PRELIMINARY SURVEY REPORT

SUBMITTED TO

P.O. Box 97379-80112
Mombasa – Kenya

CONSULTANCY SERVICES FOR DIGITAL MAPPING AREA SURROUNDING PROPOSED UYOMBO NUCLEAR POWER PLANT FACILITY.

BY

SUBMITTED BY

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Preamble:

CJGEA is a non-profit making organization. Its purpose is to promote the right to a clean and healthy environment in the field of Business and Human Rights. In this endeavour, the independence of its work is always to be maintained. The undersigned agree that the following Contract is concluded in this spirit.

ACRONYMS

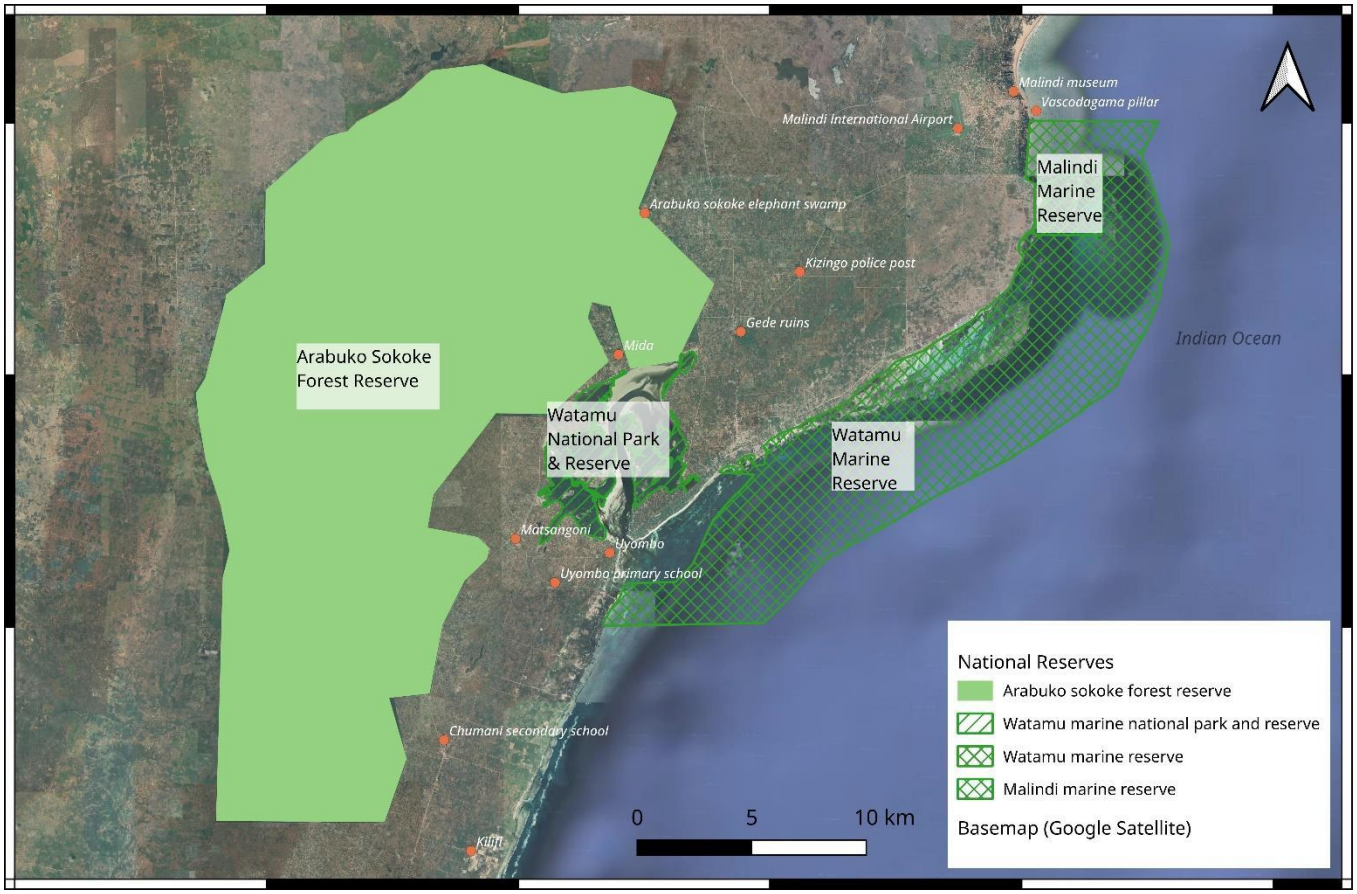
CAD	Computer Aided Design
UPZ	Urgent Protective Action
PAZ	Precautionary Action Zone
GIS	Geographic Information System
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
FRPZ	Food Restriction Planning Zone
UTM	Universal Transverse Mercator

