



ANNEX IX - Environmental and Social Management Plan

ENVIRONMENTAL ISSUE/IMPACT	IMPACT SIGNIFICANCE	MITIGATION MEASURE	RESPONSIBILITY	MONITORING	MONITORING / INSPECTION FREQUENCY	COST
WATER AND SOIL QUALITY - Construction Phase						
Groundwater, Surface water and Soil Contamination	Minor to moderate	Discharge of wastewater to the environment will be prohibited.	Contractor	Visual inspection	Periodically	Part of best working practice
	Minor	Construction management of excavations will avoid the generation of drainage pathways to underlying aquifers.	Contractor	Visual inspection	During the construction activity	Part of best working practice
	Moderate	All chemical storage containers, including diesel fuel, and hazardous liquid waste drums/containers will be placed in areas with concrete flooring, with proper secondary containments during construction. When necessary, absorbent pads or materials will be provided near the storage areas.	Contractor	Visual inspection	Periodically	Part of best working practice
	Minor to Moderate	The contractor should manage the generated domestic wastewater in an environmentally safe manner. This will include using temporary movable water closets (toilets) and transporting the resulting domestic wastewater to the nearest wastewater treatment plant.	Contractor	Visual inspection to ensure the effectiveness of the mitigation measure	Periodically	Part of best working practice
	Minor to Moderate	All wastewater generated by the construction activities will be trucked off site to the local wastewater disposal station.	Contractor	Keeping the disposal records on the site	Periodically during the activity	Part of best working practice
	Minor to Moderate	Siting and bunding of temporary fuel and oil storage will take into account proximity to water resources.	Contractor	Visual inspection to ensure the effectiveness of the mitigation measure	-	Part of the design
	Minor to Moderate	An oil/chemical spill response plan will be prepared and implemented.	Contractor	-	-	Part of best working practice

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	Minor to Moderate	Any spill from construction activities will be monitored and controlled; waste materials, which are unsuitable for reuse on-site, will be disposed in a licensed sanitary landfill site.	Contractor	Visual inspection and keeping the shipment records on the site	Periodically	Part of best working practice
WATER AND SOIL QUALITY - Operation Phase						
Groundwater and Soil Contamination	Moderate to Major	All chemical storage tanks and drums, including those containing fuel and oil as well as waste oil drums and containers will be placed in areas with concrete flooring and proper secondary containments. If necessary, absorbent materials will be placed near the chemical storage tanks.	Operator	Visual inspection	Periodically	Part of best working practice
	Moderate to Major	Any leakage oil will be collected in the bottom part of the nacelle enclosure. The wind turbine generator system will also be equipped with a series of smaller oil collection systems for individual system components.	Operator	-	-	Included in the design
	Moderate to Major	Maintenance of vehicles must be in special places and it should not be within the Project site.	Operator	Visual inspection	During the operation period	Part of best working practice
	Minor to Moderate	Regular maintenance of the turbines will minimize the potential for fluid leaks.	Operator	-	-	Part of best working practice
	Moderate to Major	Transformers will be provided with pits to retain the coolant of the transformers.	Operator	-	-	Included in the design
	Moderate to Major	Generators will be placed on impervious surface and an oil/chemical spill kit will be placed to be used for the loading operations.	Operator	-	-	Included in Design
	Moderate to Major	The cooling oil for the transformers shall not contain PCBs or any other carcinogenic type oils.	Operator	-	-	Included in the design
	Moderate to Major	Emergency Response Plan and Oil Spill Response Plan will be prepared and implemented.	Operator	-	-	Part of best working practice
Waste Oil Disposal	Moderate to major	For the liquid waste that can result from machinery and vehicles as a result of maintenance work, the maintenance of these machines and vehicles must be in special places and it should not be within the Project site.	Operator	Visual inspection	Periodically	Part of best working practice
Wastewater Disposal	Minor to moderate	Domestic wastewater generated at site should be managed in an environmentally safe manner. This will include using temporary movable water closets (toilets) and transporting the resulting	Operator	Visual inspection and keeping the disposal records on the site	Periodically	Minimal

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		domestic wastewater to the nearest wastewater treatment plant				
NOISE and Vibration - Construction Phase						
Noise Control	Minor	All construction vehicles will be maintained regularly so that their noise emissions do not cause nuisance to workers or local residents. All staff will be informed of any noise sensitive receptors in the vicinity of the site and they will be advised regularly by the Site manager of the quietest best practice methods and tools and to report any violation of noise control measures immediately when they are identified.	Contractor	Visual inspection to ensure the effectiveness of the mitigation measure	Periodically	Part of best working practice
	Minor	Exhaust mufflers will be employed on engine-powered construction equipment and vehicles. The equipment will be turned off when not in use.	Contractor	Visual inspection	Before using the vehicle or the equipment	Part of best working practice
	Negligible to minor	The use of vehicles during construction will be optimized as much as possible to reduce number of vehicles and thus reduce the potential for traffic noise.	Contractor	-	-	Part of best working practice
	Minor	All vehicles to be driven responsibly and below 20 km/h within the construction site	Contractor	Visual inspection	Periodically	Part of best working practice
	Negligible to minor	The site personnel will be provided with proper personal protective equipment in order not to be exposed to high noise levels that can be generated at the site. The site personnel will be made aware of noise risks associated with the construction contract and the need for hearing protection.	Contractor	Visual inspection to ensure the effectiveness of the mitigation measure	Periodically	Part of best working practice
NOISE - Operation Phase						
Noise Control	Moderate	Noise mitigation measures will be incorporated into the design of the turbines, including: <ul style="list-style-type: none"> The turbines with reduced noise operation system will be chosen in order to minimize noise emissions The turbines will be properly positioned in order to minimize the impact of noise by keeping a sufficient distance to the surrounding properties. 	Contractor / Operator	Noise monitoring around the noise sensitive receptor	In case of complaint	Part of best working practice

