

## 別冊添付資料

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4. ベースライン調査結果
5. ステークホルダーミーティング
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# 1. 地形測量

**-TOPOGRAPHICAL SURVEY-  
-OF-  
- PROPOSED SUBSTATION AT BADAGRY-  
-BADAGRY LOCAL GOVERNMENT AREA, LAGOS-STATE, NIGERIA-**

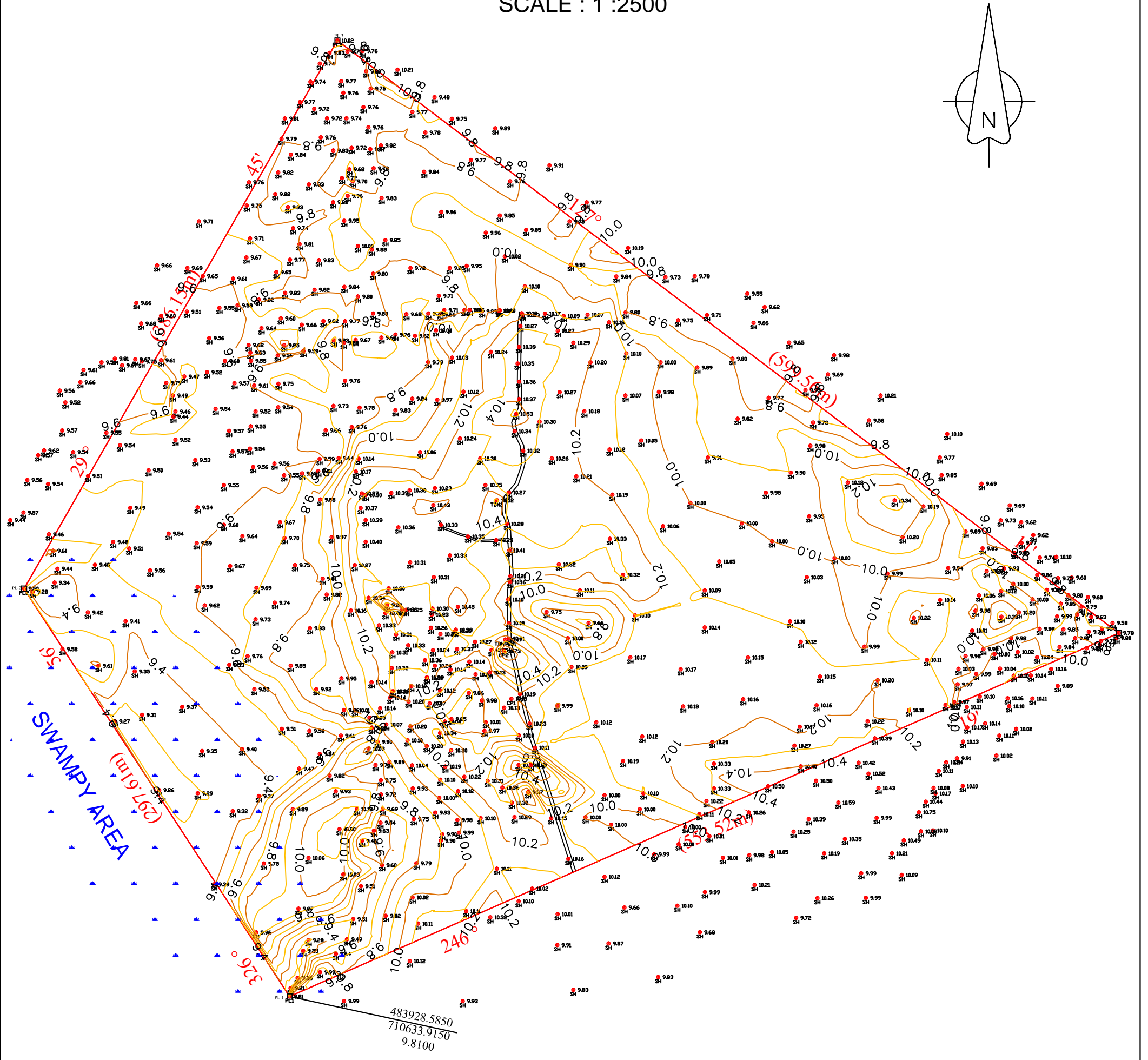
**-AREA: 19.605 HECTARES-**

**-DATUM: TBM1 : 10.473(MSL)-**

**-PROJECT: WGS 84 ( ZONE 31)-**

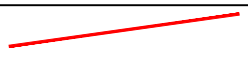
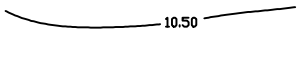

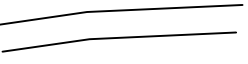
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**SCALE : 1 :2500**

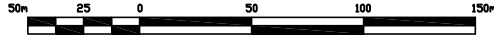


## LEGEND

| BOUNDARY BEACONS |            |             |              |      |
|------------------|------------|-------------|--------------|------|
| PTNO             | EASTING(m) | NORTHING(m) | ELEVATION(m) | DESC |
| PL1              | 483928.585 | 710633.915  | 9.810        | PL1  |
| PL2              | 483766.179 | 710883.307  | 9.500        | PL2  |
| PL3              | 483957.821 | 711218.553  | 10.015       | PL3  |
| PL4              | 484435.509 | 710856.214  | 9.783        | PL4  |

