ANNEX 3

ARCHAEOLOGICAL IMPACT ASSESSMENT

THE ETHIOPIA-KENYA POWER SYSTEMS INTERCONNECTION PROJECT: REPORT PREPARED FOR GAMMA SYSTEMS LIMITED

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INTRODUCTION:

The archaeological survey reported here was undertaken in the regions of Rift Valley (Kajiado Nakuru, Laikipia and Samburu counties), Central (Nyandarua County) and Eastern (Isiolo, and Marsabit counties) between September 12, 2011 and September 26, 2011.

The purpose the archaeological survey was to:

- 1. Identify archaeological sites and other evidence of past cultural heritage located in the Way leave of the proposed Ethiopia-Kenya Power Systems Power Line.
- 2. Assess the cultural significance of the identified archaeological and other cultural heritage.
- 3. Recommend the appropriate action to be undertaken, if any, to avoid destroying the concerned past cultural heritage.

In order to get a good picture of the results of the archaeological survey, it is necessary to first have a glimpse of the archaeological context and the culture history of the survey area.

Archaeological Context:

The chronological framework for dating archaeological heritage in sub-Saharan Africa (where the survey area lies), is based on two systems:

- The traditional system premised on the Three Age System from which the past is subdivided into the Stone Age, which is sub-divided into the Earlier Stone Age (ESA), Middle Stone Age (MSA) and Later Stone Age (LSA), Bronze Age, and Iron Age that is subdivided into the Early Iron Age (EIA) and the Later Iron Age (LIA). In the survey area, concern is with the Stone Age and Iron Age sites, since there was no Bronze Age in East Africa.
- 2. The J.D Clark System based on lithic (stone) technology is the other system. This was proposed by archaeologist David Phillipson to avoid an 'apparent ambiguity' in the terms Early, Middle, and Late Stone Ages. This alternative terminology is based on a hierarchy of 5 modes of stone technology that were aimed at helping to minimize

artificial divisions of continuous processes of technological and cultural development. Examples of these modes are:

- Mode 1: Comprises simple rudimentary tools representing the earliest culture known as the Oldowan, with the characteristic tool type being the chopper.
- Mode 2: Comprises bifacial tools, e.g., handaxes and cleavers characterizing the second technological phase of humanity, the Acheulian Industrial Complex.
- Mode 3: Constitutes flake tools produced from prepared cores. This correlates with all but the latest phases of the Middle Stone Age.
- Mode 4: Comprises punch-struck blades with steep retouch. This mode comprises technologies developed in some areas of Africa during the final phases of the MSA plus some industries regarded as belonging to the earlier part of the LSA. Such industries are found in some parts of northern and north-eastern Africa. As will be reported later on, sites of this technology were identified in the survey.
- Mode 5: This comprises microlithic components of composite tools. This mode falls in the LSA. Here, there is a reduction in tool size and the resultant tiny tools are hafted, fitted into handles, several at times used as a composite tool. Also, backing retouch was developed and helped to hold the stone inserts in place in their hafts.

Cultural History:

The oldest culture in the world – the **Oldowan Industry** (tools made with mode 1 technology) of the ESA has been found in East Africa, with the oldest sites found in Kenya and Ethiopia. This pioneer culture is represented in the area of concern. One of these early Oldowan sites is **Koobi Fora** in Marsabit County, which dates to between 2.3 and 2.1 million years ago. Archaeological and paleontological evidence suggests that Oldowan tools were made by the first direct ancestor of humans – *Homo ergaster*.

The second major cultural period, represented by the **Acheulian Industry** (used mode 2 technology in stone tool production) of the ESA, is represented in the survey area by sites from Kajiado County. These include **Isinya** along the Athi River-Namanga Road and **Olorgesailie** near Magadi, in addition to **Lewa Downs** in Isiolo County. Olorgesailie has plenty of typical Acheulian stone artifacts – the handaxe and cleaver. Acheulian tools are believed to have been made by *Homo erectus,* who descended from *Homo ergaster*. Acheulian tools are not limited to Africa like their predecessors, the Oldowan. They are also found in Europe and Asia where they are the earliest archaeological evidence of human settlement anywhere outside Africa. This evidence shows that the two regions were occupied by humans after they migrated from Africa. The Acheilian emerged about 1.8 million years ago and lasted until about 200,000 years ago.

