

	Committee				
	Local Markets				
	Workplace				
	Basic School				
	High School				
	Farming Land				
	Health Clinic				
	Religious Center				
<b>ACCESS TO UTILITIES</b>					
	<p>B. Portable Water (Choose all applicable)</p> <p>1: Hand-dug well (Private)</p> <p>2: Hand-dug well (Common)</p> <p>3: Pump well (Private)</p> <p>4: Pump well (Common)</p> <p>5: Piped Public Water Supply</p> <p>6: Bought from Vendors (Water Kiosk)</p> <p>7: Other Facilities (Specify)</p> <p>8: Other Natural Water Resources (Specify)</p>				
	<p>C. Toilet Facilities (Choose main one)</p> <p>1: Water-pond Toilet (Private)</p> <p>2: Water-pond Toilet (Common)</p> <p>3: Pit Toilet (Private)</p> <p>4: Pit Toilet (Common)</p> <p>5: Not Available</p>				
	<p>D. Access to Electricity</p> <p>1: Power Line</p> <p>2: Generator (Private)</p> <p>3: Generator (Common)</p> <p>4: Car Battery</p> <p>5: Solar energy</p> <p>6: Others (Specify)</p> <p>7: Not Available</p>				

107	<b>PERCEPTION OF THE PROJECT</b>	
	Explanation on the Project by the Enumerator	
	<p>A. Do you think the Project will provide economic benefit in the area?</p> <p>1: Yes, 2: No, 3: No Comment</p>	

	<p>B. In your opinion, what kind of economic benefit would take place?          (Choose all that apply)</p> <p>1: Wage employment, 2: Business opportunity, 3: Industry establishment,          4: Others (specify)</p>	
--	---	--

108	<p><b>IMPACTS</b></p>	
	<p>A. What social impacts are expected in relation to the wayleave agreement or land acquisition under the Project?          (Choose all applicable)</p> <p>1: Loss of residential building/house          2: Loss of agricultural plots,          3: Loss of crops, trees and fixed assets,          4: Loss of plots/fixed assets for businesses/trading;          5: Loss of businesses/trading activities,          6: Loss of sources of income and livelihoods,          7: Loss of access to working place,          8: Loss of access to public facilities and services          9: Loss of security,          9: Others (Specify)</p>	

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**APPENDIX 9      Maps representing environmental & social  
features traversed by the proposed transmission  
line**

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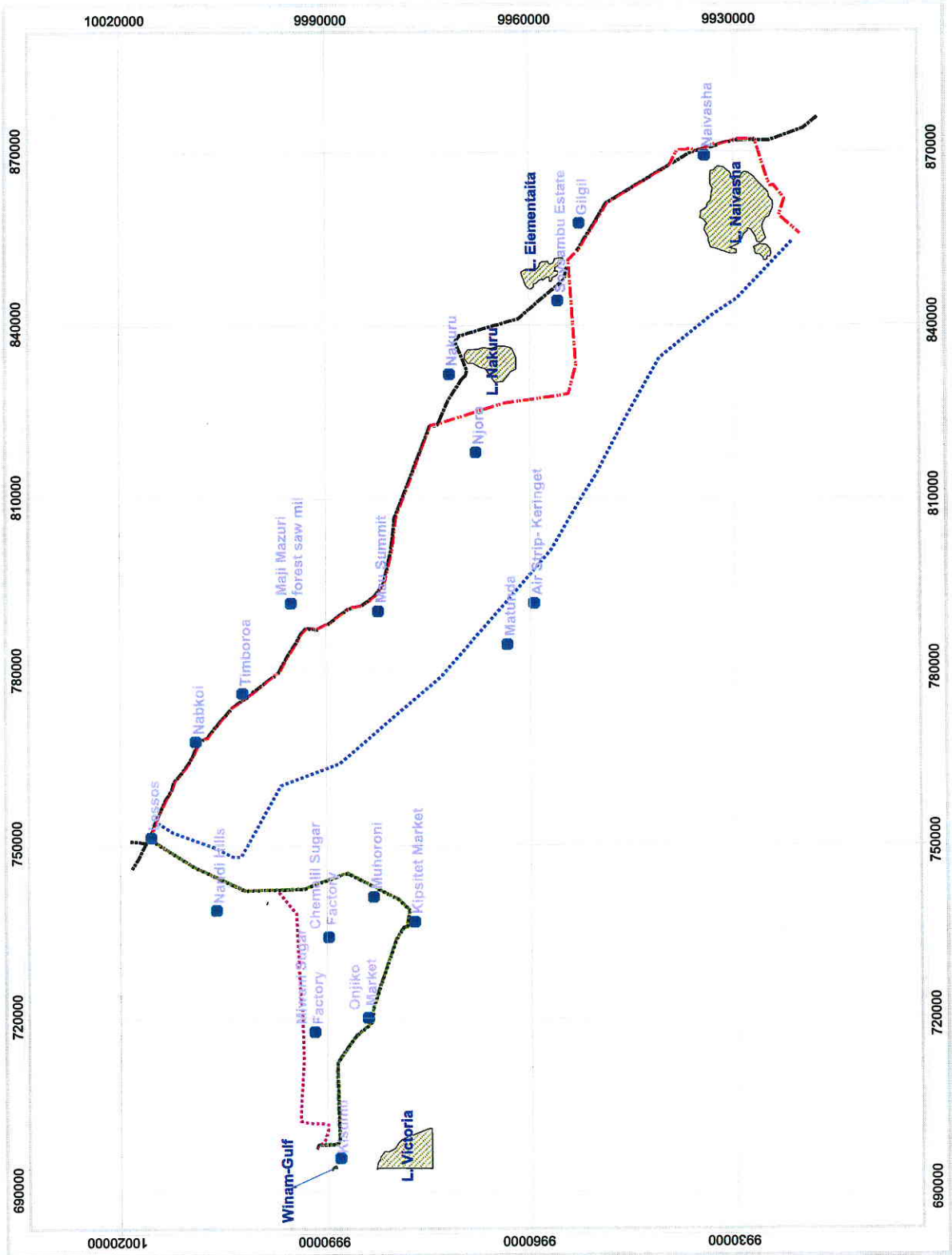
- Appendix 9.1: Transmission lines & lakes
- Appendix 9.2: Settlement along the transmission line
- Appendix 9.3: Transmission lines & river crossings
- Appendix 9.4: Transmission lines and forest cover
- Appendix 9.5: Location of archaeological features
- Appendix 9.6: Location of National Parks near the proposed transmission line

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**APPENDIX 9.1      Transmission lines & lakes**

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# POWER LINES & Lakes



- LEGEND**
- Towns/Market Centres
  - Lake
  - Olkaria\_ Jessos-1.
  - Olkaria\_ Jessos-2.
  - Kisumu\_ Jessos-1.
  - Kisumu\_ Jessos-2.
  - Existing Power line



Grid: UTM 37S  
Datum: Arc1960

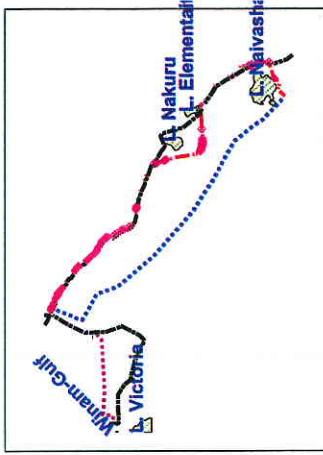
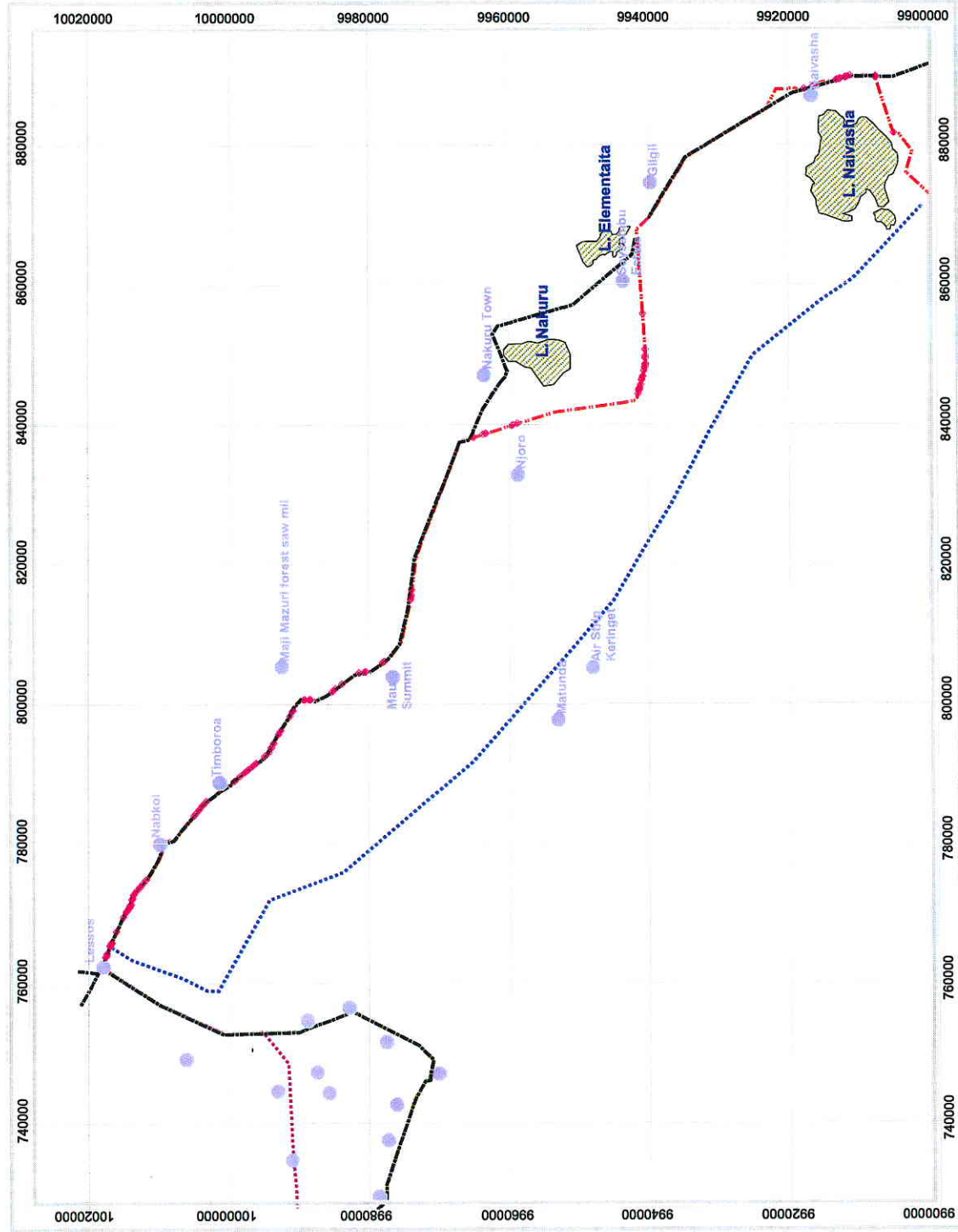


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**APPENDIX 9.2      Settlement along the transmission line**

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# SETTLMENT MAP FOR OLKARIA-LESSOS 1



Olkaria - Lessos 1, Structures :  
 - Wayleave 40m = 169

### LEGEND

- Houses/Structures
- ▨ Lake
- Olkaria\_lessons-1.
- Olkaria\_lessons-2.
- Kisumu\_lessons-1.
- Kisumu\_lessons-2.
- River Crossing
- Town/Market centre
- Existing powerline



Grid: UTM 37S  
 Datum: Arc1960





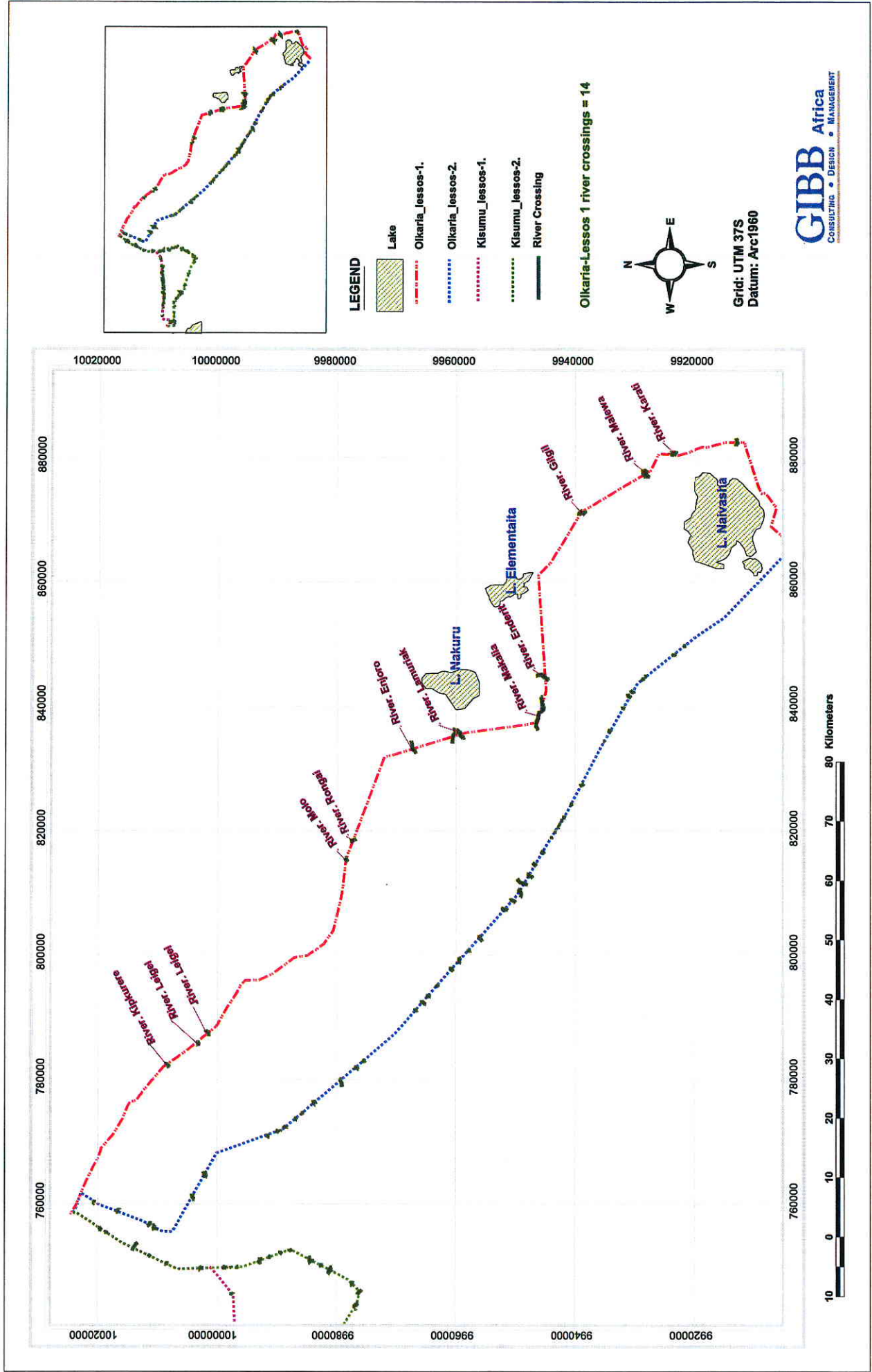
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**APPENDIX 9.3      Transmission lines & river crossings**

