JANUARY 2012

ENVIRONMENTAL IMPACT ASSESSMENT PROJECT REPORT FOR THE PROPOSED LABORATORY AT KITALE DISTRICT HOSPITAL IN KITALE ON PLOT L.R. No.

1. ENVIRONMENTAL MANAGEMENT/MONITORING PLAN

1.1 Introduction

The development of new laboratory activities will have some impacts on the biophysical environment, health and safety of its employees and members of the public, and socio economic well being of the local residents. Thus, the main aim of the project should focus on reducing the negative impacts and maximizing the positive ones associated with its activities through a programme of continuous improvement.

An Environmental Management/monitoring Plan (EMP) has been developed to assist the proponent in mitigating and managing environmental impacts associated with the life cycle of the project. The EMP has been developed to provide a basis for an Environmental Management System for the project. It is noteworthy that key factors and processes may change in the course of the life of the project and considerable provisions have been made for dynamism and flexibility of the EMP. As such, the EMP will be subject to a regular regime of periodic review.

1.2 Environmental Monitoring and Auditing Program

There will be environmental management of any implications of the project that may not have been foreseen, which will include the administrative and production staff, the management, the

public, the government and environmental experts. Once a year, the project management will submit to the National Environment Management Authority (NEMA):

- A compilation of all monitoring data;
- A highlight of the activities related to environmental protection, environmental health, public health and safety and
- If the project has been cited for violation of environment and safety standards or regulations, certification from relevant authorities showing that the defect has been corrected or an acceptable plan of action is in place to correct the defect.

This can be termed as **the Annual Environmental Audit**. The following tables provide a summary of the monitoring that could be utilized. The following tables form the core of this EMP for the construction, operational and decommissioning phases of this project. In general, the Tables outline the potential safety, health and environmental risks associated with the project and detail all the necessary mitigation measures, as well as the persons responsible for their implementation and monitoring. The EMP will be used as checklist in future environmental audits of the project.

Table 4: Occupational, Public Safety and Health Issues

Issues	Recommendations	Type of Action
Undercutting and tunneling (digging foundations) and presence of loose hanging rocks	**a.** No undercutting and tunneling should be allowed in or around the project site so as to cause collapse or result to damage to property, injury or loss of life. **b.** No loose hanging rocks/material shall be allowed near or on the face of construction so as to endanger the safety of public.	Administrative
Poor site management; no fencing, no warning notices/signage	Warnings notices/signs of appropriate font size and in the national and local languages should be erected in appropriate places to warn the public of any danger e.g. 'Danger, no smoking'.	Administrative
Lack of Personal Protective Equipment	Protective gears shall be used by persons working in the project site. These include protective helmets against falling objects; gloves to protect against cuts and bruises; protective shoes; safety goggles and overall/dust coat	Administrative
Lack of safety training and absence of any individual in charge of safety within the project site	Project workers should be trained on safety, health and environmental issues; The construction site to have a person in charge of safety; Establishment of 'Safety, Health and Environment Committees' (SHEC) at the project site.	Administrative
Inadequate welfare facilities such as sanitation, first aid facilities and drinking water.	The project contractor should ensure provision of clean water and sanitation as well as well equipped first aid kit with trained first aiders within the project site	Administrative
Working from heights, use of ladders and conveyance of materials from heights	where use of ladders is required, they should be strong, firmly secured and have a hand rail; where materials are conveyed down slope by gravity, there should be adequate barriers to check material rolling down slope.	Management / Administrative
Disaster preparedness and response	Enhance training of the project workers on Disaster preparedness and response	Management / Administrative

Table 5: Environmental Issues

Issues	Recommendations	Type of Action
Negative landscape effects due to Presence of abandoned construction materials, pits and heaps of debris/wastes	Project proponent should establish site rehabilitation and/or after use plan. The after use plan should identify suitable beautification and landscaping plans to be implemented within and around the site.	Administrative
Dust emissions	The use of PPEs is recommended for both manual and mechanized operations while watering of the aggregates within the project site should be mandatory for mechanized operations	Administrative
Excessive noise and vibrations	Adherence to the Noise and Excessive Vibrations Regulations, 2009	Administrative

Table 6: Socio-Economic issues

Issues	Recommendations	Type of Action
Underage persons working in the construction site	Ensure that no minors work in the site	Administrative
Alcoholism and Drug abuse	Ensure no alcohol or drugs are available in the site	Administrative
Inadequate advisory services by relevant Government departments	Scheduled regular inspections and site meetings/Barazas	Administrative
HIV/Aids prevalence	Awareness creation on HIV/Aids in and around the construction site	Administrative

1.3 Environmental Management Plans (EMP)

For the effective implementation of the mitigation measures, monitoring and remedial requirements presented in the EIA, a systematic Environmental Management Plan (EMP) should be set up. Environmental Auditing of the project will be done against the EMP and advise the necessary remedial actions required. The proponent and the Environmental Consultant through contractual means could enforce these remedial actions.

