portable measuring device (environmental monitoring)	Weekly and in case of wind or intense activity	Level of particles in the air ($\mu\text{g}/\text{m}^3$)	Environment manager	8000
	Measurement of gas emissions (NO _x , CO, SO ₂) in exposed work areas (environmental monitoring)	Monthly or during peaks in activity	Gas levels (ppm)	Environment Manager / Laboratory Technician	500
	Technical inspection of machinery to reduce emissions (technical monitoring)	Weekly	Maintenance log, visible emissions, leaks	Maintenance Manager	4000

	Verification of regular watering of traffic areas and foundations (operational monitoring)	Daily (morning and afternoon) during dry periods	Soil moisture, watering log	Site manager	3000
	Monitoring compliance with good driving practices: no burning, idling engines (behavioral monitoring)	Weekly	Record of violations/observations	HSE Manager	2000
	Checking that exposed workers wear filter masks (HSE monitoring)	Weekly / unannounced visits	Effective wearing of respiratory PPE	HSE Manager	10
Noise and vibration	Monitoring compliance with noisy working hours (8 a.m.-6 p.m.) and work planning	Daily	Schedules respected, no nighttime disturbances	Site manager/HSE supervisor	3000
	Verification of maintenance of noisy machinery and equipment (generators, compactors, etc.)	Weekly	Maintenance log, reduced noise levels, technical compliance	HSE Manager / Mechanic	4000
	Spot measurement of noise levels in sensitive areas (residential areas, schools, agricultural areas)	Monthly or in the event of a complaint	Results < 70 dB (according to local standards), compliance of measurements	Environment/HSE Office	3000
	Monitoring of the implementation of noise reduction measures (barriers, enclosures, distance)	Before noisy phase / Weekly	Barriers installed, soundproofed equipment, safety distance respected	Environment Manager / Site Manager	3000
Water and wastewater	Visual inspection of tracks and shoulders to detect signs of runoff or overflow (visual monitoring)	Weekly and after heavy rainfall	Traces of runoff, puddles, wet or soiled areas	Environmental manager	4000

	Checking the watertightness of tanks, septic tanks, washing areas, and concrete areas (technical monitoring)	Bimonthly	No leaks, compliance of installations	HSE Manager / Mechanic	3000
	Retention system inspection (basins, tanks, vegetation barriers) and wastewater management (visual and documentary monitoring)	Monthly	Operation of devices, volume stored, frequency of emptying	Environment Manager / Site Manager	4000
	Monitoring compliance with authorized areas for washing and concreting (on-site monitoring)	Random during wet work	Compliance with practices, no washing on bare ground	Site manager	2000
	Control of liquid discharges near wadis or agricultural land	Weekly during high-risk activities	No traces of waste, visible pollution	Environmental Manager	2000
Waste	Visual inspection of the securing and covering of materials transported on runways	Daily during transport	Presence of tarpaulins, no spillage en route	Site manager	3000
	Regular inspection of tracks and access areas for fallen waste	Weekly or after each major passage	Cleanliness of tracks, presence of solid waste	Environmental Manager	3000
	Verification of selective sorting and presence of covered dumpsters, located away from sensitive areas	Weekly	Presence and condition of bins, waste separation	Environment/Logistics Manager	4000
	Monitoring of the storage and disposal of hazardous waste (oils, solvents, batteries) by approved channels	Monthly and after production of hazardous waste	Traceability, quantities disposed of, compliance of containers	Environment/HSE Manager	500
	Cleaning of storage and circulation areas (prevention of leaks and spills)	Weekly	Cleanliness, absence of spills	Site Manager	3000
Transport and logistics	Checking signage and safety in residential areas	Weekly	Visible signage, speed bumps in place	HSE Manager	2000