Scope of Work

The Surveyor SHALL research and present on the following deliverables:

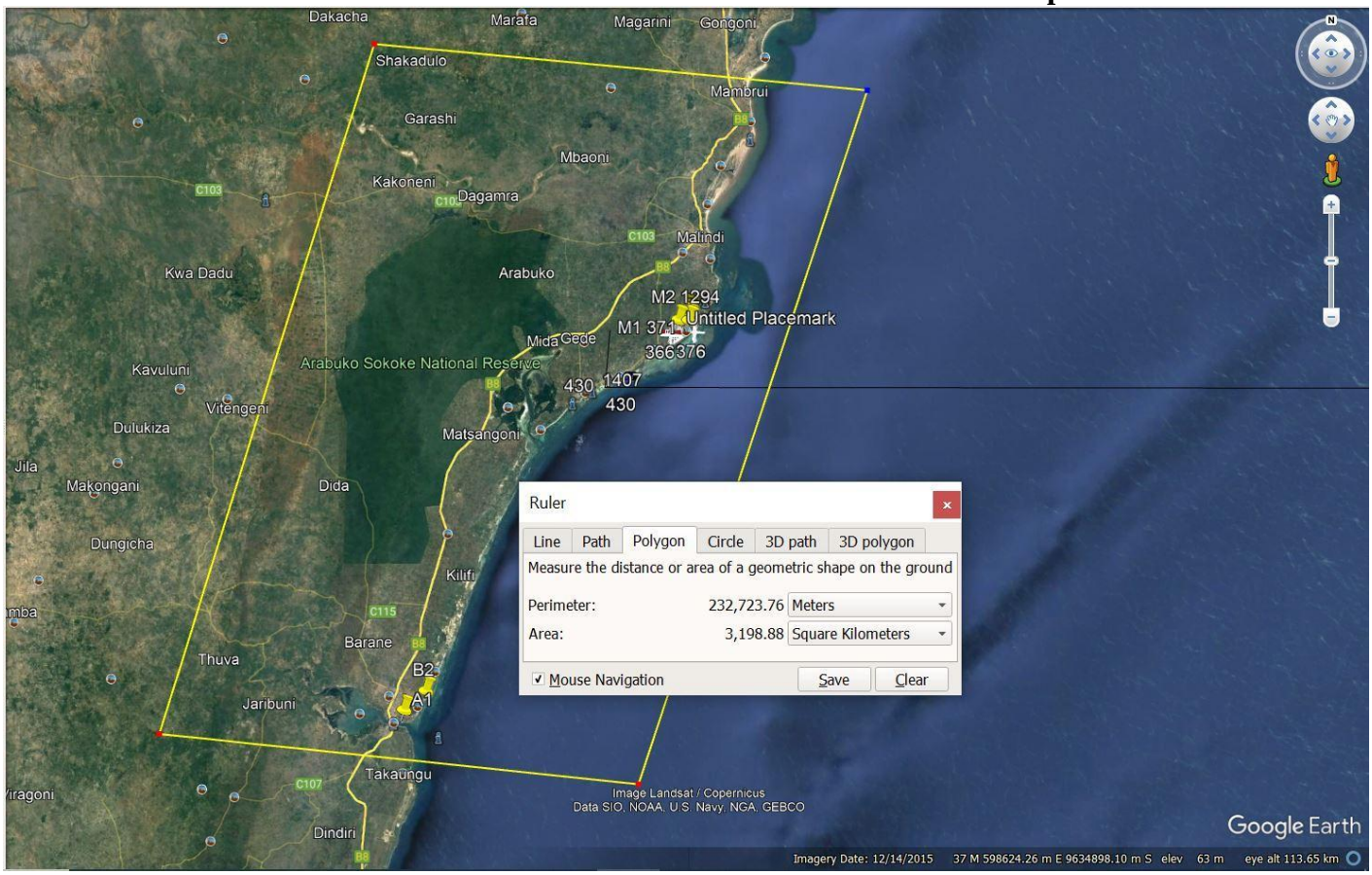
- Geospatial data.
- Land use and land cover data.
- Region of influence of the nuclear reactor.
- Identify the co-ordinates of the nuclear reactor.