An Environmental Assessment has been completed for the proposed laboratory project, according to the requirements given in the EMCA 1999 and it's Subsequent Legal Notice No. 101 of 2003. The environmental aspects that have been thoroughly studied include Air quality impact; Noise/vibration impact; Water supply and quality impact; Effect on vegetation; Disposal of storm waters; Energy supply and use; Waste management implications; Landscape and visual impact; Environmental Monitoring and Audit (EM&A) requirements. A brief summary of the mitigation measures is given below for ease of reference.

Table 7: Environmental monitoring/Management plans for the construction phase

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Estimated Cost (Kshs.)
High Demand of Raw materials	1. Source building materials from local suppliers who use environmentally friendly processes in their operations.	Resident Project Manager & Contractor	Throughout construction period	Part of the main budget
	2. Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered.	Resident Project Manager & Contractor	Throughout construction period	
	3. Ensure that damage or loss of materials at the construction site is kept minimal through proper storage.	Resident Project Manager & Contractor	Throughout construction period	
	4. Use of some recycled/refurbished or salvaged materials to reduce the use of raw materials and divert material from landfills.	Resident Project Manager & Contractor	Throughout construction period	
	5. Specify locations for trailers and equipment, and areas of the site that should be kept free of traffic, equipment, and storage.	Civil Engineer, Architect and Resident Project Manager	1 month	100, 000.00
	6. Designate access routes and parking within the site.	Civil Engineer, Architect and Project Manager	1 month	
	7. Introduction of vegetation (trees, shrubs and grass) on open spaces and their maintenance., especially at the front side of the development	Architect, Resident Project Manager & Landscape specialist	Monthly to Annually	
	8. Design and implement an appropriate landscaping programme to help in re-vegetation of part of the	Architect & Landscape specialist	During the beginning phase of the	

	project area after construction.		project	
Increased storm water, runoff and soil erosion	1. Roof water to be harvested and stored in underground/ground reservoirs for use in cleaning and in the toilets. To ensure the use of such water for the stated purposes, the building should be fitted with a dual water distribution system	The Civil Engineer, Mechanical Engineer and Resident Project Manager	During the beginning phase of the project	100, 000.00
	2. A storm water management plan that minimizes impervious area infiltration by use of recharge areas and use of detention and/or retention with graduated outlet control structure will be designed.	The Civil Engineer, Mechanical Engineer and Resident Project Manager	1 month	50, 000.00
	3. Apply soil erosion control measures such as leveling of the project site to reduce run-off velocity and increase infiltration of storm water into the soil.	The Civil Engineer, Mechanical Engineer and Resident Project Manager	1 months	
	4. Ensure that construction vehicles are restricted to existing roads to avoid soil compaction within and around the project site.	The Civil Engineer, Mechanical Engineer and Resident Project Manager	Throughout construction period	50, 000.00
	5. Ensure that any compacted areas are ripped to reduce run-off.	Civil /Mechanical Eng. and Project Manager	2 months	
	6. Open drains all interconnected will be provided on site.	Civil Engineer	Throughout construction	
	7. Roof catchments will be used to collect the storm water for some uses such as washing of floors and landscaping	Civil Engineer	Throughout construction period	
Increased solid waste generation	1. Use of an integrated solid waste management system i.e. through a hierarchy of options: reduction, sorting, re-use, recycling and proper disposal	Resident Project Manager & Contractor	Throughout construction period	50, 000.00
	2. Through accurate estimation of the sizes and quantities of materials required, order materials in the sizes and quantities they will be needed, rather than cutting them to size, or having large quantities of residual materials.	Resident Project Manager & Contractor	One-off	
	3. Ensure that construction materials left over at the end of construction will be used in other projects rather than being disposed of.	Resident Project Manager & Contractor	One-off	
	4. Ensure that damaged or wasted construction materials including cabinets, doors, plumbing and lighting fixtures, marbles and glass will be recovered for refurbishing and use in other projects	Resident Project Manager & Contractor	One-off	
	5. Donate recyclable/reusable or residual materials to local community groups, institutions and individual	Resident Project Manager & Contractor	One-off	
	6. Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste	Resident Project Manager & Contractor	Throughout construction period	

