
Site report for the assessment of Archaeological resources at a 35MW Geothermal power plant in Menengai Caldera

Prepared for: QPEA GT Menengai
Limited, Apollo Centre, 2nd Floor,
Wing A, Ring Road Parklands
Westlands, P.O Box 764 - 00606,
Nairobi, Kenya

By: Angela Kabiru: National
Museums of Kenya, P.O. box 40658-
00100 Nairobi



Table of contents

Topic	Page
Introduction.....	2
Legislative Framework.....	3
International Guidelines.....	4
Description of project site.....	4
Archaeology: definitions.....	6
Archaeological background.....	6
Field survey and findings.....	7
Mitigations and recommendations.....	8

Introduction

The Geothermal Development Company (GDC) is tasked with accelerating development of geothermal resources to support development of at least 10,000 MW by 2030 in line with Vision 2030. GDC plans to generate electricity using modular geothermal power generation technology from the Menengai Caldera, Nakuru County. Quantum Power East Africa has been contracted to construct one of the 3x 30MW power plants designed for the project.

The construction phase mainly entails construction and installation of the three (3) geothermal modular power plants of 30 MW each, construction of the substations, sump, re-injection well and transmission lines to the various proposed drilling sites. The operation phase consists of power generation and Steam field management, while the decommissioning phase involves dismantling of geothermal modular plants, substation and rehabilitation of the sites and utilizing of low discharge wells as re-injection wells.

An Environmental Impact Assessment was carried out in 2012 and a license to commence development was issued by the National Environment Management Authority (NEMA) in the same year. However, the report did not address potential impacts on Archaeological and other cultural resources that may exist within the area of development. Consequently, impacts on these resources are not mentioned in the Environmental Management Plan drawn up for the project.

The purpose of this report is to bridge that gap to ensure that archaeological and cultural sites and objects are not impacted negatively during the construction phase, in accordance with the National Museums Heritage Act (2009) and International Finance Corporation (IFC) Performance Standard 8.

This Archaeological Heritage Assessment is therefore guided by the following objectives: To

- a. identify and evaluate archaeological and other cultural resources within the project area;
- b. identify and assess all impacts on archaeological and cultural resources which might result from the project; and
- c. recommend viable alternatives for managing unavoidable adverse impacts including a preliminary program for;
 - i. implementing and scheduling impact management actions and, where necessary,
 - ii. conducting surveillance and/or monitoring

This Assessment is carried out in accordance with the National Museums of Kenya (NMK) guidelines for Archaeological and Cultural Impact Assessment in areas proposed for development in Kenya. The methodology includes a desktop study which entails reviewing all the necessary archaeological records for the region and the specific area that is to be affected by the development, a field survey to list all archaeological and historical sites and other monuments in the project area, assess their importance, and the impact of the proposed development on such, and then to produce a report with recommendations indicating whether development is permitted or not, as well as the necessary mitigation options. These may range from total preservation of the site, extensive salvage, test excavations, systematic sampling and auguring, and recommendation for no further work. No development may take place without such clearance.

Legislative Framework

The National Museums and Heritage Act CAP 216 (2006, revised 2009) protects all archaeological and historical cultural heritage objects. These objects of interest include: Antiquities, objects of archaeological or paleontological interest in existence before the year 1800, objects of historical, cultural or scientific interest which came into existence in or after the year 1800, architectural works, inscriptions, cave dwellings, works of humanity including archaeological sites which are of outstanding value from the historical, aesthetic, ethnological or anthropological point of view, and areas of religious significance.

Any object or type of object, whether or not part of an immovable structure, which being of historical or cultural interest has been and remains declared by the Minister under section 25 (1) (d) to be a protected object;

Protected areas are sites which have been declared under sections 25(1) (a), (c) or (f) by the Minister to be protected areas.

An amendment in Subsection (2) (3) Section 47 of the Physical Planning Act states that all regional and development plans shall take into account and record all heritage declared or deemed to have been declared by the Minister under the National Museums and Heritage Act.

International Guidelines

1. The International Finance Corporation (IFC) Performance Standard 8 that recognizes the importance of cultural heritage for current and future generations. This Performance Standard aims to ensure that clients protect cultural heritage in the course of their project activities.

This Performance Standard refers to (i) tangible forms of cultural heritage, such as tangible, moveable or immovable objects, property sites, structures or groups of structures having archaeological (prehistoric), palaeontological, 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.

2. 1972 UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage. This convention defines cultural heritage as monuments, buildings and sites which are of outstanding universal value from a historical, aesthetic, ethnological or anthropological point of view. These include archaeological sites.