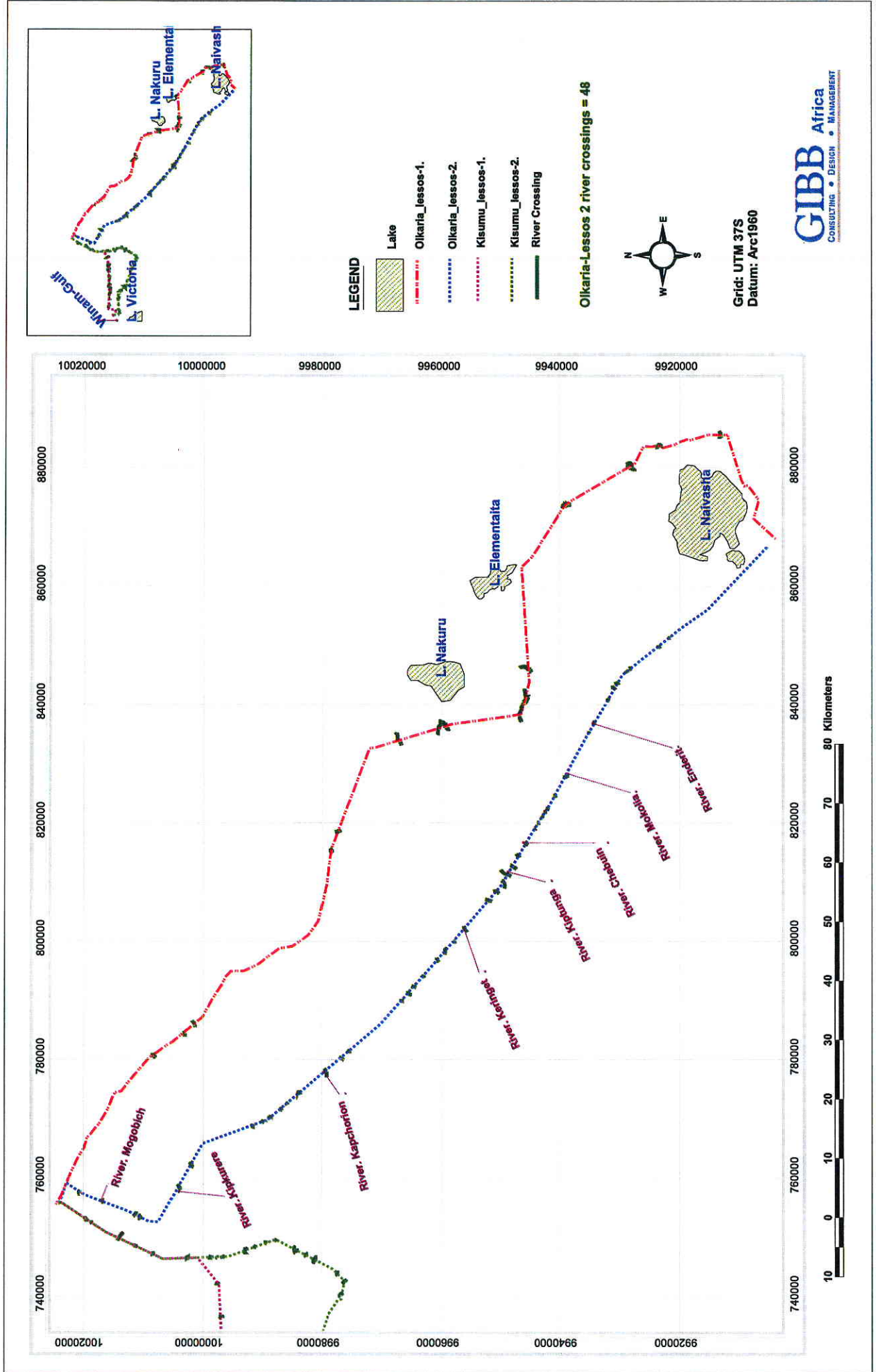
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# POWERLINE -RIVER CROSSINGS (Oikaria-Lessos 1)



# POWERLINE -RIVER CROSSINGS (Oikaria-Lessos 2)

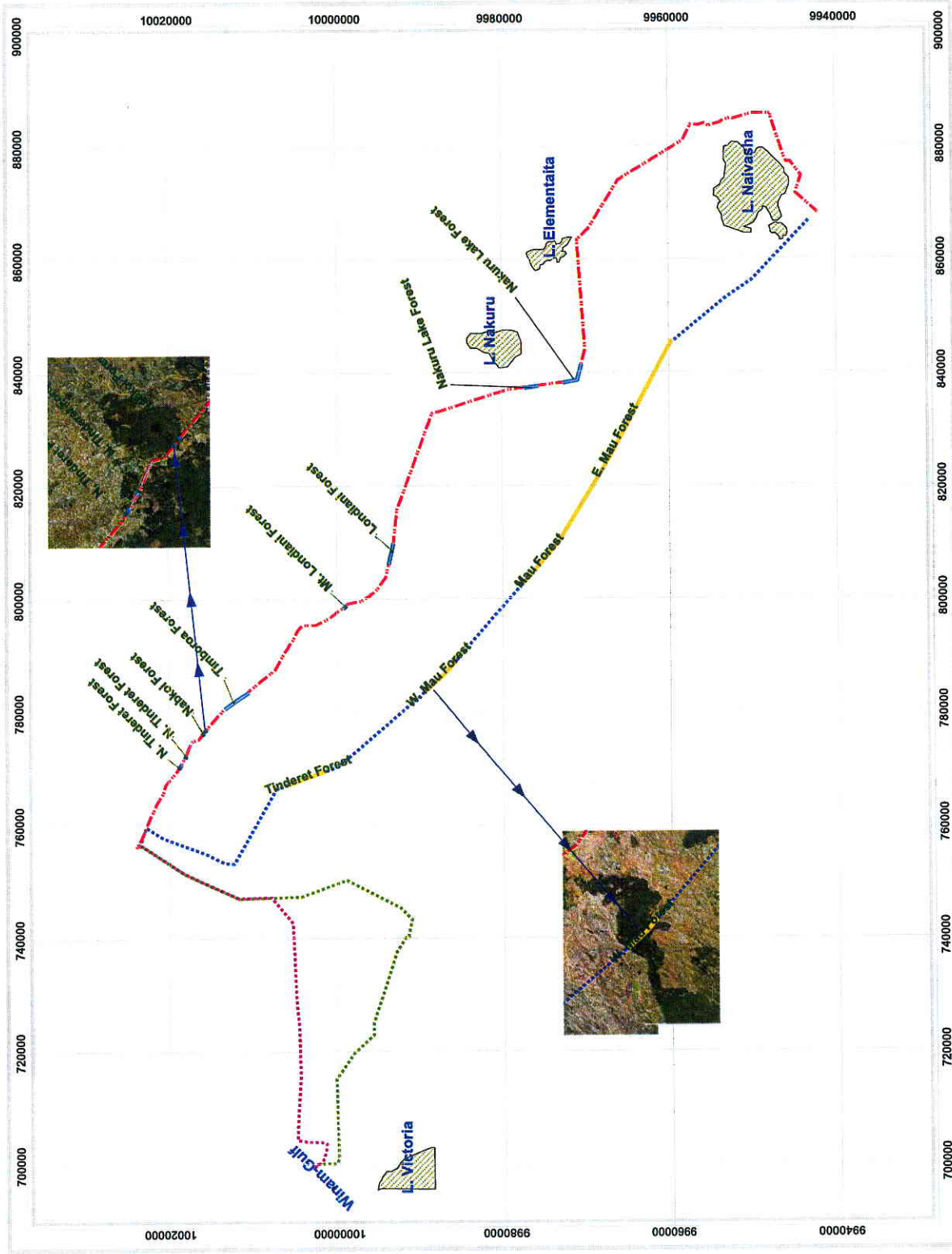


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**APPENDIX 9.4      Transmission lines and forest cover**

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# POWER LINES & FOREST COVER



**Forest Cover Area.**  
 Oikaria-Lessos 1= 113 ha  
 Oikaria-Lessos 2= 327 ha

**LEGEND**

- Power line (oik-lessly 1) through Forest
- Power line (oik-lessly 2) through Forest
- Houses/Structures
- Lake
- Oikaria\_lessly-1.
- Oikaria\_lessly-2.
- Kisumu\_lessly-1.
- Kisumu\_lessly-2.



Grid: UTM 37S  
 Datum: Arc1960

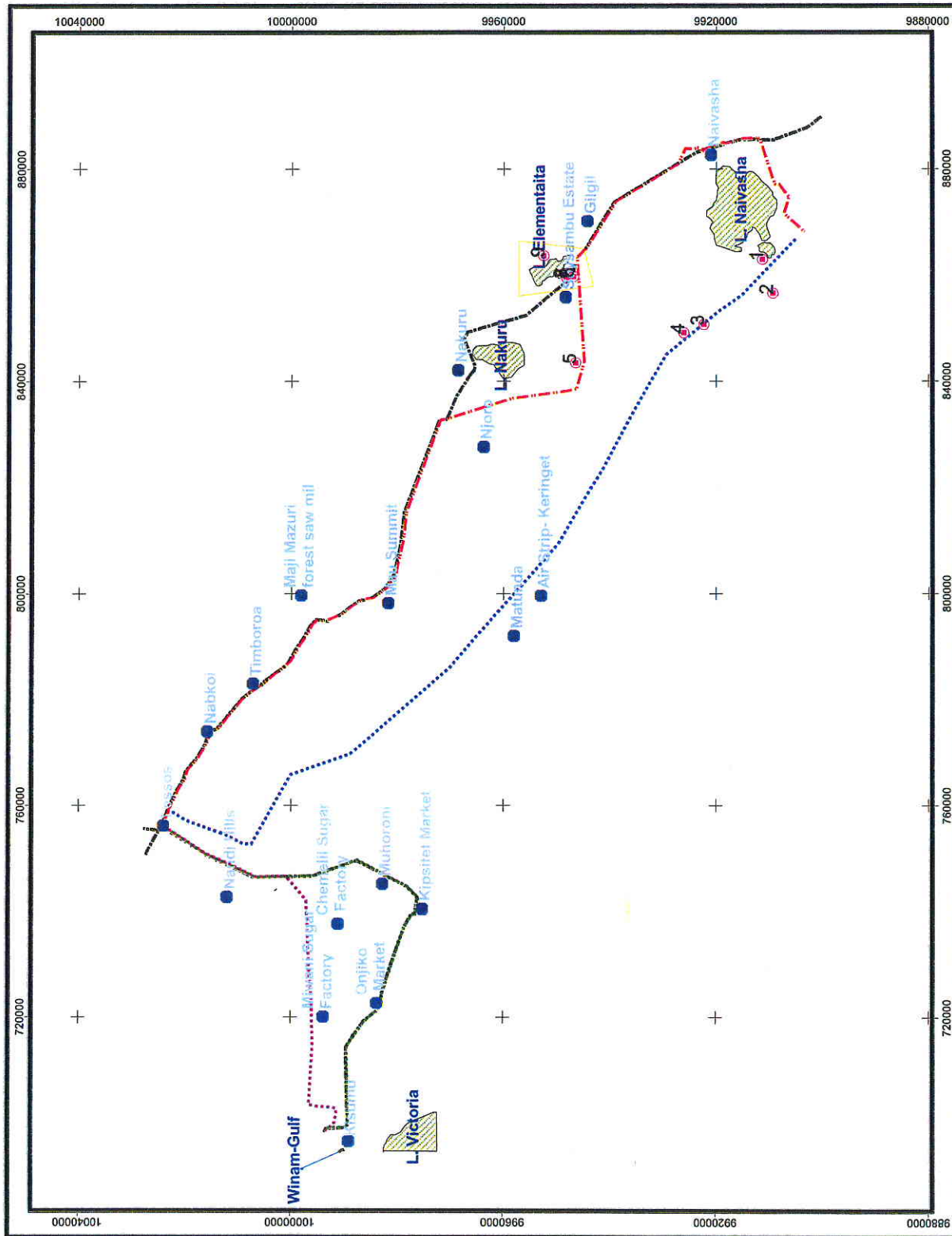


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**APPENDIX 9.5      Location of archaeological features**

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# Location of Archaeological Sites



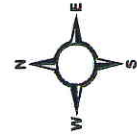
**LEGEND**

- Archaeological sites
  - ..... Olkaria\_lessons-2
  - ..... Kisumu\_lessons-1
- Lake
  - ..... Olkaria\_lessons-1
  - ..... Kisumu\_lessons-2
- Town/Market centre
  - ..... Existing powerline

Distance of archaeological sites from powerline

Site No.	Power line	Distance from powerline (m)
1	Olkaria_lessons-2	1,730
2	Olkaria_lessons-2	4,080
3	Olkaria_lessons-2	215
4	Olkaria_lessons-2	970
5	Olkaria_lessons-1	1,400
6	Existine power Line	290
7	Existine power Line	330
8	Existine power Line	370
9	Existine power Line	6,025