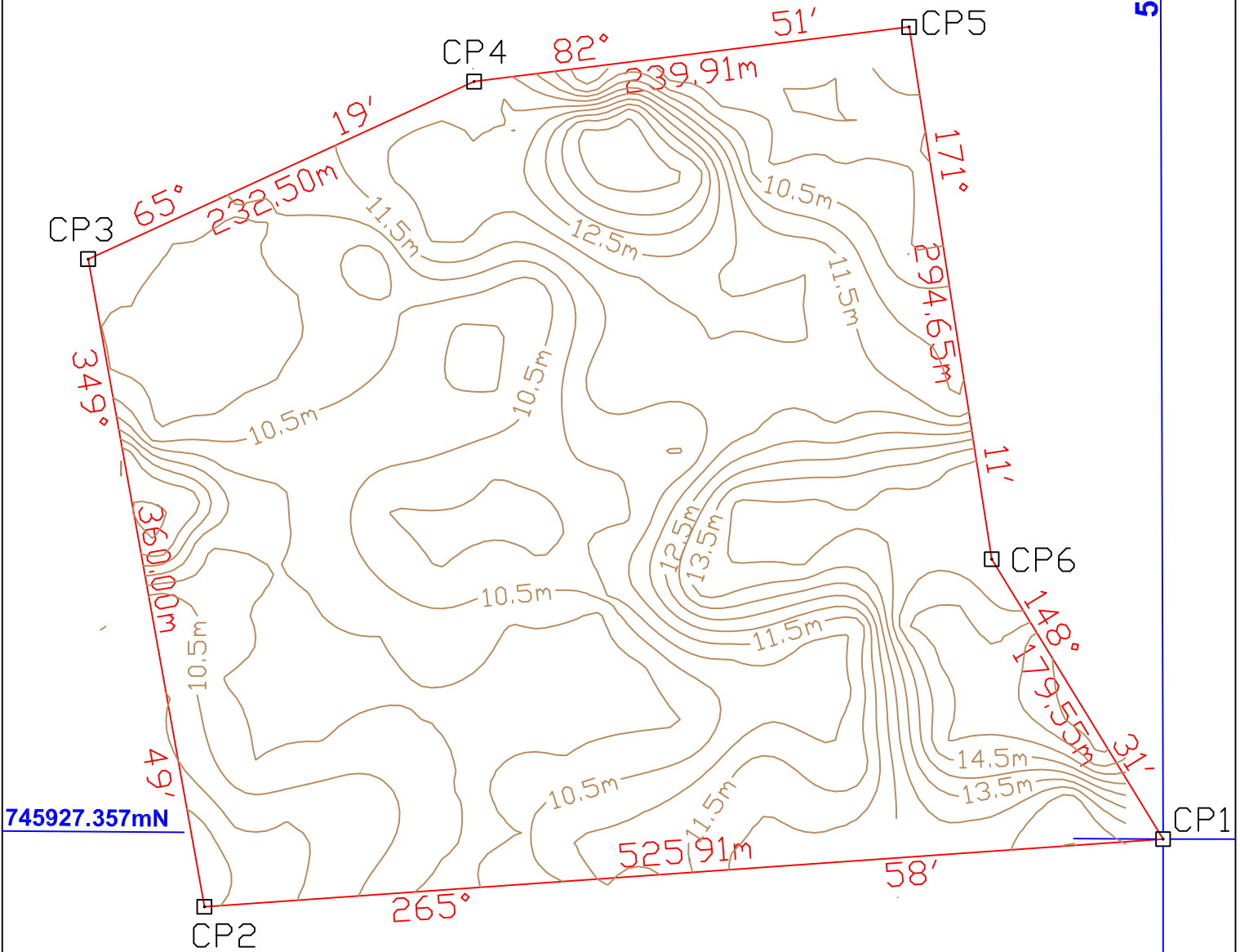
|               |   |
|---------------|---|
| Boundary      |  |
| Contour       |  |
| Spot Height   |  |
| Existing Road |  |

**TOPOGRAPHICAL SURVEY PLAN OF PROPERTY  
SAID TO BELONG TO  
MOUNTAIN TOP UNIVERSITY  
FOR TCN - PROPOSED 330KV/132KV MEGA POWER STATION  
AT MAKOGI VILLAGE  
OBAFEMI/OWODE LOCAL GOVERNMENT AREA  
OGUN-STATE.  
SCALE:- 1:2500**



**ORIGIN:U.T.M. (ZONE31)  
AREA: (49.64Acres, 20.09ha.)**

542205.352mE



PLAN NO.

PROVISIONAL COPY

PROVISIONAL COPY PREPARED BY ME ON  
02-10-2017

**SURV. OLANIYI, S. S. mnis**



**-PLAN SHEWING PROPERTY-  
-SAID TO BELONG TO-  
-TRANSMISSION COMPANY OF NIGERIA-  
-FOR PROPOSED 33/132KV/330KV MEGA POWER STATION-  
AT LIKOSI/OGIJO/ALADO VILLAGE  
-OGIJO LOCAL GOVERNMENT AREA-  
-OGUN STATE-**