The succeeding cultural timespan, **the MSA** (mode 3 and mode 4 technology), whose sites within the research area have been located within the Rift Valley and the adjacent Eastern highlands, emerged around 200,000 years ago and remained in use up to 35,000 YA, and later, in some areas. The MSA sites are located in the Nakuru-Elmenteitan Basin, the slopes of Mt.

Eburru and the Kinangop Plateau, the Nyandarua Range, Nanyuki and the lower slopes of Mt. Kenya. At the site of **Nderit Drift**, in the Elmenteita-Nakuru Basin, in Nakuru County, excavations yielded high concentrations of obsidian artifacts and many bone fragments. The artifacts comprise scraper points, bifacial pieces, and grooving and piercing pieces. The most important artifact, however, was **the** leaf-shaped spear point. The MSA industries were the product of fully developed modern humans – *Homo sapiens sapiens*.

The assemblage from Kinangop Plateau in Nyandarua County is dominated by small tanged and leaf-like points, together with scrapers and burins. One of the sites at Kinangop Plateau, the **Cartwright site**, yielded artifacts that could be regarded as being intermediate between the Late Acheulian and the MSA. Projectile points constitute the dominant stone tool types. On the slopes of Mt. Eburru in Nakuru County, is the site of **Prospect Farm**. This site discovered revealed a series of occupation and working floors. The stone industry from this is characterized by scrapers, knives and points that were either bifacially (both sides) or unifacially (one side only) retouched.

LSA industries succeeded the MSA ones, as early as about 40,000 years ago, according to archaeological evidence. Generally, there is no a clear distinction between the LSA and the preceding MSA particularly in stone tool technology. Some LSA retouched artifacts broadly resemble the MSA ones, suggesting evidence for continuity, with a number of assemblages seeming to fall typologically between the two. However, a closer observation reveals that LSA assemblages are generally much smaller, and at least in the better-known later LSA industries (especially those that date later than 20,000 years ago, they are more standardized.

One of the most diagnostic characteristics of the LSA constitutes the technological advances made in stone tool manufacture. There was continuity in the techniques of stone tool manufacture from the preceding MSA period as evidenced by the occurrences of Mode 4 technology in some LSA assemblages. Enkampune Ya Muto archaeological site from Nakuru County, dated to 46,000 years ago is one of the earliest LSA sites. The Lower Eburran is a lithic industry representing earlier periods of the LSA. This is a **backed blade industrial tradition of Mode 4 technology** based on the production of fine **punch-struck blades**. In the areas where they occur, sites of this industrial tradition largely predate a fully developed mode 5 Technology. A good example of these mode 4 industries in the survey area is the Lower Eburran in the Rift Valley of Kenya (formerly known as the **'Lower Kenya Capsian'**). This industry is best represented at the site of **Nderit Drift** in Nakuru County where it is dated to around 11,000 years ago at the very end of the Pleistocene. Other sites of the Lower Eburran in the central Rift Valley are **Gambles Cave II**, also in Nakuru County, and **Prospect Farm**, in Nyandarua County, where they been dated to about 10,000 BC (12,000 YA). The Lower Eburran of mode 4 technology appears to have evolved to the Upper Eburran Industry of mode 5 technology.

Ther later part of the LSA period is represented by sites of the **Savanna Pastoral Neolithic (SPN)** and **Elmenteitan** traditions. SPN sites in the survey area include Narosura and Salasun in Narok County, Ndabibi, Nderit and Maringishu in Nakuru County, and North Horr in Marsabit County.

Elmeteitan Tradition archaeological sites include Gambles Cave, Njoro River Cave, Masai Gorge and Ngamuriak, all in Nakuru County.

ARCHAEOLOGICAL SURVEY

The archaeological survey was carried out within and near areas close to the Way Leave of the proposed power line project.

In terms of **methodology**, the survey was carried out through **surface inspection and collection**. This involved field walking to identify archaeological materials lying on the ground surface, especially along footpaths, animal tracks, galleys and other eroded surfaces, at the base of trees, and along river banks. To discover what lay in the sub-surface, road cuttings were observed to see any hanging archaeological materials. Also, to probe what lay underground, a trowel was used to unearth a few inches of top soil to expose the artifacts.

As a result of the archaeological survey, no archaeological materials or other evidence of past cultural heritage were observed in the counties of Kajiado, Laikipia, Isiolo and Marsabit. Nevertheless, from the counties of Nakuru and Nyandarua, 16 archaeological sites reported below, which were previously unknown, were identified. The archaeological materials recovered were in the form of lithic (stone) artifacts made from obsidian (a shiny black glasslike stone).