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		<ul style="list-style-type: none"> The turbines will be equipped with optional noise reduced power operation modes to accommodate noise restrictions Noise measurements will be conducted in case of complaints from surrounding local people. Noise barriers such as tree planting will be applied at the nearest sensitive receptor in case noise measurement results exceed IFC requirements. Noise isolation will be applied at the nearest sensitive receptor in case noise measurement results exceed IFC requirements after planting trees. 				
AIR QUALITY - Construction Phase						
Dust	Minor	Good housekeeping arrangements should be employed so that the site is kept as clean as possible	Contractor	Visual inspections	Periodically	Part of best working practice
	Minor	The working areas and immediate surrounding areas will be kept clean to ensure that any dust accumulation or spillages are removed/cleaned up as soon as possible	Contractor	Visual inspections	Continuously	Part of best working practice
	Minor	Where possible, the contractor will select the equipment design to minimize the dust emissions	Contractor	Visual inspections	Periodically	Part of best working practice
	Minor	Activities that produce significant dust emissions will be monitored during periods of high winds and dust control measures implemented as appropriate.	Contractor	Visual inspections	Periodically and during the high winds	Part of best working practice
	Minor	Stockpiles of soil and similar materials will be carefully managed to minimize the risk of windblown dust, e.g. water spray dampening soils and spoil and during delivery and dumping of sand and gravel during periods of dry weather.	Contractor	Visual inspections	Periodically	Part of best working practice
	Minor	Loading and unloading of material that could generate dust will be done appropriately.	Contractor	Visual inspections	Periodically	Part of best working practice

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	Minor	Unloading of friable materials, will be minimized and carefully managed.	Contractor	Visual inspections	Periodically	Part of best working practice
	Minor	On-site and access roads will be well maintained through mechanical means (sweeping or vacuuming) or spraying with water.	Contractor	Visual inspections	Periodically	Part of best working practice
	Minor	Vehicle speeds on un-surfaced roads will be limited to 20 km/h.	Contractor	Visual inspections	Periodically	Part of best working practice
	Minor	Lorries used for the transportation of friable construction materials and spoil off-site will be covered/sheeted.	Contractor	Visual inspections	Periodically	Part of best working practice
Gaseous Pollutants	Minor	Best control technology will be adopted to reduce emissions from fuel storage, combustion emissions from engines and any other temporary equipment.	Contractor	-	-	Part of best working practice
	Minor	Engines will not be left running unnecessarily. Engines will be switched off when not in use.	Contractor	Visual inspections	Periodically	Part of best working practice
	Minor	Regular maintenance of vehicles will be undertaken to ensure that vehicles are safe and that emissions are minimized.	Contractor	-	-	Part of best working practice
	Minor	All vehicles will be maintained so that their exhaust emissions do not cause nuisance to workers or local people.	Contractor	Visual inspection and keeping the maintenance records on the site	Periodically	Part of best working practice
HAZARDOUS WASTE - Construction Phase						
Hazardous Waste Management	Moderate to Major	Hazardous wastes will be segregated from non-hazardous wastes and its management will focus on the prevention of harm to health, safety, and the environment.	Contractor	Visual inspections	Periodically	Part of best working practice
	Moderate to Major	Hazardous wastes will be stored in containers that are non-damaged, leak-proof, safe and appropriate for the international standards, on concrete place within the land of the facility.	Contractor	Visual inspections	Periodically	Part of best working practice
	Moderate to Major	The hazardous waste containers will be checked routinely in order to determine whether they are damaged or any spill occurred	Contractor	Visual inspections	Periodically	Part of best working practice
	Moderate to Major	Hazardous waste containers will be kept closed and wastes will be stored in a way that they will	Contractor	Visual inspections	Periodically	Part of best working practice