Grid: UTM 37S  
Datum: Arc1960



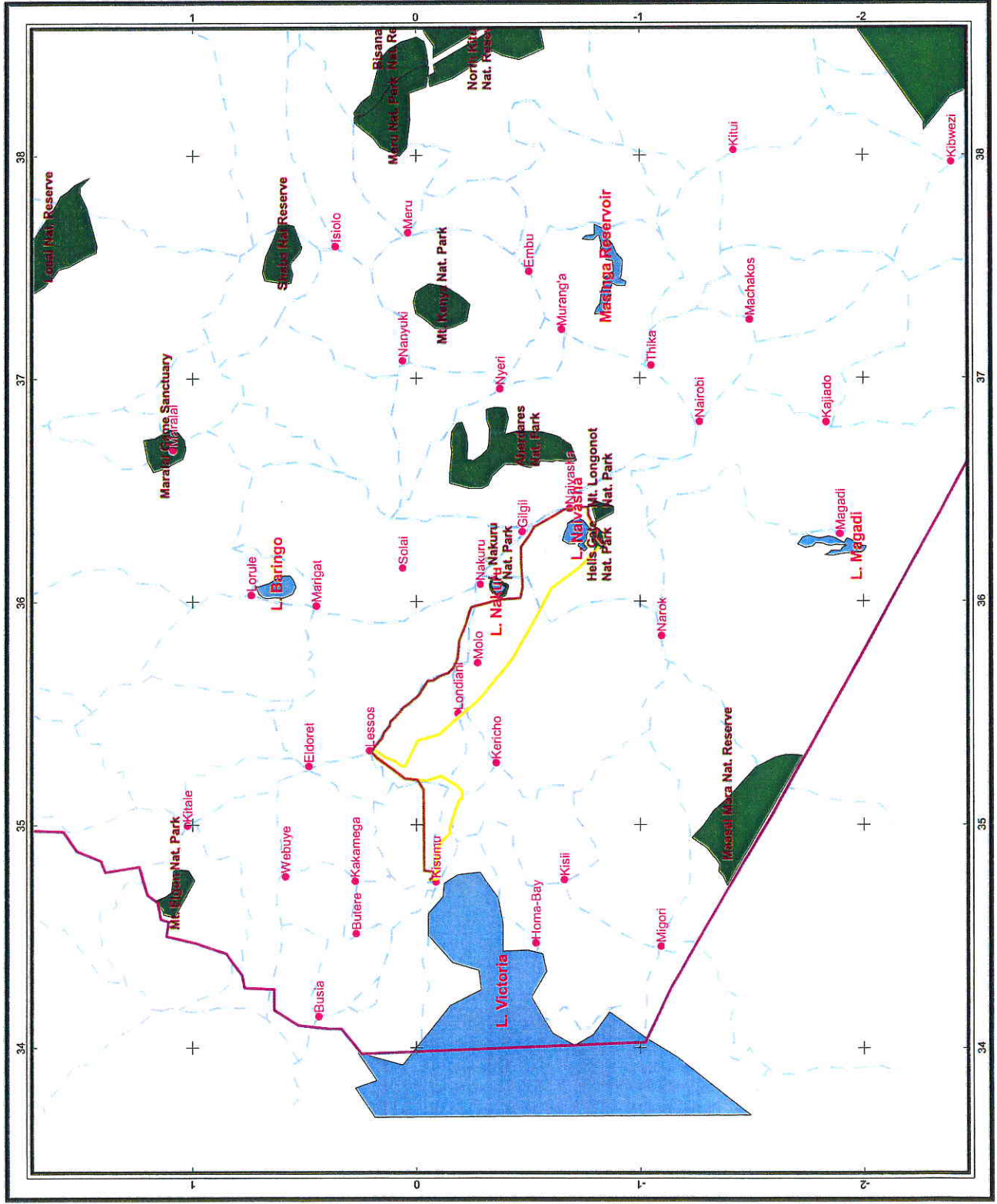


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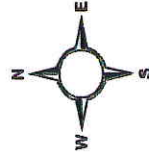
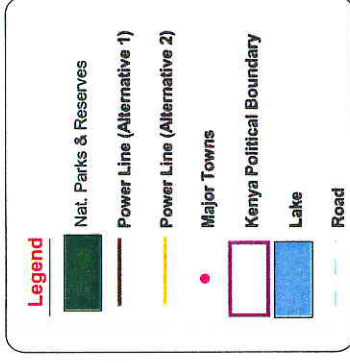
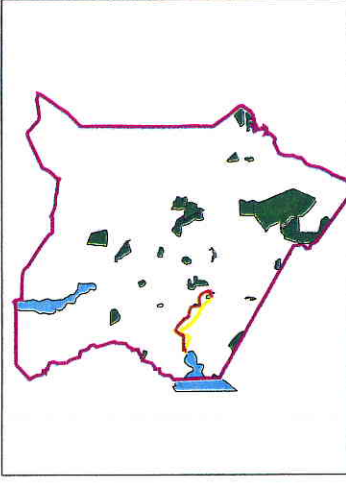
**APPENDIX 9.6      Location of National Parks near the proposed  
transmission line**

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Location of National Parks and Reserves along the Power Transmission Lines.



Map of Kenya showing Nat. Parks & Reserves



Grid: Geographic (Lat/Long)  
Datum: Arc1960

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**APPENDIX 10      Raw Data for Ecological Survey**

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# RAW DATA FOR THE SURVEY OF PLANTS, ANIMALS AND BIRDS

## HELLS GATE-LESSOS- KISUMU POWER LINE

Flora Species (trees, shrubs and grass) encountered nearby the line, and likely to be affected by the new power line

Day 1- 21/ 08/ 2009: Hells gate National Park

- Common Acacia (*Acacia drepanolodius*)
- Brown Acacia (*Acacia xanthophloea*)
- Hottentot tobacco (*Leleshwa*) - *Tarconanthus camphoratus*
- Kangaroo grass -*Hyparrhenia filipenda*
- Bermuda grass (*Cynodon dactylon*)
- Kikuyu grass (*Pennisetum clandestinum*)
- Couch grass (*Digitaria macroblephara*)
- Candelabra tree (*Euphorbia candelabrum*)
- Natal thatching grass (*Hyparrhenia filipendula*)
- *Makhamia lutea*
- *Cassia spectabilis*
- *Cotyledon barbeyi*
- *Tecomaria capensis*
- *Senna didymobotya*
- *Hibiscus fuscus*
- *Hypoestes forskailii*

Flower farms (South Lake road along the existing line, to the Naivasha Substation and KWSTI)

- Common Acacia (*Acacia drepanolodius*)
- *Tarconanthus camphoratus*
- Kangaroo grass -*Hyparrhenia filipenda*
- Bermuda grass (*Cynodon dactylon*)
- Kikuyu grass (*Pennisetum clandestinum*)
- Couch grass (*Digitaria macroblephara*)
- *Cotyledon barbeyi*
- *Tecomaria capensis*
- *Eucalyptus spp*
- *Grevillea robusta*

**Day 2- 22/ 08/ 2009: KWSTI to Prisons, Delamere Estates along to Gilgil highway crossing to Lake Elementeita**

- Brown Acacia (*Acacia xanthophloea*)- Delamere estates
- *Tarconanthus camphoratus*
- Kangaroo grass -*Hyparrhenia filipenda*
- Bermuda grass (*Cynodon dactylon*)
- *Eucalyptus spp*
- *Grevillea robusta*
- Kikuyu grass (*Pennisetum clandestinum*)
- *Cotyledon barbeyi*
- *Tecomaria capensis*
- *Senna didymobotya*
- *Hibiscus fuscus*
- *Hypoestes forskailii*

**Day 3- 23/ 08/ 2009: Elementeita, Pipeline, Edge of Lake Nakuru National Park, Nakuru Lake Forest, Njoro to the Nakuru Eldoret Highway**

- Kikuyu grass (*Pennisetum clandestinum*)
- Couch grass (*Digitaria macroblephara*)
- *Typha domingensis*;
- *Dombeya burgessiae*;
- Candelabra tree (*Euphorbia candelabrum*)
- *Makhamia lutea*
- *Lantana trifolia*
- *Olea capensis*;
- *Prunus Africana*;
- *Albizia gummifera* ;
- *Podocarpus latifolius*;
- *Balanites aegyptica*;
- *Acacia drepanolobium*;
- *Euphorbia candelabra*;
- *Acacia xanthophloea*
- *Cyperus laevigatus*;
- *Eucalyptus saligna*;
- *Grevillea robusta*;
- *Euphorbia candelabrum*;
- *Olea Africana*;
- *Acacia xanthophloea*;
- *Acacia gerrardii*;
- *Acacia hockii*;
- *Acacia seyal*;
- *Acacia xanthophloea*;

- *Cordia ovalis*;
- *Cussonia holstii*;
- *Dombeya burgessiae*;
- *Tarchonanthus camphoratus*
- *Sporobolus spicatus*;
- *Themeda triandra*;
- *Digitaria abyssinica*;
- *Cynodon nlemfuensis*;
- *Chloris gayana*;
- *Hyparrhenia hirta*;
- *Lippia ukambensis*;
- *Lippia javanica*;

**Day 5- 25/08/2009: Rongai, Ngata, Mau Summit, Koibatek Forest, Nabkoi Forest edge, Timboroa line**

- *Cupressus lusitanica*.
- *Juniperus procera*
- *Balanites aegyptica*;
- *Papyrus (Cyperus papyrus)*;
- *Sporobolus spicatus*;
- *Themeda triandra*;
- *Cynodon lemfuensis*;
- *Acacia lahai*
- *Chloris gayana*;
- *Lippia ukambensis*;
- *Lippia javanica*;
- *Lantana trifolia*
- *Cyperus immenses*
- East African doum palm (*Hyphaene compressa*);
- Tamarind (*Tamarindus indica*)
- Sedges (*Cyperus immenses*;
- Cattails (*Typha domingensis*);
- Reeds (*Phragmites mauritanus*;

**Day 6- 26/ 08/ 2009: Lessos- Nandi Hills- Muhoroni Line**

- *Cupressus lusitanica*.
- Sedges (*Cyperus immense*s);
- *Juniperus procera*
- *Strombosia scheffleri*;
- *Acacia lahai*
- *Syzygium guineense*;
- *Neoboutonia macrocalyx*;
- Reeds (*Phragmites mauritanus*;

- *Aningeria adolfi friedericii*;
- *Strombosia scheffleri*;
- *Polyscias kikuyuensis*;
- *Syzygium guineense*;
- *Neoboutonia macrocalyx*;
- *Olea capensis*;
- *Prunus Africana*,
- *Red nongo (Albizia gummifera)*;
- *Yellow wood*;
- *Cuppressus lusitanica*.

**Day 7- 28/ 08/ 2009: Muhoroni- Nandi Escarpment- Kisumu Line (The sugar plantations in Muhoroni, all the way to Kisumu town)**

- *Typha domingensis*
- *Syzygium guineense*;
- *Acacia seyal*
- *Ceratophyllum demersum*
- *Cyperus immensus*
- *Potamogeton spp*
- *Eichhornia crassipes*
- *Neoboutonia macrocalyx*;
- *Euphorbia candelabra*
- *Sedges (Cyperus immense)s*;
- *Reeds (Phragmites mauritianus)*;

**Wild Fauna Species observed during the field session**

**Day 1- 21/ 08/ 2009: Hells gate National Park**

- *Kongoni (Acelaphus buselaphus)*;
- *Thompsons Gazelle (Gazella thomsonii)*;
- *Grants Gazelle (Gazella grantii)*;
- *Impalas (Aecpyceros melampus)*;
- *Dik dik (Rhyncotragus kirkii)*;
- *Warthog*;
- *Waterbuck*

**Day 2- 22/ 08/ 2009: KWSTI to Prisons, Delamere Estates along to Gilgil highway crossing to Lake Elementeita**

- Rothschild's Giraffe (*Giraffa camelopardalis rothschildi*);
- Zebra (*Equus burchelli*);
- Thompson's Gazelle (*Gazelle thomsonii*);
- Impala (*Aecopyceros melampus*);
- Grant's gazelles (*Gazella grantii*)

**Day 3- 23/ 08/ 2009: Elementeita, Pipeline, Edge of Lake Nakuru National Park, Nakuru Lake Forest, Njoro to the Nakuru Eldoret Highway**

- No animals seen on this day.

**Day 5- 25/08/2009: Ngata, Mau Summit, Koibatek Forest, Nabkoi Forest edge, Timboroa line**

- Yellow-backed Duiker *Cephalophus silvicultor*,
- Golden Cat *Felis aurata*
- Mountain Fruit Bat *Stenonycteris lanosus*
- Elephant *Loxodonta africana* – Spoor and dung observed
- Bongo *Tragelaphus euryceros*- Dung observed
- Giant Forest Hog *Hylochoerus meinertzhageni* – Dung observed
- Black-and-white Colobus *Colobus guereza*,
- Blue Monkey *Cercopithecus mitis* and Redtailed
- Monkey *C. ascanius*
- Potto *Perodicticus potto*- Noise heard

**Day 6- 26/ 08/ 2009: Lessos- Nandi Hills- Muhoroni Line**

- No wild animals observed

**Day 7- 28/ 08/ 2009: Muhoroni- Nandi Escarpment- Kisumu Line (The sugar plantations in Muhoroni, all the way to Kisumu town)**

- No animals observed

**Avi-Fauna Species observed during the field session**



**Day 1- 21/ 08/ 2009: Hells gate National Park and surrounding environments**

- Fish Eagle (*Haliaeetus vocifer*);
- Kingfisher (*Alcedo cristata*);
- Sacred ibises (*Threskiornis aethiopicus*);
- Coots (*Fulica cristata*);
- Ducks (*Anas spp*);
- Great Crested Grebe;
- African Darter, Great Egret;
- Saddle - billed stork;
- White-backed Duck;
- Baillon's Crake;
- African Skimmer

**Flower farms (South Lake road along the existing line, to the Naivasha Substation and KWSTI)**

- Mourning Dove;
- Lesser flamingo;
- Jackson's widowbird;
- Pied Avocet;
- Great Egret;
- Greater White pelican;
- Grey-crested Helmet-shrike;
- Greater Crested Grebe;

**Day 2- 22/ 08/ 2009: KWSTI to Prisons, Delamere Estates along to Gilgil highway crossing to Lake Elementeita**

- Greater flamingo;
- Lesser flamingo;
- Pied Avocet;
- Greater White pelican;
- Grey-crested Helmet-shrike;
- Jackson's widowbird;
- Greater Crested Grebe;
- Great Egret;
- Mourning Dove;
- Cattle Egret;
- White-headed Vulture;
- Ayre's Hawk Eagle;
- African Crowned Eagle;
- Martial Eagle;
- Yellow-billed Oxpecker;
- Long-tailed Wild bird.

**Day 3- 23/ 08/ 2009: Elementeita, Pipeline, Edge of Lake Nakuru National Park, Nakuru Lake Forest, Njoro to the Nakuru Eldoret Highway**

- Greater Crested Grebe
- *Mycteria ibis*
- Great Egret;
- *Pelecanus onocrotalus*
- *Bubulcus ibis*
- *Kaliaeetus vocifer*
- Mourning Dove;
- Cattle Egret;

**Day 5- 25/08/2009: Ngata, Mau Summit, Koibatek Forest, Nabkoi Forest edge, Timboroa line**

- *Hartlaub's Turaco*;
- *Hunter's Cisticola*;
- *Jackson's Francolin*;
- *Ayres's Hawk Eagle*;
- *African Crowned Eagle*;
- *African Grass Owl*;
- *Cape Eagle Owl*;
- *Red-chested Owlet*;
- *Least Honey Guide*;
- *Grey-winged Robin*;
- *Purple throated Cuckoo-shrike*.

