8 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

8.1 Introduction

The Environmental Social Management Plan (ESMP) is developed to demonstrate how site specific concerns and mitigation measures are managed through the detailed design, pre-construction, construction and post-construction / operation phase of the Project. It provides confidence on the part of project planners that a reliable scheme will be put in place to deal with any contingency that may arise during all phases of development, from preliminary study to abandonment.

Environmental management activities of the proposed Geothermal Power Plant Project will be governed by a series of regulations that impose standards and mitigation of environmental hazards. Thus, it is a planned and integrated programme aimed at ensuring that both identified and unidentified impacts that may arise during the various phases of the project are brought to an acceptable level.

This Environmental Management Plan has the following specific long-term objectives:

- Ensure compliance with legislation and Company policy;
- Achieve, enhance and demonstrate sound environmental performance built around the principle of continuous improvement;
- Integrate environment fully into the business;
- Rationalise and streamline existing environmental activities to add value in efficiency and effectiveness;
- Encourage and achieve the highest performance and response from individual employees and contractors;
- Provide standards for overall planning, operation, audit and review;
- Enable management to establish environmental priorities;
- Be applicable throughout the organisation;
- Hold early consultations with communities and regulating authorities to ensure hitch free operations.

8.2 Framework for Implementation of the ESMP

8.2.1 Organisation Roles and Responsibilities

In order to ensure the sound development and effective implementation of the ESMP, it will be necessary to identify and define the responsibilities and authority of the various persons and organizations that will be associated with the project. The following entities should be involved in the implementation of this ESMP:

- QPEA Senior Management;
- GDC
- Project Manager;
- Contractor and Subcontractors;
- Environment, Safety and Health Department;
- NEMA;
- Project Consultant; and
- Nakuru County Government.

(e) QPEA Senior Management

It will be the responsibility of QPEA to oversee or appoint qualified and competent team to oversee the construction and operational phases of the Project. This team shall form part of the project implementation team (PIT)

It is recommended that QPEA establishes an Environment, Safety and Health Department to oversee the implementation of the ESMP.

(f) Project Manager

The Project Manager should work with their respective team members to implement the mitigation measures designed during the ESIA. He or she should monitor the implementation over time, amend measures as necessary to increase effectiveness, and report on the implementation and performance of the EMMP to senior management. He or she should also participate in the Project management meetings to ensure that relevant issues relating to the EMMP are raised and dealt with effectively. In the event of a non- compliance with the EMMP, it will be the responsibility of the Project Manager to ensure appropriate investigation, reporting, and implementation of corrective actions.

(g) GDC

GDC is the government Special Purpose Vehicle that has entered into geothermal steam sales agreement with QPEA. GDC is responsible for overall management of geothermal activities in Menengai Caldera including drilling for geothermal production, steam gathering and any re-injection of spent geothermal fluid after the electric power generation by the IPP.

GDC shall ensure environmental sustainable is maintained throughout all the stages of geothermal power production in Menengai. As part of this, GDC has to ensure that as part of the steam purchase agreement with QPEQ, the latter meets all the environmental sustainability requirements as contained in GDC's Environmental Policy and GDC Safety, Health and Environment Policy.

GDC, through its environment department shall also liaise with QPEA to ensure regular monitoring of all environmental and occupational health and safety performance within the proposed power plant.

(h) The Contractor and Sub Contractors

The contractor and Sub Contractors will be required to comply with the requirements of the ESIA, the ESMP in this report and other relevant legislations.

(i) Project Consultants

The contracted project consultant will undertake periodic third party audits as required by the Project or lender groups.

(j) Environment, Safety and Health Department

This is a recommended department to be established by the QPEA management. The department should have suitably qualified staff in the field of environment and occupational safety and health management. The department will work in liaison with GDC and QPEA contractors to ensure sound environmental and social performance by undertaking the following:

- Conduct readiness reviews with contractors to ensure their ESMS implementation meets Project requirements;
- Work with contractors to improve their ESMS where gaps are identified;

- Conduct training and awareness programmes with personnel involved in ESMP implementation;
- Ensure regular monitoring and evaluation of the Project's performance against the ESMP;
- Maintain records of all non-conformances and work with the relevant parties to resolve within reasonable time frames;
- Assess the efficacy of the mitigation measures and manage continuous improvement around these measures;
- Collate all required Project environmental and social reports and ensure they meet Project reporting requirements;
- Provide day-to-day advice on all Project environmental and social requirements;
- Work with contractors to close out grievances lodged by communities within the defined timelines;
- Ensure occupational safety and health requirements by OSHA and IFS standards are met by QPEA and appointed contractors;
- Liaise with regulatory bodies in addressing environmental and safety issues in QPEA operations;
- Maintain accurate records of open and closed grievances, and work with contractors towards reducing the number of grievances lodged by implementing appropriate mitigation measures; and
- Assist with the development of relevant and timely communications to Project-impacted communities by providing information to the Stakeholder Engagement team on upcoming Project activities.

(k) NEMA

The responsibility of the National Environment Management Authority (NEMA) is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of government in the implementation of all policies relating to the environment.

(l) County Government of Nakuru, Ministry of Environment, Natural Resources, Energy and Water

The Nakuru County government should be actively engaged in ensuring that project activities are environmentally sustainable through participatory monitoring, undertaking general environmental conservation and ensuring public participation in the environmental management activities under the project.

(m) Local administration

These mainly include local areas chiefs and their assistants. The local administration shall form one of the primary points of contact between the local communities and QPEA. There shall be a free communication between the local administration and QPEA allowing free passage of information (including address of community concerns as well as initiation of any beneficial activities) to and from the communities.

8.2.2 Training, Education and Competency

The Project assumes overarching responsibility for implementation of the ESMP and, as such, it is important that all contractors and personnel responsible for the implementation of the tasks and requirements contained in the ESMP are competent on the basis of education, training and experience.

The Project should undertake internal training and education activities to ensure that Project expectations regarding environmental and social performance are achieved. In addition, the Project should provide guidance to contractors regarding expectations for environmental and social impact management training, education and competencies. Environmental and social competencies should be appropriate to the respective parties' scope of activity and level of

responsibility. Project should undertake an initial evaluation of training needs associated with this ESMP and, on this basis, develop and maintain an ESMP training matrix.

The Project's environmental and social training programmes should include several levels of competency, depending on each individual's level of involvement and responsibility:

- **ESMP Induction Training and Awareness**: this training should be for visitors or individuals who do not have direct roles or responsibilities for implementing the ESMP, and should cover basic Project environmental and social commitments.

- **ESMP Management Training and Awareness**: this training focuses attention on management, covering key aspects of the ESMP and providing an overview of the Project's environmental and social impact management expectations and the supporting processes and procedures prescribed in the ESMS to meet performance expectations.

- **ESMP Job-specific Training and Awareness**: job-specific training should be provided to all personnel who have direct roles and responsibilities for implementing or managing components of the ESMP. This training should also include all people whose specific work activities may have an environmental or social impact.

Onsite, these provisions and responsibilities should apply to all contractors and subcontractors. Those responsible for performing site inspections should receive training by drawing on external resources as necessary. Upon completion of training and once deemed competent by management, staff will be ready to train other people. The Project will require each contractor to institute training programmes for their personnel. All contractors and their subcontractors should be responsible for implementing relevant and adequate training programmes to maintain the required competency levels. Contractor training programmes should be subject to approval by Project Management and should be assessed to confirm that:

- Training programmes are adequate;
- All relevant personnel have been trained; and
- Competency is achieved.

Contractors will be required to report on their training activities, and the Project should maintain records of all training delivered.

8.2.3 Assessment and Improvement

Assessment and improvement processes associated with this ESMP include: inspection, monitoring, audit, corrective action and improvement. These activities form an integral part of implementing the ESMP, and are necessary to:

- Verify and document the management and implementation of the mitigation measures identified in the ESMP;
- Monitor and document the effectiveness of the mitigation measures and assess the actual impacts;
- Demonstrate compliance with applicable legal and other requirements;
- Evaluate the effectiveness of the ESMS; and
- Highlight areas in need of improvement to drive continuous improvement for all ESMP activities.

Inspection

The contractor and GDC will undertake daily inspection of the construction activities to ensure the implementation of the ESMP. The Contractors will be required to implement field-based inspection programmes that demonstrate their implementation of the ESMP and, in some instances, the effectiveness of the mitigation measures. The Project will, in turn, inspect the contractors' documents to verify that they have implemented the required programmes.

Monitoring

Contractors will be required to implement field-based environmental and social monitoring to monitor the effectiveness of the mitigation measures, assess impacts and demonstrate compliance with legal and other requirements. The Project through the Project Manager and HSE officer should conduct similar monitoring events and also verify contractors' monitoring activities.

Auditing

Internal audits should be carried out internally by the Project to ensure compliance with ESMP requirements, regulatory requirements and compliance with management systems, standards, policies and procedures. Periodic external (third party) audits should also be carried out to meet NEMA regulatory and lender requirements. A qualified consultant should perform the audits, and results be described in a report that will determine the severity of non-compliances, as well as the recommended remedial action.

Corrective Action and Improvement

The Project should implement a formal environmental and social tracking system that will include the details of all environmental and social non-conformances, identify the corrective actions required, assign actions/timings to responsible parties and indicate the status of the actions required. This will ensure a coordinated approach between the Project and its contractors, and drive changes for continuous improvement.

There are several mechanisms for implementing corrective action, both during the construction and operational phases:

Verbal instruction

Verbal instructions are likely to be the most frequently used form of corrective action and are given in response to minor transgressions that are evident during routine site inspections. Verbal instructions are also used to create further awareness amongst Contractors, as often the transgressions are a function of lack of awareness.

Written instructions

Written instructions will be given following an audit. The written instructions will indicate the source or sources of the problems, and proposed solutions to those problems. The implementation of these solutions can also be assessed in a follow-up audit and further written instructions issued if required. All written instructions will be centrally logged to ensure that there is an auditable record of such instructions and how they were responded to.

Contract notice

A contract notice is a more extreme form of written notice because it reflects the transgression as a potential breach of contract. If there is not an adequate response to a contract notice, then the next step can be to have the contractor removed from the site and the contract cancelled. Contracts will be drafted with this in mind.

8.2.4 Grievance Management

The Project should develop and implement a Grievance Procedure. The Grievance Procedure should describe how community members should raise grievances regarding the project's activities. The Grievance Procedure should address verbal or written grievances, which should include sufficient information about the complaint or claim so that a proper and informed evaluation of the grievance can be made. When a grievance is filed, it should be logged and evaluated. All grievances should be tracked for monitoring and reporting purposes and to ensure timely and proper resolution.

8.2.5 Incident Management

The Project should develop an incident management process that will describe the Project's requirements for managing safety, health, environment, social and security-related incidents, including near misses. The underpinning principles should be to:

- Avoid and reduce harm to communities, personnel, environment and assets;
- Confirm proper remedial action and perform appropriate follow-up surveillance to ensure injuries, damage or illnesses do not escalate;
- Communicate incident details to internal and external stakeholders as appropriate; and
- Investigate all incidents to identify root causes and implement corrective actions to prevent incident recurrence and drive continuous improvement.

The incident management system will involve the following, which may occur concurrently during implementation:

- securing the construction site;
- initiating emergency response procedures if required;
- performing case management for injuries or illness;
- incident classification, notification and investigation;
- implementing corrective actions;
- relevant reporting; and
- Lessons learned.

8.2.6 Reporting

Reports on ESMPs performance should include the following:

- Progress towards achieving targets;
- Non-compliances and results of any investigations; and
- Corrective actions.

It is envisaged that reporting should cover at least the following areas:

(a) Contractor Monthly Reporting

Contractors should work closely with the Project Management prior to the commencement of work to define the structure, content and format for their environmental and social monthly report. This report should contain key information around the contractors' implementation of the environmental and social requirements and mitigation measures and should cover, among others:

- Environmental and social assessment and improvement findings;
- Incident notifications;
- Non-conformances/non-compliances and corrective actions;
- Key performance indicators;
- Details of any environmental or social surveys or studies; and
- Environmental and social training conducted.

(b) Quarterly Reporting

The Project will prepare and submit to the relevant government departments a Project Environmental and Social Quarterly Report. The structure, content and format will be agreed with government prior to the commencement of work. This quarterly report will document key information on the Project's performance against the ESMP requirements.

(c) Incident Notification and Reporting

Contractors will notify the Project immediately following any environmental or social incident. Project will ensure that all environmental and social incidents are appropriately documented, that the relevant parties are notified, and that reporting requirements around the incident are met.

8.2.7 Management Review

The final component of the ESMP management cycle is a formal management review that takes place at defined intervals, both during the construction and operational phases. The purpose of the management review is for senior project management to review the environmental management performance during the preceding period and to propose measures for improving that performance in the spirit of continuous improvement.

8.2.8 Liaison and communication to stakeholders

Throughout the project, ongoing liaison should be maintained with authorities and communities alike to ensure the following:

- Timeouts advance warning of any project activities that may have some adverse impact on surrounding communities, e.g. plant pre-commissioning
- Ongoing feedback on the environmental performance of the project.

8.3 Environmental and Social Management Plan during Construction Phase

Table 8-1 gives a summary of the Environmental and Social Management Plans during construction phases of the project.

Table 8-1: Summary of the Environmental and Social Management Plans during Construction Phase

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost (KES)
Impact on flora	• Any sandal wood identified on site should be marked out and made known to the engineers and contractor; • Ensure that construction site is clearly demarcated and there is selective clearing of the vegetation to allow future re-growth and regeneration. This will ensure minimal disruption of wild fauna's natural movement, territoriality, and other ecological processes; • Re-vegetate disturbed areas along roads, pipelines and steam lines and other construction sites. While the invasive *Datura stramonium* will rapidly colonize the disturbed bare grounds and still act as surrogate habitat for some fauna species, it is still desirable to minimize/discourage it's dominance by planting native trees such as *Croton megalocarpus*-. Additionally, *Digitaria sp* a native grass commonly growing at the site can be very used in checking soil erosion especially on loose soil dumps or bare slopes created during construction. • Create awareness among the local communities and discourage them from engaging in charcoal burning; • Monitor regeneration of natural vegetation as well as the appearance/spread of invasive or opportunistic species within the disturbed areas. Monitoring should include spotting and uprooting of unwanted germinating plants.	Construction site Menengai Geothermal Field	Contractor QPEA GDC KFS	500,000
Impact on micro fauna	• Limit speed of construction traffic within the caldera e.g. through erection of bumps and signage; • Vehicular disturbances such as hooting should be discouraged accordingly; • Incident records (of poaching, accidents and other human wildlife conflicts etc) should be kept by monitoring and taking of corrective measures; • Roads into/out of the Caldera area should be maintained as routes for tourist's activities and wildlife management; • Access for earthmoving machines should be regulated; • Ensure that forest rules are enforced within the caldera throughout; • Brine ponds should be located close to the source. Distant flow should be piped to prevent animal or vegetation contact; and • Monitor wildlife abundance, distribution and movement in relation to this	Construction site Menengai Geothermal Field	Contractor QPEA GDC KWS	500,000

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost (KES)
	infrastructural development during construction and operation stages to aid in decision making.			
Impact on Avifauna	• High heat points and emission vents within the project area should be sheltered or fitted with inhibitors to deter birds which may get killed as a result of using such areas • High voltage transmission lines should be fitted with wire markers and flappers to alert birds on flight; and • Develop and implement an avifauna monitoring scheme, assessing bird population trends and direct hazards relating to the project.	Construction site Menengai Geothermal Field	Contractor QPEA GDC and KETRACO KWS FOMEC	1,500,000
Impact Herpetofauna and invertebrates	• Capture any reptiles encountered hiding under rocks and sheltered terrains such as *Python sebae* and safely release them in suitable habitats; and • Re-vegetation of the cleared vegetation.	Construction site Menengai Geothermal Field	Contractor QPEA GDC KWS	
Livestock access to brine ponds	• Fence off any constructed ponds; and • Control access to the caldera by herders.	Menengai Geothermal Field	QPEA; and KFS	
Landscape and visual intrusion impacts	• Limitation of vegetation clearance and earthworks to construction areas only Implementation of soil conservation measures; • Re-vegetation of the cleared vegetation as soon as feasible; • The colour of structures within the project area should be carefully selected to reduce visual impact. Neutral, non reflective colours blend well with the surrounding landscape. • Pipeline colouring should be green or given appropriate colour • Lighting to be switched off when not required; • Lighting of temporary working areas and site compounds during periods of darkness to be minimised where possible; • Preparation of a landscaping plan for the entire project area. Planting plan to be comprised of 75% indigenous species and to be rid of any invasive species. • Stripped topsoil to be preserved and used during landscaping; and • All embankments to be vegetated or stone pitched to prevent soil erosion.	Construction site Menengai Geothermal Field	Contractor QPEA GDC	2,000,000

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost (KES)
Soil erosion	• No grey water runoff or uncontrolled discharges from the site/working areas (including wash down areas) to adjacent watercourses and/or water bodies shall be permitted; • Water containing pollutants such as cements, concrete, lime, chemicals and fuels shall be discharged into a conservancy tank for removal from site; • Potential pollutants of any kind and in any form shall be kept, stored and used in such a manner that any escape can be contained and the water table not endangered; • Wash areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas (including groundwater) are not polluted.	Construction site	Contractor QPEA	1,000,000
Impact on natural sources of construction materials	• Obtain appropriate authorisation including from NEMA and Mines and Geology department to do or use any proposed borrows pits and quarries will be obtained before commencing activities; • Any new borrow pits and quarries shall be located more than 100 meters from watercourses in a position that will facilitate the prevention of storm-water runoff from the site from entering the watercourse; • Notice will be given 14 days to nearby communities of intention to excavate in the borrow pits or quarries; • Borrow areas' rehabilitation plans will be prepared prior to use and approved by the local authorities; • Storm-water and groundwater controls through appropriate drainage shall be implemented to prevent runoff entering streams and the slumping of soil from hillside above; • The use of borrow pits or quarries for material spoil sites must be approved by the local authorities (and/or with the appropriate consent of the "landowner"). Where this occurs, the materials spoiled in the borrow pit shall be profiled to fit into the surrounding landscape covered with topsoil and re-vegetated. and • In the event that blasting for rock will be done: o A current and valid authorisation from the Department of Mines prior to any blasting activity shall be obtained; o A qualified and registered blaster by the Department of Mines and Geology shall supervise all blasting and rock-splitting operations at all	Quarry site	Contractor	1,000,000

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost (KES)
	times; ○ The Contractor shall ensure that appropriate pre blast monitoring records are in place (i.e. photographic and inspection records of structures in close proximity to the blast area); ○ QPEA and the Contractor shall ensure that emergency services are notified, in writing, a minimum of 24 hours prior to any blasting activities commencing on Site; ○ QPEA and the Contractor shall take necessary precautions to prevent damage to special features and the general environment, which includes the removal of fly-rock. Environmental damage caused by blasting/drilling shall be repaired at the Contractor's expense; ○ The Contractor shall ensure that adequate notification is provided to the local communities immediately prior to all blasting. It is preferable that warning / informative signage and billboards be erected at the site indicating operation hours as well as commencement and end of operations. All signals shall also be clearly given; ○ QPEA and the Contractor shall use blast mats for cover material during blasting. Topsoil shall not be used as blast cover. ○ Precautionary and corrective measures will be taken to avert defacing and deformation of the land features.			
Impact on water resources	• GDC and the Contractor shall ensure that necessary approvals/permits from the water authorities for the abstraction of water is adhered to; • Accidental leakages and bursts of water supply pipelines should be reported and repaired immediately; • Recycle water as much as possible should be encouraged for example water used for curing of concrete can be used for spraying dusty roads; • Control of the water flows and the water consumption records must be kept and availed to the supervising and QPEA Resident Engineers at the end of working day; • All employees should be sensitized on water usage practices like discouraging unnecessary opening of taps; • Monitoring of taps and their efficiency should be done regularly; • Where feasible, curing of concrete should be done in conservancy tank to avoid wastage;	Menengai Geothermal Field	WRMA GDC QPEA contractor	

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost (KES)
	• Harvest water during rainfall times to complement other sources; • The Contractor will be required to comply with the water quality regulations; • No grey water runoff or uncontrolled discharges from the site/working areas (including wash-down areas) to adjacent watercourses and/or water bodies shall be permitted; • Water containing pollutants such as cements, concrete, lime, chemicals and fuels shall be discharged into a conservancy tank for removal from site; • The Contractor shall instruct their staff and sub-contractors that they must use toilet provided and not the bush or watercourses; and • Continued monitoring of underground water levels.			
Air quality and dust	• Mobile machinery or vehicle maintenance and services should be undertaken away from project site in a yard set aside for this or by an approved garage or service station to prevent any incident of oil and fuel spills that could contaminate soils and possibly ground water quality. • All construction machinery shall be maintained and serviced in accordance with the manufactures specifications; • Workers shall be trained / sensitized on dust minimization techniques and management of air pollution from vehicles and machinery; • The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilized as soon as practically feasible; • Frequent watering of exposed surfaces and piles of soil to prevent airborne dust emissions; • All vehicles accessing the site shall observe low speed limits; • Minimize vehicles idling time; • Incorporate dust/fumes arrestors in the batching plant e.g. use of dust nets • Provision of appropriate protective personal equipment including respirators and aprons to affected personnel.	Construction site	Contractor QPEA	1,000,000

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost (KES)

Solid waste	• Apply the 3R (Reduce, Reuse and Recycle) principles. Diligence on the part of the Contractors during construction activities will minimise the amount of debris, and also will ensure that debris is disposed of in a sensible manner, at a specified and approved dump site;
	• The tender documents should specify the proper disposal of waste during construction;
	• The tender documents should also ensure that the contractor leaves the site in a clean condition on completion of works. The Contractors should be required to restore and landscape all areas to the satisfaction of the GDC and QPEA.
	• All solid waste generated during construction should be carefully monitored, collected, stored, and taken out of the crater for final disposal.
	• The development and rehabilitation of spoil areas shall include the following activities:
	  • Stripping and stockpiling of topsoil;
	  • Removal (to a nominal depth of 500mm) and stockpiling of subsoil;
	  • Placement of spoil material;
	  • Contouring of spoil site to approximate natural topography and drainage and/or reduce erosion impacts on the site;
	  • Placement of excavated subsoil and then topsoil over spoil material;
	  • Contouring and re-vegetation;
	  • The Contractor shall ensure that the placement of spoil is done in such a manner to minimise the spread of materials and the impact on surrounding vegetation and that no materials 'creep' into 'no-go' areas.
		Construction site	Contractor
			
			QPEA
				750,000

Increase in the amount and tonnage of traffic	• Upgrading of existing access roads where necessary to take care of the new traffic; • Erection of proper signage along all roads exploited for the construction process especially on approaches to blind corners and in populated areas ; • Construct speed bumps along Bahati entrance road and the roads within the caldera; • Sensitization and training of construction drivers;	Construction site	Contractor QPEA	800,000

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost (KES)
	• Monitoring, enforcement and disciplinary action of offenders. • Use of escort and chase vehicles where necessary e.g. in case of abnormal roads; and • Ensure full compliance to the traffic Act.			
Occupational and public health and safety	• QPEA should establish an Environment, Safety and Helath department with qualified personnel to oversee environmental and safety management through out its operations; • Contractor must develop Construction Safety and Health Policy in compliance with OSHA, and international best practice e.g. IFCs Environmental, Health and Safety Guidelines; • Undertake comprehensive assessment for PPE requirements, provide and enforce use of all ranges of required PPEs; • Contractors to establish a comprehensive Health and Safety Policy which should be in compliance with GDC's Occupation Health and Safety Policy and be approved by Environment, Health and Occupation Manager from GDC; • Ensure compliance with all standards and legally required health and safety regulations in line with OSHA; • Include standard best practice health and safety provisions in the construction contract. The provisions should include insurance to enable the contractor to pay for any and all treatments required by his workers including those of all sub-contractors, together with any subsequent lifelong disability payments in line with WIBA; • Employ a full time qualified Health and safety Officer; • Include a specific and independent task in the supervision contract concerning H&S supervision and compliance, together with the staff resources to carry this out; • Establish and enforce a strict code of conduct for all project drivers including outside suppliers delivering materials. The code should focus on safety, especially speed, and loading, especially banning all carriage of staff, workers and passengers except in seats; • Implement the specified H&S programme throughout the construction period. This should incorporate but not limited to: • An emergency response procedure and display on all work areas.	Construction site Menengai Geothermal Field	Contractor QPEA	

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost (KES)
	This is likely to require one vehicle on site equipped as an ambulance and a paramedic on site at all times during construction activities; • Provision of a standard first aid kit at the site office at all times; • Provision of fire-fighting equipment available at the workers camp; • Provision of medical facilities for staff; • Installation of appropriate safety signage for all work sites; • Registration of the work place; • Maintain an accident register; • Carry out accident and incidents investigations and implement corrective actions; • Establishment of Occupational Health and Safety Committee; • Staff and visitor induction; • Toolbox and monthly safety meetings; • Routine inspections.			
HIV/AIDs and STIs	• Education and sensitisation of workers and the local communities on HIV/AIDs and STIs in conjunction with Rongai and Nakuru North Sub-County Public Health Officers; • Provision of condoms to the construction workers, project team and the public. This should be kept in places that are not locked and are accessible to the above persons; • Where possible conduct regular sensitisation campaigns and monitoring and evaluation of the modes used during course of the project; • Formation of peer groups from among the project staff to ensure continuity in training and awareness raising; • The contractor has to institute HIV/AIDS awareness and prevention campaign amongst workers for the duration of the contract e.g. erect and maintain HIV/AIDS information posters at prominent locations as specified by the Resident Engineer in consultation with the GDC Community Liaison Office; • The contractor has to ensure that staff are made aware of the risks of contracting or spreading sexually transmitted diseases; and • The contractor should ensure that the project workers are sensitised on the local culture.	Construction site	Contractor QPEA PHO (Rongai and Nakuru North)	3,000,000

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost (KES)
Contractor's camp	• Any contractor's camp should have a comprehensive waste management and sanitation plan and facilities commensurate with population of workers and activities in the camps; • Any storage tanks and equipment should have correct labels and Material Safety Data Sheets; Adequate Emergency Response Plan should be in place in the camps; • The contractor should employ best practice management "housekeeping" (site cleanliness, waste disposal etc.) at all times; and • The contractor's facilities should be completely removed from site after use and the land restored to its previous condition or better.	Contractor's camp	Contractor QPEA GT Menengai Ltd	
Risk of wild fires	• Include an adequate fire buffer zone around the proposed power plant construction site. This could be open bare ground/un-vegetated areas and planting fire resistant trees e.g. Mexican green ash (*Fraxinus sp*) around the plant should be maintained throughout during the construction and the operation period; and • Liaise with the Menengai KFS office to sensitize construction and operation staff on wildfires and train on emergency responses.	Construction site Menengai Geothermal Field	Contractor QPEA GDC KFS	
Impact of fuel and chemical storage on site	• Ensure that the employees on site are aware of the company procedures for dealing with spills and leaks from oil storage tanks for the construction machinery though induction and safety training; • In case of spillage, isolate the source of oil spill and contain the spillage using sandbags, sawdust, absorbent material and/or other materials approved by NEMA; • ensure that there is always a supply of absorbent material such as saw dust on site during construction, readily available to absorb/breakdown spill from machinery or oil storage; • All vehicles and equipment should be kept in good working order, serviced regularly and stored in an area approved site by GDC and QPEA; • Ensure that filling areas, Oil storage drums / products storage areas have a smooth impermeable (concrete or thick plastic covered in gravel) floor. The floor should be bunded and sloped towards a sump to contain any spillages of substances in accordance with The Kenya Bureau of Standards (KEBS) KS 1969: 2006 The Petroleum Industry -The installation of underground storage tanks, pumps/dispensers and pipe work at service stations and consumer installations - Code of Practice.	Construction site	Contractor QPEA	

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost (KES)
Chance encounter and interference with buried archaeological artefacts.	• Retain an archaeologist from NMK on site during earthworks; • Notify NMK if any artefacts or bones are uncovered in the course of excavations in accordance with the National Museums of Kenya Chance Finds Procedure (Appendix VIII); and • Implement to the chance find procedure.	Construction site	Contractor QPEA NMK	

8.4 Environmental and Social Management Plan during Operation Phase

Table 8-2 gives a summary of the Environmental and Social Management Plans during operation phases of the project.

