

**Project: Responsive Assistance for Priority Infrastructure Development (RAPID)**

**– Small and Minor Works –**

**John Garang Memorial University of Science and Technology, Bor, South Sudan**

**Contract Title: Upgrading of John Garang Memorial University of Science and Technology, Bor,  
Jonglei State – South Sudan**

**Annex E:**  
**Environmental Management and  
Monitoring  
Plan**

## ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

The Contractor shall comply with the following Environmental Management and Monitoring Plan (EMMP) specific for this project. This EMMP spells out all steps to be taken by the Contractor to protect the environment in accordance with provisions of regulations and guidelines of the Republic of South Sudan. The Contractor should get familiar with this EMMP and implement all measures necessary to avoid undesirable adverse environmental and social impacts wherever possible, restore work sites to acceptable standards, and abide by any environmental performance requirements specified in the EMMP.

Project Phase and Activity	Potential Environment Impact	Mitigation Measure	Monitoring Indicators	Monitoring Method	When to monitor	Who is responsible for monitoring
<b>Construction and Handover</b>						
Construction and operation of temporary small scale contractor camps	Environmental degradation by improper disposal of solid wastes generated by the camp	Provide waste collection bins which should be regularly emptied in a designated dump site  Dispose of off wastes in approved disposal pits and recyclable materials to be recycled and organic wastes to be composted.	Presence of clearing labelled waste collection bins  No accumulation of waste materials on site  Compost pits	Inspection of disposal systems in the camp	Routine	Contractor and UNOPS for monitoring
	Contamination of surface and ground water resources by improper disposal of human wastes	Ensuring brown and grey water are not discharged into the environment by the construction of appropriate sanitary facilities  Sanitation facilities to be sited 30 metres away from surface and ground water sources	Systems for brown an gray water in place  Water quality of surface, ground water within 30m of the camp (E-coli).	Inspection and test water quality  Measure distance	Prior to installation (site plans for camp) and after construction  Quarterly (both monitoring and reporting)	Contractor for implementation and UNOPS for monitoring
	Surface water and soil contamination by fuels, oils and lubricants	Fueling bays, workshops/garages including storage facilities floors to be made of an impervious materials and wastes from such facilities to	An impervious layer in all operational areas in place and	Inspection storage facilities  Test water for	Frequently for storage facilities  Quarterly for	Contractor for mitigation implementation and UNOPS for

		be fitted with oil interceptors. Design measures for handling spills	Mechanisms for handling spills in place	chemical and physical compositions	water	monitoring
	Resource use conflicts especially for water resources	Ensure the camp does not compete for resources with the local community by providing alternatives.  Camp workers to be provided with water that is treated.  Prohibit contractor from hunting for game meat and logging	Incidence of Conflicts reported;  Distance from camp site to human settlement Incidence of illegal logging reported	Community meetings  Complaints register	Frequent	Contractor for mitigation implementation & UNOPS for monitoring
Demolition , Construction and renovation activities	Air and noise pollution disrupt nearby also lead to , eye / ear infection & respiratory related complications to workers  Body injuries from falls, dropped objects ,and tools and equipment;	Activities with intensive noise and air pollution to be undertaken during least disruptive times and holidays.  Consultations with local affected persons, staff and students to familiarize them with the work to be done.  Provide construction workers with First Aids Kits, proper protective equipment.	Reported injuries and accidents  Evidence of workers wearing protective equipments  Number of sensitization meetings to workers  Records of consultative meetings  Number of complaints from local residents and students  Dust levels	Review grievance register  Reports from the community leaders  Site inspection meetings	Weekly and monthly during planning and design  Daily during construction	UNOPS to supervise  Contractor to implement
	Removal of vegetation leading to soil erosion	Promote labour based methods with light machinery as opposed	Evidence of soil erosion	Inspect water bodies and borrow sites	Frequent	UNOPS to supervise

	& loss of bio-diversity and contaminate surface and ground water contamination	to heavy ones  Prohibit illegal logging and poaching  Ensure that soils and other construction wastes are not pushed into streams and rivers	Presence of transported soil sediment and debris in nearby surface water  Incidence of illegal logging and poaching	Complaint register		Contractor to implement
	Negative health and safety impacts of borrow areas including water-borne diseases and injuries and death	Restore and re-vegetate borrow areas as soon as possible, and inform communities about the dangers associated with using water from borrow areas	Borrow pits restored and a vegetative cover is established  Injuries reported	Inspect borrow areas Monitor the status of borrow areas	Frequent	UNOPS to supervise  Contractor to implement
Water supply & Sanitation	If not properly designed and maintained may contaminate water and provide a breeding habit for disease vectors	Site plan to make provision for adequate space for WASH and solid waste disposal systems.  Implement water quality assurance and capacity building plan to undertake periodically arsenic and faecal coliforms tests	Monitor water quality and handling of wastes	Water testing Arsenic and faecal coliforms tests	Quarterly water monitoring	UNOPS to supervise  Contractor to implement
Power Provisions: Solar and a Generator	Generators might emit noise and air pollution and contaminate the ground surface	The floor of the generator house to be made of impervious materials and generators will be frequently maintained minimize fumes and noise	Levels of noise fume and floor of generator  Monitor maintenance records	Monitor fume and noise from the generator	Daily	UNOPS to supervise  Contractor to implement
<b>Decommissioning</b>						
Failure to de-commission	Accumulation of rubble, loss of	Contractors will implement site restoration and clean up plans.	Confirm that all construction	Daily inspection of	Daily	Contractor to decommission a

contractor camps and to remove construction and hazardous materials during closure of the camp and the project	<p>aesthetic value of the landscape; pose health and safety risks to community – for instance injuries and death in case of falling in latrines</p> <p>Eroded soils in the vicinity of abandoned rubble may cause gulleying and siltation of surface water and damage to aesthetics</p>	<p>including clear all temporary structures; dispose all garbage, night soils and POL (Petroleum)</p> <p>Remove or bury all abandoned construction materials and rubble</p> <p>Fill in and close all latrines and septic systems</p>	<p>rubble has been disposed of properly.</p> <p>Conform that excluded materials have been discarded in the construction-debris disposal site.</p> <p>Verify that the disposal site has been adequately capped with soil material</p>	decommission activities		UNOPS to supervise and verify
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