	7. Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure.	Resident Project Manager & Contractor	One-off	
	8. Purchase of perishable construction materials such as paints should be done incrementally to ensure reduced spoilage of unused materials	Resident Project Manager & Contractor	Throughout construction period	
	9. Use building materials that have minimal or no packaging to avoid the generation of excessive packaging	Resident Project Manager & Contractor	Throughout construction period	
	10. Use construction materials containing recycled content when possible and in accordance with accepted standards.	Resident Project Manager & Contractor	Throughout construction period	
	11. Reuse packaging materials such as cartons, cement bags, empty metal and plastic containers to reduce waste at the site	Resident Project Manager, Mechanical Engineer & Contractor	Throughout construction period	
	12. Dispose waste more responsibly by dumping at designated dumping sites or landfills only.	Resident Project Manager, Mechanical Engineer & Contractor	Throughout construction period	
	13. Waste collection bins to be provided at designated points on site	Project Manager, Mechanical Eng.& Contractor	Throughout construction period	
	14. Private waste disposal company to be contracted to transport and dispose the solid waste from site	Resident Project Manager, Mechanical Engineer & Contractor	Throughout the project life cycle	
Dust emission	1. Ensure strict enforcement of on-site speed limit regulations	Resident Project Manager & Contractor	Throughout construction	
	2. Avoid excavation works in extremely dry weathers if and when possible	Resident Project Manager & Contractor	Throughout construction	
	3. Sprinkle water on graded access routes when necessary to reduce dust generation by construction vehicles	Resident Project Manager & Contractor	Throughout construction period	100, 000.00
	4. Personal Protective equipment to be worn	Resident Project Manager	Throughout construction	
Exhaust emission	1. Vehicle idling time shall be minimized	Resident Project Manager & Contractor	Throughout construction	
	2. Alternatively fuelled construction equipment shall be used where feasible; equipment shall be properly tuned and maintained	Resident Project Manager & Contractor	Throughout construction period	50, 000.00
	3. Sensitize truck drivers to avoid unnecessary racing of vehicle engines at loading/offloading points and parking areas, and to switch off engines at these points	Resident Project Manager & Contractor	Throughout construction period	
Noise and vibration	1. Sensitize construction vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used.	Resident Project Manager & Contractor	Throughout construction period	
	2. Sensitize construction drivers to avoid gunning of vehicle engines or hooting especially when passing through sensitive areas such as churches, residential areas and hospitals	Resident Project Manager & Contractor	Throughout construction period	50, 000.00

	3. Ensure that construction machinery are kept in good condition to reduce noise generation	Resident Project Manager & Contractor	Throughout construction period	
	4. Ensure that all generators and heavy duty equipment are insulated or placed in enclosures to minimize ambient noise levels.	Resident Project Manager & Contractor	Throughout construction period	
	5. The noisy construction works will entirely be planned to be during day time when most of the neighbors will be away at work.	Resident Project Manager & all site foreman	Throughout construction period	
Increased energy consumption	1. Ensure electrical equipment, appliances and lights are switched off when not being used	Resident Project Manager & Contractor	Throughout construction period	
	2. Install energy saving fluorescent tubes at all lighting points instead of bulbs which consume higher electric energy	Resident Project Manager & Contractor	Throughout construction period	Part of the main budget
	3. Ensure planning of transportation of materials to ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts	Resident Project Manager & Contractor	Throughout construction period	
	4. Monitor energy use during construction and set targets for reduction of energy use.	Resident Project Manager & Contractor	Throughout construction period	
High Water Demand	1. Harness rainwater for some uses such as general cleaning, in the toilets & gardening, hence the need for a dual water distribution system within the building	Mechanical Engineer, proponent and Resident Project Manager	Throughout construction period	
	2. Install water conserving taps that turn-off automatically when water is not being used as wells low flush toilets and waterless urinals	Resident Project Manager, proponent & Contractor	One-off	
	3. Promote recycling and reuse of water as much as possible (need for a dual water distribution system within the building)	Resident Project Manager & Contractor	Throughout construction period	100, 000.00
	4. Install a discharge meter at water outlets to determine and monitor total water usage	Resident Project Manager & Contractor	One-off	
	5. Promptly detect and repair water pipe and tank leaks	Resident Project Manager & Contractor	Throughout construction	
	6. Sensitize staff to conserve water by avoiding unnecessary toilet flushing etc.	Resident Project Manager & Contractor	Throughout construction	
	7. Ensuring taps are not running when not in use	Resident Project Manager & Contractor	Throughout construction	
Generation of wastewater	1. Provision of means for handling sewage generated by construction workers	Mechanical Engineer & Resident Project Manager	One-off	
	2. Conduct regular checks for sewage pipe blockages or damages since such vices can lead to release of the effluent into the land and water bodies	Mechanical Engineer & Resident Project Manager	Throughout construction period	Part of the main budget
	3. Monitor effluent quality regularly to ensure that the stipulated discharge rules and standards are not violated	Mechanical Engineer & Resident Project Manager	Throughout construction period	
Machinery/	1. Arrangements must be in place for	Resident Project Manager,	Continuous	50, 000.00