	Monitoring of internal traffic and storage plan	Weekly	Smooth traffic flow, clearly marked areas	Logistics Manager	3000
	Schedule control and traffic restrictions	Weekly	Compliance with time slots, no congestion	Transport Manager	2000
Wildlife	Ecological monitoring during works (wildlife and birdlife) (ecological monitoring)	Bimonthly during the earthworks and installation phases	Presence of sensitive species, abnormal behavior, mortality	Ecologist / Environmental Manager	4000
	Inspection of fences to check their compatibility with local wildlife (height, mesh size)	After installation and quarterly	Technical compliance, absence of traps or injuries observed	Site Manager / HSE	2000
	Verification of the installation of anti-collision markers on cables in areas at risk from birds	Before lifting the cables	Effective presence of anti-collision devices	Site manager / Environment manager	10
Flora	Monitoring of stripping areas and compliance with earthwork limits	Weekly	Affected surface area, compliance with limits	Environment manager	3000
	Monitoring of post-work revegetation implementation	Quarterly (post-work)	Recovery rate, vegetation cover	Environment Manager	3000
	Verification of limited and supervised land clearing on the transmission line	Weekly	Areas affected vs. planned	Environmental Manager	2000
Social	Monitoring of signage and safety devices in residential areas	Weekly	Presence of signs, condition of pedestrian crossings, complaints received	Site manager / HSE	3000
	Monitoring of compliance with traffic schedules in sensitive areas (schools, villages)	Weekly	Traffic log, schedules respected	Logistics Manager	2000
	Monitoring dialogue with local residents and complaint management	Monthly	Meetings held, complaints handled	Social Officer / Environment Manager	3000

	Verification of preliminary information and consultation with farmers	Before work begins and according to phases	Consultation meetings, signed contact forms	Social Manager / Project Manager	2
Economic	Monitoring of impacts on agricultural land affected by machinery and pylons	Monthly during construction	Number of complaints, affected area, compensation paid	Social manager / Site manager	2000
	Monitoring of local benefits of the project (jobs, services, local subcontracting)	Quarterly	Number of jobs or services provided locally	Project Manager / HR Manager	3000
Gender & vulnerability	Monitoring the integration of women and dialogue with vulnerable populations	Monthly	Number of women involved / Consultation meetings held	Social worker / Local NGO	2000
Archaeological heritage	Monitoring of sensitive earthworks by an INP representative, application of the protocol for chance discoveries.	Continued during earthworks.	Number of discoveries reported / compliance with protocol.	Site manager + INP.	5,000 DT.
Health & Safety	Monitoring of HSE plan implementation: PPE, training, emergency procedures	Weekly	Equipment rate, training log	HSE Manager	5000
	Verification of sanitary conditions (water, showers, shade)	Weekly	Presence/condition of facilities	HSE Manager / Base camp	3000
	Medical monitoring of workers and prevention of climate-related risks (heat stress, dehydration)	Periodic (depending on season)	Health checks, heat-related health incidents	Nurse / HSE Manager	3000
	Safety checks for local residents (crossing areas, signage, dust)	Weekly	Facilities in place, complaints, incidents	HSE Manager	2000
	Monitoring of working conditions: equality, contracts, protection, complaint mechanisms	Monthly	Complaints register, contract formalization rate	HR Manager / Social Manager	2000
Estimated total					143,000 TND