General Area

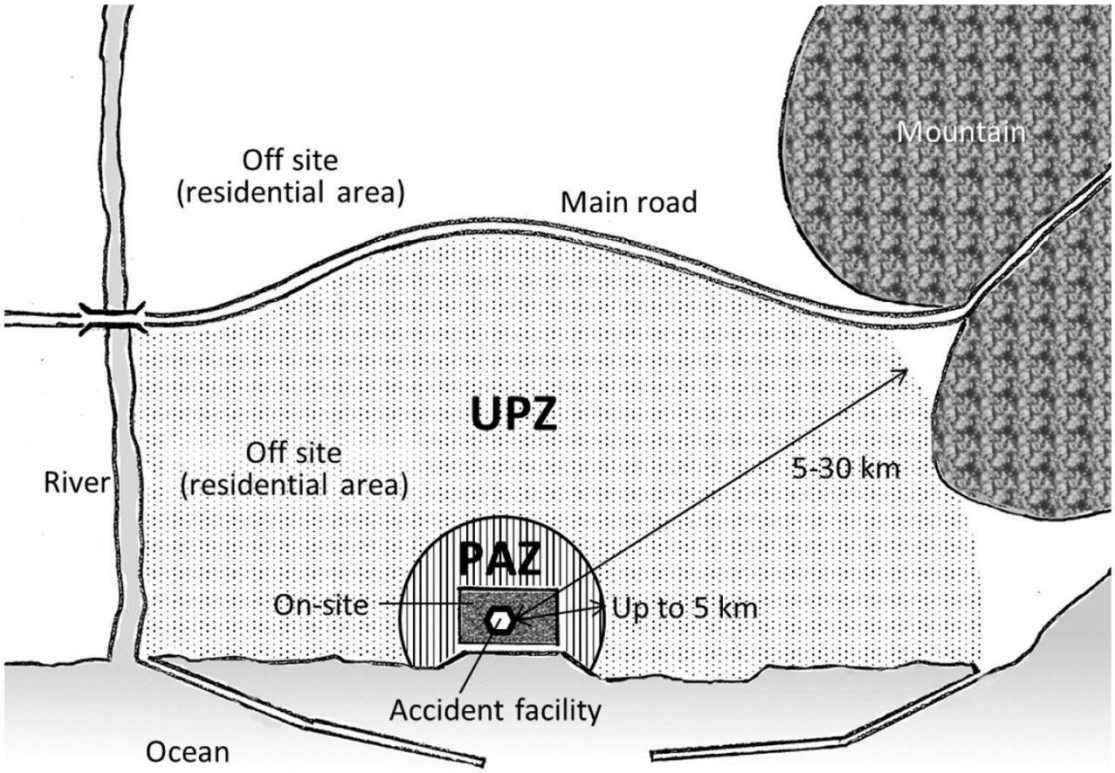


PROJECT DELIVERABLES:

1. **Land use and land cover data Geospatial data**



2. **Region of influence of the nuclear reactor.**
   Large Buffer Zones.