Table 8-2: Environmental and Social Management Plan during Operation Phase

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost
Impact on flora	• Monitor invasive plant species at the project area and uproot unwanted germinating plants; • Assess concentration geothermal gaseous effluents such as H_2S, by use of automatic sensors and continually test for any evidence of acid rain; • Plant soil-erosion preventing grass species such as *Cynodon dactylon, Digitaria abyssinica, Pennisetum clandestinum* and *Hyparrhenia sp* at bare sloppy grounds or loose soil dumps; • Steam pipe insulations should have a well camouflaged colours that are maintained so that animals don't perceive pipelines as barriers • Brine flows and ponds should be located close to the source. Distant flow should be transmitted through closed pipes; • Rehabilitate any disturbed areas along roads, pipelines and abandoned campsites etc. by planting native plant species such as *Acacia mearnsii, Psidium guajava* and *A. melanoxylon*– this should be done as soon as practicable to avoid colonization by invasive and opportunistic pioneer species; and • Create awareness among the local communities on the importance of vegetation cover and discourage them from engaging in charcoal burning.	Power Plant Site Menengai Geothermal Field	QPEA GT Menengai Ltd GDC KFS	
Impact on macro fauna	• Vehicular disturbances such as hooting should be discouraged accordingly; • Incident records (of poaching, accidents and other human wildlife conflicts etc) should be kept by monitoring and taking of corrective measures; • Ensure enforcement of forest rules within the caldera; • Brine ponds should be located close to the source and fenced. Distant flow should be piped to prevent animal or vegetation contact; • Monitor wildlife abundance, distribution and movement in relation to this infrastructural development during construction and operation stages to aid in decision making; and • Erect speed bumps in wildlife crossing zones should these be	Power Plant Site Menengai Geothermal Field	GDC QPEA KWS KFS	

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost
	established from monitoring activities.			
Impact on Avifauna	• High heat points and emission vents like NCGS stack should be sheltered or fitted with inhibitors to deter birds from perching or hovering around; • Develop and implement an avifauna monitoring scheme, assessing bird population trends and direct hazards relating to the project; and • High voltage transmission lines should be fitted with wire markers and flappers to alert any birds on flight.	Power Plant Site Menengai Geothermal Field	GDC Contractor QPEA KETRACO	
Impact on Herpetofauna	• Water and steam pipe lines should be laid across (perpendicular to) the valleys rather than running along them – as this will mean destroying large patch of this ecologically sensitive keystone habitat for many species; • re-vegetate disturbed areas along roads, pipelines and steam lines and other construction sites; and • Create awareness among the local communities and discourage them from engaging in charcoal burning which is evidently on the increase in this area.	Power Plant Site Menengai Geothermal Field	GDC Contractor QPEA KFS	
Operation solid wastes	• Use integrated solid waste management system i.e. source reduction; reuse; and recycling; • Donate any recyclable materials to local community groups, institutions and individuals; • Provide segregated waste respectable/bins within the plan premises and create awareness among staff on usage; • Dispose waste responsibly through a licensed waste handler for final disposal at designates sites; • Ensure compliance with waste management regulations	Power Plant Site Menengai Geothermal Field	GDC Contractor QPEA Nakuru County Government	
Operation liquid wastes	• Domestic waste water and sewer from septic tanks should be disposed through NEMA- licensed exhaust service providers; • Brine ponds should be sited close to the source; • Any brine ponds constructed should be lined with durable impervious materials of suitable quality and protected from any form of vandalism; • Brine re-injection through re-injection wells into underground reservoir; • Chemical composition and parameters of the brine should be regularly monitored.	Power Plant Site Menengai Geothermal Field	GDC Contractor QPEA Nakuru County Government	

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost
Fire risk	• A fire protection system of fire water tanks, fire extinguishers, fire hydrants, hose reels, fire alarms and sprinklers; • Formulate a fire emergency response plan; • Ensure no smoking signage is put up in the necessary areas; • Train some staff to be fire marshals; and • Carry out fire drills -Inspect fire fighting equipment.	Power Plant Site	Contractor QPEA Nakuru County Government	
Accidental Oil spill/Hazardous pollution	• Spill and drip trays used during servicing of machinery; • Use septic tanks while ensuring doesn't flow to the surface; • Response plans for accidental spills to be formulated and routinely tested; • Bunded storage areas and secondary containment for oil and chemicals; • Use of an oil interceptor in the plant; • Place hazardous materials up to 2 kilometres away from the public water supply reservoirs such as in Ol banita groundwater reservoirs. Also avoid placing within flood levels; • Storage of fuel and other flammable materials shall comply with standard fire safety regulations; • A secured compound shall be provided for storage tanks for chemicals and fuel. All chemicals and fuels shall be stored with manufacturer's instructions in mind as per the material safety data sheets; • Storage areas or secondary containment shall be constructed of waterproof reinforced concrete or approved equivalent, which is not adversely affected by contact with chemicals captured within them; • The minimum volume for secondary containment shall be 110% of the capacity of the largest tank system, plus 10% of the total capacity of all other separate tanks and containers within the bund wall with closed valves for controlled draining during rains; • Pipe-work carrying product from the tank to facilities outside the containment shall be provided with secondary containment; • Tank equipment such as dispensing hoses, valves, meters, pumps, and gauges shall be located within the containment or provided with own containment.	Power Plant Site	Contractor QPEA Nakuru County Government	

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost
Occupational safety and health	• Formulate a plant occupational safety and health management plan. The plan as a minimum MUST have and require: • Compliance with GDC Health, Safety and Environment policy; • Compliance with OSHA, 2007; • Continuous H_2S monitoring within the plant premises; • Equipping employees with necessary Personal Protective Equipment (PPE) including personal H_2S monitors for workers in exposed environments; • Regular and induction training, of members of the safety committee and new staff respectively on First Aid; • Ensure the plant and office blocks have adequate supply of First Aid Kits; • Location of appropriate safety and warring signs around the plant; • Inspections on conditions of machinery and equipment -Register the plant as a workplace with DOSH; • Medical examination of all employees before, during and after termination of employment; • Detailed emergency response plan; • Provision and display of relevant emergency contacts; and • Regular independent Occupational Health and Safety audits.	Power Plant Site	Contractor QPEA	
Potential thermal pollution of groundwater resources	• Undertake joint studies to investigate possibility of thermal contamination of underground water aquifers within the area with geothermal steam production wells and institute appropriate mitigations where necessary	Power Plant Site	GDC, NAWASCO and WRMA	
Air quality	• Re-injection of gases with geothermal fluids. Re-injection of geothermal fluids has already been proposed in the plant design; • Adopt air quality management plan incorporating: ○ Installation of H_2S monitors and daily monitoring of H_2S with alarm system within the Plant boundaries and other active activity sites within the caldera; ○ Training of all workers on the dangers exposure to H_2S; ○ Use of personal monitors by staff in potentially more dangerous areas; and ○ Liaison strategy for communication with communities who may be affected by odour nuisance	Power Plant Site Menengai Geothermal Field and All identified AQSRs	GDC QPEA Nakuru County Government	

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost
Cumulative Noise impacts	• Require plant equipment vendors to guarantee optimized equipment design noise levels; • Install acoustic attenuation devices on all ventilation outlet and high pressure gas or liquid should not be ventilated directly to the atmosphere, but through an attenuation chamber or device; • Ensure plant vibrating equipment are on vibration isolation mountings; • Ensure all exposed staff have and use noise protection equipment e.g. ear plugs: • Regularly monitor noise levels due to the plant and keep records; and • Develop a liaison strategy for communication with communities who may be affected by cumulative noise nuisance.	Power Plant Site Menengai Geothermal Field and All identified NSRs	GDC QPEA Nakuru County Government	

8.5 Environmental and Social Management Plan during Decommissioning Phase

QPEA must prepare and submit a power plant decommissioning plan to NEMA for approval at least three months before decommissioning in line with NEMA license conditions. The plan shall include an update of all activities involved in the decommissioning process, identification of potential environmental, safety and health risks associated with the process and review of relevant standards applicable. Table 8-2 gives a summary of the preliminary Environmental and Social Management Plans during decommissioning phase of the project. The plan does not include decommissioning of wells which are assumed to be the responsibility of GDC. Key issues identified at this stage are:

- Occupational safety and health of demolition staff.
- Management of demolition wastes; and
- Rehabilitation of site biophysical environment.

Table 8-3: Summary of the Environmental and Social Management Plans during Decommissioning

Environmental and Social Aspects	Recommended mitigation and/ or management measure	Location	Responsibility for implementation	Cost (KES)
Occupational safety and health	• Make the site safe by ensuring all electrical connections and supplies are disconnected and any dangerous chemical stores are identified and made safe	Power Plant Site	QPEA KETRACO and KPLC	
	• Comply to the OSHA; • Provide for appropriate signage and warnings; • Any closed vessels, pipes and other areas which could have hazardous gases present would be vented in accordance with normal operating procedures. These would then be tested to ensure that they are safe for entry or removal; • Provide for First Aid facilities for staff as per the OSHA, 2007; • Monitor H_2S levels during demolition works; • Maintain appropriate and serviceable fire fighting equipment on site; • Designate an emergency assembly point within the plant and create general awareness on use for all staff; • Provide and clearly display emergency contacts; and • Develop a detailed and demolition-specific Emergency Response Plan		QPEA and Contractor	1,500,000
Redundant plant equipment and recyclable wastes	• Careful removal and sale/recycling of plant and materials including	Power Plant Site	QPEA	
Non-recyclable demolition waste	• Ensure demolition wastes are segregated on site; • Disposal of waste materials by appropriate methods in accordance with waste management regulations; • Procure services of licensed waste handlers for safe disposal of both hazardous and non-hazardous wastes; and • No burning of any wastes should be done on site.	Power Plant Site	QPEA	3,000,000
Re-instatement of biophysical environment	• Landscape of the power plant site with suitable mix of indigenous species. This should be done in liaison with the; and • Ensure landscaped species are established prior to final close out of the site	Power Plant Site	QPEA and KFS	2,500,000

8.6 Environmental and Social Monitoring

8.6.1 Monitoring framework

The Environmental and Social Management Plan will be subject to monitoring. In general, monitoring will have two key elements:

- Routine monitoring against set standards or performance criteria; and
- Periodic review or evaluation. This will often focus on the effectiveness and impact of the programme or plan as a whole. In some cases, independent parties will undertake review and evaluation.

As a mechanism for public participation in monitoring, project monitors shall as part of their duties, provide an opportunity for the locals to be heard. The general public shall have an opportunity to speak freely about the project and any problems encountered as a result of its construction activities.

8.6.2 Monitoring Plan

The monitoring plan evaluates the effectiveness of the management and implementation of the mitigation measures associated with the projected environmental and social impacts.

The monitoring plan is complementary to the audits, inspections and reporting activities defined in the Section 8.2.framework for implementation of the ESMP.

The proposed monitoring plan is summarized in Table 8-4, Monitoring Plan. The table lists the related indicators, the items to be measured, the measurement frequency and the person/institution responsible and monitoring cost estimate.

Table 8-4: Monitoring Plan

Project Activity/Aspect	Parameter	Indicator	Institutional Responsibilities		Project Phase	Monitoring Cost Estimates (KES)
			Monitoring Responsibility	Frequency		
Impact on Flora (vegetation loss)	Visual inspection	• Bare soil; • Soil erosion.	Contractor QPEA Health Safety and Environment officer	Daily	Construction	Included in Supervision scope and Costs
Air Emissions and Air Quality Dust	TSP, SO_2, CO, H_2S, CO_2, CH_4 Dust fallout	• Bad odour; • Use of PPE; • H&S Plan in use; • Record of Induction for Workers • Active dust suppression	Contractor QPEA's Senior Management QPEA' Health Safety and Environment officer NEMA	Daily	Construction and operation	Included in Supervision scope and Costs
Worker and Public Safety	Visual inspection Incident and accident records	• Induction training • Safe working procedures • Shoring & appropriate precautions in place	Contractor and Sub contractors QPEA Health Safety and Environment officer	Daily	Construction	Included in Supervision scope and Costs
Occupational Safety and Health	Health and Safety records Visual inspection	• OHS Management system • Active and passive monitoring • Excellent workplace safety culture • Risk management	Contractor QPEA's Senior Management QPEA Health Safety and Environment officer	Daily	Operation	Included in Supervision scope and Costs
Protection of Ground Water Resources		• Incorporation in the Design; • Re-injection of steam.	WRMA GDC	Bi-monthly	Operation	Included in Supervision scope and Costs

Project Activity/Aspect	Parameter	Indicator	Institutional Responsibilities		Project Phase	Monitoring Cost Estimates (KES)
			Monitoring Responsibility	Frequency		
Storage of hazardous materials and chemicals	Spillages Visual inspection	• MSDS for all store Chemicals • Functioning storage containers • Chemical usage records	Contractor QPEA Health Safety and Environment officer	Monthly Audit Review	Construction	Included in Supervision scope and Costs
Traffic concerns	Visual inspection	• Prepare and implement Traffic Management Plan • Bank's men shall be used to direct vehicle traffic around construction sites and hazards during working hours (Health and Safety Plan) • Plan approved by Project Manager • Barriers and signage.	Contractor Project Manager/Supervising Engineer	Daily		Included in Supervision scope and Costs
Public Awareness and Community Perceptions		• Grievance management records • Evidence of Occurrence – Event Report	QPEA Project Management/Supervising Team	Monthly	Construction and operation	Included in Supervision scope and Costs
Noise	dB(A)	• Measure included in Design and Procurement plans • Hearing Protection and PPE in use • Record of Plant equipment Maintenance	Contractor QPEA GT Menengai HSE officer	Daily	Construction and operation	Included in Supervision scope and Costs
Soil Erosion	Visual inspection	• Bare soil; • Soil pillars; • Cracks across the slope • Sediment fans	Contractor QPEA GT Menengai HSE officer	Weekly	Construction	Included in Supervision scope and Costs
Solid waste management	Slag, domestic refuse, metallic scraps, sludge	• Documented Approvals for placement of wastes; • Comprehensive waste management plan	Contractor QPEA GT Menengai HSE officer	Daily	Construction	Included in Supervision scope and Costs

Project Activity/Aspect	Parameter	Indicator	Institutional Responsibilities		Project Phase	Monitoring Cost Estimates (KES)
			Monitoring Responsibility	Frequency		
Water Quality (both surface and underground)	pH, BOD, Temperature, COD, Turbidity, Conductivity, Dissolved Oxygen, Nitrates	• Monitoring report; • Water quality report.	GDC QPEA GT Menengai Ltd	Monthly	Operation	

9 CONCLUSION

This ESIA Study update for the proposed 1X35MW Geothermal Power Plant Project in Menengai was conducted in accordance with the required local, national, IFC and other international standards. In undertaking the study, a holistic approach was used whereby QPEA GT Menengai Limited NGO and the host communities, (the primary stakeholders) as well as the regulatory bodies and County Government of Nakuru (the secondary stakeholders) were widely consulted. Key environmental sensitivities of the project in terms of natural environment, socio-economic/cultural and health characteristics were identified and evaluated.

The significance of the impacts were duly assessed through standard field and laboratory methodologies, predictive modeling as well as desk reviews. The EIA has demonstrated that the overall impacts associated with the Geothermal Power Plant Project in Menengai can be managed within reasonable and acceptable limits by applying all identified mitigation measures contained in this report. There is no land take for the power plant and from both noise and air quality modelling outcomes, no adverse public health impacts are anticipated on the nearest sensitive receptors (settlements) hence no resettlement is anticipated based on community heath concerns. Further, the requisite conditions for most of the mitigations have been incorporated by QPEA on project design documents reviewed by the consultant.

In general, the proposed project will result in appreciable benefits to the country power production in line with Vision 2030, and create opportunities for both social and economic development. The project is already licensed by NEMA and QPEA has received a no objection letter from the NMK.

Identified potential adverse impacts of the proposed project shall be eliminated or significantly minimized through the implementation of the recommended mitigation measures. The benefits that will be derived from the proposed power plant project are therefore much greater than the short-term environmental effect.

Public consultations revealed that the local communities have high socioeconomic interests and a lot of expectations with the geothermal power development activities going on within the Menengai caldera. It is recommended that QPEA develop and implement a community liaison strategy with proper communication and feedback mechanism; and a clear and transparent employment policy for the local communities.

The project construction and operation activities are not expected to strain existing water supplies by NAWASCO. However, consultations with the regional office of Water Resources Management Authority and NAWASCO pointed out that since geothermal wells in the Menengai caldera were commissioned, the water temperature from the Ol Banita boreholes near the caldera have been recording increased temperatures. This has impacted on operation and maintenance cost of the bulk water service providers and complaints from water consumers. It is notable that underground water is the main water supply to the locals and the nearby Nakuru town. This study recommends that GDC, NAWASCO and the water resources management authority should undertake joint studies to investigate possibility of thermal contamination of underground water aquifers within the area with geothermal steam production and institute appropriate mitigations where necessary.

In consideration of the above, there is no major environmental or social issue to impede the development of the proposed 1X35MW Geothermal Power Plant Project, which is designed to supply additional electricity to the national grid.

It is recommended that the proposed project be implemented in compliance with all the relevant legislation and planning requirements of Kenya at all times. In line with this, the proponent QPEA and the contractor (s) must take the legislative framework reviewed in this report into consideration, during and after the implementation of the project, as will be appropriate.

Further, the following are recommended:

- QPEA management should establish an Environment, Safety and Health department with suitably qualified staff in the field of environment, social and occupational safety and health management. The department will work in liaison with GDC, QPEA contractors and relevant government lead agencies to ensure sound environmental and social performance;
- Ensure implementation of NMK chance find procedure during construction phase;
- In liaison with GDC Ensure that community expectations are managed through well structured community liaison plan;
- Ensure compliance with NEMA approval conditions throughout the project phases; and
- Ensure statutory annual environmental and occupational safety and health audits are carried out annually throughout the project implementation and operation period.

10 BIBLIOGRAPHY

General

- Airshed Planning Professionals, 2015. Air Quality Impact Assessment for the Proposed Menengai Geothermal Power Plant in Kenya
- Airshed Planning Professionals, 2015. Noise Impact Assessment for the Proposed Menengai Geothermal Power Plant in Kenya
- GDC, 2011. Health, Safety and Environment Policy
- GDC, 2012. Environment Policy
- GoK 1999: Environmental Management and Coordination Act, 1999 (EMCA)
- GoK 2002: Water Act Laws of Kenya. Kenya Gazette Supplement No. 107 (Acts No.9), Nairobi, 24th Oct, 2002 14.
- GoK 2003: The Environmental (Impact Assessment and Audit) Regulations. Kenya Gazette Supplement No. 75 of 14th Sep, 2003
- Howett, D.J.B. and Nagu, J. (1997).Agriculture Project Planning in Tanzania Institute of Development Management Mzumbe, Tanzania and Development Project Planning Centre, University of Bradford, United Kingdom
- http://kenyalaw.org/kenyalaw/klr_app/frames.php
- http://www.iucnredlist.org/
- http://www.kenyaforestservice.org
- IUCN Red List of Threatened Species. Version 2014.3. <www.iucnredlist.org>. Downloaded on 19 December 2014
- Kabiru A, 2015. Site report for the assessment of archaeological resources at 1x35MW geothermal power plant in Menengai Crater
- Nakuru County, 2013. First County integrated Development Plan (2013-2017)
- NEMA, 2003. State of the Environment Report for Kenya. National Environmental Management Authority.
- Physical Planning Act CAP 286 (2012). Laws of Kenya. Published by National Council for Law Reporting.
- Public Health Act CAP 242 (2012). Laws of Kenya. Published by National Council for Law Reporting
- UNDP_, Kenya National Disaster Profile
- University of Eldoret, 2013. Proposed installation of 3x30MW Menengai Modular power plants project in Nakuru County, Upgraded study report

Air quality

- ASG, 2011. Air Quality Modelling Data Sets: The Atmospheric Studies Group at TRC. [Online] Available at: http://www.src.com
- Bay of Plenty Regional Council, 2012. A review of odour properties of H2S - Odour Threshold Investigation 2012, Whakatane: Bay of Plenty Regional Council.
- CERC, 2004. ADMS Urban Training. Version 2. Unit A. s.l.:s.n.
- Hall, D. J. et al., 2000. An Inter-comparison of the AERMOD, ADMS, ISC Dispersion Models for Regulatory Applications, Swindon: Environment Agency R&D Dissemination Centre.
- IFC, 2007. Environmental, Health, and Safety Guidelines for Geothermal Power Generation, s.l.: World Bank group.
- Juliusson, B. et al., 2014. Tackling the Challenge of H2S Emissions. s.l., Reykjavik Energy.
- Muse, G., 2013. Proposed Installation of 3 x 30 MWe Menengai Modular Power Plants Projects in Nakuru County, s.l.: University of Eldoret.
- Preston-Whyte, R. A. & Tyson, P. D., 1988. The Atmosphere and Weather over South Africa. Cape Town: Oxford University Press.
- US EPA, 2004. AERMOD: Description of Model Formulation, s.l.: United States Environmental Protection Agency.

- WHO, 2000. WHO Air Quality Guidelines for Europe. [Online] Available at: http://www.euro.who.int

Noise impact assessment

- Barron, R. F., 2003. Industrial Noise Control and Acoustics. New York: Marcel Dekker, Inc.
- Brüel & Kjær Sound & Vibration Measurement A/S, 2000. www.bksv.com. [Online] Available at: http://www.bksv.com [Accessed 14 October 2011].
- Burgess, M. & McCarty, M., 2009. Review of Alternatives to 'Beeper' Alarms for Construction Equipment, Canberra: University of New South Wales.
- IFC, 2007. General Environmental, Health and Safety Guidelines, s.l.: s.n.
- Muse, G., 2013. Proposed Installation of 3 x 30 MWe Menengai Modular Power Plants Projects in Nakuru County, s.l.: University of Eldoret.
- NEMA, 2009. Noise Regulations. [Online] Available at: http://www.nema.go.ke [Accessed 17 February 2015].
- SANS 10103, 2008. The measurement and rating of environmental noise with respect to annoyance and to speech communication, Pretoria: Standards South Africa.
- SANS 10357, 2004. The Calculation of Sound Propagation by the Concawe Method. s.l.:Standards South Africa.
- WHO, 1999. Guidelines to Community Noise. s.l.:s.n.

APPENDICES

Appendix I	:	Key Informants Interview Records
Appendix II	:	Records of Public Meeting
Appendix III	:	Vegetation of Menengai
Appendix IV	:	Mammals and Reptiles of Menengai
Appendix V	:	Birds of Menengai
Appendix VI	:	NEMA License
Appendix VII	:	No Objection Letter from NMK
Appendix VIII	:	NMK Chance Finds Procedure
Appendix IX	:	Memorandum of Understanding between GDC and KFS

Appendix I: Key Informants Interview Records

Nakuru Sub-County Medical Officer/Public Health Officer

GDC
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CONSULTING · DESIGN · MANAGEMENT

UPDATING THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT FOR 1x30 MW MENENGAI POWER PLANT

STAKEHOLDER CONSULTATION GUIDE

SUB-COUNTY MEDICAL OFFICER OF HEALTH/PUBLIC HEALTH OFFICER

Nakuru North & Subur Sub-Counties

Introduction

GDC has entered into an agreement with Quantum Power East Africa (QPEA) GT Menengai Limited as one of the Independent Power Producers for Menengai Geothermal Power Plants. QPEA is applying for funding from international lenders to finance the development of the proposed 1x30MW power plant. One of the expected pre-requisites to funding is compliance with the specific lender's environmental and social safeguards. Based on the findings of the preliminary review and gap analysis of the existing project Environmental and Social Impact Assessment (ESIA) report, Licence from NEMA and Environmental and Social Management Plan (ESMP) it was determined that for the project to comply with MDBs and IFIs requirements, additional inputs to the Report will be required.

To achieve this QPEA which is to implement the project on behalf of GDC has contracted GIBB Africa to update the project ESIA and where necessary, undertake RAP to mitigate on impact on property.

The aim of this study is to collect information at household and institutional stakeholders for the purposes of impact analysis and development of mitigation measures.

Kindly assist by answering the following questions.

1. What are the top ten common illnesses within the Sub-county / District specifically the project area that is Bahati/Ngata/Kampi Ya Moto divisions?

Under 5 yrs	Over 5 yrs.
1) Diseases of respiratory system.	1) Diseases of respiratory System
2) Diarrhoea	2) Disease of the Skin.
3) Diseases of the Skin.	3) Dental diseases.
4) Clinical malaria.	4) Rheumatism, joints pains.
5) Confirmed malaria.	5) Malaria
6) pneumonia	6) Typhoid fever.
7) Eye infection.	7) Confirmed malaria.
8) Mumps.	8) Diarrhoea.
9) Chicken pox	9) Urinary tract infection.
10) Ear infection.	10 Pneumonia.

2. What is the doctor patient ratio in the Sub County / area?

1: 60670

3. What are the HIV/AIDS prevalence rates in Nakuru North/Rongai Sub County?

Nakuru North: 2·8% for the general population.

4. What initiatives are in place to mitigate the spread of the above illnesses?

Prevention through: HIV testing & Counseling (Knowledge of status); PMTCT intervention
- Distribution & education on proper and consistent condom use to the community. — Education on Abstinence to the young, Faithfulness for those in marriage.
- Timely commencement of HAART & education on adherence.

5. Which is the most vulnerable group to HIV/ AIDS infections?

- Those in marriage or serious union (attributed to low condom use).
- Women/Females (Attributed to anatomy).
- Women aged 35–39 yrs, and men aged 45-49 years
- Those living in the urban areas, as opposed to rural.

6. What health programs does the department have to deal with

a. HIV/AIDs menace?

- HIV Defaulter tracing.
- Prevention (Education, Condom distribution.
- HIV testing & counseling (HTC)
- HAART (see below).
- STIs.
- Prevention of Mother to Child transmission of HIV (PMTCT).
- Early Infant Diagnosis (EID).
- VMMC.
- HIV-Reproductive Health Integration

b. TB

- TB Diagnosis and Treatment.
- TB Defaulter Tracing.
- Referrals & Linkages.
- TB-HIV Integration.
- TB sensitization & education.

-TB-HIV Integration
-Referrals & Linkages

Meanings of acronyms.

NB:
- STI: Sexually Transmitted Infections.
- PMTCT: Prevention of Mother to Child Transmission of HIV.
- HAART: Highly Active Anti-Retroviral Therapy.
- VMMC: Voluntary Medical Male Circumcision.

c. Vaccination

1) Daily routine Vaccination
2) National Campaigns eg. Polio Campaign.
3) Outreach services to the community eg to the hard to reach areas.
4) follow up of immunization defaulters.

7. What is the number of health facilities available in the divisions? What are the categories and distribution?

The sub county has three divisions, i'd

1) Kiamaina Division
Public facilities - 4
FBO - 1
Private - 8

2) Bundoni Division.
Public facilities - 3
FBO " - 3
Private " - 5

3) Baheti division.
Public facilities - 3
FBO " - 1
Private " - 1

8. What are the services offered in the health facilities near the project area?

1) Outpatient
2) Inpatient
3) Maternity.
4) Immunization.
5) Ante natal/post natal.
6) Family planning.
7) Gender Based Violence services.
8) Youth friendly services.
9) Cancer screening services.
10) Post abortal care
11) Dental services.
12) Physiotherapy/occupational services
13) Opthamology services.
14) Comprehesive care services.
15) Laboratory services.
16) Medical engineering services.
17) Environmental & Sanitation services.
18) Maternal & Child

9. Do you foresee any positive impacts from the proposed 1x30MW Geothermal Power Plant development?
   Yes ✓ or No, if yes what impacts do you see
   i. During construction

1) Community will get employment
2) Improved road network.
3) Cheap energy.
4) Community will get the supply.

   ii. During operation

1) Will get cheap energy.
2) Almost the whole community will be supplied with energy.
3) Job opportunities and development of the area.
4) Improved water supply and security (due to power).
5) Initiation & encouragement of self employment.
6) Improved quality of education. - Reduction of diseases eg Eye problems due to straining

10. Do you foresee any negative impacts from the proposed Northern Collector Tunnel development?
    Yes or No ✓, if yes what impacts do you see
    i. During construction

—

   ii. During operation

11. If your answer No. 7 is Yes, please suggest how the anticipated negative impacts can be mitigated.
    i. During construction

ii. During operation

Stakeholder Contacts:

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Organization Represented:	MINISTRY OF HEALTH NAKURU NORTH SUBCOUNTY		
Designation:	SCMOH.		
Locality:	NAKURU NORTH		
Date:	20/11/2014		
Signature:			
Official Stamp: (if available)	MEDICAL OFFICER OF HEALTH 20 NOV 2014 NAKURU NORTH & SUBUKIA SUB COUNTIES P.O. Box 66, BAHATI		

Nakuru North Sub-County Gender and Social Development Officer

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CONSULTING · DESIGN · MANAGEMENT

UPDATING THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT FOR 1x30 MW MENENGAI POWER PLANT

STAKEHOLDER CONSULTATION GUIDE

SUB-COUNTY / DISTRICT GENDER AND SOCIAL DEVELOPMENT OFFICER

Makuru Mosl

Introduction

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Kindly assist by answering the following questions.