equipment safety	the medical examination of all construction employees before, during and after termination of employment	Developer & Contractor		
	2. Ensure that machinery, equipment, personal protective equipment, appliances and hand tools used in construction do comply with the prescribed safety and health standards and be appropriately installed maintained and safeguarded	Resident Project Manager, Developer & Contractor	One-off	
	3. Ensure that equipment and work tasks are adapted to fit workers and their ability including protection against mental strain	Resident Project Manager, Developer & Contractor	Continuous	
	4. All machines and other moving parts of equipment must be enclosed or guarded to protect all workers from injury	Resident Project Manager	One-off	
	5. Arrangements must be in place to train and supervise inexperienced workers regarding construction machinery use and other procedures/operations	Resident Project Manager	Continuous	
	6. Equipment such as fire extinguishers must be examined by a government authorized person. The equipment may only be used if a certificate of examination has been issued	Resident Project Manager	Continuous	
	7. Reports of such examinations must be presented in prescribed forms, signed by the examiner and attached to the general register	Resident Project Manager	Continuous	
Incidents, accidents and dangerous occurrences	1. Ensure that materials are stored or stacked in such manner as to ensure their stability and prevent any fall or collapse	Resident Project Manager	Continuous	50, 000.00
	2. Ensure that items are not stored/stacked against weak walls and partitions	Resident Project Manager	Continuous	
	3. All floors, steps, stairs and passages of the premises must be of sound construction and properly maintained	Resident Project Manager & Contractor	Continuous	
	4. Securely fence or cover all openings in floors	Resident Project Manager & Contractor	One-off	
	5. Ensure that construction workers are not locked up such that they would not escape in case of an emergency	Resident Project Manager & Contractor	Continuous	
	6. All ladders used in construction works must be of good construction and sound material of adequate strength and be properly maintained	Resident Project Manager & Contractor	One-off	
	7. Design suitable documented emergency preparedness and evacuation procedures to be used during any emergency	Resident Project Manager & Contractor	One-off	
	8. Such procedures must be tested at regular intervals	Resident Project Manager & Contractor	Every 3 months	
	9. Ensure that adequate provisions are in place to immediately stop any	Resident Project Manager & Contractor	One-off	