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		not go in chemical reactions.				practice
	Moderate to Major	Liquid hazardous wastes will be collected in metal or plastic drums and stored in an area with a concrete flooring and a proper secondary containment to prevent potential spills and leakages reaching to soil or groundwater.	Contractor	Visual inspections	Periodically	Part of best working practice
	Moderate to Major	Transportation of the wastes will be done by the persons and entities that are licensed for this work and by the vehicles appropriate for the properties of the transported waste. The hazardous wastes will be sent to a licensed disposal facility.	Contractor	Visual inspection and keeping the shipment records on the site	When required	Part of best working practice
HAZARDOUS WASTE - Operation Phase						
Hazardous Waste Management	Minor to Moderate	"Hazardous waste" label will be placed on to the containers and this label will indicate the amount of stored waste as well as the storage time of the hazardous waste. Hazardous solid wastes generated during operation will be collected and stored in a concrete area with proper labeling.	Operator	Visual inspections	Periodically	Part of best working practice
	Moderate to Major	All hazardous waste will be collected in leak-proof containers and removed to a licensed disposal facility by licensed transporters. The hazardous wastes will be handled, stored, transported and disposed of according to the Jordanian Legislation and the IFC requirements.	Operator	Visual inspection and keeping the shipment records on the site	Periodically	Part of best working practice
NON-HAZARDOUS WASTE - CONSTRUCTION & OPERATION						
Non-Hazardous Waste Management	Minor to Moderate	The wastes will be characterized according to composition, source, types of wastes produced, generation rates, or according to local regulatory requirements.	Operator	Visual inspections	Periodically	Part of best working practice
	Minor	Feasible waste prevention, reduction, reuse, recovery and recycling measures will be taken, waste materials will be treated and disposed of and all measures will be taken to avoid potential impacts to human health and the environment.	Operator	Visual inspections	Periodically	Part of best working practice
	Minor	Solid wastes that could be recycled, like cement bags, metal scraps, packing boxes and wooden crates, etc. and will be separated and stored temporarily on site for eventual recycling process.	Contractor	Visual inspections	Periodically	Part of best working practice

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	Minor	Domestic solid wastes that result from workers must be collected in special containers and transported periodically to the nearest solid wastes landfill.	Operator	Visual inspections and keeping thw	Periodically	Part of best working practice
	Minor	Solid waste resulting from site preparation, construction and rehabilitation will be used a fill material in the site if appropriate, while the remaining will be collected in special places far from wadis and transported to the nearest solid wastes landfill.	Contractor	Visual inspection and keeping the disposal records on the site	Periodically	Part of best working practice
BIOLOGICAL RESOURCES AND HABITAT ALTERATION - Construction Phase						
Flora	Moderate	Topsoil will be removed and stored on site for future landscaping purposes.	Contractor	Visual inspections	-	Part of best working practice
	Moderate	Reduce/ optimize amount and size of new roads as much as possible;	Contractor	Visual inspections	-	Part of best working practice
	Moderate	Limit decommissioning activities to the excavation site where possible and replant site with native plants;	Contractor	Visual inspections	-	Part of best working practice
Fauna	Moderate to Major	Hunting of animals and collecting ground nests for resident birds will be prohibited. To prohibit workers from hunting and produce awareness materials such as: <ul style="list-style-type: none"> • Signs. • Training manuals and material. • Posters. • Brochures. 	Contractor	Visual inspections	Periodically	Part of best working practice
	Moderate	All solid and liquid wastes during construction will be collected and disposed in the nearest disposal sites to decrease the impact on fauna.	Contractor	Visual inspections	Periodically	Part of best working practice
	Moderate	Before the stripped material is removed from the area, a visual control will be made for the possibility that vertebrates such as tortoises, hedgehogs, lizards and snakes may enter these stripped materials. If any fauna element is found, it will be put into a cloth bag and transferred to a	Contractor	Visual inspections	Periodically	Part of best working practice

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		nearby habitat and released carefully.				
	Moderate	Adjacent habitats will be protected from disturbance by the construction workforce, e.g. by fencing off of unused areas, warning signs and training of workers	Contractor	Visual inspections	Periodically	Part of best working practice
Birds	Major	A breeding bird survey is recommended prior to the start of construction activities to identify breeding locations of any priority birds at the site. If breeding of a priority species confirmed at the site construction activities will be conducted after breeding activity has ceased. Further annual breeding surveys are recommended if resident/summer breeding priority birds are confirmed using the site during the construction phase survey in order to inform a bird sensitive approach to construction phase activities and prevent disturbance to priority birds that may be using the site for breeding, foraging or other activities	Operator	Breeding bird survey	3-year program following which an evaluation should be done to determine ongoing level of effort.	Part of best working practice
BIOLOGICAL RESOURCES AND HABITAT ALTERATION - Operation Phase						
Flora	Moderate	Vehicle movement will be restricted to the existing roads that connect the proposed project site with the surrounding areas. Off road driving will be avoided.	Operator	-	-	Part of best working practice
Fauna	Moderate to Major	Hunting will be prohibited at and around project site by the workers. To prohibit workers from hunting and produce awareness materials such as: <ul style="list-style-type: none"> • Signs. • Training manuals and material. • Posters. • Brochures. 	Operator	-	-	Part of best working practice
	Moderate	Low intense and blinking lights will be preferred obstruction lights in order to minimize the risk of	Operator	-	-	Part of best working