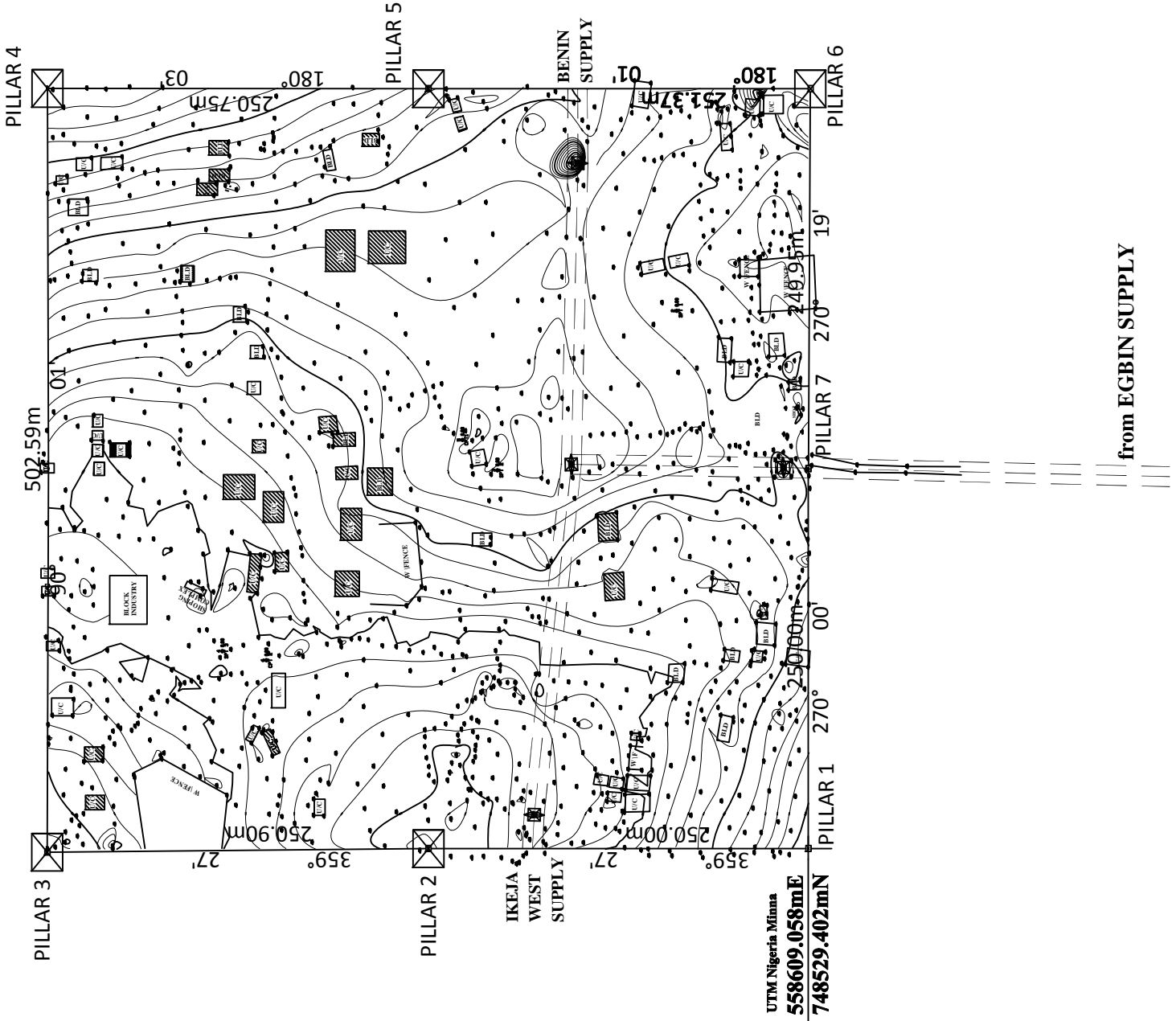
**-SCALE 1:4000- (only if A4)**



**-ORIGIN : UNIVERSAL (ZONE 31)-**

**-AREA : 25.1162HECTARES-**

**CONTOUR INTERVAL: 0.2m**



**BOUNDARY POINTS COORDINATES**

| UTM Nigeria Minna |            | UTM 31N WGS84 |         |               |               |
|-------------------|------------|---------------|---------|---------------|---------------|
| X                 | Y          | Z             | Y       |               |               |
| PILLAR 1          | 558609.058 | 748529.402    | 96.682  | 558520.80 m E | 748648.85 m N |
| PILLAR 2          | 558609.058 | 748779.402    | 100.300 | 558520.80 m E | 748898.85 m N |
| PILLAR 3          | 558606.673 | 749030.290    | 97.620  | 558518.42 m E | 749149.73 m N |
| PILLAR 4          | 559109.262 | 749030.156    | 95.210  | 559021.00 m E | 749149.60 m N |
| PILLAR 5          | 559109.058 | 748779.402    | 96.943  | 559020.80 m E | 748898.85 m N |
| PILLAR 6          | 559109.004 | 748528.031    | 98.320  | 559020.74 m E | 748647.48 m N |
| PILLAR 7          | 558859.058 | 748529.402    | 97.711  | 558770.80 m E | 748648.85 m N |

**LEGEND**

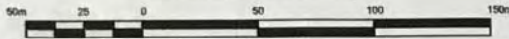
|               |                             |
|---------------|-----------------------------|
| ROAD          |                             |
| SPOT HEIGHT   | T445<br>(46.76)             |
| 330KV TOWER   |                             |
| CONTOUR LINE  | 3.60                        |
| BOUNDARY LINE |                             |
| 330KV TL      |                             |
|               | BUILDING                    |
|               | BUILDING UNDER CONSTRUCTION |

from EGBIN SUPPLY

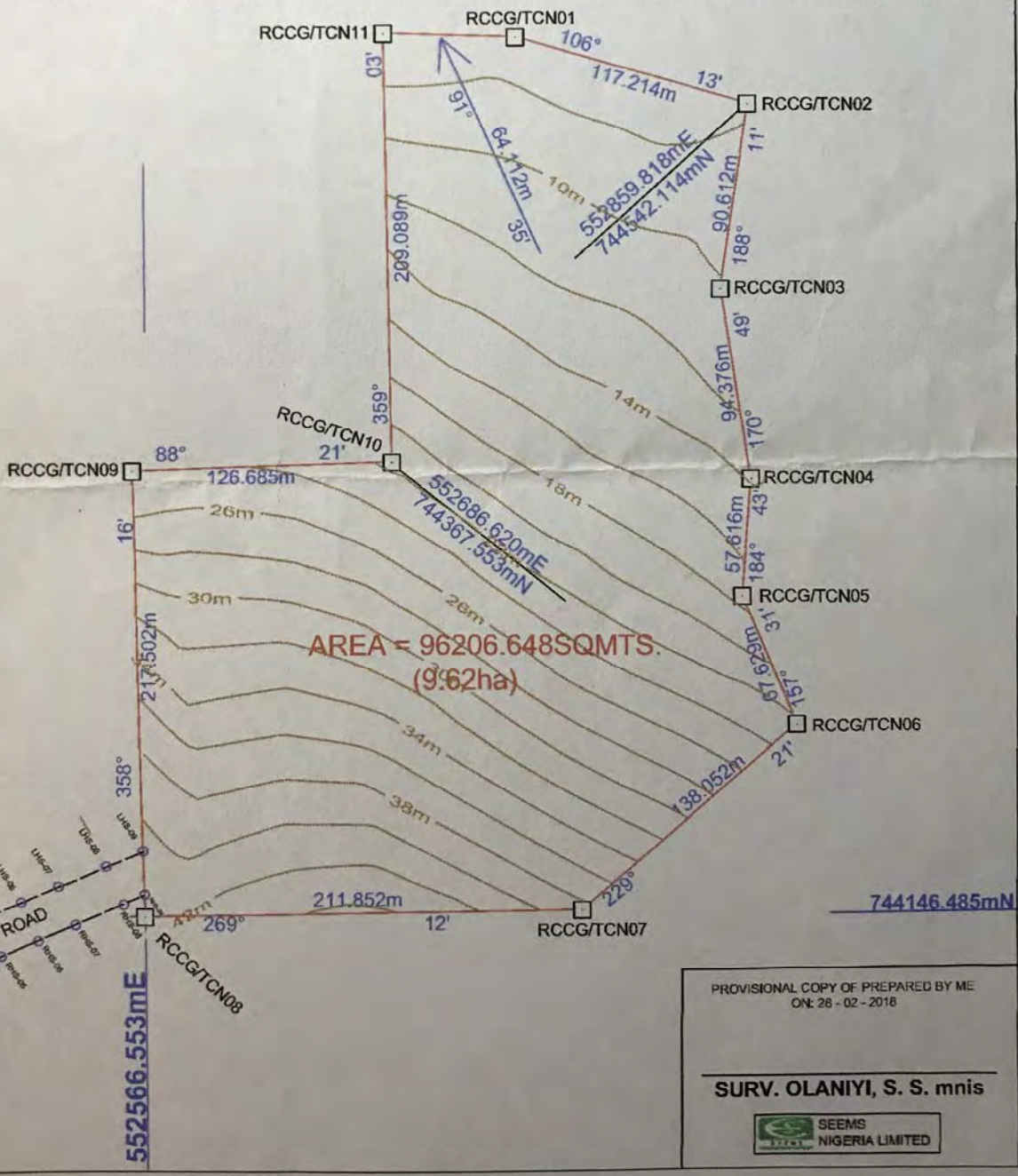
UTM Nigeria Minna  
**558609.058mE**  
**748529.402mN**



**PLAN SHEWING PROPERTY**  
**SAID TO BELONG TO**  
**THE REDEEMED CHRISTIAN CHURCH OF GOD**  
**FOR TCN - PROPOSED 132KV/33KV MEGA POWER STATION**  
**AT ABULE OBA VILLAGE, NEAR NEW AUDITORIUM**  
**SAGAMU LOCAL GOVERNMENT AREA**  
**OGUN-STATE.**  
**SCALE:- 1:2000**



ORIGIN: U.T.M. (ZONE 31)  
 AREA: (24.05 ACRES, 9.62 HA.)