1. Kiambogo-Longonot

Site: Kiambogo (north of Longonot Shopping Center) on a feeder road towards the Mombasa-Malaba Road

Region: Rift Valley

County: Nakuru

Village/Sub-location: Kiambogo

Specific Location	Latitude (N)	Longitude (E)	Elevation (meters)
	9904744	0220901	2217

Archaeological Findings: Obsidian lithic specimens

Specimen Type	Number	Spit/Level	Distribution
Artifacts	2	surface	Sparse
Flaked pieces	3	surface	Sparse

Debitage	5	surface	Sparse
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Remarks: The notable artifact recovered here was a notched scraper with steep retouch (Fig. 1a on the next page)

Cultural Affiliation: Later Stone Age (Mode 5 industry)

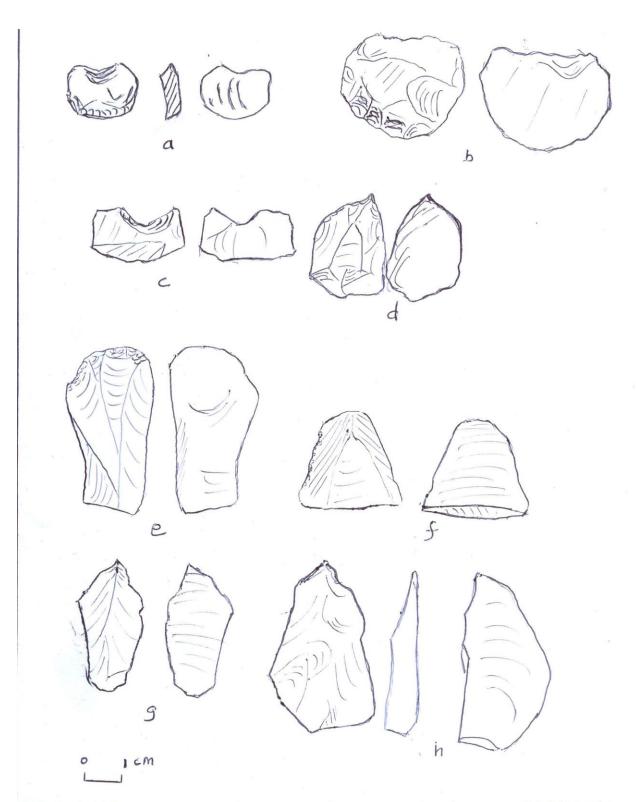


Fig. 1: Lithics; a = notched scraper; b = semi-circular convex scraper; c = notched scraper; d = point; e-f = modified flakes with retouch; g=h = projectile points

2 Nyamathi I

Site: Nyamathi (located between Kiambogo-Longonot and the Mombasa-Malaba Road)

Region: Rift Valley

County: Nakuru

Village/Sub-location: Nyamathi Village

Specific Location:	Latitude (N)	Longitude (E)	Elevation (meters)
	9913598	0220993	2179

Archaeological Findings: Obsidian lithic specimens

Specimen Type	Number	Spit/Level	Distribution
Artifacts	0	surface	Absent
Flaked pieces	2	surface	Sparse
Debitage	4	surface	Sparse

Remarks: The flaked pieces were shaped as tools but do not have wear patterns to suggest they were used as tools.

Cultural Affiliation: Later Stone Age (Mode 5 industry)

3. Nyamathi II

Site: Nyamathi (located between Kiambogo-Longonot and the Mombasa-Malaba Road)

Region: Rift Valley

County: Nakuru

Village/Sub-location: Nyamathi Village

Specific Location	Latitude (N)	Longitude (E)	Elevation (meters)
	9912541	0220993	2179

Archaeological Findings: Obsidian lithic specimens

Specimen Type	Number	Spit	Distribution
Artifacts	1	surface	Sparse
Flaked pieces	6	surface	moderate
Debitage	11	surface	moderate

Remarks: The notable artifact here recovered was semi-circular convex scraper (Fig. 1b). The relatively high umber of flaked pieces and debitage suggests the presence of an obsidian stone tool manufacturing site nearby.