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		<p>avian collision. The turbine can be equipped to mitigate shadow flicker; and with aviation lights</p>				practice
Fauna	Moderate to Major	<p>Conduct bird monitoring activities for Spring (late February to mid May) and Autumn (late August to mid November) migration season to analyze impacts of the wind farm on the avifauna(after 3-year programme an evaluation should be done to determine ongoing level of effort); Conduct summer period (late May to early Autumn) and winter bird monitoring activities for foraging Priority Birds (residents) (after a 3-year programme an evaluation should be done to determine ongoing level of effort); Establish a protocol for shut-down on demand for Priority Birds (after a 3-year programme an evaluation should be done to determine ongoing level of effort). Conduct carcass searches during Spring and Autumn Migration season within 1 week period and during summer and winter within 2 week period. Report incidents when a carcass and /or remains of a Priority Bird are found. Conduct investigation and identify corrective/remedial actions.</p>	Operator	Survey and Reporting to Lenders	<p>for Spring (late February to mid May) and Autumn (late August to mid November) migration season summer period (late May to early Autumn) and winter bird monitoring activities carcass searches during Spring and Autumn Migration season within 1 week period and during summer and winter within 2 week period</p>	Part of best working practice
Birds	Major	<p>-Priority Bird Focus: Monitoring is recommended to focus on Priority Bird (PB) VECs. During field work where there is any doubt when identifying a Priority Bird VEC, the individual/s concerned should be treated as a PB VEC as a precautionary measure. The opportunity should be taken to also record other species.</p> <p>- Vantage Points: Suitable Vantage Points (VP) should be established at strategic locations at each wind farm site. The numbers and location of VPs will be informed by the size of the site, topography, turbine numbers and layout, and the</p>	Operator	In-Flight Monitoring of Priority Birds	3-year program following which an evaluation should be done to determine ongoing level of effort.	Part of best working practice

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		<p>known activity patterns of PB VECs at the site.</p> <ul style="list-style-type: none"> - Field Observers: Field Observers/Surveyors should use VPs but be 'mobile' <i>i.e. move around site based on observations and judgement, especially with respect to the Griffon Vulture movements, which will likely follow livestock.</i> The number of observers would depend on the size of the site, topography, turbine number and turbine layout and may vary between the migration and non-migration seasons. Observers should consider presence of Bedouin/flocks of sheep within and near the wind farm area which could increase risk of increased presence of certain PB species (e.g. Griffon Vultures) - see 1.5. - Survey Effort/Resources: During the Spring (i.e. late Feb to mid-May) and Autumn (i.e. late Aug to mid Nov) migration seasons, Observers should be on-site undertaking daily in-flight monitoring. As many of the PBs are resident or summer breeders in the TRWPP area, in-flight monitoring is also recommended outside the migration seasons. A similar level of effort to that undertaken during the migration season is recommended during the summer months when these PBs may forage in the area. The level of effort of monitoring may reduce during the winter period. - Survey Times: The timing of survey windows during a day should be open to the judgement of the Field Observers Team Coordinator, building on experience and drawing on lessons learnt from previous survey periods. Survey windows should be targeted at likely periods of peak activity based 				

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		<p>on knowledge of temporal and diurnal flight activity patterns of migratory and non-migratory PB VECs, environmental conditions and feedback from previous survey sessions. For example, peak periods of activity during migration season may be from late morning to mid-afternoon.</p> <ul style="list-style-type: none"> - Training: Field Observer training should principally focus on: i) Identification of PBs; ii) Priority Bird behaviors; iii) Guidance on survey protocols, recording flight activity information; iv) turbine shut-down request protocols (see 1.2). etc. - Developers should consider the training of external bird specialists and in-house staff who could undertake Field Observation activities. - Likely that external bird specialist Field Observers will be required on-site as part of the migration season monitoring program. Trained wind farm staff could augment the monitoring teams during the migration season and undertake the role of Field Observer(s) during the summer and winter seasons outside the migration seasons. - When more than one Wind Farm is operational there may be an opportunity for Developers to consider a joint program of training Field Observers which could form part of the Joint Management & Action Plan in order to reduce risk of fatalities occurring of Priority Birds. Will inform shut-down of individual turbines in order to avoid and minimize risk of collisions 				

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Birds	Major	<p>Shut-Down Protocol Focus on Priority Birds: Shut-down protocols should be developed for wind farms based on in-flight monitoring observations. Field Observers should have a clear protocol to follow when they should trigger shut-down to occur. If an individual (or more) Priority Bird(s) are observed the Field Observer should consider shut-down of specific turbines based on their judgement considering the following parameters:</p> <ul style="list-style-type: none"> - height at which bird is flying (i.e. turbine risk-height) - likely flight path, flight pattern and behavior of bird - distance from bird to turbine (i.e. distance within which a Priority Bird could be at risk and therefore shut-down of turbine should be instigated based on the judgement of the Field Observer). <p>Shut-down of 'Individual Turbines': Shut-down protocols should focus at an individual turbine level. The presence of Priority Bird(s) that is judged by the Field Observer to present a risk of collision would generally trigger shut-down of a specific turbine for a very short time period (<i>can be a matter of minutes from shut-down to restart process</i>). The records of shut-downs should be reviewed by the Developer (see 2.3 below) to see if there is pattern and whether any issues with specific turbines in order to reduce the risk of collision and fatalities occurring of Priority Birds. If a PB fatality occurs and/or a threshold of fatalities is exceeded this could represent a non-</p>	Operator	<p>Protocol for Shut-Down on-demand for Priority Birds*</p> <p>(see note) Such an event would trigger the need for immediate Adaptive Management Response by the Operator</p>	<p>Shut-down protocols would generally be implemented throughout operation. Review of protocol should be undertaken at end of the 3-year program of in-flight monitoring / carcass searches.</p>	Part of best working practice