PROVISIONAL COPY OF PREPARED BY ME  
 ON: 28 - 02 - 2018  

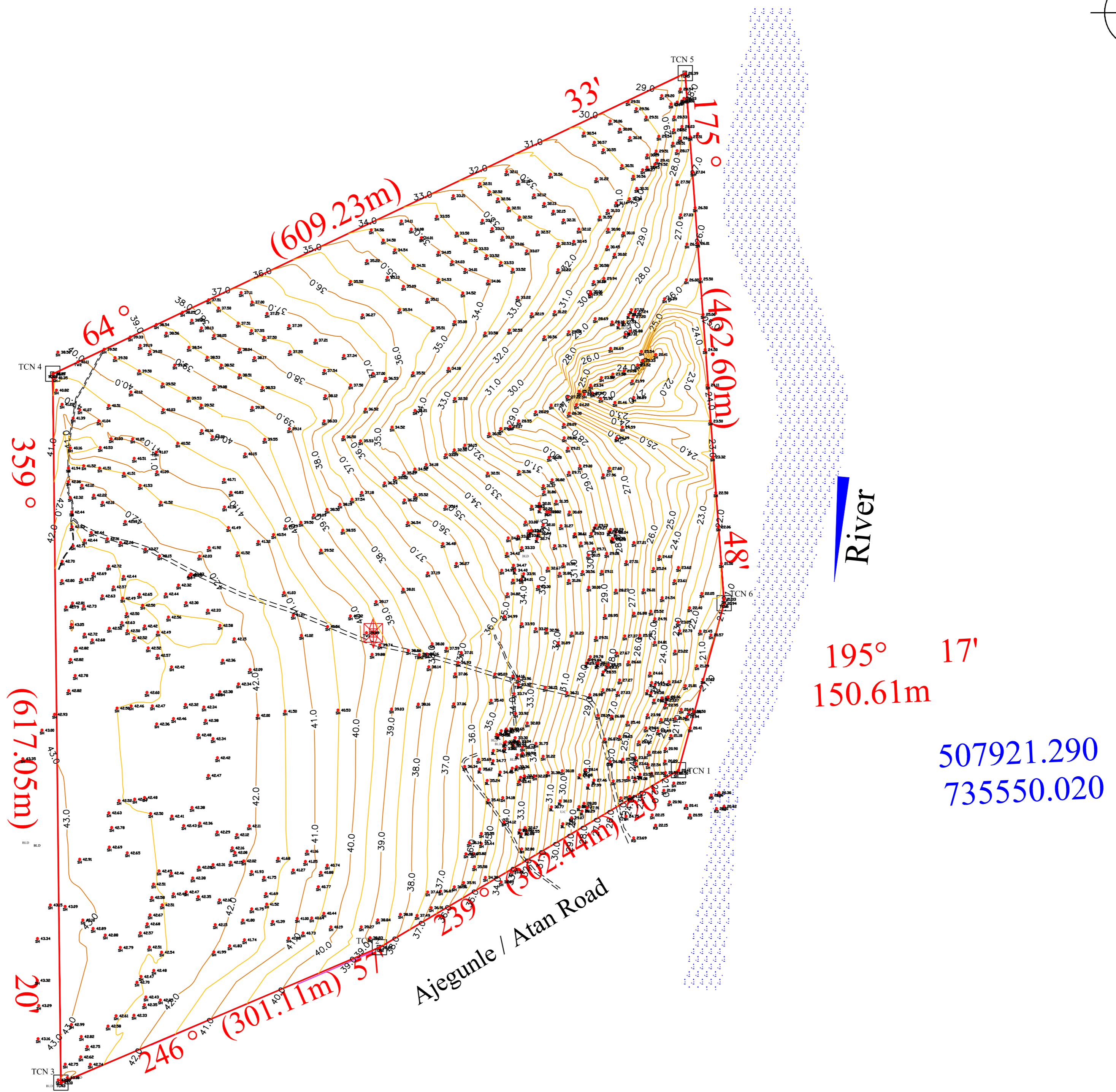
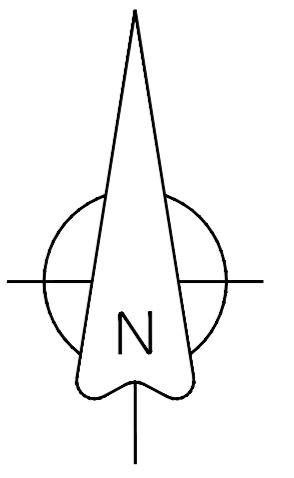

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**SURV. OLANIYI, S. S. mnis**  

 SEEMS  
 NIGERIA LIMITED

**TRANSMISSION COMPANY OF NIGERIA (TCN)**  
**-TOPOGRAPHICAL SURVEY-**  
**-OF-**  
**- PROPOSED SUBSTATION AT AJEGUNLE COMMUNITY-**  
**-ADO - ODO/OTA LOCAL GOVERNMENT AREA, OGUN -STATE, NIGERIA-**  
**-AREA: 35.047HECTARES-**  
**-DATUM: TBM1 : 108.384m(MSL)-**  
**-PROJECT: WGS 84 ( ZONE 31)-**  
**-CONTOUR INTERVAL : 0.5m-**

SCALE : 1 :2500



| BOUNDARY BEACONS |            |             |              |      |
|------------------|------------|-------------|--------------|------|
| PTNO             | EASTING(m) | NORTHING(m) | ELEVATION(m) | DESC |
| 1                | 507921.290 | 735550.020  | 20.410       | TCN1 |
| 2                | 507661.110 | 735395.820  | 38.650       | TCN2 |
| 3                | 507384.010 | 735277.990  | 43.100       | TCN3 |
| 4                | 507376.990 | 735894.990  | 40.250       | TCN4 |
| 5                | 507927.160 | 736156.660  | 28.390       | TCN5 |
| 6                | 507961.000 | 735695.290  | 20.940       | TCN6 |

**LEGEND**

|                    |  |
|--------------------|--|
| Boundary           |  |
| Contour            |  |
| Spot Height        |  |
| Existing Building  |  |
| Existing Road      |  |
| Under Construction |  |
| Tower              |  |

# EJIO SUBSTATION TOPOGRAPHIC SURVEY REPORT



September 2018

Consultants:



**Engineering & Environmental Management Services**

No 5, Eldoret Close, off Aminu Kano Crescent

Wuse II, Abuja, Nigeria

+234 8099027766, 7081961390, 8172242418

[www.eemslimited.com](http://www.eemslimited.com); [info@eemslimited.com](mailto:info@eemslimited.com)

Project #: 100.02.030



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## 1.0 Background

Ejio Substation Project requires mapping and topographical survey for the purposes of the design of the layout of the substation. Yachiyo Engineering Company on behalf of JICA request EEMS Limited to carry out the mapping and topographic survey of the Ejio Substation located in the Ewekoro Local Government Area of Ogun State, Nigeria. The mapping requires capturing the locational data of buildings, roads and other details in the project site, while the Topographical Survey requires capturing survey data in 3-dimensions (X, Y, and Z) coordinates.

## 2.0 Introduction

Surveying and Mapping has been described as an essential element in every human development activity since the beginning of recorded history. It has been discovered to be an imperative requirement in the planning and execution of every form of meaningful development. Provisions of infrastructure, planning of towns and cities, management of hazardous natural events and human actions such as erosion, flooding, earthquakes and subsidence, coastal management, exploration and exploitation of minerals, location of industries, resources exploitation on the land and on the sea are dependent on land surveying products.

Topography of an area describes the surface characteristics of relief features of the area as depicted by hills, valleys and plains. It can be used to study and represent as a surface, any characteristic that has a continuously changing value other than elevation, for instance, population, climatic, geo-magnetic data and geo-chemical data. Topographic surveying involves the acquisition of topographic data of the feature on the earth's surface both man-made and natural in three-dimension (x y z); this employs the techniques of plane surveying and other special techniques to establish horizontal and vertical controls.

Topographical surveying is a three-dimensional (3-D) survey technique. It employs the technique of determining the true position (X, Y) of features (man-made and natural) and the heights of points over a particular area or portion of the earth's surface. The relief or configuration of a terrain are located by measurement and depicted on a topographical map as contours, thus explains facts in reality of the ground terrain. Within the limits of scale, it shows as accurately as possible the location and shape of both natural and man-made features.