1. What are the NGOs and Community Based Organizations (CBO's) within the project area?

LENAMADUBA
SCODE
Menengai Bee Keepers
Karimbux Community Based Organization
CRATER GRAZING Community Group
Kagiwa Community Health workers
Kahuho Environmental water Conservation & bee keeping

2. Which groups are considered vulnerable in the community? (With emphasis on the community around the proposed Menengai Power Plant project site)

Young men abusing alcohal
Children who are not going to school

Jobless Youths
People

3. What are the main social problems in the project area?

- Taking of illicit brew especially by young men (a good number of men of all ages do take illicit brew) has rendering them dependent and unfruitful.
- Has high rates of joblessness leading to poverty and tention especially by youths of working age.
- Increased crime rate especially around Kagoto, Hesthima Centres

4. What programs do you have in place to solve the above mentioned challenges

- Mobilization of the community into registered groups to encourage them to divert their energies into profitable activities e.g IGA
- Funding of group activities through Community development grants for creation and sustenance of IGAs
- Resolution of group conflicts
- Referall programs for dealing social issues

5. What economic and social activities are the vulnerable members of the community involved in?

Economic: Car wash, tree planting and selling of seedlings, mobilization of savings, table banking, boda boda services, donkey services, casual labour etc

Social activities: drinking illicit brew, attending church services, watching international football matches, pool

6. What support or welfare do you have in the project area

- Offering community grants to group projects.
- Providing referrals and linkages to institutions of Concern.
- Assessment, monitoring & evaluation of community projects
- Arbitration of group conflicts
- Registration of groups (self help groups, women groups & Youth groups)

7. What are the socio-cultural norms that guide property ownership specifically Land within the project area.

- Property inheritance (though this is minimal since most of property/land owners have subdivided/fragmented land for sale)

8. Gender Issues

a) Resource ownership: Indicate sex (M/F)

Resources	Who buys	Who owns	Who controls	Who uses
Land	M	M	M	F
Trees and Forest				
Livestock	M	M	M	F
Crops	F	F	M/F	M/F
Household property	F	F	F	M/F
Cars motorcycles and bicycles	M	M	M	M

b) Gender roles: Who does the following? (Tick where applicable)

Activity	Men	Women	Boy	Girls
Digging	✓	✓	✓	✓
Cooking		✓		✓
Food collection		✓		
Vegetable collection		✓		
Fetching water		✓	✓	✓
Washing utensils		✓		✓
Collecting firewood		✓		✓
Looking after animals			✓	
Washing clothes		✓		✓
Total task	1 role	8 roles	3 roles	6 roles

9. Are you aware of any site of historical / Archeological importance to the community in the project are?

Menengai Crater

10. Are there NGO's and / or CBOs in the project area? If Yes, Please List them and their roles

CBOs

Menengai Ecosystem climate Adaptation & Livelihood Project (MECAP): ~~[illegible]~~ Bee keeping, tree nurseries, sheep rearing

SCODE:

Menengai Crater Bee keepers

Bahati Community Health Based Organization: Campaign Against Drug/alcohol abuse.

Kahuho Environmental water Conservation & Bee keeping – Environment Conservation, Bee keeping, water supply

House of Hope & Bread CBO: Running assorted businesses

Nakuru partners Empowerment link CBO: Caring for PLWHA

Bahati Environmental & Hygiene Community Project Service CBO: Garbage collection.

11. Do you foresee any negative impacts from the proposed development of the Geothermal Power Plant?
(Yes) or No, if yes what impacts do you see
i. During construction

- Further land fragmentation in areas around the project area.
- Increased moral decandence due to increased levels of disposable income: more drinking, higher numbers of vulnerable children etc.
- Destruction of scenic features characteristic of the Menengai landscape
- Hostility and increased tension among youth of working age perceiving that jobs are benefiting non-locals
- Environmental pollution: possible dust, noise, ~~and odour~~
- Displacement of monkeys into areas populated by humans
ii. During operation - Adulteration of social norms occasioned by influx of non-resident working at the site.
- Environmental pollution: Odour, there is also
- Climatic change: There is a common belief that drilling of geothermal wells ~~has lead to heavy raining~~ is responsible for the heavy inconsistent raining currently witnessed

12. If your answer No. 7 is Yes, please suggest how the anticipated negative impacts can be mitigated.

i. During construction

- Lobbying for classification of the area as to ~~raining~~ to prevent fragmentation
- Mobilization of individuals working at the site into ~~self help~~ groups or investment oriented groups
- Offering a percentage of works to qualified residents,
- Put environmental protection measures in place.
- Constant and meaningful involvement of residents at all levels of the project

ii. During operation

* put systems in place to curb odour
* Give an explanation as to the climatic changes experienced

13. What are your comments on this exercise?

The idea behind it is okay. It was however restrained by time ie. enough time was not given for detailed

Stakeholder Contacts:

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Designation:	Sub-county Social Dev't Officer		
Locality:	Bahati - Sub-County HQ.		
Date:	11/11/2014		
Signature:			
Official Stamp: (if available)	SUB-COUNTY SOCIAL DEVELOPMENT OFFICER NAKURU NORTH SUB-COUNTY		

Nakuru North Sub-County Water Officer

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UPDATING THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT FOR 1x30 MW MENENGAI POWER PLANT

STAKEHOLDER CONSULTATION GUIDE

Nakuru North. Sub-County.
Coverage: Bahati, Kiamaina & Kabatini locations

SUB-COUNTY / DISTRICT WATER OFFICER

Introduction

GDC has entered into an agreement with Quantum Power East Africa (QPEA) GT Menengai Limited as one of the Independent Power Producers for Menengai Geothermal Power Plants. QPEA is applying for funding from international lenders to finance the development of the proposed 1x30MW power plant. One of the expected pre-requisites to funding is compliance with the specific lender's environmental and social safeguards. Based on the findings of the preliminary review and gap analysis of the existing project Environmental and Social Impact Assessment (ESIA) report, Licence from NEMA and Environmental and Social Management Plan (ESMP) it was determined that for the project to comply with MDBs and IFIs requirements, additional inputs to the Report will be required.

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Kindly assist by answering the following questions.

1. What is the main water source for communities living in the project area?

- Bahati Chania River - (This reduces during dry season)
- Crater Stream - (seasonal) (From Aberdares)

Water is not adf ~~but~~ there are complaints of inadequate especially in dry season.

2. Who are the Water Users of underground water in the Menengai area?

- No Boreholes in the area.
- Major water users are domestic, and Schools. No major factories in the area hence no industrial water uses.

3. Is / are there any Water Users Association for the above water resources? What are their roles with regards to management of the underground water resources?

Yes,
- Olkaria Olbanita River Water Resource users association. (0721803260/0726973262)
- Major role is to protect against farming near the river and to plant wrong trees; prevent soil erosion; Also ensure nobody uses water for irrigation since the water is inadequate.

4. In the event abstraction of underground water and connections to NAWASCO supplies to meet the plants' water needs, what is the foreseen net impact of this to the

(a) Underground water resources in the area?

- No impact anticipated since the areas mentioned above do not use boreholes

(b) Community living around an using the underground water resources

N/A

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5. What corrective measure should be adopted to solve or enhance the above?

N/A

6. Do you foresee any positive impacts from the proposed Geothermal Power Plant development?
Yes or No, if yes what impacts do you see
i. During construction

If they are going to use NAWASCO supplies there will be no problem. However, NARUWASCO has no adequate water since even the current demand cannot be met.
NAWASCO has three water kiosks in Mali Kumi, Alero, Mali saba and Kiamaina.

ii. During operation

There will be no problem if NAWASCO supply them with water as NAWASCO has enough water.

7. Do you foresee any negative impacts from the proposed Geothermal Power Plant development to the environment and water resources around the project area?
Yes or No, if yes what impacts do you see
i. During construction

NARUWASCO – Nakuru Rural Water & Sanitation Company.
NAWASCO – NAKURU WATER & SANITATION COMPANY

ii. During operation

8. If your answer No. 3 is yes, please suggest how the anticipated negative impacts can be mitigated.
   i. During construction

   ii. During operation

Water for domestic use must be treated because of high fluoride content.

Stakeholder Contacts:

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Date:	5/11/2014		
Signature:	Wawer		
Official Stamp: (if available)	DISTRICT WATER OFFICE NAKURU NORTH DISTRICT		

Nakuru Water and Sanitation Services

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UPDATING THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT FOR 1x30 MW MENENGAI POWER PLANT

STAKEHOLDER CONSULTATION GUIDE

WATER USERS/SERVICE PROVIDERS

NAME: NAKURU WATER & SANITATION SERVICES Co. Ltd

Introduction

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We kindly request for your opinion in line with the issues noted below to facilitate the update of the ESIA Report.

1. What does your organization do?

Water Supply Provision (WSP)

2. Within the project area and areas neighboring it how many other companies conduct the businesses that require a high consumption of water?

Limited to domestic use

3. What is your opinion of the proposed Power Plant development?

Good Initiative that would enhance economic growth probably enabling lower energy cost in Manufacturing/ Production Sector

4. What do you see as the net impact of this the proposed project to:

(a) Your organization

Expected to reduce power outages that are currently frequent and affecting our production capacity. Noting that our system relying on Power Supply (use of Boreholes for 90% production capacity).

(b) Community living around project site

Would enable town get connected to the power grid thus facilitating improved economic activities

5. What corrective measure should be adopted to solve or enhance the above?

6. Do you foresee any positive impacts from the proposed Power Plant development?
   Yes or No, if yes what impacts do you see
   i. During construction

   ii. During operation

7. Do you foresee any negative impacts from the proposed Power Plant project to the environment and water resources around the project area?
   Yes or No, if yes what impacts do you see
   i. During construction

- The drilling process goes beyond our Aquifer layer (250 - 300m) with that of the project at 2 - 3Km. In this case the Cost is necessary if no leakage is to be experienced from our aquifer following the Project.
- Necessary Protection around the aquifer to prevent dissipation of high temp. — Already high temperatures have been noted at our B/Holes (33°C to 42°C).

   ii. During operation

Increase in Hydrogen Sulphide levels into the Natural environment which may change the Surface Water Quality and which constitutes the Groundwater recharge for our Aquifer

8. If your answer No. 7 is Yes, please suggest how the anticipated negative impacts can be mitigated.

   i. During construction

- Adoption of appropriate Construction/Technology
- Provision of adequate Insulatory material around the entire depth of our aquifer.

ii. During operation

- Adoption of Suitable Technology to reduce the Concentration of Hydrogen Sulphide
- Incorporate Adequate Safety Measures to Safeguard against accidental discharges or in cases of plant breakdown.

Stakeholder Contacts:

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Designation:	WATER PRODUCTION SUPERINTENDENT		
Locality:	NAKURU		
Date:	11. 11. 2014		
Signature:			
Official Stamp: (if available)	NAWASSCO PRODUCTION SUPERINTENDENT 11 NOV 2014 P. O. Box 16314 NAKURU		

Rift Valley Water and Services Board

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UPDATING THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT FOR 1x30 MW MENENGAI POWER PLANT

STAKEHOLDER CONSULTATION GUIDE

WATER USERS/SERVICE PROVIDERS

NAME: RVWSB.

Introduction

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We kindly request for your opinion in line with the issues noted below to facilitate the update of the ESIA Report.

1. What does your organization do?

Development of Water & Sanitation Infrastructure in the Rift Valley region Covering Seven Counties - Nakuru, Narok, Nyandarua, Baringo, Elgeyo Marakwet/Keiyo, West Pokot & Turkana

2. Within the project area and areas neighboring it how many other companies conduct the businesses that require a high consumption of water?

Two water Service providers, NAWASCO and NARUWASCO are the major water abstractors in the project area - Nakuru town and Nakuru rural/outside Nakuru town.

Once the infrastructure has been commissioned, they are handed over to WRPs.
In the project area, Boreholes have been developed by RVWSB including the main pipelines to ~~the~~ Nakuru town.

3. What is your opinion of the proposed Power Plant development?

The geothermal power plant development will add more power to the national grid and reduce electricity cost.

4. What do you see as the net impact of this the proposed project to:

(a) Your organization

There have been complaints by NAWASCO of rising borehole water temperatures since GDC commissioned their geothermal wells. This has impacted operation of Borehole water pumps and Motors which have to be replaced quite often. NAWASCO is thereby incurring increased operation costs. ~~Design~~ Equipment installed can only operate within temperatures around 30°C yet increases have been recorded to 40°C

(b) Community living around project site

The emissions from the plant may affect the local communities.
Consultant informed that there is air

dispersion modelling to establish the likely extent of air pollutants and recommendation for resettlement where necessary.
- Fear of volcanic activities being stimulated by the geothermal power production works.

5. What corrective measure should be adopted to solve or enhance the above?

6. Do you foresee any positive impacts from the proposed Power Plant development?
Yes or No, if yes what impacts do you see
i. During construction

- Geothermal Power injection into the national grid is anticipated to eventually lower the cost of electricity. This will eventually lower the cost of operation. Most boreholes are pumped using electricity.

ii. During operation

7. Do you foresee any negative impacts from the proposed Power Plant project to the environment and water resources around the project area?
   Yes ✓ or No, if yes what impacts do you see
   i. During construction

If casing is not properly done, there is a risk that water in the aquifers will be drained into the fault lines or contaminated by the minerals in the steam

   ii. During operation

- Fear of cross contamination of aquifers when brine is being reinjected.

8. If your answer No. 7 is Yes, please suggest how the anticipated negative impacts can be mitigated.

   i. During construction

Properly designed and controlled drilling process to ensure no contamination of aquifers

ii. During operation

- Reinjection wells should be encased to prevent any potential contamination of borehole aquifers.

Ensure that brine is pretreated before reinjection or disposed of safely.

Stakeholder Contacts:

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Organization Represented:	RIFT VALLEY WATER SERVICES BOARD		
Designation:	ASSETS DEV. MANAGER		
Locality:	NAKURU		
Date:	12/01/14		
Signature:			
Official Stamp: (if available)	RIFT VALLEY WATER SERVICES BOARD P. O. Box 2451 NAKURU		

WARMA-Rift Valley Water Catchment Area

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UPDATING THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT FOR 1x30 MW MENENGAI POWER PLANT

STAKEHOLDER CONSULTATION GUIDE

INTERVIEW GUIDE

WATER RESOURCES MANAGEMENT AUTHORITY – Rift Valley Catchment Area

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We kindly request for your opinion in line with the issues noted below to facilitate the update of the ESIA Report.

1. What is the main water source for communities living in the project area (Bahati, Kiamaina, Kampi Ya Moto and Ngata divisions)?

Boreholes – Ground water and some Surface water supplied by NAKWAJSCO.

2. Who are the major users of water in the area?

The general public for domestic purposes and minor irrigation.

3. Is / are there any Water Users Association for the above Water Resources? What are their roles with regards to management of the water resources?

Crater Stream WRUA. The roles of the WRUA are: being integrally involved in mgt of water resources, undertaking water resource mgt activities that serve their best interests (eg surveillance on illegal or harmful activities, adoption of best land use & catchment management activities etc). In more efficient (with respect to the WRMA) for the WRUA to mobilize the water users to solve problems at the grassroots level.

4. In the event abstraction of underground water and connections to NAWASCO supplies to meet the plants' water needs, what is the foreseen net impact of this to the

(a) Underground water resources in the area?

If the plant depends solely on groundwater pumped from the area there are possibilities of depleting or over abstracting from the aquifer - It will also affect water supply for the local communities also.

(b) Community living around an using the identified water resources

The people living in the area might be accustomed to inadequate water supplies which might result to rationing.

5. What corrective measure should be adopted to solve or enhance the above?

Along side the underground water supplies, alternative sources should be sought like storage for rain harvesting or alternative surface water supplies.

6. Do you foresee any positive impacts from the proposed Power Plant development?
Yes or No, if yes what impacts do you foresee

i. During construction

Yes - There will be jobs created for the locals. It will also come with development of other social amenities

ii. During operation

- It will boost the economy of the area hence development.
- Social amenities will be developed in the area

7. Do you foresee any negative impacts from the proposed Power Plant development to the environment and water resources around the project area?
Yes or No, if yes what impacts do you see

iii. During construction

- The construction of the plant will lead to destruction of natural environment ie forests
- It will affect groundwater recharge as the surfaces get covered by concrete.

iv. During operation

- The increase in population in the area is likely to have pressure on the available water resources and other environmental resources.
- Incoming of new people (outsiders) will affect the lives of the locals.

8. If your answer to No. 7 is Yes, please suggest how the anticipated negative impacts can be mitigated.

i. During construction

- The destruction of the environment should be minimal. There should also be plans to restore the natural environment as it was.
-

ii. During operation

- Alternative sources of water should be developed to cater for the increased population.
-

9. What been the trend of underground water levels in the project area?

- The trend in underground water in the area has been steady the area has a good groundwater potential so it has not been over exploited

10. Will the commissioning of the power plant impact the above? And what are your proposals with regards to this?

- It is likely that the commissioning of the power plant will be accompanied by population explosion which will increase water demand hence strain the available resource.
- Alternative sources of water ought to be thought about to reduce dependancy on ground water.

Stakeholder Contacts:

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Date:	12/11/2014		
Signature:	The Regional Manager Water Resources Management Authority		
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Rongai Sub-County Medical Officer/Public Health Officer

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SUB-COUNTY MEDICAL OFFICER OF HEALTH/PUBLIC HEALTH OFFICER — RONGAI

Introduction

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Kindly assist by answering the following questions.

1. What are the top ten common illnesses within the Sub-county / District specifically the project area that is Bahati/Ngata/Kampi Ya Moto divisions?

① URTI
② Diarrhoea
③ Pneumonia
④ Skin diseases.
⑤ Rheumatic Joint pains.
⑥ Typhoid
⑦ Eye infection
⑧ Malaria
⑨. Hyper tension
⑩ Chronic pox.

2. What is the doctor patient ratio in the Sub County / area?

~~1:250~~ 1:10,000

3. What are the HIV/AIDS prevalence rates in Nakuru North/Rongai Sub County? 5.3%

This reflects the prevelance of the entire County.

4. What initiatives are in place to mitigate the spread of the above illnesses?

- Programmes on promotion of behaviour change across board
- Programmes on prevention with positives - targeting support groups
- Improvement of quality of life of PLWHAs through empowerment in IGAs
- Condom use promotion.

5. Which is the most vulnerable group to HIV/ AIDS infections?

- Sex workers in Urban set ups.
- Women working in large firms & establishment eg flower farms, estate
- Orphan and Vulnerable children, widows & PLWHAs.

6. What health programs does the department have to deal with

a. HIV/AIDs menace?

- Supporting the Community to own the above Programmes/Projects.
- Organize mobile HTC Outreaches
- Strengthening referral systems for the positive Clients.

b. TB

(i) Diagnosis and Treatment
(ii) Contact Tracing
(iii) Defaulter Tracing
(iv) Health Education on Detection/Prevention Control.

c. Vaccination

- Community mobilization.
- Health Education.

7. What is the number of health facilities available in the divisions? What are the categories and distribution?

5 - Health centres.
14 - Dispensaries.
10 - Others:
- Private
- F.B.O (Faith based).

8. What are the services offered in the health facilities near the project area?

- Curative services
- Immunization.
- Preventive / Promotive services
- Post / Ante-natal services.

9. Do you foresee any positive impacts from the proposed 1x30MW Geothermal Power Plant development?
   Yes or No, if yes what impacts do you see
   i. During construction

- Employment
- Improvement of infrastructure - Roads to and from the site.

   ii. During operation

- Employment.
- Construction / setting up of shopping centres
- Power generation.

10. Do you foresee any negative impacts from the proposed Geothermal Power Plant development?
    Yes or No, if yes what impacts do you see
    i. During construction

    ii. During operation

11. If your answer No. 10 is Yes, please suggest how the anticipated negative impacts can be mitigated.
    i. During construction

ii. During operation

Stakeholder Contacts:

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Locality:	RONGAI		
Date:	21/11/2014		
Signature:			
Official Stamp: (if available)	RONGAI SUB-COUNTY HEALTH OFFICE 21 NOV 2014 Sign..... P.O. BOX 17643 NAKURU		

Rongai Sub-County Water Officer

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SUB-COUNTY / DISTRICT WATER OFFICER RONGAI

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The aim of this study is to collect information at household and institutional stakeholders for the purposes of impact analysis and development of mitigation measures.

Kindly assist by answering the following questions.

1. What is the main water source for communities living in the project area?

- Boreholes are the main water sources in Kampi ya Moto and Kiamunyi
Other parts of the Sub county get water from Rongai River, Constructed pans/dams.

2. Who are the Water Users of underground water in the Menengai area?

Farmers — residential and livestock

3. Is / are there any Water Users Association for the above water resources? What are their roles with regards to management of the underground water resources?

The area is covered under NAWASCO However, the current water supplies are provided through community-based water projects.

4. In the event abstraction of underground water and connections to NAWASCO supplies to meet the plants' water needs, what is the foreseen net impact of this to the

(a) Underground water resources in the area?

There is likely to be pressure on existing community water supplies.

(b) Community living around an using the underground water resources

5. What corrective measure should be adopted to solve or enhance the above?

- GDC and IPP should monitor their impacts of their activities on water supply to the community.
- There should be a link between the community and GDC eg. to facilitate regular meeting with water users and service providers.

6. Do you foresee any positive impacts from the proposed Geothermal Power Plant development?
   Yes ✓ or No, if yes what impacts do you see
   i. During construction

- Can affect environment through emission of smoke and dust. Can lead to respiratory related diseases
- Creation of employment to the community
- Community benefits from community water supply

   ii. During operation

- Increased power supply to the national grid. Hence Reduced power interruptions.
- Eventual reduction of power cost, further improving living standards and industrial production.
- Cost of living will come down.

7. Do you foresee any negative impacts from the proposed Geothermal Power Plant development to the environment and water resources around the project area?
   Yes or No, if yes what impacts do you see
   i. During construction

ii. During operation

- Likelihood of environmental degredation if the resultant waste is not handled with care. This can lead to water pollution
- Noise pollution from plant operation

8. If your answer No. 7 is yes, please suggest how the anticipated negative impacts can be mitigated.
   i. During construction

- Necessary precautions be put in place to managed emmissions of smoke and dust

ii. During operation

Precautionary measures on waste management

Stakeholder Contacts:

Name:	NICHOLAS KIMAIYWA		
Contacts:	**Tel:** 0722465644	**Mobile:**	**e-mail:** NKKimaiya@yahoo.com
Organization Represented:	WATER DEPARTMENT - RONGAI SUB-COUNTY.		
Designation:	SENIOR CLERICAL OFFICER		
Locality:	KAMPI YA MOTO		
Date:	12-11-2014		
Signature:			
Official Stamp: (if available)	For: RONGAI SUB COUNTY WATER OFFICER P.O. BOX 17977 NAKURU		

Friends of Menengai Crater (FOMEC)

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UPDATING THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT FOR 1x30 MW MENENGAI POWER PLANT

STAKEHOLDER CONSULTATION GUIDE

NON GOVERNMENTAL ORGANIZATIONS AND CBOs

Introduction Friends of Menengai Crater (FOMEC) 10/11/14

GDC has entered into an agreement with Quantum Power East Africa (QPEA) GT Menengai Limited as one of the Independent Power Producers for Menengai Geothermal Power Plants. QPEA is applying for funding from international lenders to finance the development of the proposed 1x30MW power plant. One of the expected pre-requisites to funding is compliance with the specific lender's environmental and social safeguards. Based on the findings of the preliminary review and gap analysis of the existing project Environmental and Social Impact Assessment (ESIA) report, Licence from NEMA and Environmental and Social Management Plan (ESMP) it was determined that for the project to comply with MDBs and IFIs requirements, additional inputs to the Report will be required.

To achieve this QPEA which is to implement the project on behalf of GDC has contracted GIBB Africa to update the project ESIA and where necessary, undertake RAP to mitigate on impact on property.

The aim of this study is to collect information at household and institutional stakeholders for the purposes of impact analysis and development of mitigation measures.

Kindly assist by answering the following questions

1. What activities does the organization involve itself in?

- Support 35 Community Based Groups in undertaking various initiatives covering development and Environment.
- Environmental initiatives cover: planning
  - Education and awareness
  - Conservation

2. What geographical areas do the operations of the NGO / CBO cover?

Entire Menengai area and immediate neighborhoods

3. What projects have you undertaken in the project area

Environmental monitoring in partnership with GDC through an agreement

Development projects include: Soil & Water Conservation ~~Tree Nursery~~ • bee keeping • dairy goats and • Energy Conservation (adoption of energy conserving devices

4. What projects are you currently running in the project area?

- Monthly Biannual environmental monitoring in Menengai Caldera focusing on existing geothermal wells and associated operations in drilling works.
- Biannual monitoring of birds (April & August) coordinated with Nature Kenya, KFS

5. What challenges do you face in the implementation of past projects?

- KFS has inadequate capacity at the Menengai forest station and cannot stem ~~existing~~ existing challenges of illegal wood collection, illegal grazing and charcoal burning within the Caldera

6. What lessons were learnt in the past projects with regard to the involvement of community, specifically in the project area?

- Training of casuals on forest fire management is necessary to help manage this common phenomenon.

7. What is the organizational structure of the organization highlighting roles of each person? And how many staff do they have?

- Board of Trustees
- Chairman
- Secretary
- Office Staff

Secretariat

8. What are the socio-cultural norms regarding the gender division of labor, rights and responsibilities, access to and control over resources in the project area?

9. In your opinion, what is the community perception on the proposed Geothermal Power Plant in the area?

Engagement of GDC in raising tree seedlings for sale and own planting is killing local groups engaged in the same. Instead, GDC should buy seedlings from local groups engaged in tree nursery business.

10. Are you aware of any sites of historical / archaeological importance in the project area?

Yes, there are sacred caves within the Caldera which are regularly patronized by a traditional/local sects. These (pictures show) should be preserved.

11. In case proposed to assist in oversight of direct implementation of the project, is the organization in a position to take part? If NO, why

Yes

12. Do you foresee any positive impacts from the proposed Geothermal Power Plant development?

Yes or No, if yes what impacts do you see

i. During construction

ii. During operation

- GDC has experimental plots for agricultural production from brine. These should be enhanced.
- Positive resource harnessing for clean power production

13. Do you foresee any negative impacts from the proposed Geothermal Power Plant development?
Yes ✓ or No, if yes what impacts do you see

iii. During construction

- Power plant staff will add pressure on already existing bad waste management system within the Caldera
- Use of poor quality brine sump lining materials which later break down
- Improper waste management. This has been rampant in the GDC operations, eg. waste oil & spillages

iv. During operation

- Erosion from accidental brine spillage. Current activities here also opened up the area to livestock keepers and has led to - overgrazing in the area, promoting erosion.
  - devegetation
- Uncontrolled leakages from GDC pipelines also attract livestock. These have led to community who initially ~~sold~~ cut & sold grass on the Caldera losing out.
- Poor quality of sump lining materials have been used leading to pollution &

14. If your answer No. 13 is Yes, please suggest how the anticipated negative impacts can be mitigated.

i. During construction

- IPPs should know that pollution is a real issue in Menengai and proper waste management should be instituted
- Some impacts could be localised but exposed workers need adequate protection measures eg. ear muffs against noise, dust and smell

ii. During operation

- At times, smell of H_2S could be felt in Kiamunyi area and serious study should be done and people informed truthfully of the findings. Mitigation measures should be very specific
- Recommend independent audits on environmental concerns

- Light pollution will especially affect insects survival. Light attract many insects which are then killed by heat.
- Recommend an Environmental Emergency Management Plan to arrest/manage any accidental spillage & associated erosion in a timely manner

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15. Please include any other comments you may have below

— Following own review of the existing ESIA study report currently under updating, alot of information was borrowed from audit reports of 2012 and covers wells 4,8,6,1,7&3 but was not specific to the proposed powerplant site near well 11. The information provided should be site-specific; including identification of species and their conservation status and endimicity.
— Need to create awareness among the Communities espeia on likely exposure to burst brine pipes and sump linings.
— Assist KFS to put a well equipped outpost within boundary of the Caldera.