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		compliance with IFC PS 6.				
Birds	Major	<p>A program of Carcass Searches of the wind farms are recommended on a continuing basis for a period of 3-years. After this period a review should be undertaken of Carcass Search program and level of effort. The level of effort recommended is described below:</p> <ul style="list-style-type: none"> - During the Spring & Autumn Migration Seasons: Whole wind farm (i.e. area of all turbines plus buffer around turbine) should be searched for carcasses within a 1 week period. - Outside the Spring & Autumn Migration Seasons (i.e. during summer & winter): Whole wind farm (i.e. area of all turbines plus buffer around turbine) should be searched for carcasses within a 2 week period. The search area around each turbine is recommended to be a distance of the 'Height of a turbine blade plus 25 m'. Record/forms of carcass searches should be 	Operator	Carcass Searches	3-year program following which an evaluation should be done to determine ongoing level of effort.	Part of best working practice

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		<p>completed routinely. The rationale for reduced effort outside migration season is because there are likely to be fewer carcasses during this period (given the reduced amount of bird flight activity).</p> <p>Actions Required if a Fatality of a Priority Bird Occurs - Adaptive Management Response</p> <ol style="list-style-type: none"> 1. Immediate escalation to management, investigation and incident reporting should occur (<i>probably by Developers Consultant/Ornithologist</i>) when a carcass and/or remains of a PB are found (2.3). A review of the findings of the investigation with site management into the fatality of the PB should occur. 2. Identify Corrective/Remedial actions in relation to in-flight monitoring & shut-down protocols. <p>Surpassing a threshold does not necessarily mean the shut-down of a turbine or turbines, the first action should be investigation into the in-flight monitoring and adjusting this to reduce risk of future collision events/fatalities.</p> <ol style="list-style-type: none"> 3. Review fatality with respect to thresholds for fatalities of the specific Priority Bird. Where a threshold is exceeded, it is likely that compensatory measures will be required to offset the loss to biodiversity. Such measures would need to be discussed with Lenders & other relevant entities / regulators. 4. Notification of Lenders within 1-3 days of the event of a fatality of a Priority Bird occurring and/or being found. 5. Share incident report with Ministry of Environment (see 2.1 below) and notify them 				

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		<p>specifically if threshold breached. To monitor fatalities of birds and identify if Priority Bird fatalities occur in order to inform ongoing review of flight activity monitoring approach, Shut-Down protocol and Adaptive Management Response. May identify specific individual turbines which over time present a collision risk. If a Priority Bird fatality occurs and/or a fatality threshold is exceeded this could represent a non-compliance with IFC Performance Standard 6. Such an event would trigger the need for immediate Adaptive Management Response by the Developer.</p>				
Birds	Major	<p>Calibration tests (or "correction factors") for Carcass Searches (1.3) are recommended - these are part of standard good practice for wind farm developments. These correction factors are required because of differences between actual and observed number of fatalities. Two tests are recommended for the TWRPP area - <i>Searcher Efficiency Trials & Carcass Removal Trials</i>. If designed correctly both trials can be conducted using the same carcasses. The type of carcass used should, within practical constraints, be as similar as possible to the expected fatalities otherwise the estimate of carcass removed can be substantially biased. It is recommended that game birds (e.g. chickens) are <u>not</u> used for the tests; options to use other species could be discussed with RSCN.</p> <p>The number and distribution of carcasses depends on a number of parameters, including:</p>	Major	Calibration Tests for Carcass Searches	Twice per year for 3 years initially then further Calibration Tests would be determined depending on on-going Carcass Search program.	Part of best working practice

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		<p>the types of habitats & land uses within the site and topography of site. Generally, a bird consultant/ornithologist experienced in assessing bird risk at wind farm developments should plan and oversee the calibration tests and prescribe recommendations based on results. Both tests should be conducted in an area adjacent to and with similar characteristics to the extant wind farm site to avoid attracting Priority Bird VECs to turbines.</p> <p>1. Searcher Efficiency Trial: This tests the ability of individuals employed to search for TRWPP related fatalities' to detect carcasses on the ground. Marked carcasses are positioned across the trial plot/s by an experienced consultant without the knowledge of the 'searchers'. Searchers examine the trial plot as if they were conducting carcass searches for wind turbine fatalities and the number of carcasses they find is compared to the number of carcasses placed to estimate the proportion of carcasses likely to be missed during carcass search monitoring.</p> <p>2. Carcass Removal Trial: This tests the rate of carcass scavenging in the vicinity of TRWPP sites. In these trials marked carcasses are distributed across the trial plot/s and monitored until they disappear. The average carcass removal time is then used to correct fatality estimates. At TRWPP sites a key factor affecting carcass persistence is the removal of carcasses by dogs belonging to Bedouin using the area.</p>				