Cultural Affiliation: Later Stone Age (Mode 5 industry)

4. Maguna Shoppinng Center

Site: Maguna Shopping Center (along the Nairobi-Naivasha Highway – Mark point 49)

Region: Rift Valley

County: Nakuru

Village/Sub-location: Maguna

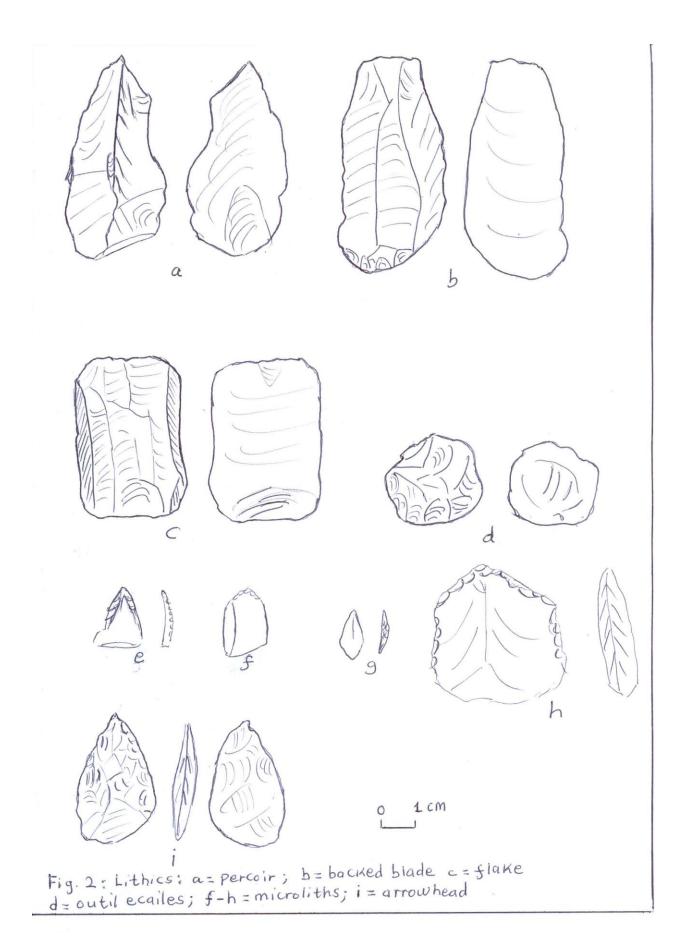
Specific Location	Latitude (N)	Longitude (E)	Elevation (meters)
	9912541	0220993	2179

Archaeological Findings: Obsidian lithic specimens

Specimen Type	Number	Spit	Distribution
Artifacts	7	surface	sparse
Flaked pieces	1	surface	sparse
Debitage	2	surface	sparse

Remarks: Lithic artifacts are dominated by scrapers, which the most notable being the notched scraper (Fig. 1 c). The other notable tool is the point (Fig. 1 d).

Cultural Affiliation: Later Stone Age (Mode 5 industry)



5. Karai Quarry

Site: Karai Quarry (about 1 km northwest of Maguna Shopping center)

Region: Rift Valley

County: Nakuru

Village/Sub-location: Maguna

Specific Location	Latitude (N)	Longitude (E)	Elevation (meters)
	9916324	0221476	2080

Archaeological Findings: Obsidian lithic specimens

Specimen Type	Number	Spit	Distribution
Artifacts	2	Level 1 (subsurface road cutting)	sparse
Flaked pieces	4	0	sparse
Debitage	0	0	sparse

Remarks: Lithic artifacts are dominated by modified flakes with retouch suggesting that they were used as tools (Fig. 1 e and f).

Cultural Affiliation: Later Stone Age (Mode 5 industry)

6. Customer Site - Mairugushu

Site: Customer Site (in Mairugushu Village)

Region: Rift Valley

County: Nakuru

Village/Sub-location: Mairugushu

Specific Location	Latitude (N)	Longitude (E)	Elevation (meters)
	9918483	0222466	2283

Archaeological Findings: Obsidian lithic specimens

Specimen Type	Number	Spit	Distribution
Artifacts	6	surface	moderate
Flaked pieces	6	surface	moderate
Debitage	3	surface	sparse

Remarks: There were 6 projectile points in the toolkit (see example Fig 1 g), which is an interesting feature as it indicates the presence of arrows and or spears, and hence a hunting economy of the human inhabitants.

Cultural Affiliation: Later Stone Age (Mode 5 industry)

7. Kahurugo Village - Karati

Site: Kahurugo Village

Region: Rift Valley

County: Nakuru

Village/Sub-location: Mununga

Specific Location	Latitude (N)	Longitude (E)	Elevation (meters)
	*	*	*

* Surface collections from different spots in the village (Kahurugo) along the Way Leave

Archaeological Findings: Obsidian lithic specimens

Specimen Type	Number	Spit	Distribution
Artifacts	8	surface	sparse
Flaked pieces	5	surface	sparse
Debitage	10	surface	sparse

Remarks: The stone tools from Kahurugo Village are bigger in size compared to those observed from other sites. These include projectile points (Fig. 1 h and i), burins, and backed blades, modified and utilized flakes. These tools were made using different technology (mode 4) from those observed from the above sites.