Stakeholder Contacts:

Name:	JACKSON RAINI		
Contacts:	**Tel:** 0712165699	**Mobile:** 0733349620 Box 13493	**e-mail:** jraini2002@yahoo.co
Organization Represented:	FRIENDS OF MENENGAI		
Designation:	CHAIRMAN		
Locality:	NAKURU		
Date:	10/11/2014		
Signature:			
Official Stamp: (if available)	FRIENDS OF MENENGAI CRATER P. O. Box 13493-20100 NAKURU, KENYA TEL: 0712-165699, 0725-777475 0720-703606 Email: info@friendsofmenengai.org		

Aggrey Kwadha

From: jackson@friendsofmenengai.org
Sent: Tuesday, November 11, 2014 12:53 PM
To: Aggrey Kwadha
Cc: jraini2002@yahoo.com
Subject: Comments on the 2013 Menengai 30x3 MW Modular Power Plant

Dear Aggrey,
It was a pleasure meeting with you yesterday. As promised, pls see below some of the comments we raised with GDC regarding the proposed power plant project:.

Dear Mr. Kubo,
FOMEC received a hard copy the "Upgraded Study Report- for the Proposed Installation of 3x30MWe Menengai Modular Power Plants Projects in Nakuru County".

I was surprised that the EIA was submitted to NEMA in September 2013, by the ESIA team from the University of Eldoret; presumably the same team of experts that conducted the Environmental audit for Year 2012 (NEMA/NKR/EA/1796).

However, concerns are as follows:

1. The ESIA team seems to downplay some of the environmental impacts that a project would have. It is clear that the EIA project report weaved its way through the NEMA review process without much scrutiny or critical review.

2 Much of the information contained in Chapter 1 to 4 and the appendices is copied material artfully disguised as new. The major cut & paste job is from the initial ESIA and the EA conducted by the ESIA team from the University of Eldoret in 2012. For example, information on Biological Environment -Page 24 (sub-title 4.3) claims that a "survey covering flora and fauna was carried out". The same material presented as new information in the EIA is what is contained in the EA report (appendix V1) submitted to NEMA in 2012 (Ref: NEMA/NKR/EA/1796). The flora survey conducted in the EA -2012 covered only MW4 & 8, MW6, MW1, MW7 and MW3 and that what is presented in the EIA report. There is no flora & fauna study at the proposed project sites near MW11.

3. Regarding public participation, the EIA experts held the public consultative meeting at Land Mawe and Kabarak area on 18th and 19th Sep. 2013. Both sites that are far from any direct project impacts. It is interesting that in the public comments section of the EIA, all participants seem to be singing the new project's praises.

4. Chapter 7 contains information on Impact identification, Cumulative Impact Risk analysis. The modified Leopold Matrix is used. The particulars of "how" and the "what" should be outlined before the project begins or else it is impossible for policy makers, stakeholders, and NEMA to adequately understand the environmental, impacts that will accompany such a large project.

5. When the specific mitigation techniques are missing from an EIA, monitoring can also be stifled since not even the project proponent knows exactly what mitigations measures should be undertaken. It is therefore impossible for monitoring agencies to hold project proponents accountable because the project proponent has only committed to non-specific goals.
Furthermore, without baseline data it is almost impossible to conduct effective monitoring to ensure those mitigation measures are effective.

6. Public comments constitute the final check on the accuracy of the

EIA report. The EMCA EIA Regulations of 2003 require NEMA to solicit the comments of the public via newspaper and radio advertisements. FOMEC was unable to get a newspaper call for public comments on the proposed project.

7. The EIA document generally has several citations, diagrams and photos whose source is not acknowledged. Plagiarism is a serious crime. The sources should be included in the reference section and photo credits and data sources be provided.

Kind regards,
Jackson Raini

Meeting with Olbanita WRUA

Notes of Meeting with Olbanita Water Resource Users Association (Olbanita WRUA) held at their Office in Bahati town on 7 November 2014

Attendance

1. Peter Waweru Mwangi -Chairman
2. Jethro Karanja Isaac - Treasurer
3. Joseph Mwangi - Ass. Secretary
4. Aggrey Kwadha – Environmentalist, GIBB Africa Ltd

Signed attendance list is attached

Project brief

After introduction, the consultant gave a brief on the proposed project in two broad areas as follows:

- Energy sector players involved in the Menengai geothermal power production and their roles including GDC, Independent Power Producers (Quantum Power EA, Ormat and Sosian), KETRACO and Kenya Power ; and
- Description of the proposed power plants including installation of turbines and generators, connection via surface pipeline networks to the existing GDC production wells, generation of 30-35MW of power for connection to the national grid and reinjection of brine from into the underground.

Roles of Olbanita WRUA

- Management of all rivers and underground water resources in Nyandarua catchment area drained by Olbanita River and its tributaries up to its confluence with Molo river. Areas covered include both Nakuru North and Rongai sub counties and measures approximately 263 km2;
- Facilitate permit acquisition by water users in liaison with WRMA;
- All consumers, projects and large scale farmers and institutions within the area should be members of the WRUA. Current membership for both individuals and institutions stands at 120. Membership registration fee is KSh 1000 and Ksh 15,000 for individuals and institutions respectively.

Current issues affecting Olbanita WRUA

- There are inadequate water storage tanks for water from rivers, the main sources of water in the rural areas under Olbanita WRUA;
- Available underground water has problems with high fluoride content and requires to be blended with river water (from Olbanita River) for improved quality like it is done with borehole water supplies to Nakuru town with water from Malewa river in Gilgil;
- Sometimes, boreholes production in Wanyororo, Banita and Ndugiri reduce in dry seasons. These areas thus face water problems and need assistance;
- Pollution of water resources is common at the catchment due to farms in upstream areas but not in the lower areas like near the proposed power plants site. Recommend that NAWASCO liaises with Olbanita WRUA to blend the water supplied by NAWASCO to the locals to improve its quality and hence health among the locals

Likely Impacts of the project

- We do not foresee any problem with the implementation of the proposed geothermal power plants since the resources used will be mainly underground-based.

Concerns

- The project might also lead to increased school dropout cases which is common in the area;

Questions asked

- Since the project is in our area, how will the local community and Olbanita WRUA benefit from it?
- The consultant responded that the local community already enjoys some water supply from NAWASCO following arrangements made by GDC as a CSR. GDC has contributed through community water tanks which facilitate local water supplies.

Recommendations

- GDC and partners should always invite Olbanita WRUA to any stakeholders meetings with the locals, especially on water resources management and all should register with the WRUA to promote management of water resources in the area;
- GDC and partners should consider putting up a water storage tank for Olbanita WRUA to facilitate supplies;
- There are many unemployed youth in the area that can benefit from the project. These include drivers, electricians who should be considered for employment in the power plant construction and operation

Compiled by Aggrey Kwadha

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY Meeting with Olbanita WRUA **VENUE** Bahati town, Nakuru North. **DATE** 07/11/16

NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE
Aggrey Kwadha	Gibb Africa	Environmentalist	0724 700 276	
Peter Wanjeru Mwangi	CHAIRMAN Olbanita	WRUA	0721 803 260	
JETHRO KARANJA YSARC	TREASURER - OLBANITA	WRUA	0723564729	
Joseph Mwaniki Mukui	Asst Secretary of Finance	WRUA	0726696598	

WRUA = Water Resource Users Association

STAKEHOLDER CONSULTATION LIST

Meeting with Kenya Forest Service, Menengai Forest Station

Consultation Meeting with KFS, Menengai Forest Station on 11 November 2014 at Menengai Forest offices, Nakuru

Attendance

James I. K. Mbuthia-	Forest station manager, Menengai forest
Aggrey Kwadha	Environmentalist, Gibb Africa Ltd

Introduction and Project brief

After introduction, the consultant gave a brief on the proposed project in two broad areas as follows:

- Energy sector players involved in the Menengai geothermal power production and their roles including GDC, Independent Power Producers (Quantum Power EA, Ormat and Sosian), KETRACO and Kenya Power ; and
- Description of the proposed power plants including installation of turbines and generators, connection via surface pipeline networks to the existing GDC production wells, generation of 30-35MW of power for connection to the national grid and reinjection of brine from into the underground.

Forest species of Menengai

The available information on the forest is mainly on plantation species which include Eucalyptus, Pine, Cedar and *Acacia mearnsii.*
Little information is available on indigenous trees within the caldera section of the forest. History has it that natural vegetation if of tropical savanna type. The caldera area has also not been under any strict protection before due to earlier lack of economic value attached to it. This exposed it to unchecked firewood collection, charcoal burning and grazing (especially by the Maasai communities for quite a long period)

Forest management plans

Currently, KFS is embarked on formulation of Participatory Forest Management Plan for the entire forest station including the caldera. This will form the basis on how the caldera site will be considered for future vegetation development and GDC is one of the stakeholders apart from the local communities. We foresee a situation where all the stakeholders will complement one another through a project implementation committee

Challenges

The area is naturally prone to wildfires (even in the absence of human interventions like charcoal burning). This implies that even any indigenous vegetation survival is difficult due o the natural conditions: stony surfaces and low water retention capacity, making dry vegetation a good conduit for wildfires.

Electric fencing of all forest areas (both plantation and in the caldera) should be enforced together with conditions limiting entry and controlling grazing. The surrounding communities currently access the forest area from any point leading to overgrazing. Part of Menengai forest association will allow grazers to be identified

Likely impacts

During construction:

No major impacts are anticipated since the area for the power plant development is very small

Element of overexposure to degradation is very minimal and with proper management, the area can be suitable for reclamation via massive tree planting. Promoting rejuvenation of natural vegetation should be done through self adaptation by planting of exotic trees species considered suitable for various management aims e.g.

- *Croton megalocarpus*- suitable for direct seeding
- Mexican greenash, Fraxinus valarman- fire resistant
- *Cassia semae* not preferred by livestock
- *Acacia melanoxylon*- easy propagation by seeds
- *Markhamia lutea*- wide dispersal characteristic
- *Acacia mearnsii*- propagation enhanced by fire
- *Psidium guajava*- wild fruits

These species will improve the diversity of flora and fauna, increase biomass production and benefit the local community through firewood and livestock forage

During operation:

- Any transmission line must be cleared of vegetation. The existing vegetation is mainly shrubs and therefore limited clearance is expected only for pylon sites
- Participatory Forest Management Plan (PFMP) advocates for management of areas on sustainable yield basis and hence no adverse impacts are expected
- Introduce fruit trees like *Psidium guajava*, to contain monkeys and baboons and reduce existing huma-wildlife conflicets with farmers.
- Pollution related issues are expected to be managed by the expertise available at GDC

Compiled by Aggrey Kwadha

Nakuru Water and Sanitation Services Company (NAWASCO)

Consultation Meeting with Nakuru Water and Sanitation Services Company (NAWASCO) on 11 November 2014 at NAWASCO offices, Nakuru

Attendance

James N. Gachuthi	Managing Director
Aggrey Kwadha	Environmentalist, Gibb Africa Ltd

Introduction and Project brief

After introduction, the consultant gave a brief on the proposed project in two broad areas as follows:

- Energy sector players involved in the Menengai geothermal power production and their roles including GDC, Independent Power Producers (Quantum Power EA, Ormat and Sosian), KETRACO and Kenya Power ; and
- Description of the proposed power plants including installation of turbines and generators, connection via surface pipeline networks to the existing GDC production wells, generation of 30-35MW of power for connection to the national grid and reinjection of brine from into the underground.

Comments

NAWASCO sources water supply from Olbanita boreholes near the Menengai geothermal fields. Since GDC commissioned its geothermal wells, NAWASCO has been recording increased borehole water temperatures. Though the Olbanita area is under the jurisdiction of Nakuru Rural Water and Sanitation Company (NARUWASCO), NAWASCO has supply points along its transmission line as part of its CSR to the community from which its gets water. The hot water cannot be used for livestock and to directly meet some of domestic water needs that do not require hot water. NAWASCO has received complaints from its customers and has also had to frequently replace the borehole pumps and motors since the installed Borehole pumps and motors can only operate well in temperatures less than 30°C. This has led to increased maintenance and operation costs.

The MD informed the consultant that the issue of increased boreholes water temperature has been raised with GDC who promised to undertake studies and share feedback.

Other concerns

There is fear that borehole water levels may be lowered to deeper aquifers since the geothermal wells have been sunk deeper than boreholes
Quality of environment may deteriorate from hydrogen sulfide gas and associate acid rain. This may corrode exposed water infrastructure like air valves, sluice valves and metallic pipelines

Aggrey informed the respondent that part of the study entail air modeling which will be able to predict likely concentrations levels of the hydrogen sulfide gas and inform formulation of appropriate mitigation measures.

Follow up

The Managing director referred the consultant to Production Superintended for further consultations. This was done and a questionnaire duly filled is separately attached.

Compiled by Aggrey Kwadha

Nakuru Sub-County Youth Development Officer

Notes of meeting with Youth Development Officer, Ministry of Devolution and Planning, Planning department held on 5 November at Ministry offices in Bahati town, Nakuru North Sub County

Attendance

1. Keziah Mwaura – Youth Development Officer, Nakuru North Sub County
2. Mary Wambui – Secretary, Youth Development Office, Nakuru North Sub County
3. Aggrey Kwadha – Environmentalist, GIBB Africa Ltd

Project brief

After introduction, the consultant gave a brief on the proposed project in two broad areas as follows:

- Energy sector players involved in the Menengai geothermal power production and their roles including GDC, Independent Power Producers (Quantum Power EA, Ormat and Sosian), KETRACO and Kenya Power ; and
- Description of the proposed power plants including installation of turbines and generators, connection via surface pipeline networks to the existing GDC production wells, generation of 30-35MW of power for connection to the national grid and reinjection of brine from into the underground.

Activities in which the area youth are involved include:

Small microenterprises e.g. shops, motorcycle taxi *boda boda* (mainly by males), table banking, farming, quarry activities, IT and value addition in farming through hatching eggs and running posh mills.

Major issue with the area youth is unemployment. Youth have inadequate access to youth-friendly funding/credit

The area youth are considered vulnerable group. Though they constitute the majority, majority are unemployed and lack technical skills. With time, there will be a youth bulge.

Current activities by the youth department to support youth include capacity building in entrepreneurship and life skills, Uwezo fund, youth funds and creation of awareness on the 30% government procurement allocated to the women and youth.

Likely Impacts of the project

- With the project, the area youth will benefit if given a chance since unemployment common in the area
- However, there have been issues between GDC and local youth on employment. The youth claim that they have not been given enough opportunities, especially on casual labour, yet the project is within their area. In meetings the department has attended with the youth, they claim that thy also have educated locals and that a certain percentage of positions should be allocated to the locals

Recommendations

- If the local youth feel represented in the development activities, they will continue to appreciate the project. However, a problem will arise when they feel short-changed;
- When allocating jobs, it should be done based on the local administrative units for a feeling of well and fair representation; and
- GDC and Independent Power developers should liaise with the local department of youth affairs whenever engaging the youth as opposed to the youth themselves inviting the department.

Compiled by Aggrey Kwadha

Nakuru North Sub-County Education Officer,

Notes of Meeting with Education Officer, Nakuru North Sub County Ministry of Education, held at Maili Sita on 7 November 2014

Attendance

1. William Kodeny – Education Officer, Bahati Zone, Nakuru North Sub county
3. Aggrey Kwadha – Environmentalist, GIBB Africa Ltd

Project brief

After introduction, the consultant gave a brief on the proposed project in two broad areas as follows:

- Energy sector players involved in the Menengai geothermal power production and their roles including GDC, Independent Power Producers (Quantum Power EA, Ormat and Sosian), KETRACO and Kenya Power ; and
- Description of the proposed power plants including installation of turbines and generators, connection via surface pipeline networks to the existing GDC production wells, generation of 30-35MW of power for connection to the national grid and reinjection of brine from into the underground.

Educational institutions within the project area in Nakuru North sub county

Educational institutions are organised into zones. The zones in the area covered by the project are Bahati and Solai zones. The number of various institutions and enrolment by third term (as at November 2014) are as indicated below.

Category	No.	Students			Teachers		
		M	F	Total	M	F	Total
Public ECD	24						
Private ECD	45						
Public Primary	20	7469	7363	14832	117	276	393
Private Primary	45	1538	1899	3437	109	112	221
Public Secondary	16						
Private Secondary	16						
Tertiary (Public Polytechnic)	1						

Likely positive Impacts of the project

- Quite a number of youth in the area are jobless. This makes them go into crime at very tender age. Using guns in robberies is common in the area including theft of books in schools. Most of the youth are likely to seek employment in the power plant project thereby reducing this menace. Alcoholism is also common among the local youth;
- The project is likely to enhance eco-tourism around Menengai. This is a new concept that is being adopted in the area;
- In the long run, schools in the locality will benefit through:
    - Parents who have employment
    - Schools working with GDC and power producers as in the case in Naivasha e.g. through supply of tree seedlings by GDC;
    - GDC will bring in other players e.g. in road development which improves access to the schools

Concerns

- Existing quarries in the area have caused problems in Kagoto primary school. When blasting, cracks have developed in the school buildings and even a fatal accident from

blasted rocks involving a pupil in the school has been reported. There is a new Heshima secondary school with a storey building next to the Kagoto primary school. Due to fears on structural failure from cracks caused by blasting at the quarries, it has led to use of very stringent quality standard materials which are very costly. Further, the cost of maintaining the institutional buildings is his high. These are likely to increase if the project sources materials from these quarries;

- The consultant however informed the respondent that in such projects, use of materials from NEMA licensed quarries is usually recommended and whenever the contractor has to establish a new quarry, a separate ESIA is usually undertaken;
- The project might also lead to increased school dropout cases which is common in the area;
- Bahati has fertile land but over the years, increased sub divisions and sale has occurred with people moving to Nakuru town after selling their lands. There are many single mothers in the area most of whom leave their homes in the evening to move to town. The project may switch this movement to town and instead encourage spread of HIV/AIDS locally;

Recommendations

- The whole Bahati Zone and even Nakuru North Sub County has no educational/social hall within which educational functions can be conducted. This is an area where GDC and partners can consider to support local education in addition to facilitating tree planting in the schools; and
- Ensure strict observation of labour laws to ensure that children remain in school with the help of local leaders.

Compiled by Aggrey Kwadha

Nakuru North Sub-County Agricultural Officer

Notes of Meeting between Agricultural Officer of Nakuru North Sub countyand GIBB International held on 4 November2014 atthe Sub County AgricultureOffices, Bahati

Attendance

Peris N. Ngatho - Deputy Sub County Agriculture Officer, Nakuru North Sub County
Aggrey Kwadha - Environmentalist, GIBB Africa Ltd

Introduction and Project brief

After introduction, the consultant gave a brief on the proposed project in two broad areas as follows:

- Energy sector players involved in the Menengai geothermal power production and their roles including GDC, Independent Power Producers (Quantum Power EA, Ormat and Sosian), KETRACO and Kenya Power ; and
- Description of the proposed power plants including installation of turbines and generators, connection via surface pipeline networks to the existing GDC production wells, generation of 30-35MW of power for connection to the national grid and reinjection of brine from into the underground.

Agricultural activities in Bahati and Kiamaina divisions

Within the areas in Menengai crater, Kiamaina, Kabatini and Engarusha the key agricultural activities include:

- Planting of cereals (mainly beans and maize) and potatoes
- Livestock husbandry in small scale levels
- In Ndugiri, farmers grow Mangoes, paw paws, Butternuts, coffee, potatoes and tubers (cassava, sweet potatoes and yams).

Average farm sizes and prices

- Average farm size in these areas is 1.5 acres but in Wanyororo, there are farms less than .25 acres in size
- Average land price ranges between KSh 250,000 to 300,000 per acre

Issues facing farming in the area

- There is an outbreak of Maize Lethal Necrosis Disease (MLND) in the Rift Valley region. The disease is multi-viral but spread by insects. Farmers are currently being encouraged to do crop rotation and not to do maize crops in successive seasons, instead plant tuber crops like potatoes
- There are challenges of soil erosion in the area
- Soil tests carried out country-wide in 2013 established that soils in Nakuru North area are acidic attributed mainly to over use of DAP fertilizers. It is recommended that farmers use NPK instead.

Positive Impact due to the Geothermal Power Plants Project

- Will bring development of infrastructure which will improve marketing of agricultural produce and even improve prices;
- Employment opportunities created through the plants will reduce incidences of unemployment and alcoholism in the area which even affect agriculture
- The ministry hopes to have well-endowed stakeholders within the area including GDC which will boost agricultural activities as well

Concerns raised by the Agricultural officer

- If hydrogen sulfide (H_2S) is not contained, it will affect crops and also contaminate soils by making it more acidic;
- Quarries within the project area have been associated with structural issues affecting houses and masonry tanks through development of cracks. E.g. the Kagoto quarry next to Kagoto primary school; and
- Farmers in Menengai crater area (Kiamaina division) have already complained of acidic rain affecting their roofs and crops and that the rain water harvested from roof catchments is yellow and cannot be used

Recommendation

- Proper management measures should be put in place to avoid soil and water pollution

Compiled by Aggrey Kwadha

Directorate of Occupational Safety and Helth

Consultation Meeting with Directorate of Occupational Safety and Health, on 10 November 2014 at DOSH offices, Nakuru town

Attendance

SYLVIA GITONGA-	Principal Occupational Safety and Health Officer, DOSH
Aggrey Kwadha	Environmentalist, Gibb Africa Ltd

Introduction and Project brief

After introduction, the consultant gave a brief on the proposed project in two broad areas as follows:

- Energy sector players involved in the Menengai geothermal power production and their roles including GDC, Independent Power Producers (Quantum Power EA, Ormat and Sosian), KETRACO and Kenya Power ; and
- Description of the proposed power plants including installation of turbines and generators, connection via surface pipeline networks to the existing GDC production wells, generation of 30-35MW of power for connection to the national grid and reinjection of brine from into the underground.

Comments

- DOSH enforces Occupational Safety and Health Act (OSHA), 2007
- In case of mishaps/accidents, DOSH also enforces Workers Injury and Benefits Act (WIBA). Currently a process is underway to review WIBA into Workers Injury compensation Act (WICA).
- Registration of work place, ensuring workers is safe, have well access to work and are trained and instructed on safety
- GDC is registered with DOSH and is regarded as the occupier of the Menengai power plant site. It is an occupier's responsibility to ensure that any contractors adhere to its safety and health policy
- The department conducts routine inspection of workplaces.

Compiled by Aggrey Kwadha

Director-Environment, Nakuru County Government

Consultation Meeting with Director-Environment, Nakuru County Government on 13 November 2014 at Nakuru County Government offices, Nakuru

Attendance

Timothy K Murithi	Director-Environment, Ministry of Environment, Natural Resources, Energy and Water
Aggrey Kwadha	Environmentalist, Gibb Africa Ltd

Introduction and Project brief

After introduction, the consultant gave a brief on the proposed project in two broad areas as follows:

- Energy sector players involved in the Menengai geothermal power production and their roles including GDC, Independent Power Producers (Quantum Power EA, Ormat and Sosian), KETRACO and Kenya Power ; and
- Description of the proposed power plants including installation of turbines and generators, connection via surface pipeline networks to the existing GDC production wells, generation of 30-35MW of power for connection to the national grid and reinjection of brine from into the underground.

Comments

The Nakuru county government embraces the project.

There is a wide stakeholder's consortium recently constituted by the county government which brings together various government agencies and private businessmen in Nakuru County. GDC is already a member of this stakeholders group. The county director of environment is the chairman of this group but it is yet to hold its first meeting. This group will facilitate communication sharing among the various development partners in the county. The other members include:

- County director of environment-Chairman
- MCA in the county environment committee
- Other county directors
- Kenya Forest Service
- Water Resources Management Authority
- Nakuru Business Association
- LENAMADUBA, an NGO

The county government will also help a lot in ensuring that the project implementation conforms to the approved ESMP

The project will attract more investment into Nakuru County

It will also create more employment and investment opportunities for people in Nakuru County.
Other concerns

Concerns

The initial ESIA report was not shared with the county government of Nakuru as one of the lead agencies for comments. However, it was noted that the first report was done in 2012 when the county government was still not in place. The consultant agreed to share the report under update via mail.

Compiled by Aggrey Kwadha

Meeting with Kenya Forest Services

Meeting with Kenya Wildlife Services

Notes on Consultative Meeting with KWS on 14 November 2014 at KWS offices, Nakuru

Attendance

Christine Mwinzi	Researcher, KWS, Rift Valley Region
Aggrey Kwadha	Environmentalist, Gibb Africa Ltd

Introduction and Project brief

After introduction, the consultant gave a brief on the proposed project in two broad areas as follows:

- Energy sector players involved in the Menengai geothermal power production and their roles including GDC, Independent Power Producers (Quantum Power EA, Ormat and Sosian), KETRACO and Kenya Power ; and
- Description of the proposed power plants including installation of turbines and generators, connection via surface pipeline networks to the existing GDC production wells, generation of 30-35MW of power for connection to the national grid and reinjection of brine from into the underground.

Comments

The project area is not protected by KWS but known to be inhabited by small mammal like vervet monkeys and baboons. Leopard's presence cannot be ruled out due to their hunting behavior.

Detailed comments can be given after site visit. GDC contacts were shared with the KWS officer to allow KWS make arrangements for site visit

Compiled by Aggrey Kwadha

Rongai Sub-County Chief Agricultural Officer

Consultation Meeting with state Department of Agriculture, Rongai Sub County on 17 November 2014 at Ministry of Agriculture offices, Kampi Ya Moto

Attendance

Lynnette Echessa	Chief Agriculture Officer, Rongai Sub County
Aggrey Kwadha	Environmentalist, Gibb Africa Ltd

Introduction and Project brief

After introduction, the consultant gave a brief on the proposed project in two broad areas as follows:

- Energy sector players involved in the Menengai geothermal power production and their roles including GDC, Independent Power Producers (Quantum Power EA, Ormat and Sosian), KETRACO and Kenya Power ; and
- Description of the proposed power plants including installation of turbines and generators, connection via surface pipeline networks to the existing GDC production wells, generation of 30-35MW of power for connection to the national grid and reinjection of brine from into the underground.

Comments

Agricultural activities in Kampi Ya Moto and Soin divisions/wards

Small scale farmers

- Food crops production: maize, beans and drought tolerant crops like cassava, sweet potatoes, sorghum and millet
- Small scale Livestock and poultry keeping
- Average farm sizes- 2 acres

Large scale farmers

- Grow wheat, canola (oil crop), sunflower and sisal plantations
- Fodder production – mainly Rhodes grass and practice conservation agriculture
- Average farm sizes- 1,000 acres

Current key issues affecting crop production in the area

- Pests and diseases, mainly Maize Lethal Necrosis Disease (MLND)
- Poor market prices
- Erratic weather patterns
- High input prices
- Poor infrastructure

Concerns on the proposed power plant project

- GDC already has plans to set up a warehouse and offices outside the caldera. This will likely reduce land available for agriculture. GDC has been buying land from farmers
- Labor used in the farms is mainly from young people. The project may reduce labor available to farmers and increase the labor cost
- Erosion from trucks moving to and from the project site
- Social issues: increased incidence of HIV/AIDS as experienced in Rongai flower farms
- What kind of pollution is likely from the project? Pollution from acid rain is likely to impact crops while that of underground aquifer will impact people since most people in the area rely on borehole water

Potential positive impacts

- Power plants workers will provide ready market for food (farm produce). Local farmers can benefit from increased capital for crop production
- Increased power availability will increase crop production e.g. via irrigation

Recommendations

- Developers should have a CSR activity for the community like tree planting, promoting 4K clubs and soil conservation activities

Compiled by Aggrey Kwadha

List of Key Informants Interviewed in Nakuru Sub-County

GIBB International
CONSULTING · DESIGN · MANAGEMENT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY STAKEHOLDERS CONSULTATIONS **VENUE** NAKURU NORTH SUB COUNTY **DATE** .....

NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE
Peris - N. Ngatho	State department of Agric	Deputy SCAO	0720255526	
Mary Wambui	Youth development	SEC	0720980140	
Lilian Koriuki	Gender & Social Development	Sub-County Social Dev't Officer	0724 017 908	
Keziah Mwaura	Youth Development	Sub-County Youth Dev. Officer	0720423690	
MARGIN O-BILLO	PUBLIC HEALTH	SubCounty P.H. Officer	0726793344	
WILLIAM KODENY	- EO. BAHATI ZONE MINISTRY OF EDUCATION.	- EO. OFFICER BAHATI ZONE	0720926626	

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY ..... STAKEHOLDERS CONSULTATIONS **VENUE** ..... NAKURU NORTH SUB COUNTY **DATE** .....

NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE
Peris - N. Ngatho	State department of Agric	Deputy SCAO	0720255526	04/11/
Mary wambui	Youth development	SEC	0720980140	04/11/
Lilian Koriuki	Gender & Social Development	Sub-County Social Devt Officer	0724 017 908	05/11/
Kezian Mwaura	Youth Development	Sub-County Youth Dev. Officer	0720423690	05/11/
MARTIN O-BILLO	PUBLIC HEALTH	Sub County P.H. Officer	0726793347	07/11/
WILLIAM KODENY	EO. BAHATI ZONE MINISTRY OF EDUCATION.	EO. OFFICER BAHATI ZONE	0720926626	07/11/

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY KEY INFORMANTS INTERVIEWED **VENUE** NAKURU **DATE** .....

NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE	
LUCY MBURU	RVWSB	Senior Supt Warden	0722576305		1/11
Cosmas Ikiugu	KFS	Senior Assistant Director	0728302257		10/11
ALFRED ARONGO	KFS	FORESTER (Athi River)	0722727486		10/11
James N. Gachathi	NAWASSCO	Managing Director	0722227570		10/11
James. I.K Mbuthia	KFS - Menengai	Forester/Menengai	0720548815		11/11
Lawrence Thooko	WRMA, RVCA	Regional Technical Manager	0716749522		12/11
JOSEPH MUNYOKI	WRMA, RVCA	Assistant Technical mngr.	0724168534		12/11
Sylvia Gitonga	DOSHS	Principal OSHO	0728530935		13/11
Timothy K. Murethi	Nakuru County Government	Director - Environment	0721117441		13/11

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY Meeting with Olbamita WRUA **VENUE** Bahati town, Nakuru North. **DATE** 07/11/14

NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE
Aggrey Mwadha	Gibb Africa	Environmentalist	0724 700 276	
Peter Wanjeru Mwangi	CHAIRMAN OLBAMITA	WRUA	0721 803 268	
JETHRO KARANJA ISAAC	TREASURER OLBANITA	WRUA	0723564729	
Joseph Mwangi Mukui	Asst Secretary of Finance	WRUA	0726 696592	

WRUA = Water Resource Users Association

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List of Key Informant Interviewed in Rongai Sub-County

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT AND RESETTLEMENT ACTION PLAN (RAP) DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY KEY INFORMANTS INTERVIEWED **VENUE** RONGAI SUB COUNTY **DATE** .....

NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE
Lucy KIPROTICH	MINISTRY OF HEALTH	PUBLIC HEALTH OFFICER	0729280278	14/11
Gitonga N. Mutiga	MIN. LABOR (SOCIAL DEV)	SOCIAL DEV. OFFICER	0722502443	17/11
LYNNETTE ECHESSA	STATE DEPARTMENT OF AGRICULTURE	CHIEF AGRICULTURE OFFICER. CCROPS OFFICER - RONGAI)	0105687264	17/11
NICHOLAS OTIENO	MINEST - RONGAI	EDEO	0720983468	16/1

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ACTIVITY KEY INFORMANTS INTERVIEWED **VENUE** RONGAI SUB COUNTY **DATE** .....

NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE
Lucy Kiprotich	Ministry of Health	Public Health Officer	0729280278	14/11
Gitonga N. Mutiga	Min. Labor (Social Dev)	Social Dev. Officer	0722550243	17/11
Lynnette Echessa	State Department of Agriculture	Chief Agriculture Officer (Crops Officer - Rongai)	0105687264	17/11
Nicholas Otieno	Maasai - Rongai	Educ	0720983468	18/11

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

KEY INFORMANTS INTERVIEWED NAKURU

ACTIVITY ..... **VENUE** ..... **DATE** .....

NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE	
LUCY MBURU	RVWSB	Senior Supt Water	0722576305		1/11
Cosmas Ikiugu	KFS	Senior Assistant Director	0728302257		10/11
ALFRED ARONGO	KFS	FORESTER (Athi River)	0722727486		10/11
James N. Gachathi	NAWASSCO	Ag Managing Director	0722227570		10/11
James. I.K Mbaithi	KFS - Menengai	Forester/Menengai	0720548815		11/11
Lawrence Thooko	WRMA, RVCA	Regional Technical Manager	0716749522		12/11
Joseph Munyoki	WRMA, RVCA	Assistant Technical mngr.	0724189534		12/11
Sylvia Gitonga	DOSHS	Principal OSHO	0728530935		13/11
Timothy K. Murethi	Nakuru County Government	Director - Environment	0721117441		13/11

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Appendix II: Records of Public Meetings

Kimira Sub-location

Notes of a Public Meeting held during Environmental and Social Impact Assessment of 1X30 MW Geothermal Power Plant at the Kirima police post compound , Kirima Sub location Nakuru North Sub County on 3rd November 2014

Location: Full Gospel Church	**Minute Rapporteur**: Alfrick Murunga
Date: 4.11.14	**Time**: Start: 11:30hrs-Finish: 13:55hrs
Purpose: Public Consultation and Sensitisation meeting during the Environmental and Social Impact Assessment of the proposed 1X30 MW Geothermal Power Plant in Menengai	

Present:

1. Alfrick Murunga — Environmentalist GIBB International
2. Dickens Seroney — Client QPEA GT Menengai Ltd
3. Esther Milgo — Assistant Chief Kirima Sub location

Introduction

The meeting commenced with a word of prayer and thereafter introduction of the Consultant by the area Chief. The Consultant thereafter introduced QPEA GT Menengai Ltd as the Client.

The Consultant from GIBB International, gave a brief description of the 1X30 MW Geothermal Power Plant and informed the meeting of the three independent power producers that had been awarded the contracts to build and operates geothermal power plants in Menengai by the Government through the Public Private Partnership. He also enlightened the meeting of the previous ESIA study undertaken by GDC and the current ESIA exercise which was solely for the power plant and involved activities such as air dispersion and noise modeling, socio-economic baseline survey, public and stakeholder consultations.

The Client enlightened the meeting on the operations of the power plant and cost per kilowatt hour of power generated from geothermal compared to diesel generators, wind, solar and hydro.

He also communicated the agenda of the meeting which was to inform the project neighbouring communities of the project prior to its commencement, the ESIA activities and to solicit their views, comments and questions about the project and impacts it might have on environment.

The community then presented their view, comments, questions and was responded to as follows;

Issues Raised	Response
1. Employment opportunities for the youth. Request was made to know the university courses that they should study in order to improve their chances of get hired.	When hiring especially semi-skilled and unskilled labour, priority would be given to the project neighbouring community. Courses such as engineering and earth sciences would enhance their chances of getting a job in the geothermal sector.
2. Increased incidences of human-wildlife conflict as animals invade private farm due to disturbances in the Caldera.	To consult KFS and KWS on suitable measure to be implemented to minimize incidences of human-wildlife conflict.
3. Geothermal development has restricted access to the caldera thus depriving the community benefits such as grazing grounds, firewood and poles for fencing.	The ESIA stud report will recommend to relevant stakeholders not to restrict certain section of the caldera in order for the neighbouring communities to continue accessing goods from the caldera.
4. Brine to be supplied to local community to be used for irrigation farming and if it could be used to cure skin infections.	Brine has high levels of toxicants thus cannot be used for irrigation farming but can be used to treat skin infections.
5. Follow up should be made by GDC to ensure success after providing tree seedlings.	To be communicated to GDC.
6. Wanted to know if rusting of iron sheet roof in the area was as a result of geothermal steam	There have been complaints raised in Olkaria Naivasha about rusting of iron sheet roofing being caused by geothermal emission but there is no evidence

released in the atmosphere.	to show that geothermal emissions was the cause. Further investigations will be required to clarify the cause.
7. Cold weather experienced in the area was affecting their potato crop thus they wanted to know if is as a result of geothermal development activities impacting the weather around the area.	Changes in climatic conditions attributed to global warming and climate change phenomenon and geothermal air emissions.
8. Hiring for job opportunities in the project area is done through SACCO in Bahati which requires membership. Majority of the youth in the area do not have the funds to join the SACCO thus they are locked out. The SACCO itself discriminates when hiring favoring persons from where it is based.	Job opportunities will be communicated through the area chief. Applicant will pass their credentials to the chief who will then pass them to the employer for review. SACCOs will not be involved in hiring.
9. When hiring unskilled workers, people from the neighbouring communities to be prioritized and not people from outside the project area.	Priority will be given to the project neighbouring communities. Job opportunities for semi-skilled and unskilled labour will be communicated through the area chief and not SACCOs.
10. The community wanted to know if rain water harvested from rusting iron sheet roofing had health risk when consumed.	Laboratory analysis of the water needs to be undertaken to verify if it has implications on human health.
11.	

Signed as true record of the meeting

Assistant Chief Esther Milgo
Kirima Sub location

Sign_____

Stamp

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI

ACTIVITY: PUBLIC MEETING FOR KIRIMA SUBLOCATION VENUE: KIRIMA POLICE POST NEXT TO SUBCHIEF'S OFFICES DATE: 4/11/2014

	NAME	VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
1	EVANS K. MURIU	KIRIMA		0724339631	[signature]
2	PAUL WANGAI	"		0720677822	[signature]
3	JOHN MWANGAI	"		0721393433	[signature]
4	STEPHEN WAKOMO	"		0753234125	[signature]
5	JOHN KAHONO	"		0723634634	[signature]
6	Joel Thuo Josephat	"		0725719281	[signature]
7	JOHNSON MWAMIKI	"		0788747232	[signature]
8	EVANS MWANGI	"		0705827334	[signature]
9	Samuel Karanja	"		0773604932	[signature]
10	Everlyn Njeri	"		0717604932	[signature]
11	GEOFFREY GATHIOMI	KIRIMA		0729746009	
12	John Njoroge	"		0722492244	[signature]
13	Joseph maingi	Kirima		0725692192	[signature]

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT AND RESETTLEMENT ACTION PLAN (RAP) DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY PUBLIC MEETING AT KIRIMA SUBLOCATION **VENUE** KIRIMA POLICE POST NEXT TO ASSISTANT CHIEFS OFFICE **DATE** 4/11/2014

NAME	~~ORGANIZATION~~ VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
WAMBUGU SAMWEL	ARAUKA	Elder		
John Ndiritu	Kirima	Farmer	0728630597	[signature]
Elind Ndungu	Arahuka	Farmer	0723-179844	[signature]
James Ruman	Kirima	Farmer	0721280255	[signature]
James Kinyanjui	Arahuka	Farmer	0726840001	[signature]
Simon Ngatia	Arahuka	Farmer	0715028888	Ngatia
CHEPSAT David	Kiongorcha	Elder	0723[illegible]	[signature]
Stephen K. Mungai	ARAHUKA	FARMER	0721696425	[signature]
Duncan M. Wainaina	ARAHUKA	Farmer	0721-836197	[signature]
George Ngigi	Arahuka	Farmer	0707478880	[signature]
John Kimani	Rigogo	Business	0710414143	[signature]
Grace Waithira Njoroge	Arahuka	Farmer	0710439969	Grace
Nancy Wanjiru Chege	Arahuka	Farmer	0712465099	[signature]

STAKEHOLDER CONSULTATION LIST

Mwaki Mugi Sub-location

Notes of a Public Meeting held during Environmental and Social Impact Assessment of 1X30 MW Geothermal Power Plant at Kabatini Chief's Office, Mwaki Mugi Sub location Nakuru North Sub County on 7th November 2014

Location: Kabatini Chief's office	**Minute Rapporteur**: Alfrick Murunga
Date: 7.11.14	**Time**: Start: 11:12hrs-Finish: 13:30hrs
Purpose: Public Consultation and Sensitisation meeting during the Environmental and Social Impact Assessment of the proposed 1X30 MW Geothermal Power Plant in Menengai	

Present:

1.	Alfrick Murunga	Environmentalist GIBB International
2.	Dickens Seroney	Client QPEA GT Menengai Ltd
3.	Aristides Ngugi	Assistant Chief Mwaki Mugi Sub location
4.		Assistant Chief Kabatini Sub location
5.		

Introduction

The meeting commenced with a word of prayer and thereafter introduction of the Consultant by the area Assistant Chief. The Consultant also introduced QPTEA GT Menengai Ltd as the Client.

The Consultant from GIBB International, gave a brief description of the 1X30 MW Geothermal Power Plant and informed the meeting of the three independent power producers that had been awarded the contracts to build and operates geothermal power plants in Menengai by the Government through the Public Private Partnership. He also enlightened the meeting of the previous ESIA study undertaken by GDC and the current ESIA exercise which was solely for the power plant and involved activities such as air dispersion and noise modeling, socio-economic baseline survey, public and stakeholder consultations.

The Client enlightened the meeting on the operations of the power plant and cost per kilowatt hour of power generated from geothermal compared to diesel generators, wind, solar and hydro.

The Consultant communicated the agenda of the meeting which was to inform the project neighbouring communities of the project prior to its commencement, the ESIA activities and to solicit their views, comments and questions about the project and impacts it might have on environment.

The community then presented their view, comments, questions and was responded to as follows;

Issues Raised	Response
1. The youth from the area be given priority when hiring for job vacancies such as drivers, plumbers, electricians etc	When hiring during the construction and operation phase of the project
2. Compensation for power transmission lines passing through private land	Power transmission is a separate project undertaken by Kenya Electricity Transmission Company (KETRACO).
3. Has the County Government been involved in the exercise?	County Government involved during key project stakeholders consultations.
4. Benefits from the project to the local community.	Benefits to local community are: • Employment opportunities for both skilled and unskilled labour; • Sourcing of building materials such as building stones from quarries around the project area.
5. Inquired if the access road to the Caldera through Mwaki Mugi to be graded and used by GDC and IPPs	The designated access road through Wanyororo will be used by the IPPs.
6. Assist the community to generate revenue and employment from the Menengai crater	Noted.

through promotion of tourism.	
7. Increased incidences of human-wildlife conflict ever since geothermal exploration started in Menengai.	ESIA study report will recommend to the stakeholders involved measures to minimize human-wildlife conflict.
8. Commended GDC for building an operation theater and providing an ambulance to Bahati district hospital. They asked if they could be assisted in renovating and building a school administration block in one of the local schools as well as a police station to enhance security in the area.	Noted.
9. Talent promotion through sports targeting local youth such as cross country athletic race to promote environmental conservation in Menengai.	Noted.
10. Tree seedlings for tree planting by the community around the project area to be provided to the local community by GDC in order to promote environmental conservation and water catchment.	To consult GDC on the tree planting programme.
11. It was suggested that a data bank of all qualified but unemployed person and a committee created to handle hiring of locals in cases where opportunities are presented to them.	
12. A request was made that local business and companies be contracted to provide materials such building stones which are abundant in the area.	The request was noted by the Client.
13. The community should be involved throughout the project cycle in order inform the community of progress and challenges.	The local community will be involved throughout the project life cycle updating them on progress and challenges. Public meetings and local administrative leaders would be used to pass information.
14. Way of involving the community in conservation of environment in the Caldera since exploration activities was degrading the natural environment.	To consult Kenya Forest Service on the issue.

Signed as true record of the meeting

Assistant Chief Aristides Ngugi
Mwaki Mugi Sub location

Sign_____

Stamp

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI

ACTIVITY: PUBLIC MEETING AT MWAKI MUGI SUB LOCATION VENUE: CHIEF OFFICE KABATINI DATE: 7/11/2014.

NAME	VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
JOHN WAMBUGU WACHIRA	MWAKI MUGI	DRIVER		[signature]
ELIJAH KUNGU KAHUNYA	TEACHERS MWANGI MUGI	ELECTRICAL TECHNICIAN	0724740310	[signature]
PENINAH WAITHIRA KIMANI	NYATHUNA	MEMBER	0722739399	[signature]
Margaret Wagio Kabugu	Maili Saba	MEMBER	0727722431	[signature]
Joyce Njeri Wabuga	Maili Saba	MEMBER	0712040333	[signature]
Lydia wanjiru Muguna	maili saba	Business	0725491869	[signature]
Susan Wairimu Kazanja	Maili saba	FARMER	0728040867	[signature]
Jacinta Gathoni	maili saba	FARMER	—	[signature]
John Mugo	MAILI SABA	BUSINESSMAN	0727587808	[signature]
PAUL M. KARIUKI	MAILI SABA	B/MAN	0721-800172	[signature]
ANNE W. KIIRU	J.C.	FARMER	0711187690	[signature]
Lydia Wambui	Maili Saba	Business lady	0726688916	[signature]
Rachel Nyambura	Maili Sita	Secretary	0726822801	[signature]

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI

ACTIVITY PUBLIC MEETING for MWAKI MUGI SUB LOCATION VENUE CHIEF OFFICE KABATINI DATE 7/11/2014

NAME	VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
PAUL THUO MWANGI.	KABATINI	Member of County Assembly Kabatini.	0722-911096	
ARISTIDES K NGUGI	MWAKI MUGI	ASSISTANT CHIEF MWAKI MUGI	0722261927	
JOHN MBUGUA ELIUD	KABATINI	ACTING CHIEF KABATINI LOCATION	0722795140	
PAUL MACHARIA NGOIYA	KABATINI	CHAIR DEV-KABATI-SUB	0723570758	
JOSEPH NGARI MURITU	MWAKIMUGI-TGACHERS	MWAKI MUGI.	0720649937	
JESSE W. CHEGE	MWAKI MUGI	CHAIRMAN CBO	0722-268711	
JOSEPH R.M. KIMANI	MWAKI MUGI	MEMBER	0721654141	
Raphael Kamo	Mwaki Mugi	Chairman unit	0726344264	
Ken Kibaara	Mwaki Mugi	Secretary Mwaki Mugi Sub-location CBO.	0722969626	
Gabriel Mwaura	Mwaki Mugi	Member Kabatini CBO	0717733528	
PETER KUNGU	Kabatini	M.C.A's office Kabatini	0720789489	
JOHN N. NGONGA	MWAKI MUGI	MEMBER	0715556578	
JOSHUA NJENGA	MWAKI MUGI	Member	0726747958	

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI

ACTIVITY PUBLIC MEETING AT MWAKI MUGI SUB LOCATION VENUE CHIEF OFFICE KABATINI DATE 2014/11/7.

NAME	VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
Peter Kwiamu	Mwaki Mugi	Chairman	0725452316	
BLASIO MWAMUI	AMOS		0712800843	
GEOFFREY NGANGA GUTACH	Maili Saba	Farmer	0721753602	
CHARLES MATHENGE KAMAU	MWAKI MUGI	ELECTRICAL INSTALLATION	0727268950	
Pauline Wanjiru	MWAKI MUGI	Farmer	0729920284	Pauline
STEPHEN MUTURI KITHIAU	MWAKI MUGI	DRIVER	0713389217	Stephen
JOAN M. NDUNGU	J. C.	FARMER	0718250312	

Ndungiri Sub-location

Notes of a Public Meeting held during Environmental and Social Impact Assessment of 1X30 MW Geothermal Power Plant at Ndungiri Cattle Dip, Ndungiri Sub location Nakuru North Sub County on 3rd November 2014

Location: Ndungiri Cattle Dip	**Minute Rapporteur**: Alfrick Murunga
Date: 3.11.14	**Time**: Start: 12:15hrs-Finish: 13:45hrs

Purpose: Public Consultation and Sensitisation meeting during the Environmental and Social Impact Assessment of the proposed 1X30 MW Geothermal Power Plant in Menengai

Present:

1.	Alfrick Murunga	Environmentalist GIBB International
2.	Annastacia Ngatti	Sociologist GIBB International
3.	Dickens Seroney	Client QPEA GT Menengai Ltd
4.	Paul Kurgat	Chief Ndungiri location
5.	Tony Kipkirui	Assistant Chief Ol Banita Sub location

Introduction

The meeting commenced with a word of prayer and thereafter introduction of the Consultant by the area Chief. The Consultant then introduced QPEA GT Menengai Ltd as the Client.

The Consultant from GIBB International, gave a brief description of the 1X30 MW Geothermal Power Plant and informed the meeting of the three independent power producers that had been awarded the contracts to build and operates geothermal power plants in Menengai by the Government through the Public Private Partnership. He also enlightened the meeting of the previous ESIA study undertaken by GDC and the current ESIA exercise which was solely for the power plant and involved activities such as air dispersion and noise modeling, socio-economic baseline survey, public and stakeholder consultations.

The Client enlightened the meeting on the operations of the power plant and cost per kilowatt hour of power generated from geothermal compared to diesel generators, wind, solar and hydro.

The Consultant communicated the agenda of the meeting which was to inform the project neighbouring communities of the project prior to its commencement, the ESIA activities and to solicit their views, comments and questions about the project and impacts it might have on environment.

The community then presented their view, comments, questions and was responded to as follows;

Issues Raised	Response
1. Consultant asked to educate the meeting on the expected environmental and social impacts from the project.	Expected environmental and social impacts from the project include: • Air emissions (H_2S and CO_2) and air quality; • Noise and disturbances; • Employment opportunities during the construction and operation phase of the project;
2. Initiation of afforestation program to improve ground cover.	To consult GDC on the issue of issuance of tree seedlings.
3. Access roads in the area are in a bad state and require improvement. Client asked if he could help with the matter.	It was noted by the Client.
4. Direct benefits from the project to Ndungiri sub location.	Direct benefits to people of Ndungiri Sub location from the project include: • Geothermal power plants can be a tourist draw when students, scientists, or interested individuals visit the site, thereby bringing

	business to the local community; • Geothermal development will bring significant economic advantages such as jobs and tax payments. Power generating companies will provide additional voluntary contributions the neighbor communities.
5. Fears that steam released from the wells is affecting vegetation growth especially grass since it rains in the area but the ground remains as it is.	Steam released into the atmosphere from the wells in the Caldera does not affect vegetation. Further investigation is required to establish the cause.
6. Fear of acid rain corroding roofing as some cases have been reported in Naivasha.	Complaints have been raised in Olkaria Naivasha on the rusting of iron sheet roofing on house being associated with the geothermal steam but this has not been proven.
7. Request to the Client to assist in constructing Ndungiri polytechnic administration block, ladies hostel and provide training machinery and equipment.	The Client noted the requested.
8. Brine from the wells to be supplied to the community to be used for household and irrigation.	Brine has high levels of toxicants which are harmful and therefore brine cannot be used for consumption, household use and irrigation of crops.
9. Bad odour from the Caldera affecting breathing especially at night.	Hydrogen Sulphide present in geothermal steam is the cause of bad odour.
10. Creation of scholarships to aid needy student and hosting sports events in the area to promote local talent among the youth.	The suggestion was noted.
11. GDC and KFS to assist in environmental education in the area and provision of tree seedlings to increase ground cover.	GDC and KFS to be consulted and informed on the matter.
12. Disease affecting maize crop in the area is caused by geothermal steam from the Caldera.	The disease affecting maize crop in the area is a viral disease and not associated with geothermal steam or activities.
13. The area is experiencing erratic weather conditions and most people attribute it to the geothermal project and emissions released.	Erratic weather conditions are being experienced worldwide. This has been linked to global warming and climate change.

Signed as true record of the meeting

Chief Paul Kurgat
Ndungiri Location

Sign_____

Stamp

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT AND RESETTLEMENT ACTION PLAN (RAP) DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY PUBLIC MEETING AT NDUNGERI SUB-LOCATION **VENUE** NDUNGERI CATTLE DIP **DATE** 3/11/2014

NAME	~~ORGANIZATION~~ VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
James M. Machoka	Mutukanio C.	Business man	0713806583	
Paul .C. Kuraj	Olbonata	Assistant - Chief	0727846000	
Paul Njoroge M.	Ndungiri	Youth Rep.	0717 091 621	
Martha Njeri K.	Ndungiri	Member	0721610874	
Emily Njoki K	Ndugiri	Member	0717178433	
Benson Njuguna	Ndungiri	Electrician	0700636281	
Beatrice Nyambura K.	Ndungiri	Member	0727609555	
Tony Kiplurui	Mangat (Ndungiri Loc)	Snr. Chief	0722525258	
John Machoka Mugo	Mutukanio C	Member	0723257394	
Harrison K. Wachira	Mutukanio (C)	Electrician	0711409245	
Peter Kamau	Mutukanio B	Peasant	—	
Josphat Wachira	Mutukanio B	Farmer	—	
Kefa. M. Ngugi	IMC	Farmer	0713020854	

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT AND RESETTLEMENT ACTION PLAN (RAP) DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY PUBLIC MEETING AT NDUNGIRI SUB LOCATION **VENUE** NDUNGIRI CATTLE DIP **DATE** 3/11/2014

NAME	~~ORGANIZATION~~ VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
HARRISON MACHARIA	MUTUKANIO C	FARMER	0720478556	
John Rugio	IME	"	0726901156	
Francis Macharia	Mutukanio-B	"	0725050418	
Nathaniel Kigia	Mutukanio C	"	0717623293	
BILHAH NYAMBURA	MUTUKANIO B	"	0707780151	

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Ol Banita Sub-location

Notes of a Public Meeting held during Environmental and Social Impact Assessment of 1X30 MW Geothermal Power Plant at Full Gospel Church, Ol Banita Sub location Nakuru North Sub County on 3rd November 2014

Location: Full Gospel Church	**Minute Rapporteur**: Alfrick Murunga
Date: 3.11.14	**Time**: Start: 15:05hrs-Finish: 16:35hrs

Purpose: Public Consultation and Sensitisation meeting during the Environmental and Social Impact Assessment of the proposed 1X30 MW Geothermal Power Plant in Menengai

Present:

1.	Alfrick Murunga	Environmentalist GIBB International
2.	Annastacia Ngatti	Sociologist GIBB International
3.	Dickens Seroney	QPEA GT Menengai Ltd
4.	Paul Kurgat	Chief Ndungiri location
5.	Tony Kipkirui	Assistant Chief Ol Banita Sub location

Introduction

The meeting commenced with a word of prayer and thereafter introduction of the Consultant by the area Chief. The Consultant also introduced QPTEA GT Menengai Ltd as the Client.

The Consultant from GIBB International, gave a brief description of the 1X30 MW Geothermal Power Plant and informed the meeting of the three independent power producers that had been awarded the contracts to build and operates geothermal power plants in Menengai by the Government through the Public Private Partnership. He also enlightened the meeting of the previous ESIA study undertaken by GDC and the current ESIA exercise which was solely for the power plant and involved activities such as air dispersion and noise modeling, socio-economic baseline survey, public and stakeholder consultations.

The Client enlightened the meeting on the operations of the power plant and cost per kilowatt hour of power generated from geothermal compared to diesel generators, wind, solar and hydro.

The Consultant communicated the agenda of the meeting which was to inform the project neighbouring communities of the project prior to its commencement, the ESIA activities and to solicit their views, comments and questions about the project and impacts it might have on environment.

The community then presented their view, comments and questions was responded as follows;

Issues Raised	Response
1. The relationship between ground shaking and exploration drilling.	Nature of some geothermal exploration activities such as drilling of wells and release of geothermal steam from underground reservoir may result in ground shaking.
2. Read in the newspaper that steam from the wells causes house roofing to rust. Wanted to know if it is true.	There have complaints in other areas such as Olkaria Naivaisha of Iron sheet roofing rusting due to H_2S but there is no evidence to link H_2S to rusting.
3. Will negative environmental impacts result in stoppage of the project?	Mitigation measures in the ESIA study report will be implemented to eradicate and minimize negative impacts thus allowing the project implementation.
4. Will GDC provide the locals especially the youth with job?	
5. Clarification as to whether work on the construction of the power plant had commenced.	Construction works had not yet commenced. Work will commence in January 2015.
6. Will QPEA provide social amenities?	QPEA will not provide social amenities.