**Day 6- 26/ 08/ 2009: Lessos- Nandi Hills- Muhoroni Line**

- Yellow-spotted Barbet (*Buccanodon duchaillui*)
- African Shrike-flycatcher (*Megabyas flammulatus*)
- Chestnut Wattle-eye (*Platysteira castanea*)
- Jameson's Wattle-eye (*Platysteira jamesoni*)
- Western Black-headed Oriole (*Oriolus brachyrhynchus*)
- Dusky Tit (*Parus funereus*)
- Olive-green Camaroptera (*Camaroptera chloronota*)
- Ansorge's Greenbul (*Andropadus ansorgei*)
- Plain Greenbul (*Andropadus curvirostris*)
- Uganda Woodland-warbler (*Phylloscopus budongoensis*)
- Turner's Eremomela (*Eremomela turneri*)
- Scaly-breasted Illadopsis (*Illadopsis albipectus*)

**Day 7- 28/ 08/ 2009: Muhoroni- Nandi Escarpment- Kisumu Line (The sugar plantations in Muhoroni, all the way to Kisumu town)**

- White-spotted Flufftail (*Sarothrura pulchra*)
- Red-chested Owlet (*Glaucidium tephronotum*)
- Blue-headed Bee-eater (*Merops muelleri*)
- Black-and-white-casqued Hornbill (*Bycanistes subcylindricus*)
- Yellow-spotted Barbet (*Buccanodon duchaillui*)
- Yellow-billed Barbet (*Trachyphonus purpuratus*)
- Buff-spotted Woodpecker (*Campethera nivosa*)
- African Shrike-flycatcher (*Megabyas flammulatus*)
- Chestnut Wattle-eye (*Platysteira castanea*)
- Jameson's Wattle-eye (*Platysteira jamesoni*)
- Grey-green Bush-shrike (*Malaconotus bocagei*)
- Petit's Cuckooshrike (*Campephaga petiti*)
- Western Black-headed Oriole (*Oriolus brachyrhynchus*)
- Dusky Tit (*Parus funereus*)
- Buff-throated Apalis (*Apalis rufogularis*)
- Olive-green Camaroptera (*Camaroptera chloronota*)
- Ansorge's Greenbul (*Andropadus ansorgei*)
- Plain Greenbul (*Andropadus curvirostris*)
- Honeyguide Greenbul (*Baeopogon indicator*)
- Common Bristlebill (*Bleda syndactylus*)
- Green Hylia (*Hylia prasina*)
- Uganda Woodland-warbler (*Phylloscopus budongoensis*)
- Turner's Eremomela (*Eremomela turneri*)
- Scaly-breasted Illadopsis (*Illadopsis albipectus*)
- White-tailed Ant-thrush (*Neocossyphus poensis*)
- Blue-shouldered Robin-chat (*Cossypha cyanocampter*)
- Green Sunbird (*Anthreptes rectirostris*)
- Green-throated Sunbird (*Nectarinia rubescens*)
- Vieillot's Black Weaver (*Ploceus nigerrimus*)

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**APPENDIX 11**

**Summary on public consultation dates, venues & issues**

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First round	Date	Second Round	Date	Third Round	Date
Kabati area, Naivasha	21.8.09	DCK market centre, Olkaria, Naivasha	28.9.09	Olkaria Sanctuary – South Lake Road, Naivasha	26.10.09
Kayole area, Naivasha	22.8.09	Olkaria Sanctuary – South Lake Road, Naivasha	28.9.09	Kayole 'B' centre, Naivasha	26.10.09
Mitimingi centre, Elementaita	23.8.09	Kayole 'B' centre, Naivasha	4.10.09	Bagaria, Elementaita	27.10.09
Jogoo centre, Elementaita	23.8.09	Mitimingi centre, Elementaita	29.9.09	Telkom-Ngata-Kirobon centre, Nakuru	28.10.09
Karabati centre, Njoro	23.8.09	Jogoo centre, Elementaita	29.9.09	Kamara, Mau Summit	28.10.09
Telkom-Ngata-Kirobon area, Nakuru	25.8.09	Telkom-Ngata-Kirobon centre, Nakuru	30.9.09	Mau Summit Centre	28.10.09
Mau Summit	25.8.09	Mau Summit area	1.10.09	Segufon, Timboroa	29.10.09
Eldama Ravine, Koibatek	24.8.09	Timboroa	1.10.09	Mumberes, Koibatek District	29.10.09
Lessos	29.8.09	Lessos centre	2.10.09	Lessos centre	29.10.09
Nandi Hills	29.8.09	Nandi Hills town centre	2.10.09	Taito Location, Nandi E. District	30.10.09
Kisumu	28.8.09	Kibos village, Miwani Location	3.10.09	Kibos village, Miwani Location	30.10.09
		Mamboleo centre, Kisumu	3.10.09	Mamboleo centre, Kisumu	31.10.09

**ESIA Proposed 220kV Oikaria-Lessos-Kisumu Transmission Line Project**  
**3<sup>rd</sup> Round of Public Consultations**  
**26-31 October 2009 (3<sup>rd</sup> round)**  
**Language: English & Kiswahili**

**SANCTUARY, SOUTH LAKE ROAD, NAIVASHA**

- Exact transmission line route & wayleave size?
- Employment of locals during construction of transmission line e.g. security;
- Destruction of buildings within wayleave
- Positive development of country;
- Land acquisition procedure?
- Concerns on sparks & lightning attraction to existing transmission line during rains;
- Adequate compensation required.

**CSR**

- Education bursaries for children in area;
- Assistance to church in area, which plays key role in aiding vulnerable society members, eg. Orphans;
- Water supply;
- Food aid during current drought.

**KAYOLE AREA, NAIVASHA**

- Exact transmission line route & wayleave size?
- Relocate after completion of new houses;
- Will electricity now be available locally?
- Hold public barazas before project starts, for sensitization;
- Ensure that compensation is fair;
- Most people have Allotment Letters – need information as to whether they will be considered for resettlement & compensation;
- Land acquisition procedure?
- Employment of locals during construction of transmission line;
- Relocate line to move adjacent to dumping site & straight to avoid densely settled area.

**CSR**

- Water provision in area;
- Help in building nursery & primary school;
- Social facility needed such as public hall for meetings;
- Transformers urgently needed in area.

**MITIMINGI & JOGOO CENTRE, ELEMENTAITA**

- Positive development of country;
- Exact transmission line route & wayleave size?
- Loss of sensitive ecological habitats eg forests;
- Employment of locals during construction of transmission line;
- Indiscriminate & non-consultative cutting of trees within wayleave
- Most people have Allotment Letters in Jogoo – need information as to whether they will be considered for resettlement & compensation;
- Will electricity now be available locally?

- Land acquisition procedure?
- Ensure that compensation is fair;
- Hold public barazas before project starts, for sensitization;
- Negative effect on farming activities;
- Farming land greatly reduced.

#### **CSR**

- Assist area electricity committee obtain electricity

#### **BAGARIA, NJORO**

1<sup>st</sup> time public meeting – information on project & public comments/concerns.

#### **NGATA & SALGAA, NAKURU**

- Exact transmission line route & wayleave size?
- Destruction of buildings within wayleave;
- Land acquisition procedure?
- Settlement land greatly reduced;
- Concern about safety of high voltage transmission lines, especially in case of accident;
- Interference with radio & TV broadcasting;
- Vandalism in area of towers.

#### **CSR**

Request for suggestions from community

#### **KAMARA**

1<sup>st</sup> time public meeting – information on project & public comments/concerns.

#### **MAU SUMMIT**

- Concern on demand for land by infrastructure in area, including old transmission line, pipeline, fibre optic cable, & now a new transmission line;
- Exact transmission line route & wayleave size?
- Consider replacing the existing 132kV line with 220kV line, instead of new parallel line;
- Employment of locals during construction of transmission line, including security;
- Indiscriminate & non-consultative cutting of trees within wayleave
- Destruction of buildings within wayleave;
- Will electricity now be available locally?
- Land acquisition procedure?
- Negative effect on farming activities;
- Farming land greatly reduced.

#### **CSR**

Request for suggestions from community

## **TIMBOROA**

- Exact transmission line route wayleave size?
- Change name of proposed substation at Makutano from Timboroa to Makutano substation, or relocate substation to Timboroa area;
- Employment of locals during construction of transmission line;
- Consider risk of landslides at Maji Mazuri, as experienced 3-4 years ago
- Indiscriminate & non-consultative cutting of trees within wayleave
- Will electricity now be available locally, eg Kisorobi village?
- Land acquisition procedure?

## **CSR**

- Rehabilitation of nearby dam

## **MUMBERES**

1<sup>st</sup> time public meeting – information on project & public comments/concerns.

## **CSR**

Request for suggestions from community

## **LESSOS & MBERERE**

- Positive development of country;
- Exact transmission line route?
- Mandatory & fair compensation for property & trees (young & mature) to PAPs (on owner's terms);
- Consider psychological effects/ trauma in compensation planning;
- Employment of locals during construction of transmission line;
- Indiscriminate & non-consultative cutting of trees within wayleave
- Destruction of buildings within wayleave
- Land acquisition procedure?
- KPLC required to obtain explicit permission from land owners during wayleave acquisition;
- Wayleave considered useless because cannot be sold, constructed in, or inherited;
- Negative effect on farming activities;
- Farming land greatly reduced;
- Work during night near schools to reduce impact of noise;
- Small agroforestry plantation affected;
- Avoid cumulative impact of wayleaves on same people (10Km apart?);
- Conduct resettlement before construction commences;
- Give widows and elderly special attention;
- Hold public barazas before project starts, for sensitization;
- Concern on safety issues due to many transmission lines in one area (EMF & radiation);
- KShs 500,000 per 0.1 acre;
- KShs 10,000 per tree affected;
- KShs 600 per tea bush for each year still remaining (100 years life span);
- KShs 1 million relocation allowance;
- Wayleave agreements to be signed in presence of KPLC, owner & local administration.

## **CSR**

- Supply primary schools in area with electricity;



- Water provision;
- Rehabilitate & equip health centre in area;
- Street lighting at main Lessos area.

### **NANDI HILLS & TAITO**

- Positive development of country;
- Exact transmission line route & wayleave size?
- Employment of locals during construction of transmission line;
- Indiscriminate & non-consultative cutting of trees within wayleave;
- Destruction of buildings within wayleave;
- Install towers at strategic points to reduce risk of landslides;
- Obtain agreement before relocation;
- Make fair compensation prior to resettlement;
- Consider community in rural electrification;
- Consider proper handling of oil & oil wastes;
- Reduce vegetation clearing;
- Avoid night activities;
- Health & safety education mandatory;
- Land acquisition procedure?
- Negative effect on farming activities;
- Farming land greatly reduced;
- Conduct resettlement before construction commences;
- Duration of resettlement procedure?
- Hold public barazas before project starts, for sensitization.

#### **CSR**

Request for suggestions from community

### **KIBOS VILLAGE**

- Exact transmission line route & wayleave size?
- Positive development of country;
- Land acquisition & compensation procedure?
- Concern on small farm sizes in area.

#### **CSR**

Request for suggestions from community

### **MAMBOLEO**

- Exact transmission line route & wayleave size?
- Employment of locals during construction of transmission line;
- Some structures currently being erected within proposed wayleave;
- Clarification sought on compensation & land ownership documents required;
- Previous experience with compensation & resettlement by KPLC in this area good.

#### **CSR**

Request for suggestions from community

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**APPENDIX 12      Relevant environmental quality  
standards/regulations**

---

**FIRST SCHEDULE (Regulation 5, 6 (1), 11  
(1))**

**MAXIMUM PERMISSIBLE NOISE LEVELS**

Zone		Sound Level Limits dB(A) (Leq,14 h)		Noise Rating Level (NR) (Leq,14 h)	
		Day	Night	Day	Night
A.	Silent Zone	40	35	30	25
B	Places of worship	40	35	30	25
C.	Residential : Indoor	45	35	35	25
	Outdoor	50	35	40	25
D.	Mixed residential (with some commercial and places of entertainment)	55	35	50	25
E.	Commercial	60	35	55	25

**Time Frame**

Day: 6.01 a.m. – 8.00 p.m. (Leq, 14 h)  
Night: 8.01 p.m. – 6.00 a.m. (Leq, 10h)

**SECOND SCHEDULE****(R. 13 (1), 14 (1) (b))****MAXIMUM PERMISSIBLE NOISE LEVELS FOR CONSTRUCTION SITES  
(Measurement taken within the facility)**

Facility	Maximum Noise Level Permitted (Leq) in dB(A)	
	Day	Night
(i) Health facilities, educational institutions, homes for disabled etc.	60	35
(ii) Residential	60	35
(iii) Areas other than those prescribed in (i) and (ii)	75	65

**Time Frame:**

Day: 6.01 a.m. – 6.00 p.m. (Leq, 14 h)

Night: 6.01 p.m. – 6.00 a.m. (Leq, 14 h)

CHAPTER 8 of 1999 - ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT | HOME

78. Air quality standards.



Register of effluent discharge licences.

Controlled areas.

Air quality standards.

**78.(1)** The Standards and Enforcement Review Committee shall, in consultation with the relevant lead agencies: -

- (a) advise the Authority on how to establish criteria and procedures for the measurement of air quality;
- (b) recommend to the Authority -
  - (i) ambient air quality standards;
  - (ii) occupational air quality standards;
  - (iii) emission standards for various sources;
  - (iv) criteria and guidelines for air pollution control for both mobile and stationary sources;
  - (v) any other air quality standards.
- (c) advise the Authority on measures necessary to reduce existing sources of air pollution by requiring the redesign of plants or the installation of new technology or both, to meet the requirements of standards established under this section;
- (d) recommend to the Authority guidelines to minimize emissions of green house gases and identify suitable technologies to minimize air pollution;
- (e) advise the Authority on emissions concentration and nature of pollutants emitted;
- (f) recommend to the Authority the best practicable technology available in controlling pollutants during the emission process;
- (g) determine for consideration by the Authority the analytical methods for monitoring air contaminants and recommend to the Director-General the establishment of such number of laboratories for analytical services as may be needed;
- (h) request the Authority to carry out investigations of actual or suspected air pollution including pollution produced by aircrafts and other self propelled vehicles and by factories and power generating stations;
- (i) request the Authority to order any industry or other source of air pollution to file such returns and provide such information as it may require; and

(i) do all such things as appear necessary for the monitoring and controlling of air pollution.

(2) Any person who emits any substances which cause air pollution in contravention of emission standards established under this Part shall be guilty of an offence and liable to imprisonment for a term of not more than two years or to a fine of not more than five hundred thousand shillings or to both such fine and imprisonment.

(3) A person found guilty under subsection (2) shall, in addition to any sentence or fine imposed on him;

(a) pay the cost of the removal of the pollution, including any costs which may be incurred by any Government agency or organ in the restoration of the environment damaged or destroyed as a result of the emission; and

(b) the cost to third parties in the form of reparation, restoration, restitution or compensation as may be determined by a competent court upon application by such third parties.

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12. The direct cost of clearing pollution through fuel emission shall be borne by the polluter.

Cost of clearing pollution.

13. The fees payable for the application for approval of a substance as a fuel catalyst under these Regulations shall be ten thousand shillings.

Fees

#### FIRST SCHEDULE

(r. 4 (2))

#### A. PETROL POWERED MOTOR VEHICLE EMISSION STANDARDS

Vehicle Class and Model Year	Maximum Emission Concentration HP (ppm)	CO (percentage)
Class I: Gross vehicle weight of 6000 pounds or less.		
1975-1977	500	5.0
1978-1979	400	4.0
1980	300	3.0
1981 +	220	1.2
Class II: Gross vehicle weight of 6001 pounds to 10,000 pounds		
1975-1977	750	6.5
1978-1979	600	5.5
1980	400	4.5
1981-1984	300	3.0
1985 +	220	1.2

#### B. DIESEL POWERED MOTOR VEHICLE EMISSION STANDARDS

Standards and Procedures for Inspection of Diesel Fueled Vehicles.....Pass/Fail Criteria

##### 1. Dynamometer Conditions

(a) A diesel-powered vehicle with a net weight greater than or equal to 6000 pounds and less than or equal to 10,000 pounds shall be tested on a loaded dynamometer by applying a single load of 30Hp ( $\pm 2$ Hp) while being operated at a drive wheel speed of 50 mph ( $\pm 2$ mph).

(b) A diesel-powered vehicle with a net weight of 6000 pounds or less shall be tested on a loaded dynamometer by applying a single load of 9Hp ( $\pm 2$ Hp) while being operated at a drive wheel speed of 30mph ( $\pm 2$ mph).

##### 2. Opacity Standard

(b) Separate measurements shall be made on each exhaust outlet on diesel-powered motor vehicles equipped with multiple exhaust outlets. For vehicles equipped with more than one exhaust pipe, the reading taken from the outlet giving the highest opacity reading shall be used for comparison with the standard. Exhaust tail pipes on diesel-powered motor vehicles shall allow for safe attachment of the opacity meter sensor unit. Dual or multiple exhaust motor vehicles will be tested by sampling all exhaust tail pipes simultaneously or individually.