Cultural Affiliation: Later Stone Age (Mode 4 – Lower Eburran Industry)

8. Light of Hope Childrens' Home I

Site: Light of Hope Childrens' Home (100 meters to the east of the Home).

Region: Rift Valley

County: Nakuru

Village/Sub-location: Mununga

Specific Location	Latitude (N)	Longitude (E)	Elevation (meters)
	9924024	02212827	2210

Archaeological Findings: Obsidian lithic specimens of Mode 4. The tools were found along the road cutting 1.5 meters below the surface.

Specimen Type	Number	Spit/Level	Distribution
Artifacts	13	Sub-surface (1.5 meters)	moderate
Flaked pieces	10	surface	moderate
Debitage	10	surface	moderate

Remarks: This site is interesting in that it is dominated by mode 4 stone artifacts of the lower Eburran Industry (just like the Kahurugo Village Site) and unlike the other sites encountered. The mode 4 artifact types recovered from the side of the road include the *percoir* – a type of point (Fig. 2 a), backed blades (2b), flakes (2 c), and scrapers.

Cultural Affiliation: Later Stone Age (Mode 4 – Lower Eburran Industry)

9. Light of Hope Childrens' Home II

Site: Kahurugo Village

Region: Rift Valley

County: Nakuru

Village/Sub-location: Mununga

Specific Location	Latitude (N)	Longitude (E)	Elevation (meters)
	9922771	0221227	2210

Archaeological Findings: Obsidian lithic specimens of Mode 4. The tools were found along the road cutting 1.5 meters below the surface.

Specimen Type	Number	Spit/Level	Distribution
Artifacts	8	surface	sparse
Flaked pieces	7	surface	sparse
Debitage	10	surface	sparse

Remarks: Lithic tools here include *outil ecailes* (e.g., Fig. 2d) and microlths Fig.2f, g and h), and percoirs, etc. The significance of this site is that it shows that the people of the Lower Eburran stone Industry were succeeded by Later Stone Age people of Mode 5 technology.

Cultural Affiliation: Later Stone Age (Mode 5)

10. Kimbo Primary School

Site: Kimbo Primary School

Region: Central

County: Nyandarua

Village/Sub-location: 100 meters west of Kimbo Primary School on an eroding gulley (on the western edge of the Way Leave)

Specific Location	Latitude (N)	Longitude (E)	Elevation (meters)
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	9942412	0211271	1975
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Archaeological Findings: Obsidian lithic specimens of Mode 4. The tools were found along the road cutting 1.5 meters below the surface.

Specimen Type	Number	Spit/Level	Distribution
Artifacts	6	Sub-surface (1.5 m below along eroding gulley)	sparse
Flaked pieces	5	surface	sparse
Debitage	8	surface	sparse

Remarks: Lithic tools found here include points and scrapers of the Mode 5 technology.

Cultural Affiliation: Later Stone Age (Mode 5)

11. Malewa Ranch

Site: Malewa Ranch

Region: Central

County: Nyandarua

Village/Sub-location: About 1 km southeast of Kamahia Shopping Center

Specific Location	Latitude (N)	Longitude (E)	Elevation (meters)
	9945739	0210810	2028

Archaeological Findings: Obsidian lithic specimens of Mode 5. The tools were collected from the surface.

Specimen Type	Number	Spit/Level	Distribution
Artifacts	15	surface	sparse
Flaked pieces	10	surface	sparse

Debitage	8	surface	sparse
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Remarks: Lithic tools found here include points, convex scrapers, endscrapers, burins and blades. Points are especially predominant in the assemblage.

Cultural Affiliation: Later Stone Age (Mode 5)

12. Kamahia Shopping Center

Site: Kamahia Shopping Center

Region: Central

County: Nyandarua

Village/Sub-location: Lereshwa

Specific Location	Latitude (N)	Longitude (E)	Elevation (meters)
	9949022	0210216	2128

Archaeological Findings: Obsidian lithic specimens of Mode 5 technology collected from the surface along footpath on the northwestern side of the shopping center.