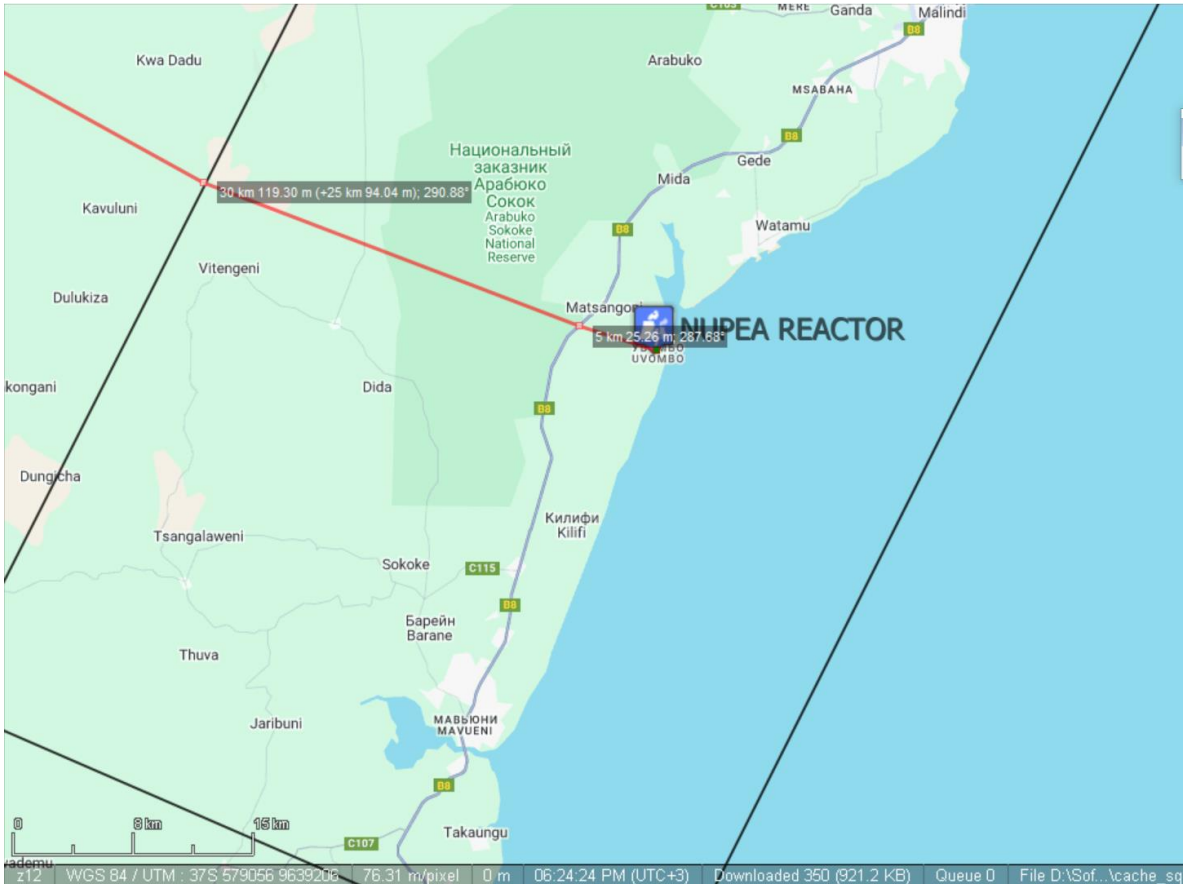
For development of buffer zones, IAEA recommends that through their guidance, countries need to develop the safety distance guidelines. Such large buffer zones will inevitably adversely affect access to these vital resources necessary for the survival of the communities if they draw their livelihood thereof. Below is a guiding chart developed by IAEA on emergency planning.