(c) Any diesel-powered motor vehicle not meeting the opacity standard shall fail the inspection.

#### 3. Idle Mode Test

When it is necessary to omit the loaded mode test, as specified below, an opacity measurement shall be made while the vehicle is operating at idle under no load.

(a) If the opacity measured during the idle mode test is greater than 5%, the vehicle shall fail the inspection.

(b) The loaded mode test shall be omitted on any motor vehicle if.....

(i) The motor vehicle is in any condition that precludes loaded mode testing for reasons of health or safety, or both, or personnel, facility, equipment or vehicle.

(ii) The motor vehicle is unable to be tested because of the vehicle's inability to attain the speeds specified on the dynamometer.

(iii) The motor vehicle is equipped with a constant four-wheel drive.

(c) Re-inspection stations shall not be allowed to perform the idle mode test for diesel-fueled vehicles.

#### 4. Inspection Rejection

The emissions inspector may refuse to perform the opacity test required by these Regulations for any motor vehicle if the motor vehicle has an obvious exhaust system leak or other condition that could affect the validity of the opacity reading, as determined by the emissions inspector.

- (e) Wastes to be exported for the purpose of D1 to D4 or R10 of Annex IV of the Basel Convention, which cannot meet the following criteria:
- (i) Wastes in solid form, which cannot meet the Ambient Soil Quality Standards in terms of PCB determined by the relevant lead agency.
  - (ii) Wastes in liquid form, which cannot meet the waste water discharge standards to soil in terms of PCB.
- (f) Wastes to be exported or imported for purposes other than those in e) above, which cannot meet the following criteria:
- (i) Wastes in solid form, which cannot meet the standards in for hazardous wastes in terms of PCB
  - (ii) Wastes in liquid form, which cannot meet the standards for effluent quality standards in terms of PCB.

## FIFTH SCHEDULE

(Regulation 16)

## LIST OF HAZARDOUS CHARACTERISTICS

## UN CODE CHARACTERISTICS CLASS

UN CLASS	CODE	CHARACTERISTICS
1	H1	Explosive An explosive substance or waste is a solid (substance or waste (or mixture of substances or mixture of substances) which is in itself capable by chemical reaction or by heating at such a temperature and pressure and at such a rate as to cause damage to the surroundings.
3	H3	Flammable Liquids The word "flammable" has the same meaning as the word "inflammable". Flammable liquids are liquids, or solids in liquid form, or liquids containing solids in suspension (for example paints, varnishes, lacquer, etc.) which are readily combustible, or may cause or contribute to the combustion of other materials under fire conditions. Flammable solids are solids which are readily combustible, or may cause or contribute to the combustion of other materials under fire conditions. Flammable gases, liquefied gases, dissolved gases, and aerosols are classified on account of their dangerous characteristics which give off a flammable vapour at temperature more than 60.5°C, closed-cup test, or not more than 60.5°C, closed-cup test, or not more than 60.5°C, closed-cup test, or not more than 60.5°C, closed-cup test (since the results of open-cup closed-cup tests are not strictly comparable with those of the closed-cup tests) and are often regulated by the same tests as the above figures allow for such difference would be within the definition.
4.1	H4.1	Flammable Solids Solids or waste solids, other than those which are readily combustible, or may cause or contribute to the combustion of other materials under fire conditions through friction.
4.2	H4.2	Substances or wastes liable to spontaneous combustion Substance or wastes which are liable to spontaneous combustion under normal conditions encountered in transport, or which become liable to spontaneous heating up on contact with air, and being then liable to catch fire.
4.3	H4.3	Substances or wastes which, in contact with water, are liable to become spontaneously flammable or give off flammable gases in quantities.



## 606 Kenya Subsidiary Legislation, 2006

12	H16	Carcinogenic wastes which may lead to development of cancer in human beings or animals.
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Corresponds to the hazardous classification system included in the United Nations Recommendations on the Transport of Dangerous Goods (ST/SG/AC.10/1/Rev.5, United Nations New York, 1988)

5.2	H5.2	necessary combustible, may generally, by yielding oxygen, cause or contribute to the combustion of other materials. Organic Peroxides Organic substances or wastes which contain the bivalent O-O-structure are thermally unstable substances which may undergo exothermic self accelerating decomposition.
6.1	H6.1	Toxic or Poisonous (Acute) Substances or wastes liable either to cause death or serious injury to the human health if swallowed or inhaled or by skin contact.
6.2	H6.2	Infectious substances extremely hazardous to health Substances or wastes containing viable micro-organisms or their toxins which are known or suspected to cause disease in animals or humans.
8	H8	Corrosives Substances or wastes which, by chemical action, will cause severe damage when in contact with living tissue, or in the case of leakage will materially damage, or even destroy, other goods in the means of transport; they may also cause other hazards.
9	9.H10	Liberation of toxic gases in contact with air or water Substances or wastes which by interaction with air or water, are liable to give out toxic gases in dangerous quantities.
9	H11	Toxic (delayed or chronic) Substances or wastes which, by interaction with air or water, are liable to give out toxic gases in dangerous quantities. Substances or wastes which, if they are inhaled or ingested or if they penetrate through the skin may involve delayed or chronic effects, including carcinogenicity.
9	H12	Ecotoxic Substances or wastes which, if released present or may present immediate or delayed adverse impacts to the environment by means of bio-accumulation and/or toxic effects upon biotic systems.
9	H13	Capable, by means, after disposal, of yielding another material e.g. leachate which possesses any of the characteristics listed above.

## PRESCRIBED FORM

## SECOND SCHEDULE

(r. 9)

## WATER QUALITY MONITORING FOR SOURCES OF DOMESTIC WATER

Name of water source.....

Sample Number.....

Description of sample (untreated).....

Date and time sample received in laboratory.....

Date and time sample was examined.....

Parameter	RESULTS	
	Observed value	Guide value (maximum allowable)
pH		6.5 - 8.5
Suspended solids		30 (mg/L)
Nitrate-NO <sub>3</sub>		10 (mg/L)
Ammonia -NH <sub>3</sub>		0.5 (mg/L)
Nitrite -NO <sub>2</sub>		3 (mg/L)
Total Dissolved Solids		1200 (mg/L)
<i>E. coli</i>		Nil/100 ml
Fluoride		1.5 (mg/L)
Phenols		Nil (mg/L)
Arsenic		0.01 (mg/L)
Cadmium		0.01 (mg/L)
Lead		0.05 (mg/L)
Selenium		0.01 (mg/L)
Copper		0.05 (mg/L)
Zinc		1.5 (mg/L)
Alkyl benzyl sulphonates		0.5 (mg/L)
Permanganate value		1.0 (mg/L)

Remarks .....

.....

.....

## THIRD SCHEDULE

(r. 1)

## STANDARDS FOR EFFLUENT DISCHARGE INTO THE ENVIRONMENT

Parameter	Maximum Allowable(Limits)
1,1,1-trichloroethane (mg/l)	3
1,1,2-trichloroethane (mg/l)	0.06
1,1-dichloroethylene	0.2
1,2-dichloroethane	0.04
1,3-dichloropropene (mg/l)	0.02
Alkyl Mercury compounds	Nil
Ammonia, ammonium compounds, NO <sub>3</sub> compounds and NO <sub>2</sub> compounds	100
(Sum total of ammonia-N times 4 plus nitrate-N and Nitrite-N) (mg/l)	
Arsenic (mg/l)	0.02
Arsenic and its compounds (mg/l)	0.1
Benzene (mg/l)	0.1
Biochemical Oxygen Demand (BOD 5days at 20 °C) (mg/l)	30
Boron (mg/l)	1.0
Boron and its compounds - non marine (mg/l)	10
Boron and its compounds -marine (mg/l)	30
Cadmium (mg/l)	0.01
Cadmium and its compounds (mg/l)	0.1
Carbon tetrachloride	0.02
Chemical Oxygen Demand (COD (mg/l)	50
Chromium VI (mg/l)	0.05
Chloride (mg/l)	250
Chlorine free residue	0.10
Chromium total	2
cis - 1,2- dichloro ethylene	0.4
Copper (mg/l)	1.0
Dichloromethane (mg/l)	0.3
Dissolved iron (mg/l)	10
Dissolved Manganese(mg/l)	10
<i>E. coli</i> (Counts / 100 ml)	Nil
Fluoride (mg/l)	1.5
Fluoride and its compounds (marine and non-marine) (mg/l)	8
Lead (mg/l)	0.01
Lead and its compounds (mg/l)	0.1
n-Hexane extracts (animal and vegetable fats) (mg/l)	30
n-Hexane extracts (mineral oil) (mg/l)	5
Oil and grease	Nil
Cyano-Phosphorus compounds (parathion, methyl parathion, methyl demeton and Ethyl parathion) phenylphosphorothioate, EPN only) (mg/l)	1.0
Polychlorinated biphenyls, PCBs (mg/l)	0.003





Water quality parameters	HOD	TSS	pH	Fecal Coliforms	Oil & Grease	Temperature	CO <sub>2</sub>	Chloride/Dye	General Phosphorus	Total Phosphorus	Ammonia as N	Organic Nitrogen as N	Nitrate
DISCHARGING FACILITY													
Ferrous Alloy manufacturing	X	X	X	X	X	X	X	X	X	X	X	X	X
Leather tanning & finishing	X	X	X	X	X	X	X	X	X	X	X	X	X
Glass	X	X	X	X	X	X	X	X	X	X	X	X	X
Adhesive manufacturing	X	X	X	X	X	X	X	X	X	X	X	X	X
Rubber processing	X	X	X	X	X	X	X	X	X	X	X	X	X
Timber products	X	X	X	X	X	X	X	X	X	X	X	X	X
Pulp, Paper & paperboard	X	X	X	X	X	X	X	X	X	X	X	X	X
Building paper & paperboard	X	X	X	X	X	X	X	X	X	X	X	X	X
Meat products	X	X	X	X	X	X	X	X	X	X	X	X	X
Packing and roofing materials	X	X	X	X	X	X	X	X	X	X	X	X	X
Intensive chemical agriculture farms	X	X	X	X	X	X	X	X	X	X	X	X	X
Edible vegetable oils and fats	X	X	X	X	X	X	X	X	X	X	X	X	X
Hotels, Restaurants and Game lodges	X	X	X	X	X	X	X	X	X	X	X	X	X

MONITORING GUIDE FOR DISCHARGE INTO THE ENVIRONMENT  
FOURTH SCHEDULE (Contd.)

DISCHARGING FACILITY	Iridium	Palladium	Rhodium	Ruthenium	Mercury (total)	Total Organic Carbon	Arsenic	Selenium	Barium	Manganese	Tungsten	Cu	Selenitic Solids	Sulfuric
DISCHARGING FACILITY														
COG and DM														
Dairy Products														
Grain Mills														
Canned Fruits & Vegetables														
Canned & Preserved Sea Foods														
Sugar Processing														
Textiles														
Textiles														
Textiles														
Foodstuffs														
Electroplating	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Organic Chemicals	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inorganic Chemicals														
Plastics & Synthetics														
Soap & Detergents														
Fertiliser Manufacturing														
Phosphate Refining														
Iron & Steel Manufacturing														
Non Ferrous														
Phosphate Manufacturing														
Steam Electric Power Generating														

MONITORING GUIDE FOR DISCHARGE INTO THE ENVIRONMENT  
FOURTH SCHEDULE—(Contd.) (p. 12)

X- means parameters to be monitored



Lead	Iron	Tin	Silver	Cadm	Indium	Palladium	Rhodium	Ruthenium	Mercury (total)	Total Organic Carbon	Arsenicum	Arsenic	Selenium	Krypton	Xenon	Radon
DISCHARGING FACILITY																
Pen Alloy manufacturing																
Leather tanning & finishing																
Glass	X															
Alloys manufacturing																
Rubber processing																
Rubber products																
Pulp, Paper & paperboard																
Builders paper & paperboard mills																
Meat products																
Packing and roofing materials																
Intensive electrical agriculture zone																
Public vegetable oils and fats																
Hotels, Restaurants and Game Lodges																

MONITORING GUIDE FOR DISCHARGE INTO THE ENVIRONMENT  
FOURTH SCHEDULE (Contd.)

Flow	Phenols	Sulphide/Sulphur	Total Chromium VI	Chromium	Copper	Nickel	Zinc	Trinc A	Cu metal	Cu A	Fluorine	Free A volatile (Mercury)	Cadmium	Lead
DISCHARGING FACILITY														
Bakeries & wheat confectioneries	X													
Breweries (malt)	X													
Soft drinks and carbonated waters	X													
Sugar confectionery	X													
Tobacco processing	X													
Distilling & blending of spirits	X													
Motor vehicle assembly	X													
Paints, varnishes & lacquers	X													
Plastics manufacture	X													
Essentials	X													
Printing, publishing & allied industry	X													
Domestic sewage system	X													
Pharmaceutical industries	X													
Tea/Coffee Industries	X													
Slaughter Houses	X													
Domestic sewage (Domestic and industrial effluent)	X													

MONITORING GUIDE FOR DISCHARGE INTO THE ENVIRONMENT  
FOURTH SCHEDULE (Contd.)