### 3.0 Scope of Work.

The scope of work involves Topographical Survey of Ejio substation, to determine the size and the direction of the boundary line of the substation.

- To determine the Topography of the terrain.
- To determine the location of all Towers, all buildings and other man – made features located within the substation in order to have fair knowledge of substation site as at the time of the survey.

The objective of the detailed topographic survey is to determine the 3D Coordinates (X, Y, and Z) at 10m grid interval within the substation. The survey involves the data capture of all permanent features including the all existing roads, buildings, and Towers. The Topographic detailed survey covers an area of approximately 25 hectares.

### 4.0 Location of Project Sites

The project site is within Ejio Community, Ewekoro Local Government, Ogun state, and is located approximately on Latitude: 6°50'55.99"N, Longitude 3°12'37.85"E.



**Figure 1: Enclosed Boundary of Ejio substation site for Topographical Survey.**

## 5.0 Methodology

- i. **Reconnaissance:** The survey team started the work by working with the Ejio Community and in particular the Substation site. The survey team studied the terrain, building pattern and identified all the boundary points. Bench Marks were selected and the beacons were emplaced accordingly.



**Figure 2: Pictures showing TBMs, Terrain and building on the project site.**

- ii. **Topographical Survey of Site:**

Differential Global Positioning System was used to observe direct coordinates of points. With the use of a dual frequency, 216 channel Hi-Target receivers which is capable of tracking the American Satellites-GPS and the Russian Satellites-GLONASS, with centimeter accuracy, data was captured in 3-dimension i.e. X, Y and Z. The base receiver (also known as Reference) was set on the Control Point.

The Rover GPS receiver was switched on and set up, then “survey” icon on the data logger was selected. The station parameters were set by entering pillar identification value, and the receiver’s antenna height through the data logger. The verticality of the tracking rod carrying the rover receiver was ensured by checking the plumb (circular bubble attached to the tracking rod).

The rover was taken to the first boundary point, and all necessary data such as the point identification value and codes were keyed in. Coordinate data were captured in 3-dimension i.e. X, Y and Z and the process was repeated at every point until all boundary points and spot levels were captured. Using the GNSS in the RTK Mode enables the levels to be determined at any arbitrary point within the enclosed boundary of parcel allocated for Ejio Substation. All data were captured in WGS 84 UTM ZONE 31.



**Figure 3: Topo Data Capturing, GPS set up, Tower and Boundary Point.**

## 6.0 Detailing and General Mapping

This is the process of acquiring spatial data necessary to fix the positions of features in the project area. The instrument was taken to the edges of the features, e.g. roads, towers, and buildings, etc, to determine their positions, shapes, and also the topological relationship between the features and the land parcel. Different point identification numbers and descriptions were used for various features within the Ejio Substation.

Mapping is the graphical representation of information based on spatial relationships. Mapping is typically used to portray scaled geographical features forests, roads, and water. It is generally an ongoing process because regular changes in climate conditions and structural developments make it necessary to carry out regular mapping processes.

Unmanned Aerial Vehicle (UAV), commonly referred to as **drone**, was deployed for general mapping of Ejio Substation site. Firstly, the GNSS was used to established ground control points at strategic points within the site that will be used for georeferencing of the UAV images.

Using DJI PHANTOM 4 PRO, the flight mission was planned ensuring the photographic images covered the whole Substation and beyond with good side and forward overlaps as per the flight planning. The Checklist before the data capture was prepared based on the expected result and accuracy as demanded by the specifications of the project.

The checklist includes the following:

- i. Total area of the area of interest
- ii. Computation of number of photos to cover the entire area
- iii. Time to fly
- iv. Altitude of the UAV
- v. Flight time
- vi. Temperature
- vii. Flight mode- P-mode as intelligent mode

- viii. Return home distance
- ix. Camera aperture and shutter
- x. And other parameters that supported accurate map production

After the checklist, the parameters were accepted and uploaded to the UAV and takeoff to capture images covering the entire project area. On completion of the flight mission, the field operation ends pending the processing of the images using sophisticated photogrammetry software packages.



**Figure 4: Drone set up, mission planning, and deployment in the project area.**

### **Data processing**

The photos of about 791 in numbers covering the Ejio Substation were downloaded via SD card using 3D Mapping Software and Agisoft for the photogrammetric image processing. It was later exported to PIX4D Mapper software application for rectification, reconstruction, and generation of different 3D spatial models such as point cloud, elevations, and contours. The models were overlaid on the composite imagery of the project area (Ejio Substation).

### **Application of Product Generation**

The result produced is a geographically or spatially referenced Orthophoto; therefore different types of geometric measurement such as accurate distances among objects within area of interest, elevations of points and other spatial characteristics can be obtained for proper planning and design of the Ejio Substation.

## **7.0 Conclusion**

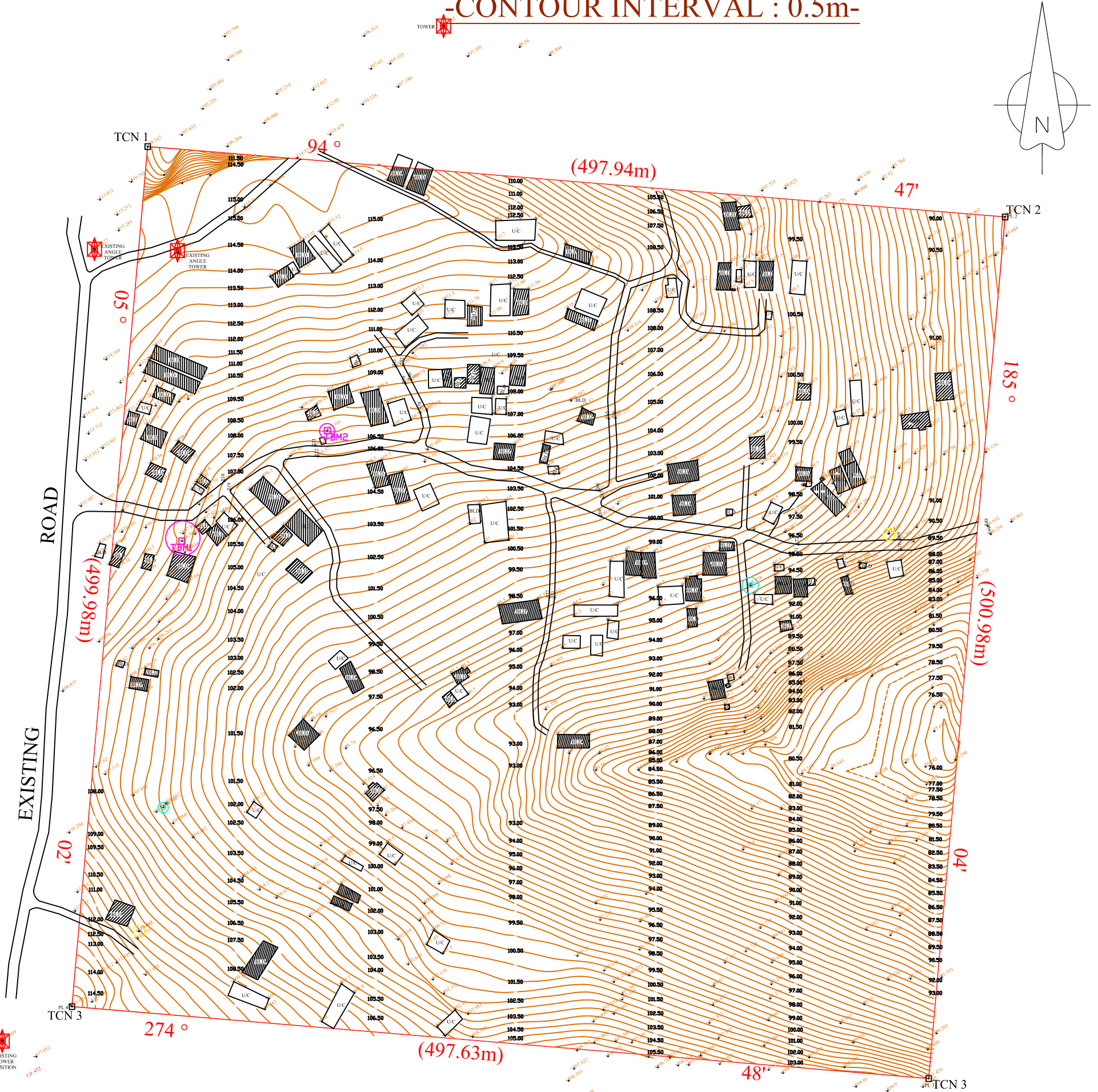
The survey of the project site was successfully completed and it is worth mentioning that, by the use of a modern sophisticated technology, UAV and Real Time Kinematic mode of operation of the GNSS, the survey was completed on a record time.