	operations where there is an imminent and serious danger to health and safety and to evacuate workers			
	10. Ensure that the most current emergency telephone numbers posters are prominently and strategically displayed within the construction site	Resident Project Manager & Contractor	One-off	
	11. Provide measures to deal with emergencies and accidents including adequate first aid arrangements	Resident Project Manager & Contractor	Continuous	
	12. Ensure that provisions for reporting incidents, accidents and dangerous occurrences during construction using prescribed forms obtainable from the local Occupational Health and Safety Office (OHSO) are in place.	Resident Project Manager, Developer & Contractor	Continuous	50, 000.00
	13. Enforcing adherence to safety procedures and preparing contingency plan for accident response in addition to safety education and training shall be emphasized.	The Contractor, Resident Project Manager& Site Safety Officer	Continuous	
	14. Ensure that the premises are insured as per statutory requirements (third party and workman's compensation)	Developer	Annually	
	15. Develop, document and display prominently an appropriate SHE policy for construction works	Resident Project Manager, Developer & Contractor	One-off	
	16. Provisions must be put in place for the formation of a Health and Safety Committee, in which the employer and the workers are represented	Resident Project Manager	One-off	
occupational health and safety risks during construction period and occupational phase	1. Well stocked first aid box which is easily available and accessible should be provided within the premises	Resident Project Manager & Contractor	One-off	
	2. Provision must be made for persons to be trained in first aid, with a certificate issued by a recognized body.	Resident Project Manager & Contractor	One-off	
	3. Fire fighting equipment such as fire extinguishers and hydrant systems should be provided at strategic locations such as stores and construction areas.	Resident Project Manager & Contractor	One-off	
	4. Regular inspection and servicing of the equipment must be undertaken by a reputable service provider and records of such inspections maintained	Resident Project Manager & Contractor	Every 3 months	50, 000.00
	5. Signs such as "NO SMOKING" must be prominently displayed within the estate, especially in parts where inflammable materials are stored	Resident Project Manager & Contractor	One-off	
	6. Enough space must be provided within the premises to allow for adequate natural ventilation through circulation of fresh air	Resident Project Manager & proponent/residents/ contractor	One-off	
	7. There must be adequate provision for artificial or natural lighting in all parts of the premises in which persons are working or passing	Resident Project Manager & Contractor	One-off	

	8. Circuits must not be overloaded	Project Manager & Contractor/ proponent	Continuous	
	9. Distribution board switches must be clearly marked to indicate respective circuits and pumps	Resident Project Manager & Contractor	One-off	
	10. There should be no live exposed connections	Project Manager & Contractor/ proponent	Continuous	
	11. Electrical fittings near all potential sources of ignition should be flame proof	Project Manager & Contractor/ proponent	One-off	
	12. All electrical equipment must be earthed	Project Manager & Contractor/ proponent	One-off	
	13. Develop a suitable system for the safe collection, recycling and disposal of chemical wastes, obsolete chemicals and empty chemical containers to avoid their reuse for other purposes and to eliminate or minimize the risks to safety, health and environment	Resident Project Manager & Contractor/ proponent/residents	One-off	
	14. Ensure that all chemicals used in construction are appropriately labeled or marked and that material safety data sheets containing essential information regarding their identity, suppliers classification of hazards, safety precautions and emergency procedures are provided and are made available to employees and their representatives	Resident Project Manager & Contractor/ proponent/residents	One-off	
	15. Keep a record of all hazardous chemicals used at the premises, cross-referenced to the appropriate chemical safety data sheets	Resident Project Manager & Contractor/ proponent/residents	Continuous	
	16. There should be no eating or drinking in areas where chemicals are stored or used	Resident Project Manager & Contractor/ proponent/residents	Continuous	
	17. Provide workers in areas with elevated noise and vibration levels, with suitable ear protection equipment such as ear muffs	Resident Project Manager & Contractor/ proponent/residents	One-off	
	18. Ensure that construction workers are provided with an adequate supply of wholesome drinking water that should be maintained at suitable and accessible points.	Resident Project Manager & Contractor	One-off	
	19. Ensure that conveniently accessible, clean, orderly, adequate and suitable washing facilities are provided and maintained in within the site	Resident Project Manager & Contractor	One-off	
	20. Provision for repairing and maintaining of hand tools must be in place	Resident Project Manager & Contractor	One-off	
	21. Hand tools must be of appropriate size and shape for easy and safe use	Resident Project Manager & Contractor	One-off	
	22. Height of equipment, controls or work surfaces should be positioned to reduce bending posture for standing workers	Resident Project Manager & Contractor	One-off	
Oil Spills	1. A designated garage section of the site fitted with oil trapping equipments	Resident Project Manager	Continuous	5, 000.00n per month