Signed as true record of the meeting

Chief Paul Kurgat
Ngungiri Location

Sign_____

Stamp

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT AND RESETTLEMENT ACTION PLAN (RAP) DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY: PUBLIC MEETING AT OLBANITA SUB LOC. VENUE: FULL GOSPEL CHURCH DATE: 3/10/2014

NAME	~~ORGANIZATION~~ VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
ROSE WANJIKU MWANGI	AMPIVA	VILLAGE RESIDENT	0711545491	Rose
Dickson Ngugi Murungi	OLBANATA.	Village Resident	0700409789	[signature]
PETER KAMAU NJUGUNA			0717832743	[signature]
EVALINE ACHIENG			0711611119	[signature]
DAVID KIRUI			~~0715978053~~	[signature]
Johson ABENYO			0715978053 ~~0722 23 4487~~	[signature]
Peter Ochunga			0722334487	
MONICAH ATIENO A.			0711-624597	[signature]
PETER GATHOGO			—	[signature]
Maria Akali			0718 04 8109	[signature]
Rosemary Nyambura I			0725128985	[signature]
Anna Akiru			—	[signature]
Mary Njeri			—	[signature]
Beth Wangui			0708 495993	[signature]

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT AND RESETTLEMENT ACTION PLAN (RAP) DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY PUBLIC MEETING AT OLBANITA SUBLOCATION VILLAGE **VENUE** FULL GOSPEL CHURCH **DATE** 3/11/2018

NAME	~~ORGANIZATION~~ VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
JAMES GICHINGIA		Village resident	0724058052	[signature]
CRISTINE NJERI			0712145459	[signature]
John Kamau			0718432318	[signature]
Moses Mwangi		Village Resident	0702 891854	[signature]
Joshua Saus			0717413855	[signature]
NG'ANG'A NJUGUNA			07165316	[signature]
PETER ERI			0715095889	[signature]
DAVID NG'ANG'A			0721855177	[signature]
David Mugunyas			0921 87195	[signature]
DANIEL NJUGUNA			0724830760	[signature]
Jane Wambui			0722896232	[signature]
KENEDY OTIENO			0710255189	[signature]
JOSEPH IRUNGU			0770505410	[signature]
Margaret Sungura			—	—

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY PUBLIC MEETING AT OL BANITA SUBLOC **VENUE** FULL GOSPEL CHURCH **DATE** 3/11/2014

NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE
Mirian Wangeci	AMPIVA		0710 106109	[signature]
Paulina Artula			0723 142264	[signature]
Julius Mwagi Chege			07	[signature]
Mary Muthami			0710174841	[signature]
PAUL CHURCHAT		ASS-CHIEF	0727846000	
WILLIAM NDUNGU			0723397608	[signature]
Tony Kipkurui	CHIEF NAUNGURU LOC	SNR CHIEF	0722252578	[signature]
FREDRICK OWINO	AMPIVA			[signature]
George odhiambo	Ampiva		0718984920	[signature]
Aggrey Kwache	Gibb Africa		0724700278	[signature]
Alfrick Mumnga	Gibb Africa	Environmentalist	0721926132	[signature]

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Wanyoro Sub-location

Notes of a Public Meeting held during Environmental and Social Impact Assessment of 1X30 MW Geothermal Power Plant at Wanyororo Trading Centre, Wanyororo Sub location Nakuru North Sub County on 5th November 2014

Location: Wanyororo trading centre	**Minute Rapporteur**: Alfrick Murunga
Date: 5.11.14	**Time**: Start: 11:30hrs-Finish: 14:08hrs
Purpose: Public Consultation and Sensitisation meeting during the Environmental and Social Impact Assessment of the proposed 1X30 MW Geothermal Power Plant in Menengai	

Present:

1.	Alfrick Murunga	Environmentalist GIBB International
2.	Dickens Seroney	Client QPEA GT Menengai Ltd
3.	Charles Macharia	Chief Kirima location
4.	Joseph Macharia	Assistant Chief Wanyororo Sub location

Introduction

The meeting commenced with a word of prayer and thereafter introduction of the Consultant by the area Chief. The Consultant thereafter introduced QPTEA GT Menengai Ltd as the Client.

The Consultant from GIBB International, gave a brief description of the 1X30 MW Geothermal Power Plant and informed the meeting of the three independent power producers that had been awarded the contracts to build and operates geothermal power plants in Menengai by the Government through the Public Private Partnership. He also enlightened the meeting of the previous ESIA study undertaken by GDC and the current ESIA exercise which was solely for the power plant and involved activities such as air dispersion and noise modeling, socio-economic baseline survey, public and stakeholder consultations.

The Client enlightened the meeting on the operations of the power plant and cost per kilowatt hour of power generated from geothermal compared to diesel generators, wind, solar and hydro.

The Consultant communicated the agenda of the meeting which was to inform the project neighbouring communities of the project prior to its commencement, the ESIA activities and to solicit their views, comments and questions about the project and impacts it might have on environment.

The community then presented their view, comments and questions was responded as follows;

Issues Raised	Response
1. Benefits from the project to the local community.	Benefits to the local community will include: • Employment opportunities for skilled, semi-skilled and unskilled labour from the project area; • Sourcing construction materials such as sand and building stones from local suppliers; • Reliable power source; • Reduced cost of electricity.
2. It was suggested that QPEA GT Menengai Ltd have a Memorandum of Understanding with the local community on employment of persons from the area so that in case the issues in the M.O.U are not fulfilled they can hold QPEA responsible.	It was noted by the Client.
3. Long term effects from the project and mitigation measures.	Some of the long term impacts from the geothermal power plant are: • Air emissions (CO_2 and H_2S);

	• Noise; • Reduction in the cost of electricity. Mitigation measure will include: • Sitting and design changes; • Air quality monitoring; • Continuous noise measurement; • Building barriers around the power plant to contain noise.
4. Public disclosure of the ESIA study report to educate the local community on the impacts and mitigation measures.	Public disclosure workshop will be organized in Nakuru after the approval of the report where all stakeholders will be invited. Impacts and mitigation measures from the ESIA study report will be communicated.
5. The use of brine after power generation for irrigation in greenhouses.	Brine cannot be used for household use and irrigation because it contains high levels of pollutants. It can only be used to treat skin infections
6. Prioritize employment of locals especially women and youth. Hiring not to be undertaken through SACCOs as there is no equity when hiring.	Priority will be given to persons from the project neighbouring communities when hiring semi-skilled and unskilled labour. Available vacancies will be advertised through the area Chief and not through SACCOs.
7. On job trainings for non skilled labour to build their technical capacity and issuance of long term contract.	Qualified persons with job specific skills will be hired for the duration of the work.
8. When will construction of the power plant commence?	Construction of the power plant will commence in January 2015 and will last for a period of 15 to 17 months.
9. A big portion of land in the Caldera belonged to Wanyororo yet the community had not been compensated for their private land. It was suggested that the community be part of any agreement between GDC and IPPs and given shareholding in the projects.	Where private land is acquired for geothermal energy development, land owners should be compensated.

Signed as true record of the meeting

Chief Charles Macharia
Kirima Location

Sign_____

Stamp

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT [illegible] DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY PUBLIC MEETING [illegible] WANYORORO SUB LOCATION VENUE WANYORORO TRADING CENTRE DATE 5/11/2014

NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE
JOHN NJOGU KIMANI	Wanyororo -B.		0724-281190	[signature]
HENRY ODUOR ODINGA	Wanyororo B		0718707881	[signature]
DENIS CHUNCHU	Wanyororo		0711310924	[signature]
JOSEPH NDERITU GITHINJI	11		0714358833	[signature]
PATRICK KARIUKI	11		0703648569	[signature]
Charles Mungai Mwangi	"		0722328987	[signature]
[illegible] Njoroge	11		0724890804	[signature]
ANN [illegible]	11		0715152538	[signature]
SAMSON K. CHEGENJO	11		0713486917	[signature]
Tom M. Mwangi	"	Welder	0725974236	[signature]
Bebnwell muigai	"	welder	0719683836	[signature]
Joseph Isigahi	"		07270345	[signature]
DAVID NJUGUNA	"		0712681971	[signature]
James Mukuru	"	mech	0726474212	[signature]

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT [illegible] DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY PUBLIC MEETING AT WANYORORO SUB-LOCATION **VENUE** WANYORORO TRADING CENTRE **DATE** 5/11/2014

NAME	ORGANIZATION / VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
SAMUEL GACIBE	WANYORORO "B"	DRIVER	0723879[illegible]	
SAMUEL MWANGI	"	PLANT OPERATOR	0701367505	
JOSEPH NDUNGU	WANYORORO	WELDER	0726 905688	
MARY NYAMBURA	"	STILL TYXED	0725538302	
STEPHEN KARIUKI	"	DRIVER	0726955[illegible]	
GEOFREY M. KANJA	"	DRIVER	0726601185	
SOLOMON MAINA	"	DRIVER	0712148158	
JAMES KARIUKI	"	FARMER	0701800499	
MOSES M GACIBE	"	PLANT OPERATOR	0720106947	
BEN MWANGI	"	FARMER	0702[illegible]478	
PAUL MBAE	"	FARMER	07	
JOSEPH NJUMGUNA	"	DRIVER	0728052907	
DENIS KIPROP	"	FARMER	0711297272	
Margaret Wanjiku Wagura	"	Computer	0720439750	

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY: PUBLIC MEETING AT WANYORORO SUB-LOCATION VENUE: WANYORORO TRADING CENTRE DATE: 5/11/2014

NAME	~~ORGANIZATION~~ VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
RENARD K ISIAHO			0727550295	[signature]
JOEL MUYA			0724318830	[signature]
JAMES KAHARA			0723746804	[signature]
PAUL Mbugua			0704169518	[signature]
MILTON KURIA			0728507988	[signature]
SIMON CHARAGU			0700327847	[signature]
ABRAHAM G. NDERITU			0726510834	[signature]
ISAAC GITAU M			0712211706	[signature]
FRANCIS THEURI			072882019	[signature]
JOSEPH KABIRU			0726928436	[signature]
SAMUEL MARIA			0712154503	[signature]
ZAKAYO N'WANJOH	WANYORORO		0702431392	[signature]
David Mwangi Kamau			070125472	[signature]

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT . DEVELOPMENT OF 1X30 MW
GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY PUBLIC MEETING AT WANTORORD SUB. LOCATION **VENUE** WANTORORO TRADING CENTRE **DATE** 5/11/2014

NAME	~~ORGANIZATION~~ VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
PAULINE WANERU	WANTORORO B'	YOUTH LEADER	0708389935	
MIRIAM WANJIRA G	"	"	0724611348	
VERONICAH NYANGICHU	"		0724466077	
STEVEN GITUATHI	"		0714665456	
Frechia W. Rachan	Wanyororo 'B'	plant operator	0710710228	
Johannah Rachau	Wanyororo 'B'	Driver	0720838189	
CAROL MUNYIRA	" "	YOUTH (CATERER)	0723912794	
SAMMY CHEGE	" "	KIRING	0723912794	
LUCY WANGARE	" "	DRIVER	0713652065	
JOHN NDUNGI	" "	WELDER	0725155075	
GRACE WAMBUI	" "	PHARMACIST	0710340370	
ELIZABETH WANJIRU	" "	PLANT operator	0714974693	
ANTHONY NDUMBO	" "	ELECTRICIAN	0724107032	

STAKEHOLDER CONSULTATION LIST

ACTIVITY: PUBLIC MEETING AT WANYORORO SUB LOCATION VENUE: WANYORORO TRADING CENTRE DATE: 5/11/2014

NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE
JOEL MAINA	WANYORORO		0725501685	[signature]
STEPHEN MBUGO	WANYORORO		0722 674644	[signature]
JOHN NDONYO	WANYORORO		0722 247571	[signature]
PETER KAMAU THUO	"		0729 995983	[signature]
RADIA NJENGA	"			
SILOGWA GICHANGO	"	Plant operator	0715 855 366	[signature]
DAVID K. NJENGA	"		0721 336 1536	[signature]
Joseph Munene	"		0724 070833	[signature]
BARTHLOMEW NDIRANGU	"		0729761539	B.[signature]
JAMES NDIRITU	"		0704220230	[signature]
John Kilise	"		0771350377	[signature]
Will Minai	"		0714 81967	[signature]
Henry Odhov Odinga	"		0718 707881	[signature]
JAMES KAMAU	"	DRIVER	0723 839 799	[signature]

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- George Mwangi	Wanyororo 'A' Mason	Mason /	0729 268467	— [signature]
- Ehud Ndungu	Wanyororo	Driver/mech	0712 145178	— [signature]
- Denis Kiprop	Wanyororo 'B'	Youth	0711 297272	— [signature]
- Jane Wairimu	Wanyororo 'F'	- Youth	- 0713652060	— [signature]
- Peter Karanja K.	Wanyororo 'A'	- Youth	- 0724235308	— [signature]
- Michael Ikai	Wanyororo 'B'	Mason	—	— [signature]
- Kamau Muhoro	Wanyororo 'B'	- Painter	- 0718446502	— [signature]
- John Mwangi	"	Member	- 0715593346	- [signature]
- Denman Kiboro	"	Driver	- 0701496279	- [signature]
Joseph M. Gitangu	"	ASST. CHIEF	0712253548	[signature]

JAMES NDIRITU	"	0710415279		
CHARLES MBURU.		0711358		
Eliau Kagu Gichuhi		0		
			- Emmaly	
Tom M. Mwangi	Wangororo		Welder	0725974236
WILSON KIOKO WAMBUA	" " "		DRIVER.	0723584026
Benjam. Thuo Kamau	" "	0721618232	Mechanical engineering	
Patrick Githaiga	" "	0728724285	Mason	

Solomon Kemunt D 0713268774

GEOFFREY	KIHUHA	0715 922269
JAMES	GATHIMBA	0713 472304
DANIEL	MBUGUA	0724218031
Michael	ergai	0723843756
Daniel	Njuguna	0728179287

JANE	MAIRIMU		FARMER	0717053551
SAMUEL	MWANGI	NJOROGE	11	07
PETER	NGURE		DRIVER	0789828225 55
JOSEPH	KIMANI		SECURITY	0718124103
GEORGE	GICHUKI		DRIVER	0724863902
GILBAF	KARANJA		FARMER	0702186187
FREDICE	MAINA			0702752241
JAMES	MWAURA		MECHANIC	0725474212
JAMES	MBUGUA		FARMER	

Mutukania/Land Mawe/Karonga Sub-location

Notes of a Public Meeting held during Environmental and Social Impact Assessment of 1X30 MW Geothermal Power Plant at Rehema Church Ahero, Mutukania/Landi Mawe/Karonga Sub location Nakuru North Sub County on 11th November 2014

Location: Rehema Church Ahero	**Minute Rapporteur**: Alfrick Murunga
Date: 11.11.14	**Time**: Start: 11:30hrs-Finish: 13:40hrs
Purpose: Public Consultation and Sensitisation meeting during the Environmental and Social Impact Assessment of the proposed 1X30 MW Geothermal Power Plant in Menengai	

Present:

1.	Alfrick Murunga	Environmentalist GIBB International
2.	Paul Mbuthia	Chief Mutukania location
3.	Charles Kahongo	Assistant Chief Kiamaina Sub location
4.	Eunice Kamau	Assistant Chief Landi Mawe Sub location
5.	Grace Change	Assistant Chief Karonga Sub location

Introduction

The meeting commenced with a word of prayer and thereafter introduction of the Consultant by the area Chief. The Consultant from GIBB International, gave a brief description of the 1X30 MW Geothermal Power Plant and informed the meeting of the three independent power producers that had been awarded the contracts to build and operates geothermal power plants in Menengai by the Government through the Public Private Partnership. He also enlightened the meeting of the previous ESIA study undertaken by GDC and the current ESIA exercise which was solely for the power plant and involved activities such as air dispersion and noise modeling, socio-economic baseline survey, public and stakeholder consultations. He also communicated the agenda of the meeting which was to inform the project neighbouring communities of the project prior to its commencement, the ESIA activities and to solicit their views, comments and questions about the project and impacts it might have on environment.

The community then presented their views and was responded to as follows

Issues Raised	Response
1. Consultation and sensitization of the project neighbouring communities was important and commended the Consultant for undertaking it prior to commencement of the project.	It is a requirement by law for community involvement prior to commencement of any project of such magnitude.
2. Hiring should prioritize youth for semi-skilled and unskilled labour. Those with qualifications but lacked job experience should also be considered.	The Consultant in the ESIA report will recommend that people from the project area be prioritized when hiring semi-skilled and unskilled labour during construction of the power plants.
3. A request was made for assistance to community health workers (registered group) in the area with the following; • First Aid kits. • Rent for office space. • Identification materials and stipend for members.	Noted and will be forward to the project proponent for consideration.
4. Sport evangelism to be initiated in collaboration with NACADA to curb alcoholism among the youth.	Noted.
5. Benefits from the power plant project to the community.	Benefits from the geothermal power plant project include: • Creation of employment opportunities during the construction and operation phases of the project;

	• Electricity cost reduction making it affordable to majority of the people in the area.
6. The area experiences scarcity of water and those present at the meeting requested that the project proponent drill for them boreholes to help avert the problem.	Noted and will be forward to the project proponent for consideration.
7. The area around Ahero where the meeting was being held lacked public toilets for use by the inhabitants therefore a request for assistance to the project proponent to construct one for the community to run and generate revenue. These would be a sustainable source of revenue for a youth group in the area.	Noted.
8. Request was made to the project proponent to sub contract local businesses to supply locally available materials such as sand and building stones.	Suggestion to be passed to the project proponent for consideration.
9. GDC has told the community in a previous meeting that carbon credit fund would be made available thus they wanted to know when it will be available.	To consult GDC on the matter as he was not aware.
10. The project proponent asked if community social responsibility (CSR) would be part of the project.	Community Social Responsibility program will be recommend to the project proponent.
11. Water supply from NAWASCO was available in the area at the water kiosks. They requested if water mains could be provided from where they could connect to their homes.	Noted.
12. People living near the caldera were inhaling bad odour and experiencing high noise levels and vibrations. What measures will be put in place to mitigate these effects.	The ESIA study report will recommend mitigation measure will be implemented by the project proponent to minimize impacts on air quality and noise and vibrations.

Signed as true record of the meeting

Chief Paul Mbuthia
Mutukania Location

Sign_____

Stamp

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI

ACTIVITY: PUBLIC MEETING AT REHEMA CHURCH VENUE: REHEMA CHURCH AT AHERO DATE: 11/11/2014

NAME	VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
PAUL MBUTHIA KARIUKI	MWIKANO	CHIEF I	07238853 4.	[signature]
Pst Robert Mungai	"	PASTOR	0723944746	[signature]
FRANCIS MWITHIGA	KARUNGA	C.H.C	0727830849	[signature]
James K. Njoroge	Wanyororo	Framer	0728765639	[signature]
JOHN NJOROGE	KARUNGA	CHW	0723583813	[signature]
David Kirunyu	KARUGA	FAMER	0720842902	[signature]
ALICE W KARIMI	KARUNGA	CHW	0721776270	[signature]
PETER KARANJA	Land Mawe	CHC	0721858002	[signature]
Douglas Gitiga	Land mawe	farmer	0702106865	[signature]
Joseph W. Gitahi	Land mawe	farmer	0727 140306	[signature]
BENSON KINYUA	LAND MAWE	PASTOR	0717680427	[signature]
MARY WAMBUI	~~LAND~~ MAA KARUNGA	FAMER	0713 082575	[signature]
Peter Mwaniki	LAND MAWE	CHAIRMAN WRUA	0721503260	[signature]
JAMES K MWANGI	LAND MAWE	NRUA	0722232045	[signature]
MARGERET W. MWANGI	KARUNGA	FARMER	0728632717	[signature]
EUNICE N. NJOGU	LAND MAWE	FARMER	0702915219	[signature]

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI

ACTIVITY PUBLIC MEETING AT REHEMA CHURCH **VENUE** REHEMA CHURCH AT AHERO **DATE** 11/11/2014

NAME	VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
PHILIP K. NJINDO	AHERO	V. CHAIRMAN BUSINESS PEOPLE	0722734400	
Kingori Mwangi	Land Mawe	Hero Chairman	0723465576	
Paul Gachunga	Land Mawe	Business man	0723546949	
F. M. Muchai	MAILI KUMI	BUSINESSMAN	0711757729	
Adamson Mukunja	Ahero	" "	0720987955	
PATRICK N MWANIKI	MAILI KUMI	"	0720459197	
ISAAC M. NJUGUNA	LAND MAWE	"	0720265752	
PAUL MUTITO	"	"	0721973764	
SIMON M. KARIRI	KARUNGA	"	0722550978	
JANE N. WANJIKU	AHERO	"	0720079900	
BETH WANJIKU	LAND MAWE	"	0725924056	
LABAN KARIUKI	LAND MAWE	YOUTH	0725581407	
ANN WANJA	LAND MAWE	FARMER	0725519626	

JECNTA AND JOAN	WANJIKN MUTHONI KIMANI	KARUNGA LAND MAWE KARUNGA	FARMER BUSSINESS B		0712838886 0705277277

Menegai Sub-location

Notes of a Public Meeting held during Environmental and Social Impact Assessment of 1X30 MW Geothermal Power Plant at Menengai Trading Centre, Menengai Sub location Nakuru North Sub County on 6th November 2014

Location: Menengai trading centre	**Minute Rapporteur**: Alfrick Murunga
Date: 6.11.14	**Time**: Start: 11:40hrs-Finish: 12:38hrs
Purpose: Public Consultation and Sensitisation meeting during the Environmental and Social Impact Assessment of the proposed 1X30 MW Geothermal Power Plant in Menengai	

Present:

1. Alfrick Murunga — Environmentalist GIBB International
2. Dickens Seroney — QPEA GT Menengai Ltd
3. Chief Kiamaina location
4. Daniel Muchendu — Assistant Chief Kiamaina Sub location

Introduction

The meeting commenced with a word of prayer and thereafter introduction of the Consultant by the area Chief. The Consultant thereafter introduced QPTEA GT Menengai Ltd as the Client.

The Consultant from GIBB International, gave a brief description of the 1X30 MW Geothermal Power Plant and informed the meeting of the three independent power producers that had been awarded the contracts to build and operates geothermal power plants in Menengai by the Government through the Public Private Partnership. He also enlightened the meeting of the previous ESIA study undertaken by GDC and the current ESIA exercise which was solely for the power plant and involved activities such as air dispersion and noise modeling, socio-economic baseline survey, public and stakeholder consultations.

The Client enlightened the meeting on the operations of the power plant and cost per kilowatt hour of power generated from geothermal compared to diesel generators, wind, solar and hydro.

The Consultant communicated the agenda of the meeting which was to inform the project neighbouring communities of the project prior to its commencement, the ESIA activities and to solicit their views, comments and questions about the project and impacts it might have on environment.

The community then presented their views and was responded to as follows

Issues Raised	Response
1. Benefits to the community from the project.	Benefits to the community from the project include: • Employment opportunities; • Geothermal power plants can be a tourist draw when students, scientists, or interested individuals visit the site, thereby bringing business to the local community.
2. Access to electricity from the project.	Electricity from the project will be injected into the national grid and accessed by application to Kenya Power.
3. Potential of IPPs to assist the community programs such as: • Feeding programs in schools; • Water project; • Construction of a hospital in the area; • Construction of a permanent building for a community eco-tourism group.	

4. The Menengai crater view point located in the area poses a risk to animals and people as it is not fenced off. Fatal accidents have been report at the view point involving either cattle or people especially children.	Noted.
5. Project proponent urged to involve and liaise with the community to ensure successful implementation of the project.	The project proponent will involve the neighbouring communities throughout the construction and operation phases.
6. Menengai Sub location experience severe water scarcity and depend mainly on rain water harvested during the rainy season. The community requested that in case the project proponent would consider doing something for them water project to be priority.	Noted.
7. Promises to Menengai Sub location community by GDC have not been realized. Project proponent urged to do something for the community.	Noted.
8. A request was made to the project proponent to support entrepreneurs and community self help groups.	Noted.
9. A consensus was reached that any employment presented to the community should be advertised through the area Chief.	Noted.

Signed as true record of the meeting

Chief
Kiamaina Location

Sign_____

Stamp

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI

ACTIVITY PUBLIC MEETING ~~FOR~~ MENENGAI SUB LOCATION VENUE KIRIMA POLICE POST NEXT TO SUB-CHIEF'S OFFICE DATE 4/11/2014

	NAME	VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
1	ELIUD K. GAKUNG	KIAMAINA	VILLAGE ELDER	0725645131	
2	FREDRICK Maina	KIAMAINA	VILLAGE	0727728449	
3	DAVID NGANGA	KIAMAINA	VILLAGE ELDER	0725370070	
4	SULEIMAN MWANGI	KIAMAINA	Mwenyeji	0728730311	
5	DAVID WAITHAKA	KIAMAINA	Mwongeji	0700 215497	
6	PHILIP MUCHENJU	KIAMAINA	VILLAGE ELDER	0722265607	
7	SAMSON WAMBUGU	KIAMAINA	MWENYENJI	0718709710	
	Wainaina Kimani	Kiaina	MWENYENJI	—	WAINAINA
	SAMMY NJOROGE	KIAMAINA	MWENYEJI	0702633268	
	Samuel mwangi	KIAMAINA	mwenyeji	0714037319	
	PETER NGUGI NDUNGU	KIAMANA	MWENYENI, Carpenter	0726704905	
	Stanley M. Wahome	Kiamaina	Saudi Radio/worker	0727122390	
	JOEL NJOROGE	KIAMAINA	MECHANIC	072 3051697	
	Peter Mwangi	Kiamaina	driver	070 33-96500	

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI

ACTIVITY: PUBLIC MEETING AT MENENGAI SUB LOCATION VENUE: KARAMA [illegible] NEXT TO SUBCHIEF'S OFFICE MENENGAI TRADING CENTRE DATE: 6/11/2014

NAME	VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
Jane Njeri	Menengai			[signature]
Mary W. Kiawuya	Creator		0725 533 207	[signature]
Jacinta Wanjiru	Creator		0715 484243	[signature]
Monica NJERI	MENENGAI		0735917684	[signature]
Tabitha Wandia	MENENGAI		0711850153	[signature]
Grace Nyambura	Menengai		0702-170744	[signature]
GRACE NGUNGIRI	MENENGAI		0717811244	[signature]
Tabitha Mambura	MENENGAI		0721529485	[signature]
Frolence Njeri mwangi	MENENGAI			[signature]
magret Gathima	MENENGAI			[signature]
Hannah Wangari	MENENGAI		0718080322	[signature]
Peninah Kuria	MENENGAI		0723753422	[signature]
Lucy Kabiru	MENENGAI		0720601863	[signature]

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI

ACTIVITY: PUBLIC MEETING AT MENENGA SUB-LOCATION VENUE: MENENGA TRADING CENTRE DATE: 6/11/2014

NAME	VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
ESTHER WANGUI	Menengai		0724703478	[signature]
John Wathua Ndegwa	Menengai		0727102894	[signature]
Jecinta Mwangi	MENENGAI		0713893377	[signature]
Racheal Nduta	MENGAI		0720246669	[signature]
NYAMBURA MARY	MENENGAI		0707023048	[signature]
HANNA Muthoni	MENENGAI		~~07203183~~	[signature]
MILKA NYAMBURA	MENENGAI		0720318349	[signature]
Peter Chege Maina	MENENGAI		0727050066	[signature]
MAINA KARANJA	MENENGAI		072628258	[signature]
REV J. U. KAMAU	Menengai		0723537305	[signature]
EVANTAS KINGORI	Menengai		—	[signature]
Gathumbi Nganunja	Menengai		0753536560	[signature]
David muranga mugingi	menengai		0716 885 227	[signature]

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI

ACTIVITY: PUBLIC MEETING AT MENENGA SUB-LOCATION VENUE: MENENGA TRADING CENTRE DATE: 6/11/2014

NAME	VILLAGE	DESIGNATION	MOBILE NO.	SIGNATURE
[illegible] Mwangi Roi	Crater	Community Policing	0724681576	[signature]
DANIEL KIMANI	Kirima	CDF Rep Kiamaina	0724921430	[signature]
CAROLINE MWAURA	CRATER	C/person	0734991504	[signature]
EDWARD NJURAI	RURII	A/CHIEF	0720987926	[signature]
MUGO TITUS	MENENGAI	A/CHIEF	0720254273	[signature]
MARY KAMAU	RURII LOC	CHIEF	0721224380	[signature]
NEWTON N. KARANJA	Rurii Loc	Community Policing	0727483449	[signature]
DANIEL N. MUCHENDU	KIAMAINA	A/CHIEF	0722265607	[signature]
Bernard T. Kabue	Kiamaina	Agriculture officer	0722793988	[signature]
Mambura Mundolo	KIRIMA		0728782875	[signature]
TIMOTHY MATHARIA NJOROGE	Kiamaina		0723577844	[signature]
Joseph ngure	Kirima	Resident.	0725888260	[signature]
James wawen	Kirima	Resident	0720409563	[signature]
Moses Ndungu	Kirima	Resident	0700907039	[signature]
- Amos M. Kuhu	Kiriko Central	Resident	0710213865	[signature]

Kampi ya Moto Location

Notes of a Public Meeting held during Environmental and Social Impact Assessment of 1X30 MW Geothermal Power Plant at GDC Kabarak Farm, Kampi ya Moto Location Rongai Sub County on 30th October 2014

Location: GDC Kabarak Farm	**Minute Rapporteur**: Alfrick Murunga
Date: 30.10.14	**Time**: Start: 10:55hrs-Finish: 12:35hrs
Purpose: Public Consultation and Sensitisation meeting during the Environmental and Social Impact Assessment of the proposed 1X30 MW Geothermal Power Plant in Menengai	

Present:

1. Alfrick Murunga — Environmentalist GIBB International
2. Patrick Mbugua — Chief Kampi ya Moto location
3. Susan Soy — Assistant Chief Morop sub location

Introduction

The meeting commenced with a word of prayer and thereafter introduction of the local leaders present and the Consultant by the area Chief.