## **8.0 Annexes**

The following reports in separate files are part of this report

- Ejio Substation Topographic Map\_23-09-18.dwg
- EJIO\_FINAL\_DATA\_LAT-LONG\_23-09-18.xls
- EJIO\_FINAL\_DATA\_UTM\_23-09-18.xls

**TRANSMISSION COMPANY OF NIGERIA (TCN)**  
**-TOPOGRAPHICAL SURVEY-**  
**-OF-**  
**- PROPOSED SUBSTATION AT EJIO COMMUNITY-**  
**-EWEKORO LOCAL GOVERNMENT AREA, OGUN -STATE, NIGERIA-**  
**-AREA: 24.910HECTARES-**  
**-DATUM: TBM1 : 108.384m(ABMSL)-**  
**-PROJECT: WGS 84 ( ZONE 31)-**  
**-CONTOUR INTERVAL : 0.5m-**



**LEGEND**

|                    |  |
|--------------------|--|
| Boudary            |  |
| Contour            |  |
| Spotheight         |  |
| ExistingBuilding   |  |
| Existing Road      |  |
| UNDER CONSTRUCTION |  |
| TOWER              |  |
| BORE POINTS        |  |

**BOUNDARY BEACONS**

| PTNO | EASTING(m) | NORTHING(m) | ELEVATION(m) | DESC  |
|------|------------|-------------|--------------|-------|
| 1    | 523212.279 | 756556.164  | 116.031      | TCN 1 |
| 2    | 523256.100 | 757054.224  | 108.167      | TCN 2 |
| 3    | 523752.373 | 757013.469  | 85.893       | TCN 3 |
| 4    | 523708.112 | 756514.493  | 101.453      | TCN 4 |



## 2. 地質調査

PREPARATORY SURVEY  
FOR  
TRANSMISSION POWER PROJECT  
IN THE  
FEDERAL REPUBLIC OF NIGERIA

PROPOSED 330/132KV SUBSTATION  
AT ALAKOTOMEJI, BADAGRY  
BADAGRY LGA, LAGOS STATE

**GEOTECHNICAL INVESTIGATION**

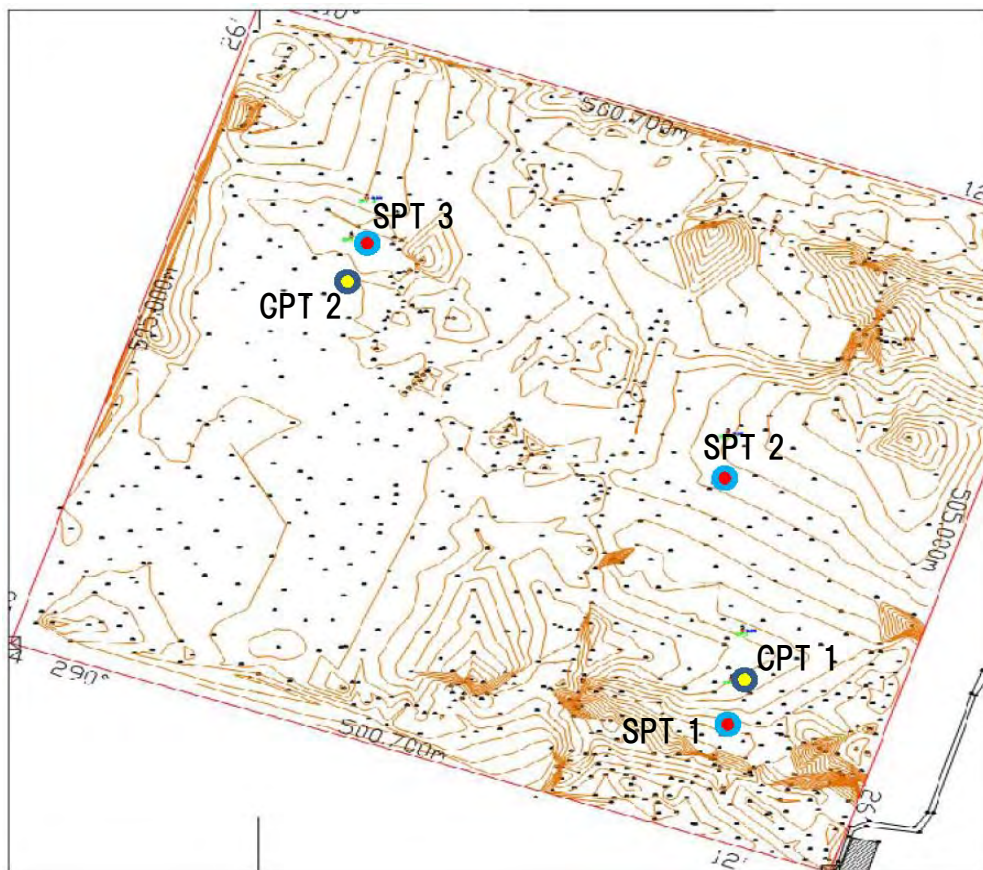
**2015 May**

**Yachiyo Engineering Co., Ltd.**

**BEST & CROMPTON ENGINEERING AFRICA LTD**



Total Grid Plan



Badagry Site Location Plan

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3.0 DESCRIPTION OF WORK

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3.2 ANALYSIS OF RESULTS

3.2.1 Geological Description

3.2.2 Subsoil Condition

3.2.3 Ground Water Condition

3.2.4 Site description and condition

4.0 DISCUSSION AND RECOMMENDATION

APPENDIX:

Borehole Log

Penetrometer test plotting

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## 1.0 INTRODUCTION

The Client commissioned Best & Crompton Engineering Africa Ltd., to proceed with subsoil investigations at the proposed 330/132KV Substation at ALAKOTOMEJI, BADAGRY, BADAGRY LGA, LAGOS STATE. This report is a consequence of the soil investigation and analyses, which is presented in an objective and professional manner.