1.4.2 Operational phase

Component	Follow-up action	Frequency	Indicators	Responsible	Budget estimate
Ground	Inspection of traffic areas and storage areas	Quarterly	Traces of leaks, compaction, subsidence	Environmental manager	5000
	Inspection of product storage areas (watertightness, retention tank)	Quarterly	Storage compliance, absence of contamination	HSE/Maintenance Manager	4000
Air quality	Visual inspection of dust and gases generated by vehicles	Monthly (dry season)	Presence of visible dust, level of vehicle maintenance	Logistics manager	6000
	Inspection of generator sets	Every six months	Visible emissions, maintenance performed	Maintenance manager	3000
Noise	Occasional monitoring of noise levels around the site and equipment	Annual or upon complaint	Measured noise level (dB), number of complaints	HSE Manager	4000
Wastewater	Specific monitoring of runoff and runoff towards the sebkha (after heavy rains).	Spontaneous (after heavy rainfall)	Drainage functioning, no abnormal runoff	Environmental manager	5000
	Inspection of septic tanks and management of sanitary water	Half-yearly	Emptying carried out, no odors or overflow	Base camp manager	300
Waste	Checking waste sorting, storage, and disposal	Monthly	Output logs, clean areas, active service providers	HSE Manager / Base camp	5000
Transport	Inspection of runway condition and signage	Quarterly	Damage, speed compliance, visibility of signs	Logistics manager	4,500
Landscap	General visual condition of the site and fences	Annual	Cleanliness, visual integration,	Technical	4000

e			alignment of signs	manager	
Wildlife	Occasional observation of birdlife and verification of anti-collision devices; Increase the frequency of ecological monitoring (monthly) on the northern section along Bouhedma, with a specialist ecologist.	Annual or seasonal	Presence of dead or disturbed birds, condition of spirals	Environmental manager	3000
Flora	Monitoring of spontaneous vegetation under panels and peripheral areas	Half-yearly	Coverage rate, erosion, over-maintenance	Environmental manager	3000
Social	Community visits and complaint handling	Semiannual	Number of meetings, complaints received and handled	Social/HSE Manager	4000
Local economy	Annual review of local opportunities (services, subcontracting)	Annual	Number of local contracts, direct economic benefits	Project management	3000
Health & safety	Medical monitoring of staff and inspection of sanitary facilities	Half-yearly	Accidents, incidents, hygiene, PPE available	HSE/HR manager	6000
Estimated total					62,500 TND

1.4.3 Dismantling phase

Component	Follow-up action	Frequency	Indicators	Responsible	Budget estimate
Soil	Inspection of excavated areas, vehicle traffic, and waste management	Weekly	Disturbed surface, leaks, site cleanliness	Environment/site manager	6000
	Monitoring of waste storage and transport	For each operation	Compliance of containers, absence of spillage	HSE / Site manager	4500

Air	Observation of dust emissions and inspection of machinery	Weekly, dry period	Visual dust level, condition of engine filters	Environment/Mechanics Manager	5000
Noise & Vibration	Spot measurement of noise levels around sensitive areas	Monthly	Noise level dB(A), feedback from local residents	HSE Manager	3000
	Monitoring of schedules and noisy equipment	Weekly	Compliance with time slots, abnormal machine noise	Site Manager / HSE Manager	3000
Water/wastewater	Monitoring of runoff, runoff, and storage points	Weekly + after rain	Presence of erosion, leaks, condition of ditches/basins	Environmental manager	4000
Waste	Monitoring of waste sorting, storage, and disposal (metals, concrete, cables, oils)	Weekly	Quantity sorted, disposal in accordance with regulations, clean area	HSE manager/waste service provider	8000
Transport /logistics	Inspection of runway conditions, vehicle traffic, loading/unloading areas	Weekly	Runway passable, no traffic jams or risks	Logistics / Safety manager	4500
Landscaping	Monitoring the visual condition of the site, progress of structure removal and restoration	Monthly	Area cleared, ground leveled, revegetation underway	Site manager/environment	400
Wildlife	Observation of local wildlife and disturbance in sensitive areas	During sensitive work	Observed disturbance, species fleeing, nesting affected	Environmental manager	3000
Flora	Monitoring of vegetated areas or areas to be replanted	Bimonthly	Degraded/regenerated areas, vegetation recovery rate	Environment manager	3500
Social	Quick surveys of local residents, communication about progress via e	Monthly	Number of complaints, satisfaction survey level	Communications manager	3000