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		<p>Therefore, it is recommended that carcass removal trials in particular are designed to quantify the removal rate with and without the presence of Bedouin in order to calibrate the results of the carcass searches and determine a correction factor to account for potential numbers of 'missed' fatalities due to searcher efficiency factors and removal of carcasses from the site (e.g. by dogs/other scavengers).</p>				
Birds	Major	<p>The presence of livestock, which may include weak/injured animals, is known to directly increase attraction of certain Priority Birds (e.g. Griffon Vultures). Building on the findings of the in-flight monitoring (1.1) WPPs should seek to develop:</p> <p>i) an understanding of the pastoral/livestock movements around and within their sites during the different seasons.</p> <p>ii) Review and identify measures to encourage/incentivize owners/shepherds to inform wind farm of presence of carcasses.</p> <p>It is recommended that Developers review with their in-flight monitoring team periodically any noticeable trends in the presence of Griffon Vultures within site or vicinity of site/study area and observations of livestock movements (1.1). in order to To reduce attraction of certain Priority Birds (e.g. Griffon Vultures) to the wind farm area</p>	Operator	Develop a baseline understanding of pastoral movements.	3 year timeframe envisaged running alongside in-flight monitoring & carcass search.	Part of best working practice

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		and therefore reduce likelihood of collisions occurring. To inform shut-down on demand and on-site flight activity monitoring design based on knowledge of livestock presence within the TRWPP within area.				
Birds	Major	<p>Recommended that Developers share data and prepare a series of reports which are submitted to a central data center accessible by all Developers (Internal Committee) (2.2). The following reporting into the central data center/sharing of data is recommended:</p> <p>1. Monthly Carcass Search Results (i.e. from 1.4): Monthly report of carcasses along with identification of bird species. This should be drawn from the standard Carcass Search forms.</p> <p>2. 6-monthly In-flight Monitoring of Priority Birds (i.e. from 1.1): A bi-annual report covering the following key parameters should be shared on a 6-month basis (i.e. December and June following migration seasons).</p> <p>3. IMMEDIATE Incident Reports on Fatalities of Priority Birds: As recommended in 1.4, incident reports should be prepared when a fatality occurs of a Priority Bird. These should be shared with the Ministry of Environment.</p> <p>The Ministry has a regulatory function to audit that ESMMP measures within the EIA are implemented. Therefore, it is recommended that the Internal Committee (Developers) (2.2) submit bi-annually (i.e. December and June) a 6-month summary of in-flight monitoring, monthly reports</p>	<p>Data Sharing - Developers (Internal Committee would collate developer results)</p> <p>Overseeing Data Review (Part of regulatory function) – Developers would share with Ministry of Environment</p>	Data Sharing & Centralized Reporting	Data Sharing to commence once at least 2 wind farms are operational. An initial period of 3 years should be agreed and at this stage and an evaluation undertaken to determine ongoing data sharing.	Part of best working practice

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		<p>on Carcass Searches and any incident report on fatality of Priority to Ministry of Environment for bi-annual review in order to improve knowledge of Priority Bird activity across the TRWPP to enable cumulative effects to be monitored and Adaptive Management Responses to be determined.</p>				
Birds	Major	<p>It is recommended that an Internal Committee between the Developers is established to oversee the central data center where data from the wind farms would be shared (as noted above in 2.1).</p> <p>The data shared and reviewed by the Internal Committee would be shared with the Ministry of Environment given their regulatory role for the environmental approvals of the EIAs and ongoing auditing role of EIA commitments (as noted above in 2.1).</p> <p>Quarterly meetings of the Internal Committee are recommended to review data/results and agree any Adaptive Management Response required.</p> <p>Bi-annual meetings of the Internal Committee and the Ministry of Environment are recommended to review reporting outcomes and Adaptive Management Response proposals by the Developers for PBs. These meetings could also be a forum to discuss progress and outcomes of Joint Management Plans in order to improve knowledge of Priority Bird activity across the TRWPP to enable cumulative effects to be monitored and Adaptive Management Responses</p>	<p>Internal Committee – Developers</p> <p>Ministry of Environment – regulatory function & review of submitted data/bi-annual meeting with developers to discuss findings and any Adaptive Management responses required.</p>	<p>Establishment & Operation of an Internal Committee to Collate & Review Results</p>	<p>It is recommended that an Internal Committee should be established when 2 of the wind farms are operational.</p>	<p>Part of best working practice</p>