FIFTH SCHEDULE

STANDARDS FOR EFFLUENT DISCHARGE INTO PUBLIC SEWERS

PARAMETER	Maximum levels permissible
Suspended solids (mg/L)	250
Total dissolved solids (mg/L)	2000
Temperature °C	20 - 35
pH	6-9
Oil and Grease (mg/L) - where conventional treatment shall be used	10
Oil and Grease (mg/L) - where ponds is a final treatment method	5
Ammonia Nitrogen (mg/L)	20
Substances with an obnoxious smell	Shall not be discharged into the sewers
Biological Oxygen Demand BOD <sub>5</sub> days at 20 °C (mg/L)	500
Chemical Oxygen Demand COD (mg/L)	1000
Arsenic (mg/L)	0.02
Mercury (mg/L)	0.05
Lead (mg/L)	1.0
Cadmium (mg/L)	0.5
Chromium VI (mg/L)	0.05
Chromium (Total) (mg/L)	2.0
Copper (mg/L)	1.0
Zinc (mg/L)	5.0
Selenium (mg/L)	0.2
Nickel (mg/L)	3.0
Nitrates (mg/L)	20
Phosphates (mg/L)	30
Cyanide Total (mg/L)	2
Sulphide (mg/L)	2
Phenols (mg/L)	10
Detergents (mg/L)	15
Colour	Less than 40 Hazen units
Alkyl Mercury	Not Detectable (nd)
Free and saline Ammonia as N (mg/L)	4.0
Calcium Carbide	Nil
Chloroform	Nil
Inflammable solvents	Nil
Radioactive residues	Nil
Degreasing solvents of mono-di-trichloroethylene type and any other parameter as the Authority and the sewerage service provider may prescribe.	Nil

FOURTH SCHEDULE (Cont)

MONITORING GUIDE FOR DISCHARGE INTO THE ENVIRONMENT

Discharging Facility	Oil	Settleable Solids	Surfactants
DISCHARGING FACILITY			
Bakeries & wheat confectioneries			
Breweries (malt)			
Soft drinks and carbonated waters			
Sugar confectionery			
Tobacco processing			
Distilling & blending of spirits			
Motor vehicle assembly		X	
Paints, varnishes & lacquers			X
Batteries manufacture			
Cosmetics		X	
Printing, publishing & allied industry		X	
Domestic sewage system			
Pharmaceutical industries			
Tea/Coffee Industries			X
Slaughter Houses			
Combined sewage ( Domestic+ and Industrial effluent)	X		X

X - Means parameters to be monitored

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**APPENDIX 13**

**JBIC Environmental Checklist No. 14**

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Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
1 Permits and Explanation	(1) EIA and Environmental Permits	<ul style="list-style-type: none"> <li>① Have EIA reports been officially completed?</li> <li>② Have EIA reports been approved by authorities of the host country's government?</li> <li>③ Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied?</li> <li>④ In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?</li> </ul>	<p>ESIA reports officially completed. EIA reports awaiting submission to NEMA &amp; subsequent approval. Upon NEMA approval, KPLC to organise for appropriate approvals.</p>
	(2) Explanation to the Public	<ul style="list-style-type: none"> <li>① Are contents of the project and the potential impacts adequately explained to the public based on appropriate procedures, including information disclosure? Is understanding obtained from the public?</li> <li>② Are proper responses made to comments from the public and regulatory authorities?</li> </ul>	
2 Mitigation Measures	(1) Water Quality	<ul style="list-style-type: none"> <li>① Is there a possibility that soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling will cause water quality degradation in downstream water areas? If water quality degradation is anticipated, are adequate measures considered?</li> </ul>	<p>Yes, possibility of soil runoff in Olkaria, Elementaita and Nandi Escarpment areas. Adequate measures considered.</p>
	(1) Protected Areas	<ul style="list-style-type: none"> <li>① Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?</li> </ul>	
3 Natural Environment	(2) Ecosystem	<ul style="list-style-type: none"> <li>① Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?</li> <li>② Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?</li> <li>③ If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?</li> <li>④ Are adequate measures taken to prevent disruption of migration routes and habitat fragmentation of wildlife, and livestock?</li> <li>⑤ Is there a possibility that improved access by the project will cause impacts, such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystem due to introduction of exotic (non-native invasive) species and pests? Are adequate measures for preventing such impacts considered?</li> <li>⑥ In cases where the project site is located in undeveloped areas, is there a possibility that the new development will result in extensive loss of natural environments?</li> </ul>	<p>Project encompasses highland forests (Appendix 9) &amp; Ramsar sites. Adequate protection measures taken to reduce impacts on ecosystem &amp; prevent disruption of migration routes (Elementaita, Alternative 4 proposed). Yes, possible destruction of sensitive ecosystems due to increased access by project &amp; adequate measures considered. No extensive loss of natural environments.</p>

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
3 Natural Environment	(3) Topography and Geology	<ul style="list-style-type: none"> <li>① Is there a soft ground on the route of power transmission lines that may cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides, where needed?</li> <li>② Is there a possibility that civil works, such as cutting and filling will cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides?</li> <li>③ Is there a possibility that soil runoff will result from cut and fill areas, waste soil disposal sites, and borrow sites? Are adequate measures taken to prevent soil runoff?</li> </ul>	No anticipated slope failure or landslides. Adequate measures suggested to prevent soil runoff
4 Social Environment	(1) Resettlement	<ul style="list-style-type: none"> <li>① Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?</li> <li>② Is adequate explanation on relocation and compensation given to affected persons prior to resettlement?</li> <li>③ Is the resettlement plan, including proper compensation, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?</li> <li>④ Does the resettlement plan pay particular attention to vulnerable groups or persons, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?</li> <li>⑤ Are agreements with the affected persons obtained prior to resettlement?</li> <li>⑥ Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?</li> <li>⑦ Is a plan developed to monitor the impacts of resettlement?</li> </ul>	Extensive involuntary resettlement caused by project implementation (between 530 and 1016 settlements). Proposed transmission line has already been shifted in some areas (Olkaria, Elementaita & Mamboleo) to decrease impacts. Adequate explanation given to potential PAPs. Resettlement Action Plan still to be developed.
	(2) Living and Livelihood	<ul style="list-style-type: none"> <li>① Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?</li> <li>② Is there a possibility that diseases, including communicable diseases, such as HIV will be introduced due to immigration of workers associated with the project? Are adequate considerations given to public health, if necessary?</li> <li>③ Is there a possibility that installation of structures, such as power line towers will cause a radio interference? If significant radio interference is anticipated, are adequate measures considered?</li> </ul>	Yes, possibility of adverse effect by project on living conditions of inhabitants, due to involuntary resettlement. Risk of communicable diseases minimal as no worker camps to be set up. No significant radio interference anticipated.
	(3) Heritage	<ul style="list-style-type: none"> <li>① Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage sites? Are adequate measures considered to protect these sites in accordance with the country's laws?</li> </ul>	No archaeological, historical, cultural and religious heritage sites will be impacted.
	(4) Landscape	<ul style="list-style-type: none"> <li>① Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?</li> </ul>	No.

Environmental Checklist: 14. Power Transmission and Distribution Lines ㊦

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
4 Social Environment	(5) Ethnic Minorities and Indigenous Peoples	<p>① Where ethnic minorities and indigenous peoples are living in the rights-of-way, are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples?</p> <p>② Does the project comply with the country's laws for rights of ethnic minorities and indigenous peoples?</p>	No ethnic minorities and indigenous peoples living in the RoW
	(1) Impacts during Construction	<p>① Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?</p> <p>② If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?</p> <p>③ If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?</p> <p>④ If necessary, is health and safety education (e.g., traffic safety, public health) provided for project personnel, including workers?</p>	Yes, adequate measures considered during construction
5 Others		<p>① Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?</p> <p>② Are the items, methods and frequencies included in the monitoring program judged to be appropriate?</p> <p>③ Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?</p> <p>④ Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?</p>	Monitoring program developed. KPLC SHE department required to establish an adequate monitoring framework
6 Note	Note on Using Environmental Checklist	① If necessary, the impacts to transboundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	None.

1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are made, if necessary.

In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).  
 2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

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**APPENDIX 14      Comments on Draft ESIA Report**

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**The Kenya Power & Lighting  
Co. Ltd.**

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*The Kenya Power & Lighting Co. Ltd.  
Central Office - P.O. Box 30099, Nairobi, Kenya  
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Telex No. 22253 Fax No. 254-02-3201889  
Simsa Plaza, Kolobot Road*

*Our Ref:* KPLC/1F/8/3/1/2009

2<sup>nd</sup> November 2009

*Your Ref:* JK1383/EAN/L19981

GIBB Africa Limited,  
P.O. Box 30020 - 00100,  
**NAIROBI**

TEL: + 254 20 324500.

Attn. Elizabeth Ndinya

Dear Madam,

RE: **KPLC COMMENTS ON THE ENVIRONMENTAL AND SOCIAL IMPACT  
ASSESSMENT (ESIA) DRAFT REPORT FOR THE PROPOSED KISUMU-  
LESSOS-OLKARIA 220/132 KV TRANSMISSION LINE**

Please find attached herewith our comments on Draft Environmental & Social Impact Assessment (ESIA) for the proposed Kisumu-Lessos-Olkaria 220/132 KV transmission line submitted on 19/10/2009.

Yours faithfully,

For: **THE KENYA POWER & LIGHTING COMPANY LTD**

Walter Barongo Nyatwang'a  
**FOR: DEPUTY MANAGER, SHE**

CC: Managing Director & CEO, KETRACO  
Acting Chief Manager, Energy Transmission, KPLC

**KPLC comments on the Environmental and Social Impact Assessment (ESIA) Draft Report for the Proposed Kisumu-Lessos-Olkaria 220/132 kV Transmission Line-Volume 1**

We would like to make few comments and suggestions that can be considered and incorporated in the final ESIA report. The comments are meant to enrich the reports.

**1.0 GENERAL**

The ESIA report captures well the proposed project setting. It provides a good indication that the consultant understood the scope and nature of the assignment.

The report is well structured and the consultant has enhanced visual appreciation of the project for stakeholders who may not be able to visit the project routing by including adequate photographs and other illustrations. Specific comments include:

**2.0 Specific comments**

**Table of Contents**

It will help if the list of abbreviations used in the report is given

**EXECUTIVE SUMMARY**

- Page 1 under project description line 4 “.....approximate distance of the proposed line is 255 Kms.....” while in page 7 under provisional project cost second paragraph line 2 “.....by 316 Km from Olkaria to Kisumu.....” please check this.
- In pg. 8, part 8 Environment and Social Management and Monitoring Plan line 1, the word “transmissionline” is supposed to be two words “transmission line”.

**INTRODUCTION**

- In Section 1.1 Background, Pg. 1-1, Para. 6, line 2, “*The aim of the exercise is to comply with statutory requirements*” include also JICA guidelines for confirmations of Environmental and Social Considerations.
- In Section 1.5 Purpose of carrying out the ESIA, Sub-section 1.5.1 Justification for preparation of the ESIA report. Include also in compliance to JICA’s guidelines for confirmations of Environmental and Social Considerations.
- Section 1.10 Deliverables  
No need to include this section in the ESIA report.



## **POLICY, LEGAL & REGULATORY FRAMEWORK**

This section is elaborate. It will be appropriate to relate each regulations and Acts to the project and explain how the project complies or what will be needed to be done in order to comply. Compliance issues should be clearly stated.

Two Kenyan Acts relating to the project were left out. These include:

- **Civil Aviation Act, Cap 394**-Under this Act, the Kenya Civil Aviation Authority (KCAA) has to authorise and approve the height of transmission lines when they are near flight paths so as ensure the safety of flying aircraft over the proposed project area. Please indicate whether the project complies.
- **Public Roads & Roads Act (Cap 22 Laws of Kenya)**-This Act consolidates the law relating to traffic on all public roads. The Act also prohibits encroachment on and damage to roads including land reserved for roads. Please indicate whether the project complies.
- In section 2.7 **African Development Bank requirements**  
This part is irrelevant as it doesn't relate to the project. World Bank Safeguard Policies part can be left since World Bank requirements have a universal application

## **DESCRIPTION OF THE PROJECT ENVIRONMENT**

- In Section 3.4.4 Archaeological, Cultural and Historical Sites pg 3-21 para 3 states that "*Archaeological sites that could occur along the proposed transmission line are summarized below*" This statement is not acceptable since it is generic than factual. We expect the consultant to exactly state which sites occur along the proposed transmission line since the coordinates are known. It there are no sites indicate so and remove the table

## **PROJECT DESCRIPTION AND JUSTIFICATION**

Section adequately handled. No comment

## **ANALYSIS OF ALTERNATIVES**

As you are aware, the other project alternative was one passing through Mau forest. We are not sure whether alternative (2) two you have mentioned in the report refers to it. If so please mention Mau forest and related disadvantage. It not the one implied, please include the Mau forest alternative.

## **PUBLIC CONSULTATION**

This was done exhaustively and satisfactorily. Excellent.

## **ASSESSMENT OF POTENTIAL IMPACTS AND PROPOSED MITIGATION MEASURES**

- In the summary of potential impacts identified and discussed, only negative impacts have been included. What happened to the positive impacts? *Refer to the RPF Section E, part 3, Task 4.*
- In Section 7.4 Summary of potential Impacts pg 7-1, Table 7-2 has indicated that impact on National parks and conservancies and Archaeological, cultural and historical sites will be direct, permanent and major. The description in part 7.8 pg 7-14 doesn't indicate that it is a major impact same case to part 7.15 where the archaeological sites haven't been identified in the first case. Please revise these areas so as to give a factual situation. As it is JICA might pick it and create issues. Furthermore in the ESMP pg 8-11 it's indicated that no archaeological sites identified within the transmission line project vicinity. Which is which?
- In Section 7.10 Impacts on wetland ecosystem. Please indicate the extent of the impact in the wetland ecosystems. If no wetland ecosystem will be affected, please say so. The towers will be constructed across wetland if any and Construction activities will not be massive (only tower holes will be dug). Therefore this finding may not be correct. Further more you have said that "*However, under the proposed alignment, no major earthworks will be required in areas adjacent to the lakes*". If this is the case it makes the other details irrelevant. Under this section just mention this last statement and that is all.
- In Section 7.13 Impacts on Fauna and Avifauna. In this section you have indicated that the proposed line is to be located as far as possible to any significant breeding or staging areas. If this is factual, please state this and leave the other irrelevant and confusing information. Concerns from KWS, ERC, NEMA and Soysambu conservancy should be included in the public consultation section. Further in section 1.6 Methodology the consultant indicated that ecological survey, Avifaunal survey and mammal sampling was done. Where are the outcomes of this?
- Section 7.14 Impacts on Aviation. The ESIA was based on the surveyed route will has been chosen. Therefore the statement "*These should be considered when finalizing the proposed transmission line route, and the transmission line route through low risk areas and away from the aircraft flight paths*" is not acceptable. What we expect in this section is a clear indication whether the proposed route meets KCCA requirements or not. The finding as it is isn't helpful.
- Section 7.18 Occupational Health and Safety in part b (i) the consultant has indicated that no scientific evidence exists to prove effects of EMF exposure and disease. This is true because even the World Health Organization (WHO) has concluded that current scientific evidence does not confirm the existence of any health

consequences from exposure to low level electromagnetic fields (like one existing in Transmission lines). If this is the case why is then the consultant indicating in the ESMMP pg 8-12 that *“Effects of EMF levels generated by the transmission line project on public health”* as environmental issue which need to be mitigated.

- Section 7.18 Occupational Health and Safety in part c (ii) Electromagnetic interference. It is indicated that overhead transmission lines may result in the creation of radio noise. Please note that acoustic noise produced by transmission lines is greater with high voltage power lines (400-800 kV). Furthermore the lines will be lines will be transposed at least three times to mitigate this effect.
- Section 7.19 Hazardous Materials. Please note that KPLC stopped the use of transformers with PCBs. Therefore remove it or say that PCBs are no longer in use.
- Section 7.22 Impacts on Fuel and Chemical storage on Site. The report indicates that *“It is anticipated that refueling and maintenance of large vehicles will take place on the construction site and that, correspondingly, there will be storage of fuel and lubricants on the site”* This is not true. You would have asked to establish whether this will take place in construction site. The number of vehicles to be used will be minimal. Only construction material storage site will be required.

#### **ENVIRONMENTAL & SOCIAL MANAGEMENT & MONITORING**

- Environmental and social management and monitoring plan table doesn't have the time frame for the mitigation measures and the estimated costs of the mitigation measures implementation.
- The consultant to re-check assessment of potential impacts and re-do the ESMMP accordingly. Please carefully look at the ESMMP, Do not include impacts (environmental issues) which were not identified.

#### **WASTE MANAGEMENT PLAN**

It is our considered opinion that what is discussed on this section is more generic than factual. This is because the project won't generate a lot of waste to warrant this kind of plan. It can be annexed just for information since the section of waste should be taken care of in the ESMMP. Waste generation will be minimal.

#### **In conclusion,**

I hope the comments will assist the Consultant to come up with acceptable reports.

The consultant should strive to provide factual ESIA report and a compressive factual Environmental and Social Management and Monitoring Plan.

**KPLC comments on the Environmental and Social Impact Assessment (ESIA) Draft Report for the Proposed Kisumu-Lessos-Olkaria 220/132 kV Transmission Line-Public Consultation and Disclosure Plan Volume II**

This was done exhaustively and satisfactorily. Brilliant.