Specimen Type	Number	Spit/Level	Distribution
Artifacts	5	surface	sparse
Flaked pieces	7	surface	sparse
Debitage	2	surface	sparse

Remarks: Points and scrapers were the tool types found here. Lithic tools found here include points, convex scrapers, endscrapers, burins and blades. Points are especially predominant in the assemblage.

Cultural Affiliation: Later Stone Age (Mode5)

13. Lake Olobolosat Secondary School

Site: Lake Olobolosat Secondary School

Region: Central

County: Nyandarua

Village/Location: Northwestern edge of Lake Olobolosat Secondary School

Specific Sub-location	Latitude (N)	Longitude (E)	Elevation (meters)
	99478424	0218936	2338

Archaeological Findings: Obsidian lithic specimens of Mode 4 technology collected from the surface along footpath on the northwestern school fence.

Specimen Type	Number	Spit/Level	Distribution
Artifacts	10	surface	sparse
Flaked pieces	8	surface	sparse
Debitage	3	surface	sparse

Remarks: Ponts and scrapers are the tool types found here.

Cultural Affiliation: Later Stone Age (Mode 5) – Lower Eburran Industry

14. Warukira Shopping Center

Site: Warukira Shopping Center

Region: Central

County: Nyandarua

Village/Sub-location: Northwestern edge of Lake Olobolosat Secondary School

Specific Location	Latitude (N)	Longitude (E)	Elevation (meters)
	9942412	0211271	1975

Archaeological Findings: Obsidian lithic specimens of Mode 4 technology collected from the surface on the roadside.

Specimen Type	Number	Spit/Level	Distribution
Artifacts	3	surface	sparse
Flaked pieces	2	surface	sparse
Debitage	1	surface	sparse

Remarks: All the tools located were points.

Cultural Affiliation: Later Stone Age (Mode 5) – Lower Eburran Industry

15. Ndemi Village

Site: Ndemi Village

Region: Central

County: Nyandarua

Village/Sub-location: Ndemi Village

Specific Location	Latitude (N)	Longitude (E)	Elevation (meters)
	9959977	0212882	2280

Archaeological Findings: Obsidian lithic specimens of Mode 5 technology collected from the surface along footpath.

Specimen Type	Number	Spit/Level	Distribution
Artifacts	10	surface	sparse
Flaked pieces	8	surface	sparse
Debitage	4	surface	sparse

Remarks: Tools located included points, scrapers with steep retouch, outil ecailles and burins.

Cultural Affiliation: Later Stone Age (Mode 5) – Lower Eburran Industry

16. Ndururi Village

Site: Ndururi

Region: Central

County: Nyandarua

Village/Sub-location: Ndaragwa

Specific Location	Latitude (N)	Longitude (E)	Elevation (meters)
	9999129	0226009	2184

Archaeological Findings: Obsidian lithic specimens of Mode 5 technology were collected from the surface along a footpath northwestwards behind the shopping center.

Specimen Type	Number	Spit/Level	Distribution
Artifacts	4	surface	sparse
Flaked pieces	4	surface	sparse
Debitage	2	surface	sparse

Remarks: Tools located included points and scrapers. A spectacular find was an obsidian arrowhead (Fig. 2 i) flaked on all sides, a typical feature of the Later Stone Age hunter-gatherer societies. .

Cultural Affiliation: Later Stone Age (Mode 5) – Lower Eburran Industry

SIGNIFICANCE OF THE SITES IDENTIFIED AND RECOMMEDATIONS

The sites identified are significant in the sense that they confirm that the Rift Valley and Central regions of Kenya were inhabited in the ancient past. Although the archaeological materials recovered from most of these sites are sparsely distributed, they are important in that they show that most of these areas were occupied especially by hunters and gatherers who would have traversed the landscape in search of game.

More importantly is the fact that the survey revealed new sites not known before. Areas around Nyamathi Village near the Mombasa-Malaba Road, Mairugushu, and Light of Hope Childrens' Home in Naivasha counties, which had 'moderate' distribution of obsidian stone tools need to be investigated further for detection of sub-surface archaeological materials and possibly for excavation. It is, therefore, necessary that the results of this survey are put to the knowledge of the concerned authorities – the national Museums of Kenya, and to the public.

This survey **did not encounter any site with an abundant distribution** of archaeological materials within the Way Leave of the proposed power line. Most of those detected were mostly either outside or o the edge of the Way Leave. Also most of such sites had a sparse distribution of the cultural materials. Therefore, there is **no apparent danger of destroying past cultural heritage if the proposed project proceeds**.