	to be planned for changes. Such an area will be well protected from contaminating the soil			
Increased Food Supply/demand	**1.** Construction workers will be given breaks to go for lunch	Resident Project Manager & Contractor	Continuous	50, 000.00
	2. Onsite canteen to supply food if possible	Resident Project Manager & Contractor	Continuous	
Hydrology and Water Quality Degradation	*1.* Hazardous substance control and emergency response plan that will include preparations for quick and safe clean up of accidental spills.	The Mechanical Engineer, Resident Project Manager, Contractor & the Developer	Continuous	*Part of erosion control*
	2. Hazardous-materials handling procedures to reduce the potential for a spill during construction	The Mechanical Engineer	Continuous	
Vector /Water Borne Disease Incidence	1. Complete refuse collection and handling service to be provided	Mechanical Engineer	Continuous	50, 000.00
Possible Exposure to Diseases	1. Shall be mitigated by occupational health and safety standards enforcement	Contractor & all foremen	Continuous	
Increased Pressure on Infrastructure	**1.** Coordinate with other planning goals and objectives for region	Contractor and the Developer	Continuous	
	2. Upgrade existing infrastructure and services, if and where feasible.	Contactor and the Developer	Continuous	
Insecurity	**1.** Appoint security personnel operating 24 hours	Security Officer, Resident Project Manager & Police	Continuous	Part of general safety
	2. Body-search the workers on entry, to avoid getting weapons on site, and leaving site to ensure nothing is stolen.	Security Officer	Continuous	
	3. Ensure only authorized personnel get to the site	Security Officer	Continuous	
Air Pollution	**1.** Suitable wet suppression techniques need to be utilized in all exposed areas	The Contractor & Site Safety Officer	Continuous	Part of dust control
	2. All unnecessary traffic must be strictly limited on site; speed controls are to be enforced	The Contractor & Site Safety Officer	Continuous	
Emergence of new environmental concerns during the construction phase	1. Due to the nature of the project, the Firm of experts shall carry out monitoring and evaluation. More so an initial environmental audit will also be carried within a period of 12 months after commencement of the operations	Firm of Experts.	Continuous	100, 000.00

1.4 Operational Phase EMP

The necessary objectives, activities, mitigation measures, and allocation of responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with the operational phase of proposed Health Care Project are outlined in the table below

Table 8: Environmental Management Plan for the operation phase

Environmental Concerns	Mitigation	Responsibility	Monitoring Means	Monitoring Frequency	Monitoring by:	When and Budget
Safety Likely open areas	Such holes should be filled with soil or covered with a concrete cover that is	Management	Observation to ensure that any open pits are covered	One off activity	An EIA Expert and the management.	Ksh. 20,000

	heavy enough not to be lifted by children to prevent accidental falls.					
Safety Fire outbreak preparedness	-Place sand filled buckets in strategic places; Install a fire hydrant preferably near the main entrances; Train all workers in fire fighting and subject them to frequent fire grills; All windows should be fitted with openable grills	Management	Observation to ensure that all fire fighting mechanisms are put into place	Continuous activity	An EIA Expert and the management.	Ksh. 20,000
Health and Safety For Patients and general public	Waste bins should never be placed within the patients' waiting shades, especially those holding medical waste	Management	Observation to ensure that this is implemented	Continuous activity	An EIA Expert and the management.	Ksh5, 000 per month
Health and Safety Lack of protective gears	All staff within the facility should be in protective gears at all times	Management	Observation to ensure that this is implemented	Continuous activity	An EIA Expert and the management	Ksh5, 000
Health and Safety within the facility Accidents	Reporting all incidents and accidents to include details of: -The nature of the accident or incident; The place and time of the accident or incident; The staff who were directly involved; Any other relevant circumstances	Management	Observation to ensure that this is implemented	Continuous activity	An EIA Expert and the management.	
Health and Safety Spillages	-Evacuate the contaminated area; Decontaminate the eyes and skin of exposed personnel immediately; Inform the designated person (usually the Waste Management Officer), who should coordinate the necessary actions.; Determine the nature of the spill; Evacuate all the people not involved in cleaning up if the spillage involves a particularly hazardous substance; Provide first aid and medical care to injured individuals; Secure the area to prevent exposure of additional individuals; Provide	Management	Observation to ensure that this is implemented	Continuous activity	An EIA Expert and the management.	

	adequate protective clothing to personnel involved in cleaning-up; Limit the spread of the spill; Neutralize or disinfect the spilled or contaminated material if indicated; Collect all spilled and contaminated material. [Sharps should never be picked up by hand; brushes and pans or other suitable tools should be used. Spilled material and disposable contaminated items used for cleaning should be placed in the appropriate waste bags or containers. -Decontaminate or disinfect the area, wiping up with absorbent cloth. The cloth (or other absorbent material) should never be turned during this process, because this will spread the contamination. The decontamination should be carried out by working from the least to the most contaminated part, with a change of cloth at each stage. Dry cloths should be used in the case of liquid spillage; for spillages of solids, cloth impregnated with water (acidic, basic, or neutral as appropriate) should be used. -Rinse the area, and wipe dry with absorbent cloth. -Decontaminate or disinfect any tools that were used. -Remove protective clothing and decontaminate or disinfect it if necessary. -Seek medical attention if exposure to hazardous material has occurred during the					