ENVIRONMENTAL ISSUE/IMPACT	IMPACT SIGNIFICANCE	MITIGATION MEASURE	RESPONSIBILITY	MONITORING	MONITORING / INSPECTION FREQUENCY	COST
		to be determined.				
Birds	Major	<p>Adaptive Management Responses are recommended to be undertaken at a:</p> <ul style="list-style-type: none"> - Project level by Developers based on the ongoing on-site monitoring measures; and - reviewed by the Internal Committee based on the review of data/reports shared by the Developers (i.e., as outlined under 2.1). <p>A core part of the Adaptive Management process is a review of data and a response process that <u>must be triggered if a fatality</u> of a Priority Bird occurs, especially where this breaches a threshold, OR where unexpected events occur. The Internal Committee should review annual, monthly and immediate incident reporting to assess 'cumulative issues' for discussion with Ministry of Environment in a bi-annual meeting and provide recommendations in relation to Adaptive Management Responses and trends to inform planning of forward mitigation & monitoring at a site level. Where incident reports might reveal that 'other' issues within the landscape (e.g. waste disposal sites attracting birds to wind farm etc.) are contributing to the fatalities are encouraged to engage with other entities/stakeholders to try and encourage remedial/control measures and/or solutions to be found.</p> <p>Actions Required if a Fatality of a Priority Bird Occurs - Adaptive Management Response by</p>	<p>Developers - Internal Committee would convene to discuss the cumulative impact & Adaptive Response.</p> <p>Ministry of Environment – regulatory function & review of submitted data/bi-annual meeting.</p>	<p>Adaptive Management Response: Review & action planning for 'extreme events' based on breaching thresholds and/or unexpected events - DEVELOPER & ENGAGEMENT WITH REGULATORY BODY (Ministry of Environment)</p>	<p>3-year program following which an evaluation should be done to determine ongoing level of effort.</p>	<p>Part of best working practice</p>

ENVIRONMENTAL ISSUE/IMPACT	IMPACT SIGNIFICANCE	MITIGATION MEASURE	RESPONSIBILITY	MONITORING	MONITORING / INSPECTION FREQUENCY	COST
		<p>Developers (as also stated in 1.3)</p> <p>1. Immediate escalation to management, investigation and incident reporting should occur (<i>probably by Developers Consultant/Ornithologist</i>) when a carcass and/or remains of a Priority Bird are found (see 2.3). A review of the findings of the investigation with site management into the fatality of the Priority Bird should occur.</p> <p>2. Identify Corrective/Remedial actions in relation to in-flight monitoring & shut-down protocols. Surpassing a threshold does not necessarily mean the shut-down of a turbine or turbines, the first action should be investigation into the in-flight monitoring and adjusting this to reduce risk of future collision events/fatalities.</p> <p>3. Review fatality with respect to thresholds for fatalities of the specific Priority Bird. Where a threshold is exceeded, it is likely that compensatory measures will be required to offset the loss to biodiversity. Such measures would need to be discussed with Lenders & other relevant entities / regulators.</p> <p>4. Notification of Lenders within 1-3 days of the event of a fatality of a Priority Bird occurring and/or being found.</p> <p>5. Share incident report with Ministry of Environment (see 2.1 below) and notify them specifically if threshold breached.</p>				
CULTURAL HERITAGE - Construction Phase						

ENVIRONMENTAL ISSUE/IMPACT	IMPACT SIGNIFICANCE	MITIGATION MEASURE	RESPONSIBILITY	MONITORING	MONITORING / INSPECTION FREQUENCY	COST
Cultural and Archeological Resources	Negligible	Construction works will be monitored for archaeological remains.	Contractor	Visual inspections	Periodically	Part of best working practice
	Negligible	Strict instructions will be provided to the contractor to suspend the construction upon discovery of any antiquities or archaeological items. Such discoveries should be reported to the Director of Department of Antiquities or to the nearest Public Security Center. The Department of Antiquities may recommend certain measures to protect the found items.	Contractor	Visual inspections	Periodically	Part of best working practice
	Minor	Chance find procedure will be prepared and implemented in line with IFC Performance Standard 8.	Contractor	-	-	Part of best working practice
TRAFFIC - Construction Phase						
Traffic Management	Moderate	Speed limit will be set to 20 km/h in the wind farm site and speed will be reduced below 20 km/h at sharp bends.	Operator	Visual inspections	Periodically	Part of best working practice
	Moderate	Safety and traffic signs will be clearly placed near and around the project site on the road to the project site.	Contractor	Visual inspections	During the activity	Part of best working practice
	Moderate	Road safety training and adherence to speed limits will be stressed to all drivers.	Contractor	Visual inspections	During the activity	Part of best working practice
	Moderate	Entrance to the site will be clear and properly designed.	Contractor	Visual inspections	During the activity	Part of best working practice
	Moderate	Construction materials should be well-sealed in the trucks to prevent spill during transportation	Contractor	Visual inspections	During the activity	Part of best working practice
	Moderate	To protect the roads, trucks which will be used for transporting activities should have a gross weight within the axial permissible load	Contractor	Visual inspections	During the activity	Part of best working practice
TRAFFIC - Operation Phase						
Traffic Management	Moderate	Speed limit will be set to 20 km/h in the wind farm site and speed will be reduced below 20 km/h at sharp bends.	Operator	Visual inspections	Periodically	Part of best working practice
	Minor	Road safety training and adherence to speed limits will be stressed to all drivers.	Operator	Visual inspections	Periodically	Part of best working practice