The purpose of the subsoil investigation and attendant report is as follows:

- Determine the subsoil and surface/groundwater conditions of the designated location.
- Evaluation of the subsoil stratigraphic sequence geotechnical/engineering properties of the soil and the subsequent effects on foundation design and construction.
- Analysis of the data/results of tests carried out on the soil samples obtained and provide recommendations on the fit-for-purpose type of foundation for the proposed structure.

## 2.0 SITE ACCESSIBILITY

The sites are accessible through **Badagry expressway** to mention but a few.

## 3.0 DESCRIPTION OF WORK

The soil investigation comprised of and carried out in three parts;

- Field Work: Test (2Nos. DCPTs and 3Nos. Borehole/SPT), Laboratory analysis and collation of the test results.

### 3.1 FIELD WORK

The site works were carried out on January 2015.

The Scope of Work executed involved the performance of 2Nos. 2.5tons Dutch Cone Penetrometer Tests (DCPTs) to a depth of refusal and 3Nos Borehole/SPT.

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## **BOREHOLE**

This stage involved carrying out 1No borehole to a depth between 15.00m to 20.00m below the existing ground level as specified by the client.

## **DRILLING METHOD**

The tools are attached to the wire rope which is then operated by the winch. The tools are operated using percussive techniques to progress the borehole to depths between 15.00m to 20.00m. As the borehole progresses, temporary casing is installed to provided support to the borehole sides. In firm or stiff cohesive soils casing is sometimes not required, as the clay is self supporting. For the drilling of deeper boreholes it is sometimes necessary to commence the borehole at one diameter, and then reduce to a smaller diameter to deepen the borehole. This would normally require the use of two or more strings of casing. Where it is necessary to add water to advance the borehole, only potable water will be used and the only the minimum amount necessary will be used. The amount added will be recorded on the driller's log. SPT is taken at 1.5m interval

## **Sampling Method**

1. Ordinary disturbed samples were collected at changes of strata and as deemed fit for strata identification purposes, through visual inspection and classification tests.
2. Undisturbed 100mm diameter samples were collected from cohesive strata. The operation is effected through a "jarring arrangement". The arrangement allows 100mm I.D. by 450mm length-sampling tube complete with a cutting shoe to be driven by the weight of the string rod above the sampler with minimum disturbance of the sample. The number of blows recorded is that used to obtain the last 300mm of penetration by the driven weight referred to above.

## **DUTCH CONE PENETROMETER**

The apparatus consists of a cylindrical probe, of 1000mm<sup>2</sup> cross sectional area, and a conic head of apex angle of 60°. The probe is forced down through the soil at a steady rate of about 20mm/s in the closed position by exerting pressure force on outer

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sounding tube. If desired the point resistance and the resistance to side friction can be measured separately.

2Nos. static cone penetration tests were carried out using a 2.5tons capacity testing equipment (machine) on each site. The test involves advancing the cone into the ground slowly at a constant rate and the resistant to penetration measured at predetermined intervals of 0.25m depth. The tests were terminated at depths where the machine anchor legs lifted.

These tests were taken from the existing ground level down to depths refusal at each location.

The cone penetration test results are presented in a graphical form respectively in the Appendix to this Report.

## **3.2 ANALYSIS OF TEST RESULTS**

### **3.2.1 Geological Description**

Available geological record reveals that the investigated area is within the basement complex of Nigeria; it is characterized by crystalline rocks of Precambrian age. Rocks of granitic origin later intruded these rocks.

The sedimentary deposits found on top of the basement rock are product of the parent rocks that have undergone weathering and decomposition.

### **3.2.2 Subsoil Condition**

The subsoil condition of the site, based on the DCP and Borehole/SPT test carried out reveals cohesive and cohesionless soil as observed from the DCP Plot and the Borehole log. Details of the subsoil characteristics encountered during the Penetrometer tests and Borehole/SPT are stated below:

---

**Subsoil Condition based on the field work.**

**Dutch Cone Penetrometer Test**

| <b><u>Depth (m)</u></b> | <b><u>Description of Stratum</u></b>     |
|-------------------------|--|
| 0.00 to -4.50           | Soft to firm cohesive soil.              |
| 4.50 to -6.00           | Loose to medium dense cohesionless soil. |

**Geotechnical Properties**

| <b><u>Depth (m)</u></b> | <b><u>Geotechnical Properties</u></b>  |
|-------------------------|--|
| 0.00 to -4.50           | Poor to moderate geotechnical properties, low to moderate shear strength and moderate compressibility potential. |
| 4.50 to -6.00           | Moderate geotechnical properties, moderate shear strength and low compressibility potential.                     |

**Geotechnical Engineering Parameters**

| <b><i>Depth (m)</i></b>    | <b><i>P1 (kgf/cm<sup>3</sup>)</i></b> | <b><i>P2 (kgf/cm<sup>3</sup>)</i></b> |
|----------------------------|---------------------------------------|---------------------------------------|
| <b><i>0.00 – 4.50m</i></b> | <b><i>2 – 15</i></b>                  | <b><i>2 – 14</i></b>                  |
| <b><i>4.50 – 6.00m</i></b> | <b><i>25 – 90</i></b>                 | <b><i>22 – 94</i></b>                 |

**Borehole/SPT 1**

| <b><u>Depth (m)</u></b> | <b><u>Description of Stratum</u></b>             |
|-------------------------|--|
| 0.00 to -4.50           | Soft to firm dark grey sandy CLAY                |
| 4.50 to -10.50          | Medium dense light grey silty sand with gravels. |
| 10.50 to -15.00         | Dense light grey silty SAND.                     |



---

## Geotechnical Properties

### Depth (m)

0.00 to –4.50

4.50 to –10.50

10.50 to –15.00

### Geotechnical Properties

Poor to moderate geotechnical properties, low to moderate shear strength and moderate compressibility potential.

Moderate geotechnical properties, moderate shear strength and low compressibility potential.

Very good geotechnical properties, high shear strength and low compressibility potential.

## Geotechnical Engineering Parameters

| <i>Depth (m)</i>      | <i>SPT Values</i> | <i>U4 Sample</i> |
|-----------------------|-------------------|------------------|
| <i>0.00 – 4.50m</i>   | <i>2 – 6</i>      | <i>Taken</i>     |
| <i>4.50 – 10.50m</i>  | <i>12 – 26</i>    | <i>N/A</i>       |
| <i>10.50 – 15.00m</i> | <i>30 – 34</i>    | <i>N/A</i>       |

### Borehole/SPT 2

#### Depth (m)

0.00 to –5.25

5.25 to –9.00

9.00 to –15.00

#### Description of Stratum

Soft to firm dark grey sandy CLAY

Medium dense dark grey silty sand.

Medium dense to dense light grey silty SAND.

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## Geotechnical Properties

### Depth (m)

0.00 to -5.25

5.25 to -9.00

9.00 to -15.00

### Geotechnical Properties

Poor to moderate geotechnical properties, low to moderate shear strength and moderate compressibility potential.