Local economy	Monitoring of local employment and local purchasing	Quarterly	% of local jobs, volume of local spending	Administrative/HR manager	2000
Health/safety	HSE inspection on site, PPE, safety procedures, and sensitive areas	Daily	Wearing PPE, accidents, site compliance	HSE Manager	6000
	Regular training and safety briefings for workers	Weekly	Number of training sessions, incidents reported	HSE/HR Manager	3,500
Estimated total					63,000 DT

1.5 Capacity building and budgeting plan

Awareness program / Training	Related impact	Responsible	Target	Budget estimate (DT)
Raise awareness among drivers about good driving practices, maintenance, and speed limits	Air quality / Transport and logistics	HSE Manager (Qair Group / Subcontractors)	Machine operators/drivers (Subcontractors and Qair)	2000
Raise awareness among workers about local wildlife, critical periods (nesting) and appropriate behavior	Wildlife	Ecology Expert (Subcontractor) / HSE Manager (Qair Group)	All on-site workers (Subcontractors and Qair)	2,500
Raise awareness among teams about issues related to flora and implement post-work ecological monitoring	Flora	Ecology Expert (Subcontractor) / HSE Manager (Qair Group)	All workers on site (subcontractors and Qair)	2500
In-depth and repeated training in health and safety (HSE), including management of extreme weather conditions (heat stress) and procedures in the event of a serious accident	Health and safety (workers - construction)	Safety/HSE Manager (Qair Group)	All workers and supervisors (subcontractors and Qair)	4000
Raising awareness among local communities about the risks associated with the construction site (road accidents, potential pollution) and preventive behaviors	Health and safety (populations)	HSE Manager (Qair Group) / Communications Manager	Local communities living nearby	2000
Train staff in best practices for managing chemicals and environmental incidents (leaks, soil and water pollution). Includes an emergency anti-pollution plan in the event of a major leak	Soil contamination / Wastewater	Environment / HSE Manager (Qair Group)	Personnel responsible for chemical management (Qair and subcontractors)	3000
Specific training in wastewater management and implementation of emergency procedures in the event of accidental spills (groundwater)	Water and wastewater management	Environment/HSE Manager (Qair Group)	Technical staff, workers, and maintenance personnel (Qair and subcontractors)	2,500
Staff training in the recognition of protected species in Bouhedma (gazelles, birds of prey, reptiles), with instructions on what to do in case of encounter.	Wildlife	Environment/HSE Manager (Qair Group)	Technical staff, workers, and maintenance personnel (Qair and subcontractors)	5,000

Specific training on the chance find procedure.	Archaeological Heritage	Environment/HSE Manager (Qair Group)	Technical staff, workers, and maintenance staff (Qair and subcontractors)	500
Train staff in best practices for managing and handling hazardous waste, with a hazardous waste emergency plan in case of a major leak	Waste management	Environment/HSE Manager (Qair Group)	Technical staff, workers, and maintenance personnel (Qair and subcontractors)	3000
Ongoing training for staff in hazardous chemical management and emergency anti-pollution procedures (operational phase)	Soil contamination (operations)	Environment/HSE Manager (Qair Group)	Maintenance technicians and operators (Qair and subcontractors)	2,500
Regular training program on electrical and climatic risks specific to photovoltaic operations, including an electrical/health emergency plan	Health and safety (workers – operations)	Safety Manager (Qair Group)	Maintenance technicians, workers involved in electrical installations (Qair and subcontractors)	3,500
Raise awareness among workers about behaviors that respect flora and fauna during dismantling work	Fauna/Flora (dismantling)	Environment Manager (Qair Group) / Ecologist Expert (Subcontractor)	Workers and technicians during dismantling (Subcontractors and Qair)	2500
Training staff in first aid for bites/stings (snakes, scorpions, rodents), availability of antidotes and first aid equipment	Health and safety (workers)	HSE/Safety Manager (Qair Group)	All workers and technicians on site (subcontractors and Qair)	1,500
Estimated total				41,500