The Consultant from GIBB International, gave a brief description of the 1X30 MW Geothermal Power Plant and informed the meeting of the three independent power producers that had been awarded the contracts to build and operates the geothermal power plants in Menengai by the Government through the Public Private Partnership. He also enlightened the meeting of the previous ESIA study undertaken by GDC and the current ESIA exercise which was solely for the power plant and involved activities such as air dispersion and noise modeling, socio-economic baseline survey, public and stakeholder consultations. He also communicated the agenda of the meeting which was to inform the project neighbouring communities of the project prior to its commencement, the ESIA activities and to solicit their views, comments and questions about the project and impacts it might have on environment.

The community then presented their views as follows

Issues Raised	Response
1. The impacts of the power transmission line and where it would pass.	Power transmission line from the power plants to the substation is a different project undertaken separately by Kenya Electricity Transmission Company (KETRACO).
2. Water supply source for the power plant since water is a problem in the area.	Water supply to the power plants will be provided by GDC from their boreholes located in the Caldera.
3. Benefits from the project to the local community.	Benefits to local community are: • Employment opportunities for both skilled and unskilled labour; • Sourcing of building materials such as building stones from quarries around the project area;
4. As part of the IPP community social responsibility programme, attendants at the meeting asked that the following projects be given priority in this order: • Water supply; • Education; • Development of a hospital (Kachwera); • Grading of access roads.	
5. A community member wanted the Consultant to educate the meeting on the significant impacts associated with the power plant.	Significant impacts associated with geothermal power generation are: • Noise; • Air quality; • Cheap renewable energy.

6. Impacts of the project on climate change.	
7. Relationship between Independent Power Producers and Geothermal Development Company.	GDC is a government parastatal mandated with geothermal exploration in Kenya where the IPPs are private companies involved in power generation. The two have signed an agreement where the IPPs purchase steam from GDC for power generation.
8. Local community to be prioritized when employing skilled and unskilled labour during the construction and operation phases of the project. Unskilled labour should not be sought from outside the project area.	The ESIA study report will recommend to the Contractors and Quantum to prioritize the local community when employing unskilled labour.
9. The Consultant should organize meetings with neighbouring communities after completion of the ESIA study to educate them on the outcome of the study and how the community will be impacted by the project and mitigation measures put in place to avoid or minimize the impacts.	A disclosure workshop will be organized in Nakuru after the approval of the ESIA study report where key stakeholders will be invited.
10. A nominated Senator present at the meeting informed the attendants that there is a new law (Natural Resources Sharing Bill) being debated in the Kenyan Senate which will ensure benefits from the exploitation of natural resources are shared with the local communities through a signed agreement.	
11. A local leader advised the community as a way forward to avoid being left behind was to organize themselves and set up special committees to make follow on the development in Menengai on technical, legal and socio-economic issues.	
12. A community member wanted to know the project size in comparison to Olkaria.	Olkaria has several power plants with a higher capacity compared to the three to be constructed in Menengai.
13. Local community involvement prior to commencement of the project was welcomed as a right step.	The public meeting was one of the avenues of involving the local community prior to commencement of the construction phase of the project.
14. The ESIA Study report should be disclosed at the local level for the community to enable discussion and debate by the project beneficiaries and affected persons.	A disclosure workshop will be organized in Nakuru after the approval of the ESIA study report where key stakeholders will be invited.

Signed as true record of the meeting

Chief Patrick Mbugua
Kampi ya Moto Location

Sign_____

Stamp

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY PUBLIC MEETING FOR KAMPI YA MOTO | MOROP | **VENUE** G.D.C FARM KABARAK **DATE** 30/10/2014

NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE
JOSHUA KANDIE	MOROP/RAFIKI	ELDER	0723703666	[signature]
STEPHEN KARIUKI	JACK EVANS	ELDER	0719673883	[signature]
GICHURU JOHN	"	ELDER	0713620102	[signature]
JOB KINYANJUI	"	"	0729608952	[signature]
JOSEPH NJUGI	"		0721646802	[signature]
Charles K. Ngetich	Morop	Elder	0721768989	[signature]
Felix KIPKANIN	MOROP	Elder	0716 765 786	[signature]
William KEITANY	Rafiki	ELDER	[illegible]	[signature]
PATRICK WANJERU	JACK EVANS		0705248663	[signature]
David [illegible]	[illegible]		0726383342	[signature]
Angeline J. Kiptoo	Morop | Rafiki		0728214052	[signature]
[illegible] K. GIDEON	Morop/Rafiki	Youth	0720 [illegible]	[signature]
TIMOTHY K KOMEN	Morop | Rafiki	Youth	0705954465	[signature]

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY PUBLIC MEETING (KAMPI YA MOTO/ MOROP SUB-LOC) **VENUE** G.D.C FARM SITE KABARAK **DATE** 30/10/2014

NAME	Sublocation ORGANIZATION/Location	DESIGNATION	MOBILE NO.	SIGNATURE
SHAGEES ASZIED	Lowling Farm	MANAGER	0735780058	[signature]
MALCOLM BELL	" "	OWNER	"	
PATRICK W. MBUGUA	CHIEF / K/MOTO	ADMINISTRATION	0722947062	[signature]
JOSEPH GITHIAYA	MOROP	ELDER		Joseph
SUSAN SOI	MOROP	Administration	0725998871	[signature]
DENNIS KIBIWOT	K/moto		0700047365	[signature]
PIUS MITEI	K/Moto	Community	0722114355	[signature]
FELIX KEBENEI	K/moto	Community	0727852150	[signature]
KEVIN K. RUTTO	K/moto	COMMUNITY	0716 338 035	[signature]
ANGELINE J. KIPTOO	K/moto	community	0728214052	[signature]
Susan Chelal	Rafiki	community	0721422570	[signature]
Amos Kiger	K/moto	Community	0724-837715	[signature]
Eric Kimani	K/Moto	Community	0710358559	[signature]

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ACTIVITY PUBLIC MEETING (KAMPI YA MOTO | MOROP) **VENUE** GDC FARM SITE KABARAK **DATE** 30/10/2014

	NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE
1	CHARLES WAMBS	H/M MOROP	H/EVANS	0710-986630	[illegible]
2	Joakim K. Arusei	Nil MOROP	Nil	0724776706	[illegible]
3	John Mwangi	HSC MOROP	H7	0702221611	[illegible]
4	JENIFFER KIMENGICH	Nil MOROP	Nil	0715736415	[illegible]
5	Grace Chebii	N/A MOROP	N/A	0707695800	[illegible]
6	Janet J Kipsang	N/A MOROP	N/A	0721617170	[illegible]
7	EULITA CHEPKURUI	N/A MOROP	N/A	0725808599	[illegible]
8	Teresia Nyambura	N/A MOROP	N/A	0727782350	[illegible]
9	Godfrey Gicheha	N/A TEG	N/A	0722774012	[illegible]

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY PUBLIC MEETING- KAMPI YA MOTO/MOROP **VENUE** GDC FARM KABARAK **DATE** 30/10/2014

NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE
JOSEPH AKUSE	LENGINET		0708520274	
KENETH KIPCHUMBA	MOROP		0720 955 705	
martin k. maina	EX EVAN SCH		0720459220	
PETER NGANGA KIHARA	EX JACK EVANS SCH		0715 298000	
KEVIN . E. RUTO	K/MOTO		0716 338 035	
Mengich L. Elvis	Kaptiki		0727 440 602	

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY PUBLIC MEETING - KAMPI YA MOTO | MOROP **VENUE** GDC FARM KABARAK **DATE** 30/10/2014

NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE
JANE MATHAI	EX JACK EVANS	YOUTH	0713 815 999	
JOYCE BOSIRE	EX JACK EVANS	YOUTH	0714 334 055	
CAROLYNE CHEBET	MOROP	YOUTH	0716 95 4073	
ABIGAEL JEPKIRUI	EX JACK EVANS	YOUTH	0729 574 239	
DAMARIS WANGARE	EX JACK EVANS		0714 761 57	

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE DEVELOPMENT OF 1X30 MW GEOTHERMAL POWER PLANT IN MENENGAI NAKURU COUNTY

ACTIVITY PUBLIC MEETING - KAMPI YA MOTO / MOROP SUB LOCATION **VENUE** GDC FARM KABARAK **DATE** 30/10/2014

NAME	ORGANIZATION	DESIGNATION	MOBILE NO.	SIGNATURE
Alfred Ronch.		Elder.	0729095909	
Veronica N. Mburu	~~Sub~~-K.Y. Moto.	Farmer	0711884755	
Holly .M. Giathi	Kampi ya moto	Farmer	0720 707 599	
Emily Lenduiywa	Rafiki Farm	FARMER	0720292606	
Margaret Chelangat	" "	Youth	0729147002	
Daniel Kihara Wahinya	Jack Evans Scheme	Youth	0711 418706	
Beatrice Towett C.	Lemgerget	Youth	0716 817 469	
Nancy Kibet	Rafiki Farm	Farmer	0722583188	
Kiptum Koibarak	Morop	Hustler/Youth	0700 373 009	
Kenneth Kibet	Morop	Youth	0723920785	
Peter Lekamparish	Morop	Youth	0721130104	
Simon B. Kiplagat	Morop	Youth	0727246389	
Samuel Kandie	morop	Sufferer	0721221817	

STAKEHOLDER CONSULTATION LIST

Appendix III: Vegetation of Menengai

BOT NAME	FAMILY	HABIT	STATUS	HABITAT TYPE	WELL PADS				
					4 & 8	6	1	7	3
Abutilon longicuspe A. Rich.	MALVACEAE	SH	N	T	0	0	0	0	1
Abutilon mauritianum (Jacq) Sweet	MALVACEAE	SH	N	T	0	0	0	0	1
Acacia kirkii Oliv.	MIMOSACEAE	TR	N	T	0	0	0	1	1
Acacia seyal Del.	MIMOSACEAE	TR	N	T	1	1	1	1	1
Acacia xanthophloea Benth.	MIMOSACEAE	TR	N	RR	0	0	0	0	1
Achyranthes aspera LL.	AMARANTHACEAE	EH	N	T	0	0	0	1	1
Agauria salicifolia (Comm. & Lam.) Hook.f. ex Oliv	ERICACEAE	TR	N	T	0	1	1	1	1
Ageratum conyzoides L.	ASTERACEAE	EH	N	T	1	1	0	1	1
Aloe deserti Waud.	ALOACEAE	RSH	N	T	1	1	0	0	0
Amaranthus hybridus L.	AMARANTHACEAE	EH	N	T	0	1	0	0	1
Amaranthus spinosa L.	AMARANTHACEAE	EH	N	T	0	0	1	0	1
Andropogon	POACEAE	G	N	T	1	0	0	0	0
Anthospermum ammannioides S. Moore	RUBIACEAE	SH	N	T	1	1	1	1	1
Antopetitia abyssinica A. Rich	PAPPILIONACEAE	TH	N	T	0	0	0	0	1
Aristida kenyensis Henr.	POACEAE	G	N	T	0	0	0	0	1
Artemisia afra Willd	ASTERACEAE	SH	N	T	0	1	0	1	0
Aspilia mossambiscensis (Oliv) Willd.	ASTERACEAE	SH	N	S/A	1	0	0	0	1
Australina flaccida (A.Rich) Wedd	URTICACEAE	TH	N	T	0	0	0	0	1
Bidens buchneri (Klatt) Sherff	ASTERACEAE	SH	N	T	0	0	0	1	0
Bidens pilosa L.	ASTERACEAE	EH	N	T	1	0	1	0	1
Bothriochloa insculpta (A. Rich) A. Camis	POACEAE	G	N	T	0	1	0	1	0
Bromus unioloides (Willd.) Rasp	POACEAE	G	N	T	0	0	0	1	0
Buddleia polystachya Fres	LOGANIACEAE	SH/TR	N	T	0	0	0	1	0
Chamaecrista hildebrandtii (Vatke) Lock.	CAESALPINIACEAE	DSH	N	T	0	1	0	1	0
Chamaecrista usambarensis	CAESALPINIACEAE	DSH	N	T	0	0	0	0	1
Chenopodium album L.	CHENOPODIACEAE	EH	N	T	0	0	0	0	1
Chenopodium ambrosioides L.	CHENOPODIACEAE	EH	N	T	1	1	1	1	1
Chenopodium carinatum R. Br.	CHENOPODIACEAE	PH	N	T	1	1	1	1	0
Chloris gayana Kunth	POACEAE	G	N	T	0	0	0	1	0
Chloris pycnothrix Trin	POACEAE	G	N	T	1	1	1	1	1
Cirsium vulgare (savi) Ten	ASTERACEAE	EH/SH	N	T	0	0	1	0	0
Clematis simensis Fres	RANUNCULACEAE	CL	N	T	0	0	0	0	1
Clerodendrum myricoides(Hochst) Vatke	LAMIACEAE	SH	N	T	0	0	0	1	0
Clutia abyssinica Jaub & Spash	EUPHORBIACEAE	SH	N	T	1	0	0	1	1
Clutia lanceolata Hochst	EUPHORBIACEAE	SH	N	T	1	0	0	0	0
Combretum molle G. Don	COMBRETACEAE	TR	N	T	0	0	0	0	1
Commelina africana L.	COMMELINACEAE	SCH	N	T	1	0	1	1	1

BOT NAME	FAMILY	HABIT	STATUS	HABITAT TYPE	WELL PADS				
					4 & 8	6	1	7	3
Commelina beghalensis L.	COMMELINACEAE	SCH	N	T	0	0	0	0	1
Conyza floribunda H.B.K.	ASTERACEAE	EH	N	T	1	1	1	1	1
Conyza hochstetteri Sch. Bip ex A. Rich	ASTERACEAE	EH	N	T	1	0	0	1	0
Conyza newii Oli & Hiern	ASTERACEAE	SH	N	T	1	1	0	1	1
Conyza schimperi A. Rich	POLYGALACEAE	EH	N	T	0	1	1	1	0
Conyza stricta Willd.	ASTERACEAE	EH	N	T	0	0	0	1	0
Conyza subscaposa O. Hoffm	ASTERACEAE	EH	N	T	0	1	0	0	0
Crassocephalum montuosum (S. Moore) Milne-Redh	ASTERACEAE	EH	N	T	1	0	0	0	0
Crassocephalum picridifolium (Dic.) S. Moore	ASTERACEAE	EH	N	T	0	0	0	1	0
Crassocephalum rubens (Jacq) S. Moore	ASTERACEAE	EH	N	T	0	1	1	1	0
Crassula alba Forsk	CRASSULACEAE	PH	N	T	0	0	1	0	0
Crotalaria agatiflora Schweinf.	PAPPILIONACEAE	SH	N	T	0	0	0	1	0
Crotalaria brevidens Benth	PAPPILIONACEAE	SH	N	T	1	1	1	0	0
Crotalaria incana L.	PAPPILIONACEAE	DSH	N	T	0	1	0	1	0
Crotalaria laburnifolia L.	PAPPILIONACEAE	SH	N	T	1	0	0	1	1
Crotalaria polysperma Kotschy	PAPPILIONACEAE	DSH	N	T	0	0	0	1	0
Cucumis figarei Naud.	CUCURBITACEAE	CL/CR	N	T	0	1	1	0	0
Cussonia holstii A. Rich	ARALIACEAE	TR	N	T	0	0	0	1	1
Cymbopogon nardus (L.) Rendle	POACEAE	G	N	T	1	1	0	1	1
Cynodon nlemfluensis Vanderyst	POACEAE	G	N	T	0	1	1	0	1
Cyperus rigidifolius Steud	CYPERACEAE	SD	N	A	0	0	0	1	0
Cyphostemma adenocaule (A. Rich) Willd & Drum	VITACEAE	CL	N	T	0	0	0	0	1
Cyphostemma junceum (Webb.) Descoign	VITACEAE	CR	N	T	0	0	0	0	1
Cyphostemma maranguense (Gilg.) Descoign	VITACEAE	EH	N	T	0	1	1	0	0
Dactyloctenium aegyptium (L.) Willd	POACEAE	G	N	T	0	0	1	0	0
Datura stramonium L.	SOLANACEAE	EH	N	T	1	1	0	0	1
Delonix elata (L.) Gamble	CAESALPINIACEAE	TR	N	T	0	0	0	1	0
Dichrocephala integrifolia O. Kuntze	ASTERACEAE	EH	N	T	0	0	0	0	1
Digitaria abyssinica (A. Rich) Stapf	POACEAE	G	N	T	0	0	0	0	1
Digitaria diagonalis (Nees) Stapf	POACEAE	G	N	T	1	1	0	1	0
Digitaria macroblephala (Hack.) Stapf	POACEAE	G	N	T	1	0	0	0	0
Digitaria scalarum (Schweif.) Chiov	POACEAE	G	N	T	0	1	0	0	0
Digitaria velutina (Forssk.) P. Beauv	POACEAE	G	N	T	1	1	0	1	1
Dioscorea quartiniana A. Rich	DIOSCOREACEAE	CL	N	T	0	0	0	0	1
Diplolophium afficanum Turcz	APIACEAE	RTH	N	T	0	1	0	1	1
Dissotis brazzae Cogn.	MELASTOMATACEAE	DSH	N	T	0	0	0	0	1
Dissotis senegambensis (Giull & Perr) Triana	MELASTOMATACEAE	SH	N	S/A	0	1	0	1	0

BOT NAME	FAMILY	HABIT	STATUS	HABITAT TYPE	WELL PADS				
					4 & 8	6	1	7	3
Dodonea angustifolius L.f.	SAPINDACEAE	SH/TR	N	T	1	1	1	1	1
Dombeya torrida (J.F. Gmel) P. Bamps	STERCULIACEAE	SH/TR	N	T	0	0	0	0	1
Dracaena steudneri Engl.	DRACAENACEAE	TR	N	T	0	0	0	0	1
Dropteris filix-mas (L.) Schott	DRYOPTERIDACEAE	RH	N	T	0	1	0	0	0
Eleucine indica (L.) Gaertn	POACEAE	G	N	T	1	1	0	1	0
Eleucine multiflora A. Rich	POACEAE	G	N	T	0	0	1	0	0
Emilia coccinea (Sims.) Sweet	ASTERACEAE	EH	N	T	1	0	0	0	0
Emillia javanica (Burm f.) Merr	ASTERACEAE	EH	N	T	0	0	0	1	0
Eragrostis chalcantha Trin	POACEAE	G	N	T	1	0	1	1	1
Eragrostis ciliaris (L.) R. Br.	POACEAE	G	N	T	0	1	0	0	0
Eragrostis tenuifolia A. Rich	POACEAE	G	N	T	0	1	0	0	1
Erica arborea L.	ERICACEAE	SH	N	T	1	1	0	1	1
Eriosaema shirense Bak. f.	PAPPILIONACEAE	SH	N	T	0	0	0	1	0
Erythrina abyssinica DC.	PAPPILIONACEAE	TR	N	T	0	0	0	1	0
Euclea divinorum Hiern	EBERNACEAE	SH/TR	N	T	0	0	0	0	1
Euphorbia candelabrum Kotschy	EUPHORBIACEAE	TR	N	T	0	0	0	0	1
Euphorbia prostrata Ait.	EUPHORBIACEAE	RTH	N	T	0	1	0	0	0
Exotheca abyssinica (A. Rich) Anders	POACEAE	G	N	T	0	0	0	1	0
Ficus natalensis Hochst.	MORACEAE	TR	N	T	0	0	0	0	1
Ficus sycomorus L.	MORACEAE	TR	N	RR	1	0	0	0	0
Ficus thoningii Bl.	MORACEAE	TR	N	T	0	0	0	0	1
Fuerstia africana T.C.E Fr.	LAMIACEAE	DSH	N	T	0	0	0	0	1
Gadiolus newii Bak.	IRIDACEAE	RH	N	T	0	1	1	0	0
Galinsoga parviflora L.	ASTERACEAE	EH	N	T	1	1	1	1	1
Galium scioanum Chiov.	RUBIACEAE	CR	N	T	0	0	0	0	1
Geranium ellamellatum Kokwaro	GERANIACEAE	PH	N	T	1	0	0	0	1
Geranium ocellatum Cambess	GERANIACEAE	RTH	N	T	0	0	0	1	1
Girardinia diversifolia (Link.) Friis	URTICACEAE	EH	N	T	0	0	0	0	1
Gnaphalium luteo-album L.	ASTERACEAE	EH	N	T	1	1	1	0	0
Gomphorcarpus fruticosus (L.) Ait f.	VITACEAE	SH	N	T	0	1	0	1	0
Grevillea robusta A. Cunn ex R. Br	PROTEACEAE	TR	E	T	1	0	0	1	1
Grewia similis K. Schum	TILIACEAE	TR	N	T	0	0	0	0	1
Gutenbergia cordifolia Benth ex Oliv	ASTERACEAE	SH	N	T	1	0	0	0	1
Harpachne schimperi A. Rich	POACEAE	G	N	T	0	0	1	0	0
Hebenstretia angolensis Rolfe	SCROPHULARIACEAE	EH	N	T	1	0	0	0	1
Helichrysum forskahlii (J.F. Gmel) Hilliard & Burt	ASTERACEAE	EH	N	T	1	1	0	0	0
Helichrysum globosum Sch. Bip	ASTERACEAE	EH	N	T	0	0	0	0	1
Helichrysum nandense S. Moore	ASTERACEAE	SH	N	T	0	1	0	0	0
Helichrysum odoratissimum (L.) Less	ASTERACEAE	RTH	N	T	0	0	1	0	0

BOT NAME	FAMILY	HABIT	STATUS	HABITAT TYPE	WELL PADS				
					4 & 8	6	1	7	3
Helinus myrstacinus (Ait.) Steud	RHAMNACEAE	CL/L	N	T	0	0	0	0	1
Heteromorpha trifoliata (Wendl.) Eckyl & Zeyh	APIACEAE	TR	N	T	1	0	0	1	1
Hibiscus canabinus L.	MALVACEAE	SH	N	T	1	1	0	1	0
Hibiscus diversifolius Jacq.	MALVACEAE	SH	N	T	0	1	0	1	1
Hirpicium diffusum (O.Hoffm) Roess	ASTERACEAE	PH	N	T	0	0	0	0	1
Hymenodictyon floribundum Hochst & steudel	RUBIACEAE	TR	N	T	1	0	0	0	1
Hyparrhenia filipendula (Hochst) Stapf.	POACEAE	G	N	T	0	0	0	0	1
Hyparrhenia hirta (L.) Stapf	POACEAE	G	N	T	0	0	1	0	0
Hyparrhenia rufa (Nees) Stapf.	POACEAE	G	N	T	1	1	1	1	1
Impatiens tinctoria A. Rich	MENISPERMACEAE	SH/EH	N	T	1	0	0	0	0
Indigofera homblei Bak f. & Martin	PAPPILIONACEAE	DSH	N	T	0	1	0	0	0
Indigofera volkensii Taub.	PAPPILIONACEAE	DSH	N	T	0	0	0	0	1
Ipomoea wightii (Wall.) Choisy	CONVOLVULACEAE	CL	N	T	0	0	0	0	1
Juniperus procera Endl.	CUPRESSACEAE	TR	N	T	1	0	0	0	1
Lagenaria abyssinica Hook. f.	CUCURBITACEAE	CL	N	T	0	0	0	1	0
Laggera brevipes Oliv & Hiern	ASTERACEAE	SH	N	T	1	0	0	1	1
Laggera elatior R.E. Fries	ASTERACEAE	EH/SH	N	T	0	0	0	1	0
Launea cornuta (Oli & Hiern) C. Jeffrey	ASTERACEAE	EH	N	T	0	1	0	0	0
Leonotis ocymifolia (Burm f.) Iwarsson	LAMIACEAE	SH	N	T	1	1	0	0	0
Leucus callostachys Oliv.	LAMIACEAE	SH	N	T	0	0	0	1	0
Leucus martiniscensis (Jacq) Ait. f.	LAMIACEAE	EH	N	T	0	0	0	1	0
Lippia javanica (Burm. f.) Spreng	VERBENACEAE	SH	N	T	0	0	0	1	0
Lippia kituiensis Vatke	VERBENACEAE	SH	N	T	0	0	0	0	1
Lobelia fervens Thunb.	CAMPANULACEAE	EH	N	T	0	1	0	0	0
Loudentia kagerensis (K. Schum) Hutch.	POACEAE	G	N	T	0	1	0	0	1
Lycopersicum esculentum L.	SOLANACEAE	EH	E/C	T	0	0	0	1	0
Malva verticillata L.	MALVACEAE	SH	N	T	1	0	0	0	0
Maytenus senegalensis (Lam.) Exell	CELASTRACEAE	TR/SH	N	T	0	0	0	0	1
Momordica foetida Schummach	CUCURBITACEAE	CL	N	T	0	0	0	0	1
Monsonia angustifolia A. Rich	GERANIACEAE	PH	N	T	1	1	0	0	0
Myrsine africana L.	MYRSINACEAE	SH	N	T	1	1	1	0	1
Nicotiana glauca R. Grah	SOLANACEAE	SH/TR	N	T	0	1	1	0	0
Oldenlandia lancifolia (Schum.) DC.	RUBIACEAE	CR	N	T	1	1	1	1	1
Oldenlandia monanthes(Hochst ex A.Rich) Hiern	RUBIACEAE	CR	N	T	1	1	0	0	0
Olea africana (Mill.) P. Green	OLEACEAE	TR	N	T	1	1	0	0	0
Osteospermum vaillantii (Decne0 T. Norl	ASTERACEAE	EH	N	T	1	1	1	0	1
Osyris lanceolata Hochst & Steudel	SANTALACEAE	TR	N	T	1	1	1	0	1