	operation.					
Latrines and other public areas	The walls and floors of the latrines and walls of public areas should be fitted with white smooth tiles for easy cleaning	Management	Observation	One off activity	An EIA Expert and the management.	Ksh.300, 000
Water harvesting and storage facilities	Initiate roof water harvesting and install water storage tanks	Management	Observation are fixed	One off activity	An EIA Expert and the management.	Ksh.200, 000
Poor waste disposal	-Construct a well functioning incinerator -sort waste at source -connect all laboratory sink to a functioning biomedical liquid waste treatment system.	Management	Observation	A continuous activity to ensure that appropriate solid and liquid waste management is established	An EIA Expert and the management.	Ksh.500, 000
Lack of enough vegetation cover around the Health Care Facility	-The management should plan for the establishment of trees and other aesthetic plants within and around the facility	Management	Observation	Continuous activity	An EIA Expert and the management.	Ksh. 10,000 per month

1.5 Decommissioning Phase

In addition to the mitigation measures provided in the tables above, it is necessary to outline some basic mitigation measures that will be required to be undertaken once all operational activities of the health care project have ceased. The necessary objectives, mitigation measures, allocation of responsibilities, time frames and costs pertaining to prevention, minimization and monitoring of all potential impacts associated with the decommissioning and closure phase of the project are outlined in the table below.

Table 9: Environmental Management/Monitoring Plan for the decommissioning phase

Recommended Mitigation Measures	Responsible Party	Time Frame
1. Demolition waste management		
All buildings, machinery, equipment, structures and partitions that will not be used for other purposes must be removed and recycled/reused as far as possible	Contractor, Proponent	One-off
All foundations must be removed and recycled, reused or disposed of at a licensed disposal site	Contractor, Proponent	One-off
Where recycling/reuse of the machinery, equipment, implements, structures, partitions and other demolition waste is not possible, the materials should be taken to a licensed waste disposal site	Contractor, Proponent	One-off
Donate reusable demolition waste to charitable organizations, individuals and institutions	Contractor, Proponent	One-off
2. Rehabilitation of project site		
Implement an appropriate re-vegetation programme to restore the site to its original status	Contractor, Proponent	One-off
Consider use of indigenous plant species in re-vegetation	Contractor, Proponent	One-off
Trees should be planted at suitable locations so as to interrupt slight lines (screen planting), between the adjacent residential area and the development.	Contractor, Proponent	Once-off

2. AUXILLIARY INFORMATION

2.1 Budget

TOTAL PROJECT COST **Kshs.XXXXXXXXXXXX**

2.2 Monitoring Guidelines

Continuous observations and assessment is essential so that if unforeseen dangers are noticed, alternatives are sort for. Risk assessment of fire outbreaks, and others should not be ignored in the construction plan. Waste management within the project site should be strictly followed. Mitigation measures of storm water management are essential. Safety standards should constantly be maintained. In brief, monitoring guidelines could be based on the following parameters:

- Health and safety measures using such standards as the laid down regulatory framework
- Water demand, availability and use
- Waste management
- Quality management systems
- Laboratory Bio-safety
- Accidents and risk assessment arising from the use of water, roads, electricity and or any other amenity
- Conservation and establishment of vegetation cover

2.3 Reporting

Constant reporting by the site contractor to the architect is necessary to ensure the project is executed as per the architectural drawings. The safety officer should always remain on site to report any safety concerns for urgent mitigation. He should also at all times enforce safety requirements as per the relevant legislations. The contractor must consult the architect to maintain a clear understanding of all the aspects of the project.

2.4 Conclusion and Recommendations

During the preparation of this report for the proposed laboratory development it was observed and established that most of the negative impacts on the environment are rated low and short term with no significant effect. They are all localized with no residual effects.
The positive impacts are highly rated and will benefit all stakeholders at large. The project proponent has proposed to adhere to prudent implementation of the Environmental Management Plan. They are obtaining all necessary permits and licenses from the relevant authorities and have qualified and adequate personnel to do the project as proposed. They have proposed adequate safety and health mitigation measures as part of the relevant statutory requirements

They could therefore be licensed to implement this project subject to adherence to the Environmental Management Plan proposed in this report and the statutory requirements.

3. APPENDICES

Architectural Designs and Drawings and NEMA Licenses

4. REFERENCES

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