Each State Party to this Convention should ensure the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage in its territory, and commits to adopt a general policy which aims to give the cultural and natural heritage a function in the life of the community and to integrate the protection of that heritage into comprehensive planning programmes. State parties are further required to develop scientific and technical studies and research and to work out operating methods as will make the State capable of counteracting the dangers that threaten its cultural or natural heritage, and to take the appropriate legal, scientific, technical, administrative and financial measures necessary for the identification, protection, conservation, presentation and rehabilitation of this heritage.

Description of Project site

The Quantum project site is one of three power plant sites, each measuring 140m by 180m with an access road running along one border in a Western-North Eastern direction. North of this road are two Laydown Areas measuring 100m by 121m each. South of the Power plant areas is the

area marked for a proposed substation connected to the power plants by underground cables. Other access roads already exist around the proposed development area (Fig. 1).



Figure 1: Access roads have already been constructed. The landscape has therefore been modified considerably.

The area is thinly covered with tufts of grass and shrubs, and littered with large boulders of weathered obsidian and pumice.



Figure 2: Obsidian blocks are common at the site.

There are no Physical markers such as a river or cave, and the general area slopes gently towards the south.

Archaeology: definitions

Archaeology is defined as the study of prehistoric peoples and their cultures by study and analysis of their excavated physical remains. An archaeological site is a place in which evidence of past activity is preserved, usually identified by the presence of artifacts, ecofacts or features. Ecofacts are biological materials such as bones and feces that are the result of human activity but are not deliberately modified. Early Stone Age sites are identified by the presence of stone artifacts or fossils; Middle and Later Stone Age sites can be identified by scatters of stone, bone, pottery and beads.

An archaeological artifact is defined as an object that has been intentionally made or modified by human activity. Examples here are stone tools, weapons, or grinding stones or beads. Stone tools differ from place to place depending on availability and chemical composition of raw materials but the most common ones are made from obsidian, quartz, chalcedony, phonolite and rhyolite. Most artifacts are small in size and can be moved from place to place. Features are objects that cannot be moved like the remains of hearths and houses. Others include inscriptions or engravings in a rock shelter, hearths, walls and forts.

Archaeological sites, although usually formed through human-related processes, can be altered by natural, post-depositional factors such as water or wind related activities. This means that artifacts and features may be hidden in the ground and are only accidentally uncovered by human activity. The earliest Archaeological artifacts in Kenya date from about 2.5 million years but fossils may be much older than that.

Archaeological background

No previous archaeological surveys have been carried out in the crater, and therefore no archaeological sites are recorded.

There are however several sites recorded on the map covering this area, Sheet Number 119/1, Series Y731. The sites, named GqJi 1-6 all belong to the Later Stone Age (LSA) with artifacts

such as pottery, stone bowls and stone tools recovered from them. The closest site to the crater, GqJi6 is located about 5 km from northern edge of the crater.

The area south of Menengai crater covered by map Sheet number 119/3 also has LSA sites (GrJi 1-70) with artifacts similar to those mentioned above. This area is interesting because it contains many prehistoric human remains at sites such as Makalia, Bromheads and Nakuru burial sites. The high density of artifacts found in these sites is an indication of intense occupation over long periods of time. It is therefore likely that some form of evidence of human occupation may be present in parts of the crater.

Field Survey and findings

A short field survey was carried out on the 11th February, 2015 to establish whether there are any archaeological sites, monuments or features within the area proposed for development.

No archaeological objects or features were seen on the surface. There are no caves, rock art or fossils at the site. Neither are there objects of historical, cultural, artistic and religious value located on and around the proposed area of development.

None of the obsidian is worked and there is no evidence of human modification on any objects found here. There is however a slight possibility that human remains may be present, as they have been found in similar settings on Mt Suswa. These burials are usually marked with piles of loose stones commonly referred to as cairns.



Figure 3: Human burials are commonly found in such environments. Stone piles should be treated with care.

Mitigations and recommendations

Since no sites are recorded and no artifacts were seen on the proposed development site, no mitigation measures are suggested, and it is recommended that development may go on as planned. However, since the absence of artifacts on the surface does not exclude the possibility existence of artifacts or features buried in the ground, it is also recommended that the developer shall notify the National Museum if any artifacts or bones are uncovered in the course of excavations. This is in accordance with the National Museums of Kenya Chance Finds Procedure which aims to minimize damage to objects accidentally uncovered during the construction phase. The detailed Chance Finds Procedure is attached to this report.

If something is discovered in the course of excavation, the exercise must be stopped to determine whether a rescue operation needs to be carried out. This requires a pause in the construction in the construction and removal of the objects in question and only then can the construction continue. Any questionable objects must be shown to the archaeologist on duty in order to determine its value, and any of the management options outlined in the procedure applied.

Decisions regarding cultural heritage must be consistent with the requirements of IFC Performance Standard 8 and the UNESCO 1972 World Heritage Convention.