BOT NAME	FAMILY	HABIT	STATUS	HABITAT TYPE	WELL PADS				
					4 & 8	6	1	7	3
Oxygonum sinuatum (Meissn.) Dammer	POLYGONACEAE	PH	N	T	1	0	0	0	0
Ozoroa insignis Del.	ANACARDIACEAE	TR	N	T	0	0	0	0	1
Panicum maximum Jacq	POACEAE	G	N	T	0	0	0	0	1
Pappea capensis Eckyl & Zeyh	SAPINDACEAE	TR/SH	N	T	0	1	1	0	1
Paspalum scrobiculatum L.	POACEAE	G	N	T	0	0	0	1	0
Pellaea calomelanos (Sw) Link	ADIANTACEAE	PT	N	T	1	0	0	0	0
Pennisetum cladestinum Chiov.	POACEAE	G	N	T	0	1	1	0	0
Pentas longiflora W.R.B. Oliv.	RUBIACEAE	SH	N	T	0	1	0	0	0
Physalis peruviana L.	SOLANACEAE	EH	N	T	0	0	0	0	1
Phytolacca dodecandra L'Herit	PHYTOLACACEAE	L/SH	N	T	0	0	0	0	1
Phytolacca octandra L' Herit	PHYTOLACACEAE	L/SH	N	T	0	1	0	1	1
Pittosporum viridifolia Sims	PITTOSPORACEAE	TR	N	T	0	0	0	1	0
Plectranthus caninus Roth.	POACEAE	SH	N	T	1	0	0	0	0
Podocarpus gracilior Pilger	PODOCARPACEAE	TR	N	T	0	0	0	0	1
Polygala petitiana A. Rich	POLYGALACEAE	CR	N	T	1	0	0	1	1
Polygala sphenoptera Fres	POLYGALACEAE	DSH/CR	N	T	0	1	0	0	0
Polyscius fulva (Hiern.) Harms	ARALIACEAE	TR	N	T	0	0	0	0	1
Protea gaguedi J. F. Gmel	PROTEACEAE	TR	N	T	0	0	0	1	1
Prunus africana (Hook. f.) Kalkm	ROSACEAE	TR	N	T	0	0	0	0	1
Rhus chiridensis Baker f.	ANACARDIACEAE	TR	N	T	1	1	1	0	1
Rhus natalensis Krauss	ANACARDIACEAE	TR	N	T	0	1	0	1	1
Rhus ruspolii Engl.	ANACARDIACEAE	TR	N	T	1	1	1	1	1
Rhynchérytrum roseum (Willd) C.E. Hubbard	POACEAE	G	N	T	1	1	0	1	1
Rhynchérytrum scabridum (K. Schum) Chiov.	POACEAE	G	N	T	0	1	1	0	0
Rhynchosia minima (L.) DC.	PAPPILIONACEAE	CL/CR	N	T	0	0	0	1	0
Richardia braziliensis Gomez	RUBIACEAE	PH	N	T	0	0	0	1	0
Ricinus communis L.	EUPHORBIACEAE	SH	N	T	0	1	0	1	0
Rubia cordifolia L.	RUBIACEAE	CL	N	T	0	1	1	1	0
Rumex usambarensis (Engl.) Damm	POLYGONACEAE	SH	N	T	0	1	1	1	0
Satureia biflora (D. Don) Benth	LAMIACEAE	DSH	N	T	1	1	1	1	1
Satyrium cotiifolium Rolfe	ORCHIDACEAE	RH	N	T	0	1	0	0	0
Schkhuria pinnata (Lam.) O. Kuntze	ASTERACEAE	EH	N	T	1	1	1	1	0
Senecio ruwenzoriensis S. Moore	ASTERACEAE	EH	N	T	1	0	1	1	0
Senecio syringifolia O. Hoffm	ASTERACEAE	L/SH	N	T	0	0	0	0	1
Senna didymobortrya (Fresen.) Irwin & Barneby	CAESALPINIACEAE	SH	N	T	0	0	0	0	1
Setaria pallide-fusca (Schumach) Stapf & Hubbard	POACEAE	G	N	T	0	0	0	0	1
Setaria plicatilis (Hochst.) Engl.	POACEAE	G	N	T	0	0	0	0	1
Setaria sphacellata (Schummach.) Moss	POACEAE	G	N	T	0	0	0	1	0

BOT NAME	FAMILY	HABIT	STATUS	HABITAT TYPE	WELL PADS				
					4 & 8	6	1	7	3
Sida ovata Forsk.	MALVACEAE	DSH	N	T	0	0	0	0	1
Silene burcheli DC.	CAMPANULACEAE	EH	N	T	0	0	0	1	0
Sisymbrium officinale (L.) Scop	BRASSICACEAE	EH	N	T	1	0	1	1	0
Smithia elliotii Bak. f.	PAPPILIONACEAE	CL/CR	N	T	0	0	0	1	0
Solanum incanum L.	SOLANACEAE	SH	N	T	1	0	0	0	0
Solanum nigrum L.	SOLANACEAE	EH	N	T	0	1	1	0	0
Solanum sessilistellatum Bitter	SOLANACEAE	SH	N	T	0	0	0	1	0
Solanum villosum Miller	SOLANACEAE	EH	N	T	0	1	0	0	0
Sonchus asper (L.) Hill	ASTERACEAE	EH	N	T	1	1	1	1	0
Sparmania ricinocarpa (Eckyl & Zeyh) Kuntze	TILIACEAE	SH	N	T	0	0	0	0	1
Sporobolus pyramidalis P. Beauv	POACEAE	G	N	T	0	1	0	0	0
Steganotaenia araliacea Hochst.	APIACEAE	TR	N	T	0	0	0	0	1
Syzygium guineensis (Willd.) DC.	MYRTACEAE	TR	N	T	0	0	0	0	1
Tagetes minuta L.	ASTERACEAE	EH	N	T	1	1	1	1	0
Tarchonanthus comphoratus L:	ASTERACEAE	SH	N	T	1	1	1	1	1
Tephrosia holstii Taub	PAPPILIONACEAE	DSH	N	T	1	0	0	1	0
Tetradenia riparia (Hochst.) Codd.	LAMIACEAE	SH	N	RR	1	1	1	0	0
Themenda triandra Forssk.	POACEAE	G	N	T	0	0	0	0	1
Tinnea aethiopica Hook. f.	LAMIACEAE	SH	N	T	0	0	0	1	1
Torilis arvensis (Huds.) Link	APIACEAE	EH	N	S/A	0	1	0	0	0
Trema orientalis (L.) Blume	ULMACEAE	TR	N	T	1	1	0	0	1
Triticum aestivum L.	POACEAE	G	E/C	T	0	0	0	1	0
Triumfetta rhoboidea Jacq	TILIACEAE	SH	N	T	0	0	0	1	0
Urtica masaica Mildbr.	URTICACEAE	RH	N	T	0	0	0	0	1
Vangueria infausta Burch.	RUBIACEAE	SH/TR	N	T	0	0	0	0	1
Verbena bonariensis L.	VERBENACEAE	EH/SH	N	T	0	0	0	0	1
Vernonia lasiopus O. Hoffm	ASTERACEAE	SH	N	T	0	0	0	1	1
Vigna parkeri Baker	PAPPILIONACEAE	CL	N	T	1	0	0	0	0
Withania somnifera (L.) Dunal	SOLANACEAE	SH	N	T	1	1	1	1	1
Zea mays L.	POACEAE	G	E/C	T	0	0	0	1	0

Appendix IV: Mammals and reptiles of Menengai

FAMILY	COMMON NAME	SCIENTIFIC NAME	HABITAT						
			1	2	3	4 & 8	6	7	WYR B
Mammals									
Cercopithecidae	Olive Baboon	Papio anubis		✓					✓
Procaviidae	Rock hydra	Procavia capensis (Pallas)	✓		✓	✓	✓	✓	✓
Cephalophinae/	Kirks dik dik	Maoqua Kirkii		✓	✓	✓			
Neotraginae	Striped ground squirel	Xerus erythropus		✓					
Sciuridae	African Rabbit	Poelogus marjorita	✓						
Leporidae	Mole-rate	Tachyorycetes spalacinus			✓		✓		
Rhizomyidae	Leopard	Panthera pardus			✓			✓	✓
Felidae	African wild cat	Felis libyca	✓		✓				
Felidae	Striped hyaena	Hyaena Hyaena	✓	✓					
Hyaenidae									
Reptiles									
Agamidae	Red-headed Rock Agama	Agama agama					✓		✓
Agamidae	Elmentaita Rock Agama	Agama calldospina						✓	
Boidae	African Rock Python	Python sebae	✓				✓		
Elapidae	Forest cobra	Naja manoleuca			✓				

Appendix V: Birds of Menengai

Birds of Menengai

FAMILY	COMMON NAME	SCIENTIFIC NAME	HABITAT						
			1	2	3	4& 8	6	7	WYR B
Accipitridae	Black kite	Milvus migrans	✓			✓			
Columbidae	Namaqua Dove	Oena capensis		✓			✓		
Columbidae	Laughing Dove	Streptopelia senegalensis		✓			✓		✓
Columbidae	Red-eyed Dove	Streptopelia senitorqusta		✓			✓	✓	✓
Turdidae	Schalows wheatear	Oenanthe lugubris	✓			✓		✓	
Turdidae	Moutain chat	Pinathochroa sordida	✓	✓	✓	✓	✓		✓
Turdidae	Cliff chat	Thamnolea cinnamomeireatris							✓
Nectariiniidae	Beutiful sunbird	Nectarinia erythrocerca							
Nectariniidae	Malachite sunbird	Nectarinia famosa		✓	✓				✓
Ploceidae	Yellow Bishop	Euplectes capenis	✓	✓	✓	✓	✓	✓	✓
Ploceidae	Red – collared	Euplectes ardens		✓	✓				
Laniidae	widowbird	Lanius collaris	✓	✓					✓
Estrildidae	Common shrike	Lonchura cucullata	✓		✓				✓
Ploceidae	Bronze Mannikin	Eupletes jacksoni							
Turdidae	Jacksons widowbird	Cossypha caffra				✓	✓		✓
Pycnotidae	Robin chat	Pycnotus barbatus	✓	✓		✓	✓		✓
Apodidae	Common bulbul	Apus niansae			✓				✓
Apodidae	Nyanza swift	Apus aequatorialis	✓	✓			✓		✓
Apodidae	Mottled Swift	Apus affinis			✓			✓	
Hirundinidae	Little Swift	Hirunudo fuligula							✓
Hirundinidae	African rock martin	Hirundo angolensis	✓	✓					✓
Coliidae	Angola swallow	Colius striatus	✓	✓					
Picidae	Speckled mousebird	Campethera nubica	✓					✓	
Sturnidae	Nubian woodpeaker	Spreo superbus			✓				✓
	Super starling								

Appendix VI: NEMA licence

Application Reference No: EIA/827

Certificate No: 0000406

For official use

THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT

CERTIFICATE OF VARIATION OF ENVIRONMENTAL IMPACT ASSESSMENT LICENCE

This is to certify that the Environmental Impact Assessment Licence No: **0014205**

Issued on **28th November, 2012** (date) to **Geothermal Development Company.** (name of individual/firm) of **P. O. Box 100746 - 00101, Nairobi.** (address) regarding **Proposed installation of 5-10 MW Modular Geothermal Power Plant** (title of project) whose objective is to **Construction of 10x5-10 MW Modular Geothermal Power Plant.**

(briefly describe purpose) located at **Menengai Caldera, Nakuru County** (locality and district) has been varied to **Change of the Modular Plants installed capacity to 3x30-35 MW.**

(nature of variation) With effect from **2nd October, 2013** (date of variation) in accordance with the provisions of the Act.

Dated this **7th** day of **Oct.** 20 **13**

Signature

(SEAL)

Director General
The National Environment Management Authority

GPK (L)

Application Reference No. EIA/827

Registration No: 0014205

For official use

nema

mazingira yetu | uhai wetu | wajibu wetu

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT LICENSE

This is to certify that the Project Report/Environmental Impact Assessment Study Report received from ~~Geothermal Development Company~~.....(Name of individual/firm) of ~~P. O. Box 17700-20100, Nairobi~~..... (Address) submitted to the National Management Environment Authority (NEMA) in accordance with the Environmental Impact Assessment and Audit Regulations regarding ....**Proposed Installation of 5-10 MWE Modular Geothermal Power Plants at Menengai Drilling Project**.....(title of project) whose objective is to carry on ..... (briefly describe purpose) located at ~~Menengai Caldera, Nakuru County~~.....(locality and district) has been reviewed and a licence is hereby issued for implementation of the project, subject to attached conditions.

Dated this.....**28th**.....Day of .....**Nov 2012**.....

Signature.....

(SEAL)

Director General
The National Environment Management Authority

CONDITIONS OF LICENSE

1. This licence is valid tor a period of.....(time within which the project should commence) from the date hereof.
2. The Director-General shall be notified of any transfer/variation/surrender of this license.

P.T.O.

1.0 General Conditions

1.1 This approval is for the proposed installation of 5-10 modular geothermal power plants at Menengai Drilling Project, costing KShs.637,500,000/=.

1.2 The license shall be valid for 24 months from the date of issue.

1.3 Without prejudice to the other conditions of this license, the proponent shall implement and maintain an environmental management system, organizational structure and allocate resources that are sufficient to achieve compliance with the requirements and conditions of this license.

1.4 The Authority shall take appropriate action against the proponent in the event of breach of any of the conditions stated herein or any contravention to the Environmental Management and Coordination Act, 1999 and regulations therein.

1.5 This license shall not be taken as statutory defence against charges of environmental degradation or pollution in respect of any manner of degradation/pollution not specified herein.

1.6 The proponent shall ensure that records on conditions of licenses/approval and project monitoring and evaluation shall be kept on the project site for inspection by NEMA's Environmental Inspectors.

1.7 The proponent shall submit an Environmental Audit report in the first year of occupation/operations/commissioning to confirm the efficacy and adequacy of the Environmental Management Plan.

1.8 The proponent shall comply with NEMA's improvement orders throughout the project cycle.

1.9 The proponent shall provide the final project accounts (final project costs) on completion of the construction. This should be done prior to project commissioning/operation/occupation.

2.0 Construction Conditions

2.1 The proponent shall put up a project signboard at the project office as per the Ministry of Public Works standards showing the NEMA EIA license number among other details.

2.2 The proponent shall ensure that adequate and appropriate sanitary facilities are provided for the workers during construction phase and that proper decommissioning of the facilities is carried out once construction is complete.

2.3 The proponent shall ensure that the cooling systems fitted have zero ozone depleting potential as per the Environmental Management and Coordination (Controlled Substances) Regulations of 2007.

2.4 In the event that the project site borders a river to a stream, the proponent, pursuant to Regulation 6 (c) of the Water Quality Regulations of 2006, shall protect the riparian reserve by ensuring that **NO** development activity is undertaken within the full width of the river or stream to a minimum of six (6) meters and a maximum of 30 meters on either side, based on the highest recorded flood level.

2.5 The proponent shall ensure that all potentially affected households are fully informed and involved in the development and implementation of the Resettlement Action Plan (RAP).

2.6 The proponent shall ensure that authorization of the Kenya Civil Aviation Authority is acquired before the Lattice Street self-supporting towers are installed.

2.7 The proponent shall obtain a transmission license from Energy Regulatory Commission in accordance with Section 27 of the Energy Act No. 12 of 2006.

2.8 The proponent shall ensure that the transformer plinths are surrounded by bund walls and potential spillages drained into sumps for recovery.

2.9 The proponent shall ensure that adequate surge and lightning protection and mitigation against bird electrocution is incorporated in the construction works.

2.10 The proponent shall ensure that adequate access control measures and safety signage are provided for throughout the project phases.

2.11 The proponent shall ensure that clearing of trees and vegetation for the erection of towers and overhead distribution lines is done as per approvals from the local authority and Kenya Forest Service.

2.12 The proponent shall ensure that the design of the equipment and site comply with the Environmental Health and Safety Policy for the electric power sector.

2.13 The proponent shall ensure that all excavated material and debris is collected, re-used and where need be, disposed off as per the Environmental Management and Coordination (Waste Management) Regulations of 2006.

2.14 The proponent shall ensure strict adherence to the provisions of Environmental Management and Coordination (Noise and Excessive Vibrations Pollution Control) Regulations of 2009.

2.15 The proponent shall ensure strict adherence to the Occupational Safety and Health Act (OSHA), 2007.

2.16 The proponent shall ensure that construction workers are provided with adequate personal protection equipment (PPE) as well as adequate training.

2.17 The proponent shall ensure that construction activities are undertaken during the day (and not at night) between 08.00 hrs and 17.00 hrs; and that transportation of construction material to site are undertaken during off peak hours.

2.18 The proponent shall ensure strict adherence to the Environmental Management Plan developed throughout the project cycle.

2.19 The proponent shall ensure that the development adheres to zoning specifications issued for development of such a project within the jurisdiction of the Municipal Council of Nakuru, with emphasis on approved land use for the area.

3.0 Operational Conditions

3.1 The proponent shall ensure proper signage and containment is maintained throughout the project cycle.

3.2 The proponent shall ensure that all waste water is disposed as per the standards set out in the Environmental Management and Coordination (Water Quality) Regulations of 2006.

3.3 The proponent shall ensure that rain water harvesting facilities are provided to supplement surface and ground water.

3.4 The proponent shall ensure that all drainage facilities are fitted with adequate functional oil water separators and silt traps.

3.5 The proponent shall ensure that appropriate and functional efficient air pollution control mechanisms are installed in the facility to control all air emissions.

3.6 The proponent shall ensure that all equipment used are well maintained in accordance with the Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations of 2009.

3.7 The proponent shall ensure that all solid waste is handled in accordance with the Environmental Management and Coordination (Waste Management) Regulations of 2006.

3.8 The proponent shall ensure that all workers are well protected and trained as per the Occupational Safety and Health Act (OSHA) of 2007.

3.9 The proponent shall comply with the relevant principal laws, by-laws and guidelines issued for development of such a project within the jurisdiction of the Municipal Council of Nakuru, Energy Regulatory Commission, Water Resources Management Authority, Ministry of Public Health and Sanitation, Directorate of Occupational Health and Safety Services, Kenya Civil Aviation Authority, Ministry of Energy, Kenya Forest Service, Kenya Forest Service, Kenya Wildlife Service and other relevant Authorities.

3.10 The proponent shall ensure that environmental protection facilities or measures to prevent pollution and ecological deterioration such as observing and protecting riparian reserves, forest areas and any fragile ecosystems, anti-vibrating devices, taking precautions on electro-magnetic field risks mechanisms are designed, constructed and employed simultaneously with the proposed project.

4.0 Notification Conditions

4.1 The proponent shall notify the Energy Regulatory Commission in writing of any accident or incident causing loss of life, personal injury, explosion, oil spill, fire or any other accidents or incidents as per section 117 (1) of the Energy Act of 2006.

4.2 The proponent shall seek written approval from the Authority for any operational changes under this license.

4.3 The proponent shall ensure that the Authority is notified of any malfunction of any system within 12 hours on the NEMA hotline No. **020 6006041** and mitigation measures put in place.

4.4 The proponent shall keep records of all pollution incidences and notify the Authority within 24 hours.

4.5 The proponent shall notify the Authority in writing of its intent to decommission the facility **three (3) months** in advance.

5.0 Decommissioning Conditions

5.1 The proponent shall ensure that a decommissioning plan is submitted to the Authority fc approval at least three (3) months prior to decommissioning.

5.2 The proponent shall ensure that all pollutants and polluted material is contained and adequat mitigation measures provided during the phase.

Appendix VII: No Objection Letter from NMK

NATIONAL MUSEUMS OF KENYA

WHERE HERITAGE LIVES ON

Ref: NMK/DMSM/STM/01/15

February 16, 2015

Mr. Paul Nguru,
The Director
QPEA GT Menengai Limited,
Apollo Centre, 2nd Floor, Wing A
Ring Road Parklands Westlands,
P.O Box 764 – 00606
Nairobi

Dear Mr. Nguru,

Re: Statement of No Objection – National Museums of Kenya

This is to certify Quantum Power East Africa in their development of a 35MW Geothermal Power Plant in the Menengai Crater in the Central Rift Valley following an archaeological and cultural site visit to assess the potential of the site on the same.

The findings of the visit indicate that the area within which the project is being undertaken has no archaeological objects, cultural or monuments above ground. It is however noted that the site lies in a region that is rich in Later Stone Age sites and there are possibilities that objects of archaeological or cultural interest including human burials may be uncovered during construction. The Developer is therefore requested to pay attention to the Chance Finds Procedures provided in the report to avoid damaging any such resources.

We wish Quantum Power EA success in their undertaking to provide energy to the people of Kenya.

Please find attached the site report and a manual on Chance Finds Procedure.

Yours sincerely,

Dr. Purity Kiura
Ag. Director, Museum Sites and Monuments

Address P.O. Box 40658 00100 GPO Nairobi Telephone 254 20 4448930/3 , 254 20 3742161/4 , 254 20 3742131/4 Fax 254 20 3741424 Website www.museums.or.ke

Appendix VIII: NMK Chance Finds Procedure

NATIONAL MUSEUMS OF KENYA

WHERE HERITAGE LIVES ON

National Museums of Kenya Chance Finds Management Plan

This Chance Finds Procedure defines requirements for the management of archaeological, palaeontological and other cultural deposits, finds and features encountered during construction and development activities in Kenya. The objectives of this document are to provide protocols that will minimize disruption to construction scheduling while promoting the preservation of prehistoric and cultural heritage.

This Procedure is defined in accordance with

- The National Museums and Heritage Act 2006,
- The International Finance Corporation Performance Standard 7 and 8 on Indigenous Communities and Cultural Heritage.
- UNESCO 1972 World Heritage Convention

1. Definitions

Cultural Heritage is defined as:

(i) **Tangible forms of cultural heritage**, such as tangible moveable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values;

(ii) **Unique natural features or tangible objects that embody cultural values**, such as sacred groves, rocks, lakes, and waterfalls; and

(iii) Certain instances of **intangible forms of culture** that are proposed to be used for commercial purposes, such as cultural knowledge, innovations, and practices of communities embodying traditional lifestyles.

(iv) Graves and places of burial.

2. Emergency Impact Management Guidelines for Intact or Disturbed Archaeological and Palaeontological Deposits

The following requirements are to be executed in the event that an unrecorded cultural heritage site is discovered during any phase of the Contractor's activities:

- All activity in the vicinity of the find/feature/site will cease immediately.
- The artefact shall not be moved from where it has been found, unless supervised by the on-site NMK advisor.
- The on-site NMK advisor, together with the contractor / project manager, will undertake an inspection of the cultural heritage site.
- The discovered cultural heritage site will be delineated by the on-site cultural/archaeology advisor.
- The on-site NMK advisor will assess, record and photograph the cultural heritage site as per the appropriate Chance Finds Report,
- In consultation with the project manager and Contractor, the onsite NMK advisor will determine the appropriate course of action to take.
- Sensitive sites defined in the Chance Finds Report shall be marked off with hazard tape, detour signs and if necessary the site secured as detailed in the chance finds report. The site will be secured to prevent any damage or loss of removable objects.

Management Options

In consultation with the developer or Project Manager, the following options should be considered when deciding on how to proceed:

- Avoidance through partial or complete project redesign or relocation. This ensures minimal impact to the archaeological site and is the preferred option from a cultural resource management perspective. When feasible, it can also be the least expensive option from a construction perspective. This option is preferred as it will allow the later excavation of the finds with due scientific care and diligence.
- Emergency archaeological excavation, if necessary. This "salvage recovery" option is required where it is not possible to relocate the development project.
- Application of site protection measures, such as erecting fencing or barricades to protect the site, or capping the site area with fill. Appropriate protection measures should be identified on a site –specific basis.

3. Emergency Impact Management for Burial Sites

If definite or possible human remains are encountered:

- Immediately stop construction in the vicinity of the remains.
- Contact the project archaeologist for further guidance

If it is determined that the remains are not archaeological, negotiations will follow to establish an appropriate procedure for handling the remains. An appropriate protocol for handling human remains will require consultation with local communities. A human remains protocol should be established prior to commencement of construction.

Management Options

- Avoidance through partial or complete project redesign or relocation. This would ensure that the remains are protected from further disturbance.
- Salvage or emergency excavation to respectfully remove the remains for reburial in a location chosen by local residents.

Should the developer / contractor encounter archaeological artifacts, fossils or human remains, the form below should be filled for every finding.

Chance Finds Report

Chance Find Report				
Date (xx / xx / 2014)	Time (xx:xx)	Site Name	GPS Coordinates (Northing)	GPS Coordinates (Easting)
Description of Find				
Proximity to Contractor Activity				
Sensitivity				
Vulnerability				
Recommended Action Description				

Site Checklist	Yes / No	Comment
Responsible persons notified		
Coordinates verified		
Site Marked		
Site Secured		
Photograph(s)		

Impacts Assessed		
Actions Agreed		

Authorised Instruction

National Museums Kenya Representative	Position	Signed (Name)
Contractor / Project Manager		**Signed (Name)**

Signed.....18/2/15

Head, Archaeology Section

Appendix IX: Memorandum of Understanding between GDC and KFS

KENYA
Forest Service

GDC Geothermal Development Company
Powering the Vision

MEMORANDUM OF UNDERSTANDING (MOU)

BETWEEN

KENYA FOREST SERVICE

AND

GEOTHERMAL DEVELOPMENT COMPANY LIMITED

ON

GEOTHERMAL RESOURCES DEVELOPMENT AT MENENGAI CRATER FOREST RESERVE

THIS Memorandum of Understanding (MOU) is made this 1st day of June Two Thousand and Eleven between **KENYA FOREST SERVICE**, a body corporate established under the Forests Act No 7 of 2005, of the Laws of the Republic of Kenya, whose address is Kiambu Road, Post Office Box Number 30513-00100, Nairobi in the Republic of Kenya (hereinafter called "the Service") of the one part and **GEOTHERMAL DEVELOPMENT COMPANY LIMITED** a registered entity duly established under the laws of the Republic of Kenya and whose address is Post Office Box Number 100746 -00101, Nairobi (hereinafter called "the Company") of the other part.

WHEREAS

A. The Service is a State corporation established under the Forests Act, 2005 as a body corporate with the overall mandate of ensuring establishment, development and sustainable management, including conservation and rational utilisation of forest resources for the socio-economic development of the country.

B. The Company is 100 % owned by the Government of Kenya and is mandated to promote rapid development of geothermal resources in Kenya through surface exploration and drilling for steam and managing the geothermal reservoir's (where the steam has been harnessed) so as to ensure constant supply of steam for power generation.

C. The Service and the Company agree to co-operate in the development of geothermal Resources, management and conservation of Forest resources.

PURPOSE

This MOU is entered into by the parties to ensure proper co-existence and safeguard the interests of the two parties and therefore it shall operate so long as the need for the parties to work in the same environment and areas exists.

NOW THIS MOU WITNESSETH that it is hereby agreed and declared by and between the parties hereto as follows:-

In this MOU, unless the context otherwise requires:-

'Agent' means a person appointed by the Company or the Service to act on its behalf.

'Company Premises' means all or any part of or portion of Forest that the Service shall by way of sub-lease or otherwise grant to the Company for its use.

'Contractor' means a person contracted by the Company to carry out work or to provide supplies under a specific contract.

'Flora' means all the plants including trees within the Company premises and in the surrounding forest area.

'Fauna' means all animals inhabiting the Company premises and the surrounding forest area.

"Term" means the term of this Memorandum of Understanding.

'Visitor' means one who visits the Company premises, on the Company's invitation or to carry out official business with the Company.

'Forest' means any land declared to be a forest land under the Forest Act, 2005.

ARTICLE 1: ENVIRONMENTAL CONSERVATION

The Service shall regularly create awareness to the staff of the Company on the forest rules and regulations particularly with regard to conservation, proper disposal of waste, and handling of forest visitors by the Company's staff.

1.1 Forest conservation

The impacts on flora will be assessed during development and production of geothermal resources and appropriate mitigation measures undertaken against removal of vegetation in areas to be cleared for roads, buildings and other structures.

AS WITNESSED by the hands of the duly authorized representatives of the parties the day and year first above written

SIGNED by **David .K. Mbugua**
For and on behalf of **KENYA FOREST SERVICES**)
In the presence of: -)
)
)
)
In the presence of)
)
Sam Owino)
Corporation Secretary)
)
MANAGING DIRECTOR)
GEOTHERMAL DEVELOPMENT CO. LTD.)
P. O. Box 100746 - 00101)
NAIROBI, KENYA.)
SIGNED by **Dr. Silas Simiyu**)
For and on behalf of **GEOTHERMAL DEVELOPMENT)**
COMPANY LIMITED)
)
In the presence of)
COMPANY SECRETARY)
GEOTHERMAL DEVELOPMENT CO. LTD.)
P. O. Box 100746 - 00101)
NAIROBI, KENYA.)
Praxidis Saisi)
Company Secretary)
)

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DOCUMENT CONTROL SHEET

FORM MP180 / B

CLIENT: QPEA GT Menengai Limited

PROJECT: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR DEVELOPMENT OF 1 X 30 MW GEOTHERMAL PLANTS IN MENEGAI, KENYA

JOB NO: JK001089

TITLE: FINAL ENVIRONMENTAL AND SOCIAL IMPACT ASSESMENT REPORT

	Prepared by	Reviewed by	Approved by
ORIGINAL	NAME: Aggrey Kwadha	NAME: George Owuor	NAME: Maurice Namiinda
DATE: 27.05.2015	SIGNATURE	SIGNATURE	SIGNATURE
REVISION	NAME	NAME	NAME
DATE	SIGNATURE	SIGNATURE	SIGNATURE
REVISION	NAME	NAME	NAME
DATE	SIGNATURE	SIGNATURE	SIGNATURE
REVISION	NAME	NAME	NAME
DATE	SIGNATURE	SIGNATURE	SIGNATURE

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