Table 6-4: Nuclear Power Emergency Planning Zones

Facilities	PAZ radius	UPZ radius	FRPZ radius
Reactors > 1000MW (th)	3 – 5 km	25 km	300 km
Reactors > 100 - 1000MW (th)	0.5 -3 km	5 – 25 km	50 - 300 km

Source: EU, 2008

Settlements and Ecological Sensitive Areas falling under different Buffer Zones		
PAZ RADIUS Less 5 km	**UPZ Radius 5-25 km**	**FRPZ Radius 300 km**
1) South Watamu **2) Matsangoni** **3) Chumani** **4) Uyombo** **5) Mida Creek** **6) Timboni** **7) Roka**	**1) Kilifi** **2) Tezo** **3) Malindi/Marine Park** **4) Arabuko Sokoke Forest** **5) Gede** **6) Kilifi Creek** **7) Bamba** **8) Ganze** **9) Watamu North** **10) Dida**	**1) Garsen** **2) Hola** **3) Voi** **4) Kwale** **5) Diani** **6) Mombasa** **7) Emali** **8) Mpeketoni** **9) Lamu Island** **10) R. Tana Bura to Kipini Delta 140km Length** **11) Tsavo East and** **12) West National Park** **13) South Kitui National Reserve** **14) R. Galana/Sabaki 290 Km Length.** **15) Arawale National Reserve**



Map Modelling Showing PAZ, UPZ and FRPZ Radius for Reactor facilities over 1000 Mw. RED line shows cumulative distance.

3. Identify the co-ordinates of the nuclear reactor.

According to SESA report 2023, the nuclear reactor requires 1 to 4 Square Kilometer. Or 100 Ha/247 ac to 400 Ha/ 988 ac. See Excerpt Attached from Page 36 of 288.

2.5.5. Requirement land and water

The required installation area will depend on the reactor design and type, reactor capacity and site location, but in principle, about 1 to 4 km^2 area is required for the construction and operation of a nuclear reactor. The nuclear power plant site includes several buildings and structures such as reactor containment and auxiliary buildings, operating waste treatment building, fresh fuel storage, interim storage for spent nuclear fuel, storage for low- and intermediate-level waste, control room building, back-up power generators, electric building, turbine building, water pumping station, water treatment structures, administrative buildings, fire station, etc.

Nuclear power plants, like any other conventional power plants, needs cooling water. Most nuclear power plants use one of the following two types of cooling water systems, namely, the once-through cooling system or the recirculating cooling system.

The once-through or open cooling system withdraws a large amount of water from a nearby large water surface body (i.e., the sea, a big river, or large inland water body) and runs it through the condensers in a single pass and discharging it back into the sea, lake, or river a few degrees warmer and without much loss from the amount withdrawn. Because the temperature of the water leaving the installation is higher, it must be discharged at a sufficient distance from the intake point so that it may mix with the ambient waters in the area and so that heated water does not return at the intake point. The water may be salty or fresh. Some small amount of evaporation will occur off site due to the water being a few degrees warmer.

The recirculating or closed cooling system uses a cooling tower and is mostly considered if there is no access to abundant water. After passing through the condenser, the heated water moves through the cooling tower, where an up draught of air through water droplets cools the water. Sometimes an on-site pond or canal may be sufficient for cooling the water. Wet cooling towers can be either natural or forced draft type. Normally the cooling is chiefly through evaporation, with simple heat transfer to the air being of less significance. The cooling tower evaporates up to 5% of the flow and the cooled water is then returned to the power plant's condenser. The 3% to 5% or so is effectively consumed and must be continually replaced.

Reactor Location covering 1.0 Square Kilometer.

UTM Zone 37 South Arc 1960

	EASTING	NORTHING
A	605990	9621975
B	606579	9621962
C	607056	9623218
D	606096	9623355