Comments on the Draft ESIA Report of GIBB Africa

Page/Section No.	Descriptions in the Draft ESIA Report	Comments by JICA Study Team	Response by GIBB Africa
<b>Vol.1 ESIA</b>			
4	Flora	Some information is not on flora but on climate such as elevation, precipitation, etc. Pls review and revise them.	Sentence removed
5	Areas of Conservation Interest	Pls review and revise the section since the mentioned heritage sites are not really within the RoW. Pls try to mention significant impacts of the project in the executive summary.	Noted. Proposed line originates from within Hell's Gate National Park. Lakes in Rift Valley floor important due to bird breeding and migratory routes that would impact on proposed transmission line. The tourist attractions in Kisumu district are irrelevant to the transmission line. Additionally, since they are not in the actual project area (RoW), pls rephrase "in the project area" as "near the project area". <b>Done.</b>
5 (4-1)	4. Project Description (4.1)	Pls review the sentence of "The principal objective o the project is to upgrade to 220kV the 132kV transmission system..."	'to construct a new 220kv transmission line' <b>Not amended in report</b> <b>Done</b>
5 (4-12) (4-13) (4-15)	Existing Substations	JICA Survey Team's understanding is that this project does not involve Naivasha sub-station. Pls confirm with KPLC engineers. Pls check the entire chapters and make it consistent.	Substations mentioned in report included in entire transmission line system <b>Only mention the two sub-stations that are to be</b>

Page/Section No.	Descriptions in the Draft ESIA Report	Comments by JICA Study Team	Response by GIBB Africa
5 (4-2)	Timboroa/Makuta no substation	JICA Survey Team's understanding is that the scope of this project does not involve Timboroa/Makutano substation. Pls confirm with KPLC engineers. Pls check the entire chapters and make it consistent.	extended as part of the project Three substations Same as above Same as above
6 / 7	Five route alternatives	We do not recognise the alternatives described in the Gibb ESIA. Their Alt 1a, following the existing route all the way, was never considered in the FS, by KPLC, or by JICA. The 'basic' route has always been expected to deviate from the existing route to avoid Nakuru town and the NP. The Gibb Alt 1b is presumably that 'basic' route. Their Alt 2 of a 'completely new route' is presumably a combination of the Mau Forest route plus the new escarpment route. This is not a combination which is being considered. Their Alt 3 is the 'do nothing' option, which is not being considered realistically, but is OK for comparative purposes in an EIA. Their Alt 4, which includes underground section(s), has never been considered previously and would probably be too expensive to be considered now. We should get back to the Routes 1 and 2 as described by JICA and now recognised by all other parties (and 'do nothing').	Alternatives presented based on technical, economic, environmental and social criteria, as well as public views and concerns. The selected alternative will be the most environmentally and socially sustainable, while also taking into account the technical and economic feasibility List of five alternatives has not been amended. For the minimum requirements for alternative considerations, pls see the report of JICA Study Team. Three alternatives presented, including the No-Action option
7	Alt 3 (do nothing) is not feasible.	Of course it is feasible to do nothing.	Noted
7	Alt 4 is selected as the favoured option	It mentions that this would be the existing route with some underground. Surely, the section of line along the bottom of the escarpment would be better than the existing route.	Noted Underground option is still mentioned under Alternative 4. Has this been

Page/Section No.	Descriptions in the Draft ESIA Report	Comments by JICA Study Team	Response by GIBB Africa
9	Conclusion – Gibb recommends approval of the project.....	It is not the place of an ESHIA report to recommend approval or rejection of a project. It should present all the evidence and submit it to the decision-making authority. It is allowable to score alternatives to indicate which is preferred. It is also allowable to warn of particular problems, or provide assurance that there are no major problems. However, recommendation of approval cannot be given in the ESHIA, especially as the decision-making authority will need to weight and take into account various factors according to a wider spectrum of issues.	discussed with KPLC? Yes. Noted
1-2	Section 1.3	The Olkaria-Lessos line is a 200 kV -> 220 kV (typo?)	Corrected
1-2	Section 1.3	JICA Survey Team's understanding is that Muhoroni is not included in this project. Pls remove it after you confirm with KPLC engineers.	The existing Lessos-Kisumu line passes through Muhoroni (Alternative 2) hence its mention. However, the planned alternative 2 does not pass Muhoroni sub-station. Pls change after confirming with KPLC engineers. Done
1-2	Section 1.3	The length of the transmission is approx. 178 – 213 km between Olkaria and Lessos and approx. 77 – 103 km between Lessos and Kisumu depending on the alternative.	Done
1-2	Section 1.3	The alternative routes should be described at this point in the report. They are shown (poorly) in Fig 1-1, but there is no text indication that there are alternative routes. A much better quality map is also required at this point in the report.	Done Do not refer to the 'Jinja' line – this is not defined and will not be understood by most readers. Deleted The map is still inadequate. New one included.
1-4	Section 1.5.1	(item 10) should be 9. Pls. review.	Kindly confirm in EMCA (1999), p 174 Pls. confirm it again since a

Page/Section No.	Descriptions in the Draft ESIA Report	Comments by JICA Study Team	Response by GIBB Africa
1-8	(iii). 2 Field Survey		copy of the EMCA on NEMA's website says "9. Electrical infrastructure including – (a) electricity generation stations; (b) electrical transmission lines; (c) electrical sub-stations; (d) pumped-storage schemes. 10. Management of hydrocarbons including – the storage of natural gas and combustible or explosive fuels." Difference due to website & Government Printer numbering.
2-2	Para 1	"Use of toposurvey maps" seems to be a desk-base study. Pls review. (item 10) should be 9. Pls review.	Moved to Section (iii) 1 Literature Review Please see comment above Same as above.
2-4	(g)	Pls include the relevant noise standards if you mention the vibration standard.	Done
2-18	Section 2.6	Note that IFC Performance Standards apply to the business of IFC (commercial financing of projects) and not to the World Bank Group as a whole. That said, it is useful to refer to the IFC Guidelines, as has been done.	Noted
2-18/19	2.6/2.7	You may consider to delete Section 2.6 and/or 2.7 since they are not directly relevant to this project.	Section 2.6 deleted
2-20	Table 2-2	Note that AfDB Categories 1 and 2 are equivalent to Categories A and B respectively used by the World Bank and former JBIC.	Noted
2-20	Section 2-7-2	This refers to Alternatives 1 and 2. These are presumably different from the alternatives referred to in the Exec Summary (pp 6/7). Pls review the approx. number of resettlers'	Noted



Page/Section No.	Descriptions in the Draft ESIA Report	Comments by JICA Study Team	Response by GIBB Africa
3-5 / 3-6	(i) and (ii)	structures with the latest data but excluding non-residential structures such as animal sheds and storages. Our record shows 268 residential structures or Alt. 1 and 374 for Alt. 2 between Kisumu-Lessos and 262 for Alt. 1 and 642 for Alt. 2 between Lessos and Olkaria.	Done
3-5 / 3-6	Paras I and II	(i) Challenges within the Basin and (ii) Mitigation Measures seem to be not relevant here since the section is for the baseline data. Please review and reorganise them. This amount of detail relating to water management in the Basin is not needed. This is not a project that will affect hydrology. Inclusion of so much unnecessary and irrelevant detail detracts from the main focus of the study.	Noted Figs 3-3 and 3-4 are inadequate. New ones presented
3-8	Flora	The section is not adequate since you have conducted the ecological survey and sites visits for the project. Please provide more specific descriptions on flora since the project area (including Alt. 1 and 2) consists of many forests.	Done
3-10	Last para	This mentions the forests that Alts 1 and 2 would pass through, but does not give any details of their vegetation. It does not even state whether they are plantation or natural forest. Pp 1-6 / 1-7 give details of the ecological survey methodology, but it seems that the field work was not actually carried out.	Noted This has not been addressed
3-13	3.3.3 (iv) Fauna of Mau Forest	The description of the Mau Forest fauna is very general. None of it is site-specific, i.e. it does not state what the fauna is in the forest areas that will be crossed by the powerline. It seems that the fauna description is from existing broad info., and no field study was carried out for the ESIA. The same comment applies to all of the ecological material – it is general information from existing sources, with no evidence of site-specific fieldwork along the powerline routes.	Noted This has not been addressed There is no evidence that any ecological fieldwork was conducted for this ESIA. Discussed with KPLC, JICA study team & ecologist – concerns addressed.
3-17	3.4.2 Socio-economic Characteristics	In this section, we expect more basic descriptions on the area, GDP/average income, industries, population, education level, literacy, employment, social facilities, tribe, poverty, life expectancy, average no. of household members, heritage sites, etc. of each relevant district. Pls. review and revise them since the data should be available in District Development Plans.	Done. Pls provide the methodology of the socio-economic survey (when, how, whom (no of respondents) and where (names of villages, division, districts, and provinces))

Page/Section No.	Descriptions in the Draft ESIA Report	Comments by JICA Study Team	Response by GIBB Africa
3-20	3.4.3 Areas of Conservation Value	All of the areas mentioned need to be shown on a map, which should also show the alternative transmission line routes. Without such a map it is impossible to see whether the described conservation areas will be affected or not.	<p>you conducted the survey) if you do not use the data of the DDPs.                      Incorporated in Section 1.6                      Done, Appendix 9                      The Appendix 9 maps do not show the locations of the Areas of Conservation Value referred to in the text.                      Included as Appendix 9.6</p>
3-20	3.4.3 Areas of Conservation Value	Pls list the all the forest names of the Mau Forests Complex and provide the Mau Forests Complex map which was given by JICA Study Team.	<p>Note also that Fig 3-4 is inappropriate and inadequate.                      New ones inserted                      Done                      Not done in this section                      Previously done in Section 3.3. Preference now also made in Section 3.4.4 to this &amp; new map on national parks (Appendix 9.6)</p>
3-21	First para	Ogiek people are mentioned, but there is no information on whether they live in the vicinity of the powerline route or could be affected by it.	<p>Noted                      Still no information on whether Ogiek people remain in the vicinity of the powerline.                      Alternative 1 (preferred) does not pass through Mau Forest Complex, where the Ogiek live</p>
3-22 / 3-23	Table 3-1	This is the info taken from the Feasibility Study report. We need to know whether any of the	Done, Appendix 9

Page/Section No.	Descriptions in the Draft ESIA Report	Comments by JICA Study Team	Response by GIBB Africa
	Archaeo Sites	sites listed are on or near to any of the proposed transmission line route alternatives.	<p>Put the map (App. 9.5) in the same place as the table (3-1) of sites. Done, Fig 3-6</p> <p>Distances quoted on the map are nonsensical. Corrected, unit in metres</p>
4-16	4.7	Pls check and confirm the length of "316 km" from Olkaria to Kisumu.	Done
4-16	4.7	Pls check and confirm whether the land for the tower is acquired by the project proponent with KPLC.	<p>Yes</p> <p>Needs to confirm with SHE dept.</p> <p>Done – no land acquisition</p>
5-1	Section 5-1 Project Alternatives	<p>We need agreement on what the alternatives should actually be. These are the ones mentioned in the Exec Summary, which we do not recognise. Elsewhere, the report refers to Alts 1 and 2 which we do recognise.</p> <p>We need decent maps of the alternative routes in the report.</p>	<p>Noted</p> <p>...but not actioned.</p> <p>Now actioned</p> <p>No decent map provided</p> <p>Done. See Fig 1-1</p>
5-3/5-4	5.1	<p>Pls review and revise the alternative considerations as previously requested. If you are going to provide the table for comparison, please fill out all the cells (see Table 5-1).</p> <p>For alternative considerations, pls include the technical evaluation (e.g. the length of the alignment, construction period, etc.) and the economical evaluation (e.g. the cost, IRR, etc.) in addition to the existing environmental and social items.</p>	<p>Noted</p> <p>Table still shows five alternatives</p> <p>Revised to show 3 alternatives, including No-Action option</p>
Chapter 6	Public Consultation (All)	<p>It is noted that effects on birds (fatalities) is a major issue raised. This is also mentioned under the review of alternative routes (Chap. 5) and is a main reason for suggesting that the line should be put underground near Elementeita. However, I have seen no evidence of such fatalities. Is it birds flying into the conductors or birds being electrocuted on the towers? We need evidence, not just hearsay. I suspect that the big landowners are raising this as a bird issue, whereas they are actually more concerned about the likely effect on their airstrips /</p>	<p>Noted</p> <p>No evidence provided</p> <p>Bird migratory routes illustrated - See Fig 3-5</p>

Page/Section No.	Descriptions in the Draft ESIA Report	Comments by JICA Study Team	Response by GIBB Africa
6-6	light aircraft. 6.2	Please confirm whether "Earlier Consultation Activities" were conducted by KPLC with JICA Study Team or by GIBB. If by KPLC with JICA Study Team, please mention so, otherwise it is very confusing.	Scoping exercise by KPLC
6-7	6.3	Pls add one table which summarises the entire activities of the CPP including the dates, venues, the number of participants, topics, used languages, types of distributed handouts, and invitation method.	Please see Table 6-1, with 3 round presented. Reference is also made to further details in Volume II <b>Dates and the number of participants for each meeting not provided in Table 6-1. Done</b> <b>Pls provide more detailed place of the venues (e.g. Kisumu, Lessos and Nandi Hill are not appropriate since they are too vague) Done</b> <b>The rest of the details (topics, used languages, distributed handouts and invitation/notice method) should also be in the annex II. Incorporated in Section 6.3 &amp; summary of issues in Appendix 11</b>
Chapter 7	-	Pls provide both identified impacts and their mitigation measures in this chapter (pls use the consistent organization throughout the chapter).	Noted <b>Pls do double check.</b>
7-2	Visual and Aesthetic Impacts	We expect more descriptions should be provided here since the landscape study was done separately as you mention on p. 1-8. Pls. try to analyse the impacts systematically by using the matrix or any other evaluation method. You may consult and collaborate with Norken for this study. However, please note that your scope covers the entire project area including	Noted <b>No consultation with Norken? Contacted Wanjiku</b>

Page/Section No.	Descriptions in the Draft ESIA Report	Comments by JICA Study Team	Response by GIBB Africa & Harub, but no information forthcoming
7-3	Section 7.3.4	alternative 1 and 2 while Norken's scope covers only selected scenic sites along Alt. 1.	Done
7-3 (pls check the page number)	7.6.1	All of this section is in the wrong place. It relates to implementation of the EMP and should therefore be in Chapter 8. 7.6.1 Landmarks in the project area should be "near the project area."	Done
7-4 / 7-5	Table 7-1 Impact Matrix	The impact matrix could be more sophisticated and therefore more useful. Impacts should be indicated as + or -, and could be quantified to a degree, even major / minor would help.	Done The + / - done. Quantification of impacts not done Done
7-4 / 7-5	Table 7-1 Impact Matrix	Pls review the impact items and add more (e.g. noise can be separated from air and dust, add the breakdown of social impacts, add vibration, etc.) FYI, JICA uses 30 environmental and social impact items consisting of involuntary resettlement; local economy such as employment & livelihood; land use & utilization of local resources; social institutions such as split of communities; existing social infrastructures & services; the poor, indigenous & ethnic people; misdistribution of benefit & damage; cultural heritage; local conflict of interest; water usage or water rights & rights of common; sanitation; hazards (risk), infectious diseases such as HIV/AIDS; topography & geographical features; soil erosion; groundwater; hydrological situation; coastal zone; fauna, flora & biodiversity; meteorology; landscape; global warming; air pollution; water pollution; soil contamination; waste; noise & vibration; ground subsidence; offensive odour; bottom sediment; and accident.	Noted  <b>This has not been addressed</b> <b>Noise separated from dust in assessment of impacts. JICA impact items presented in initial public questionnaire</b>
7-3 (note page numbering problem here)	Section 7.6.2 Tower Design	I do not agree that the Chinese style towers are less intrusive. Their concrete cores are more visible in the landscape, whereas the lattice towers become almost invisible at a distance. Additionally, if you are going to recommend a different design which would cost more and/or increase efforts to mitigate environmental and social impacts, please make sure you discuss not only with SHE Dept. of KPLC but also with KPLC engineers/management.	Noted  <b>No evidence of discussion / agreement with the project proponent.</b> <b>Maintained after discussion with KPLC.</b>