ENVIRONMENTAL ISSUE/IMPACT	IMPACT SIGNIFICANCE	MITIGATION MEASURE	RESPONSIBILITY	MONITORING	MONITORING / INSPECTION FREQUENCY	COST
						practice
	Minor	Safety and traffic signs will be clearly placed near and around the project site on the way to project site.	Operator	Visual inspections	Periodically	Part of best working practice
	Minor	To protect the roads, trucks should have a gross weight within the axial permissible load.	Operator	Visual inspections	Periodically	Part of best working practice
ENVIRONMENTAL AND SOCIAL MANAGEMENT						
Environmental and social management system	Moderate	ISO 14001 management system will be implemented for carrying out project activities.	Operator/Contractor	Visual Inspections and Records	Prior to construction	Part of best working practice
SOCIAL ISSUES						
INCOME – Construction Phase						
Income	Major	Priority should be given to qualified local contractors to execute some of the construction works related to the Project.	Operator/Contractor	Visual Inspections	During construction	Part of best working practice
	Major	Priority should be given to qualified local people in recruitment for skilled and non-skilled jobs in the Project	Operator/Contractor	Visual Inspections	During construction	Part of best working practice
INFRASTRUCTURE – Construction Phase						
Roads	Moderate to Major	The trucks that will be used for construction and equipment transporting should have a gross weight within the axial permissible load to protect the roads.	Operator/Contractor	Visual Inspections	Periodically	Part of best working practice
	Moderate to Major	Ruined roads by heavy vehicles should be fixed.	Operator/Contractor	Visual Inspections	Periodically	Part of best working practice
	Moderate to Major	While constructing new roads, workers should be careful not to disturb local people in the Project area.	Operator/Contractor	Visual Inspections	Periodically	Part of best working practice
Traffic Safety	Moderate to Major	Strict instruction should be given to the drivers in this Project to comply with the rules of road traffic (internal and external).	Operator/Contractor	Visual Inspections	Periodically	Part of best working practice
HEALTH – Operation Phase						

ENVIRONMENTAL ISSUE/IMPACT	IMPACT SIGNIFICANCE	MITIGATION MEASURE	RESPONSIBILITY	MONITORING	MONITORING / INSPECTION FREQUENCY	COST
Accident risk because of heavy vehicles	Major	All precautions should be taken and both national and international standards should be followed to prevent any accidents.	Operator/Contractor	Visual Inspections	Periodically	Part of best working practice
LIVING ENVIRONMENT – Construction and Operation Phases						
Nuisance of Shadow Flicker	Major	Light sensor will be installed on the shadow receptor in order to monitor the shadow flicker impact during operation and shut down the turbine which causes the impact if the receptor receives more than 30 hrs shadow flicker per year or more than 30 min per day. The turbines should be fitted shadow flicker control systems that automatically shut down individual turbines during periods when shadow flicker could occur.	Operator	Automatic control	-	Part of best working practice
LABOUR AND WORKING CONDITIONS – Construction and Operation Phases						
Improved labour practices, working conditions, contractor performance and reliability. Minimize potential risks associated with the subcontracted facilities and operations.	Major	Develop a written policy and needed procedures for labour practices and human resources in line with national requirements and IFC PS 2.	Operator/Contractor	Recruitment Policy	Periodically	Part of best working practice
Risk of misunderstandings during calculations as monthly wages.	Major	Labour contracts will involve working conditions and terms of employment including their entitlement to wages, hours of work, overtime arrangements and overtime compensation, and any benefits (such as leave for illness, maternity/paternity, or holiday), and when any material changes occur.	Operator/Contractor	Contract Forms and Grievance Record	Periodically	Part of best working practice
To build a strong and trustworthy relationship between the workers and employers;	Major	Abour Energy Company will guarantee its employees about fair working conditions and hours, wages, overtime payments and other reliefs by adding related sections in labour agreements.	Operator/Contractor	Grievance Records	Periodically	Part of best working practice

ENVIRONMENTAL ISSUE/IMPACT	IMPACT SIGNIFICANCE	MITIGATION MEASURE	RESPONSIBILITY	MONITORING	MONITORING / INSPECTION FREQUENCY	COST
Better handling of the problems that will occur in the facility.						
Risk of poor relationship with the employees and media exposure. Better handling of the complaints.	Major	Develop a formal grievance mechanism for workers including contractors. Ensure that this mechanism includes written procedures describing the process on how to handle a complaint, designated personnel for this purpose and related forms. Ensure that all workers are aware of this grievance mechanism. Inform the workers of the grievance mechanism at the time of hiring, and make it easily accessible to them.	Operator/Contractor	Grievance System and Grievance Records	Periodically	Part of best working practice