1.6 Emergency and risk management plans

Emergency plan	Related impact	Responsible	Budget estimate (DT)
Establish emergency procedures in case of accidental leaks or spills (chemicals, hydrocarbons, liquid pollutants)	Soil contamination / Water and wastewater management	HSE Manager (Qair)	4000
Define emergency procedures (evacuation, rescue) and first aid facilities on site (construction site)	Health and safety (workers/population)	Safety Manager (Qair)	5000
Establish an emergency plan with rapid response in the event of an accident or illness during operations (particularly electrical and climatic risks)	Health and safety (operations)	Safety Manager (Qair)	4000
Provide a rigorous health emergency plan (waste management, sanitary water, drinking water) for the base camp (construction and dismantling)	Health and safety / Working conditions	Base camp / HSE Manager (Qair)	4000
Establish an emergency response protocol during the dismantling phase (mechanical and electrical accidents, environmental incidents)	Health and safety (dismantling)	Safety Manager (Qair)	4000
Specific emergency plan in case of bites or stings (snakes, scorpions, rodents)	Health and safety (workers)	HSE/Safety Manager (Qair)	1500
Estimated total			22,500 DT

1.7 Responsibility for implementing the ESMP

Manager	Role(s)/Responsibilities
EPC Contractor	Execution of technical and social measures during construction and dismantling.
Environmental supervision	Support for monitoring environmental compliance on the construction site.
Project operator	Site management during operation, maintenance, environmental monitoring, technical coordination.
Environmental manager	Environmental monitoring (soil, air, fauna, flora, waste, water, landscape), compliance reports, training support.
HSE (Health, Safety, and Environment) Manager	Monitoring compliance with HSE standards, protective equipment, audits, emergency procedures, awareness raising.
Safety Manager	Implementation of safety plans, risk management, safety training, incident management.
Technical Manager	Maintenance of technical equipment (inverters, transformers), noise management during operation.
Social Manager	Social monitoring, local consultations, complaints, gender integration, vulnerability.
HR Manager	Human resources management, contracts, equality, working conditions.
Site manager	Daily coordination of work, compliance with measures, monitoring of practices in the field.
Logistics Manager	Organization of flows, traffic plan, transport, track maintenance, supply management.
Transport manager	Specific traffic management, compliance with schedules and traffic rules.
Maintenance Manager	Vehicle and equipment maintenance, technical monitoring, emissions reduction.
Base camp manager	Management of living conditions on site: drinking water, sanitation, cleanliness, comfort.
Administrative Manager	Monitoring of local jobs, purchasing, support for economic monitoring during dismantling.
Laboratory technician	Air quality analysis (gases), spot measurements during the construction phase.
Nurse	Medical monitoring of workers, prevention of thermal and health risks.
Social/communication officer	Community dialogue, awareness raising, complaint management, project communication support.
Ecology expert	Ecological monitoring (fauna/flora), sensitive periods, replanting, specific training.
Waste service provider	External management of solid and hazardous waste (collection, treatment).
Local NGO	Support for the integration of women, gender and vulnerabilities, local awareness-raising.
Project management/Project manager/Project management	General monitoring, coordination between teams, monitoring of economic and social indicators.
Mechanic	Machinery maintenance, leak reduction, on-site technical maintenance.
Security guard	Physical surveillance of the site (access, intrusions, theft), security of equipment and facilities.
Cleaning agent	Maintaining cleanliness in living areas, base camps, sensitive areas, supporting hygiene on site.
Laborers	Direct execution of work (earthworks, assembly, cleaning, planting,

	handling, etc.), compliance with HSE instructions.
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1.8 ESMP budget

Total cost for the construction phase	\$253,000
Total cost for the operational phase	\$455,000
Total cost for the dismantling phase	63,000
Cost of the Stakeholder Engagement Plan	145,700
Complaints management mechanism	50,000
Total cost of implementing positive impacts	146,000
Total cost of monitoring plan	268,500
Total cost of reinforcement plan	\$41,500
Total cost of emergency plan	22,500
Total in TND	1,503,200