Page/Section No.	Descriptions in the Draft ESIA Report	Comments by JICA Study Team	Response by GIBB Africa
7-6	Fig 7-5 Project Context	I do not understand this sketch. It seems to be showing landscape views from the powerline route, whereas we should be concerned about public views towards the powerline.	Recommendation based on pure aesthetical analysis, as required by JICA study team, and can be considered in future Views from powerline Surely, we are not concerned about views from the powerline? Confirmed with landscape specialist – views <b>TOWARDS power line</b>
7-13	Section 7.7.1	It is our understanding that KPLC will not acquire title to land in the right-of-way or wayleave.	Except where land area left is too small and cannot be used at all by owner. Please state this in the report. Done
7-14	Section 7.8 first para	The transmission line will not enter Lake Nakuru National Park.	Deleted It still refers to reduction of aesthetic value in the national parks (plural) in 7.11 first para. Corrected, only Hell's Gate National Park directly affected
7-15 / 7-16	Section 7.9 Impacts on Forests	This is very general because the consultants have not conducted a proper ecological field study of the forests concerned.	Noted .....but not addressed Discussed with KPLC, JICA study team & ecologist – concerns addressed.
7-16 / 7-17	Section 7.9.2 KPLC Afforestation	Comment – <i>Eucalyptus</i> plantations in Kenya do not have any ecological value other than reducing soil erosion. In fact, they have adverse effects on forest biodiversity, soil fauna and soil quality. KPLC should plant <i>Eucalyptus</i> only for pole production. All other KPLC tree	Information obtained from consultations with KFS. KPLC already plants and

Page/Section No.	Descriptions in the Draft ESIA Report	Comments by JICA Study Team	Response by GIBB Africa
7-18 / 7-19	<p>Project</p> <p>Section 7.10 on Impacts on Wetland Ecosystems</p> <p>Last para -....'no major earthworks will be required in areas adjacent to the lakes'.</p>	<p>planting should be of indigenous species.</p> <p>Note that the Alt 1 line passes Makutano Station and Equator Station to rejoin and cross the main road close to <b>Lake Narasha</b>. Care will be needed in constructing the new line through the 'pinch-point' between the existing line and the lake, to avoid its pollution by soil particles, oils/grease, etc.</p>	<p>supplies indigenous tree species to farmers in nearby areas</p> <p>Done</p>
7-19	<p>Section 7.11.1 Mitigation Measures</p>	<p>Add bullets:</p> <p>On steep slopes, coir netting will need to be pegged over the ground in addition to grass planting.</p> <p>Any ripping or ploughing of compacted soils must be done across slope to avoid creating erosion channels.</p>	<p>Done</p> <p>These additional bullets should be moved from new section 7.13.1 to new section 7.14.1</p> <p>Done</p>
7-20/ 7-21	<p>7.13</p>	<p>We expect that the migratory bird routes should be studied and the appropriate mitigation measures should be proposed in the ESIA report (e.g. how far the transmission line should be from Lake Elementeita). Pls. review the section. Additionally, the underground transmission line shall be discussed and agreed between GIBB and KPLC since it is very expensive and technically more difficult.</p>	<p>Bird migratory routes discussed in Section 3.3.3</p> <p>This does not report or discuss the proximity of transmission lines to bird migration routes.</p> <p>Not fully documented yet, but bird migratory routes map presented in Fig 3-5</p>
7-22	<p>7.14</p>	<p>Same applies to the impacts on aviation. "There should be considered when finalising the</p>	<p>Has undergrounding been discussed with KPLC?</p> <p>Yes</p> <p>KCAA requires KPLC to</p>

Page/Section No.	Descriptions in the Draft ESIA Report	Comments by JICA Study Team	Response by GIBB Africa
7-25	proposed transmission line route, and the transmission line routed through low risk areas and away from the aircraft light paths" is not acceptable. This should be studied and appropriate mitigation measures shall be prepared in this ESIA.	This section consists of baseline data (7.17.4 upto (a) Basic profile of PAPs, (d) household budget on pp. 7-32/33, (e) accessibilities on pp. 7-33/34, (f) Perception of the Project on p.7-34); impacts ((i) PAPs, (b) land likely to be affected, (c) structures likely to be lost/affected, (g) Impacts on pp.7-34/35); and mitigation measures (7.17.2 and 7.17.3). Pls review and reorganise the section.	organize flight inspection prior to line construction to confirm proposed line routes, thus this information is not available at this stage, despite consultations with KCAA <b>This does not make sense – the line route has been mapped, and KCAA can inspect the map in order to give an opinion. KCAA opinion</b> Done
7-35	7.18	Pls note there is the KPLC SHE policy. The policy has own noise standards. Pls refer in relevant sections.	Done <b>Please add the KPLC noise standards under 7.21 I (iii) KPLC uses NEMA noise standards</b> Done
7-42	7.21	Pls separate noise from air and dust emission. Pls discuss vibration together with noise by referring the Kenyan noise and vibration standards during construction.	Done
7-42	7.21, para 3	Please note that your work is to assess the impacts of noise and prepare the feasible and cost-effective mitigation measures. Is the noise cancelling acoustic device cost effective and feasible?	Noted <b>But not answered Deleted</b>
7-44	7.24	It does not sound like a positive impact. Pls revise the section.	Noted
7-44	Section 7.25 Contractor Code of Conduct	In addition, each contractor should be required to submit their own EMP, which should be reviewed / approved by KPLC and then appended to the contract. The contractor EMPs should be based on the master EMP in the ESIA report (Chapter 8), focussed on the issues of relevance to the individual contractors.	Done



Page/Section No.	Descriptions in the Draft ESIA Report	Comments by JICA Study Team	Response by GIBB Africa
8-1	8-1 Environmental and Social Management and Monitoring Plan	Where monitoring is referred to in the table (8-1) more detail should be provided, e.g. where water quality monitoring or air quality monitoring is a requirement, the parameters, methods and frequency of sampling and analysis should be stated. Also, see below.	Done
Chap 8	8-1 Environmental and Social Management and Monitoring Plan	Pls consider preparing separate tables for EMP and EMoP since for both of them we would like to ask you to add the frequency, time frame (planning, construction & operation), and budget in addition to existing items of the responsibility and location. Additionally, we would like to have one mitigation measure for one cell so that we could distinguish the frequency, time frame, budget, responsibility and location for each mitigation measure.	Time Frame & Estimated Costs added to existing ESMP <b>But no actual cost figures are stated. Done</b> <b>Pls prepare separate tables, one for EMP and the other for EMoP. Done</b>
Chap 8	8-1 Environmental and Social Management and Monitoring Plan	Pls make sure all the identified impacts in Chap 7 are included in Chap 8 EMP and EMoP, and vice versa.	Done <b>However, the environmental impacts you mentioned in Table 7-1 are different from the impacts you discussed in the rest of section. Pls revise Table 7-1 accordingly.</b>
Chap 8	8-1 Environmental and Social Management and Monitoring Plan	Pls make sure all the cells of the table are filled out.	Done
8-19	8-1 Environmental and Social Management and Monitoring Plan	For air and noise, if you are proposing the sampling analysis report preparation. Pls indicate parameters in addition to the frequency, time frame, budget, responsibility and location.	Done <b>Pls provide specific parameters of air and noise monitoring. It is not adequate to refer the NEMA's standards since it does not provide the specific requirements. More specific</b>

Page/Section No.	Descriptions in the Draft ESIA Report	Comments by JICA Study Team	Response by GIBB Africa
10-1 / I0-2	Conclusion	<p>As mentioned before, GIBB should not recommend approval of the project within the ESIA report.</p> <p>The total cost of the project is not relevant and need not be mentioned in the ESIA report, unless the consultants also want to prepare a budget for the costs of the mitigation measures. If that is the case, an additional column should be added to Table 8-1 giving the cost of each mitigation measure. This would be a normal element within an ESMP. The additional cost of the mitigation as a percentage of the whole project cost would then be of interest.</p>	<p>reference made to relevant NEMA schedules in the appropriate Regulations</p> <p>Noted.</p> <p>Total cost mention a requirement by NEMA</p>
JBIC Environmental Checklist	-	<p>Pls prepare the JBIC Environmental Checklist No. 14 Power Transmission and Distribution Lines which is available at <a href="http://www.jica.go.jp/english/publications/jbic_archive/environmental_guidelines/">http://www.jica.go.jp/english/publications/jbic_archive/environmental_guidelines/</a></p>	<p>Done</p> <p>It is not enough to state that "adequate measurements considered". Pls provide the summary of measurement and specify where you state in the report.</p> <p>Pls. add the dates if applicable (e.g. EIA completion date &amp; submission date, and dates of public consultation meetings).</p> <p>Pls answer each question.</p> <p>Done guided by JICA Study Team Preparatory Survey Draft Final Report</p> <p>Done</p>
Annex	-	Pls include the relevant environmental standards such as water, noise and vibration and air quality (draft) in the Annex and refer in the main volume of the ESIA report.	
Vol.2 Public Consultation			
1-2	I.3	Pls add one table which summarises the entire activities of the CPP including the dates,	Done


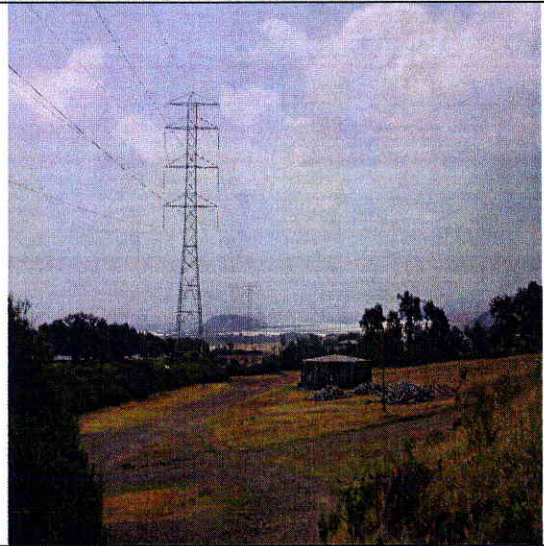
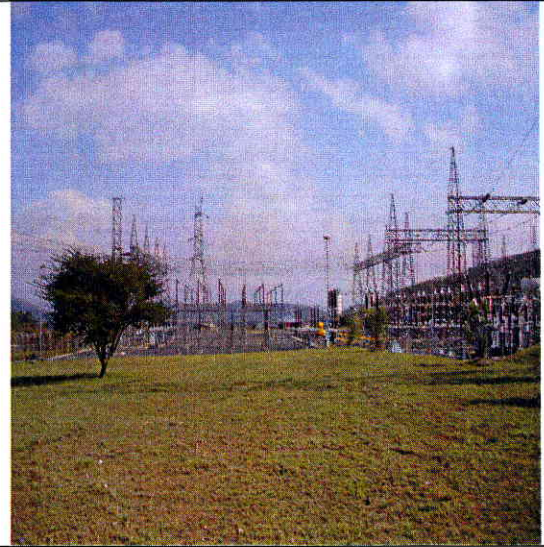
Page/Section No.	Descriptions in the Draft ESIA Report	Comments by JICA Study Team	Response by GIBB Africa
1-4	Nippon Koei/JBIC	venues, the number of participants, topics, used languages, types of distributed handouts, and invitation method. Please remove them.	Done
2-2	2.2.1	“JICA representatives indicated that for transmission line projects...” needs to be changed to “JICA Study Team indicated that for this transmission line project....”	Done
4-2 (pls check the page number)	Table 4-7	Pls review the ranking of “sensitization programs for local community” (3: low) since it is very similar to “need for comprehensive public consultation” (4: medium).	Done
5-3	5.1.1	Pls discuss with SHE dept. and management of KPLC on the recommendation for CSR projects.	Noted Pls make sure it was discussed and agreed. Discussed 15 Dec 2009
Chap 6	-	This is an extensive plan or work after ESIA. Pls discuss with SHE dept. and management of KPLC.	Noted Pls make sure it was discussed and agreed. Discussed 15 Dec 2009
New comments on the revised draft as of Dec. 2009			
3.4.3	Overview of Scio-economic characteristics for landowner/residents-preliminary survey results	Pls rephrase JICA as JICA Study Team since they are different. Additionally, since the questionnaire was provided as a sample, we would like to ask you to attach the actual questionnaire you used in the field. Otherwise, the most readers would expect you should add more data obtained by the questionnaire.	Done. Appendix 8 Methodology also included
3.4.3 (g) impacts	-	Pls review the impacts of loss of agricultural land, crops, access to the work place and loss of access to public facilities. Pls differentiate the impacts during construction and operation since during operation, most farming is allowed and people can cross under the transmission lines.	True, but results based on respondents’ views. During operation, farming is allowed, but land area is nonetheless reduced.

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**APPENDIX 15      Photoplate**

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**PHOTO PLATE**

<p>View of Naivasha substation from Mai Mahiu road</p>	
<p>View of existing transmission line from Naivasha GK Prison</p>	
<p>View of Olkaria II substation, from which the proposed transmission line will take off</p>	

View of existing transmission line at Ngata-Kirobon area, Nakuru



View of existing transmission line as it descends the Nandi Escarpment



View of existing line in Nandi Hills area



View of storage shed at Mamboleo substation, where expansion for the proposed transmission line will take place



View of existing Muhoroni and Sondu-Miriu transmission lines as they approach the Mamboleo substation in Kisumu



Existing airfield at Soysambu Conservancy



Existing gliding grounds at Soysambu Conservancy



Toilets at Jogoo Primary School, Molo – built under existing transmission line





**DOCUMENT CONTROL SHEET**




**FORM MP180 / B**

**CLIENT: KENYA POWER & LIGHTING COMPANY**

**PROJECT: ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT**

**JOB NO: JK 1383A**

**TITLE: ESIA PROPOSED KISUMU-LESSOS-OLKARIA TRANSMISSION LINE UPGRADING PROJECT**

	Prepared by	Reviewed by	Approved by
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DATE <b>22 Dec 2009</b>	SIGNATURE 	SIGNATURE 	SIGNATURE 

<b>REVISION</b>	NAME	NAME	NAME
DATE	SIGNATURE	SIGNATURE	SIGNATURE

<b>REVISION</b>	NAME	NAME	NAME
DATE	SIGNATURE	SIGNATURE	SIGNATURE

<b>REVISION</b>	NAME	NAME	NAME
DATE	SIGNATURE	SIGNATURE	SIGNATURE

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