Moderate geotechnical properties, moderate shear strength and low compressibility potential.

Good geotechnical properties, high shear strength and low compressibility potential.

## Geotechnical Engineering Parameters

| <i>Depth (m)</i>     | <i>SPT Values</i> | <i>U4 Sample</i> |
|----------------------|-------------------|------------------|
| <i>0.00 – 5.25m</i>  | <i>2 – 5</i>      | <i>Taken</i>     |
| <i>5.25 – 9.00m</i>  | <i>14 – 23</i>    | <i>N/A</i>       |
| <i>9.00 – 15.00m</i> | <i>26 – 31</i>    | <i>N/A</i>       |

### Borehole/SPT 3

#### Depth (m)

0.00 to -5.25

5.25 to -11.25

11.25 to -20.00

#### Description of Stratum

Soft to firm dark grey sandy CLAY

Medium dense dark grey silty sand.

Medium dense to dense light grey silty SAND.

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## Geotechnical Properties

### Depth (m)

0.00 to –5.25

5.25 to –11.25

11.25 to –20.00

### Geotechnical Properties

Poor to moderate geotechnical properties, low to moderate shear strength and moderate compressibility potential.

Moderate geotechnical properties, moderate shear strength and low compressibility potential.

Good geotechnical properties, high shear strength and low compressibility potential.

## Geotechnical Engineering Parameters

| <i>Depth (m)</i>      | <i>SPT Values</i> | <i>U4 Sample</i> |
|-----------------------|-------------------|------------------|
| <i>0.00 – 5.25m</i>   | <i>2 – 5</i>      | <i>Taken</i>     |
| <i>5.25 – 11.25m</i>  | <i>12 – 24</i>    | <i>N/A</i>       |
| <i>11.25 – 20.00m</i> | <i>28 – 32</i>    | <i>N/A</i>       |

### 3.2.4 Site description and condition

The project site is an open piece of land. Structures around site show no sign of distress at the time of our investigation.

### 3.2.5 Topography.

The topography of the project site is nearly even topography.

### 3.2.6 Vegetation.

Vegetation around the project site area is mainly grasses and weeds.

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## **4.1 FOUNDATION DISCUSSION AND RECOMMENDATION**

### **4.1.1 Proposed Development**

No structural detail of the proposed development was made available to us prior to the subsoil investigation, thus our recommendations are based on the Borehole and DCP tests carried out.

The geotechnical issues considered relevant to the proposed development include

- Soil bearing pressure
- Level of groundwater
- Recommendation of a suitable foundation type
- Excavation

### **4.1.2 RECOMMENDATION**

The foundation type to be chosen for a particular structure depends largely on the followings;

- Loads to be transmitted
- Receiving soil strata
- Factor of safety against shear failure of the supporting soil must be adequate.
- Settlement should neither cause any unacceptable damage nor interfere with the function of the structure.

Foundations can be classified as shallow foundation or as deep foundation.

The choice between shallow foundation and deep foundation can be arrived at after careful consideration of the following elements.

1. The magnitude of the transmitted loads from the stratum,
2. The soil nature,
3. The economic aspects of the elements of the foundation work,
4. Problems concerning foundation construction.

---

### **4.1.3 Allowable bearing pressure and foundation recommendation**

Allowable bearing pressure calculated in accordance with theoretical soil mechanics principle for depths are indicated below:

| <b>Differential Depth<br/>(m)</b> | <b>Allowable bearing<br/>Capacity (KN/m<sup>2</sup>)</b> |
|-----------------------------------|--|
| <b>0.00 – 0.50</b>                | <b>17</b>  |
| <b>0.50 – 1.00</b>                | <b>17</b>  |
| <b>1.00 – 1.50</b>                | <b>29</b>  |
| <b>1.50 – 2.00</b>                | <b>29</b>  |
| <b>1.50 – 2.00</b>                | <b>38</b>  |
| <b>1.50 – 2.00</b>                | <b>40</b>  |

### **FOUNDATION RECOMMENDATION**

#### **Shallow Foundation**

Shallow Foundation could be considered for any ancillary facilities with foundation pressure not exceeding the allowable bearing capacity stated.

Shallow is restricted to the use of stiffened raft slab because it helps to minimize differential settlement.

#### **Groundwater**

Groundwater was encountered during the subsoil investigation work

### **METHOD OF CALCULATING ALLOWABLE BEARING PRESSURE IN COHESIVE SOIL IS GIVEN BY:**

Method for calculating in Cohesive Soil is given by:

$q_{ult} = 5.14C_u + \Sigma D$  (Prandtl method of estimating allowable bearing pressure)

$$q_a = q_{ult}/F.S \text{ (3) – For Shallow foundation}$$

Correlation between  $q_c$  and SPT (N – Values)

$$N = q_c / 2$$

$$q_a = 10N \text{ or } 5.0N \text{ (If Submerged)}$$

### Correlation between $q_c$ and $C_u$

$$C_u = q_c / 20 \text{ (KN/m}^2\text{)}$$

$q_{ult} = c \cdot N_c + q \cdot N_q + 0.5 \cdot \gamma \cdot B \cdot N_\gamma$  (Terzaghi method of estimating allowable bearing pressure)

Where:

$c$  = cohesion of soil

$\gamma$  = unit weight of soil

$q = \gamma \cdot D_f$

$N_c, N_q, N_\gamma$  = Bearing capacity factor

### 4.2.2 Settlement

Settlement for this allowable bearing pressure for each location stated above would not exceed **50mm**.

Our analysis on settlement is based on the method below:

$$S = q_n B \left\{ \frac{1 + u^2}{E_s} \right\} I_f$$

Where  $S$  = Settlement

$B$  = Width of foundation

$E_s$  = Modulus of elasticity of soil

$u$  = Poisson's ratio

$q_n$  = Net foundation pressure

$I_f$  = Influence factor

The table below shows the permissible settlement as per I.S Code.

| Soil type | Permissible total settlement |                   | Permissible differential settlement |                   |
|-----------|------------------------------|-------------------|-------------------------------------|-------------------|
|           | For isolated footings        | For raft footings | For isolated footings               | For raft footings |
|           |                              |                   |                                     |                   |

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|       |       |               |       |       |
|-------|-------|---------------|-------|-------|
| Sandy | 4.0cm | 4.cm to 6.5cm | 2.5cm | 2.5cm |
| Clays | 6.5cm | 6.5 to 10.0cm | 4.0cm | 4.0cm |

### 4.2.3 Factor of Safety

Factor of safety of 3 was adopted for our estimation of allowable bearing pressure.

### 4.2.4 Excavation

- Excavation could be achieved using conventional excavating equipment.
- Excavation support might be required

Excavations deeper than 1.2m must be sloped. Temporary trench slope of 1 vertical to 1 horizontal are expected to remain stable through the fill and the native clay. Where there is insufficient space for open cut excavations, shoring or a trench liner box will be required.

If the soils are saturated at the time of construction, the condition of each soil type should be re-evaluated.

Stock piles, materials or any heavy equipment should be kept at least 5.0m from the upper edge of the excavation; All surface drainage must be directed away from any open excavations and trenches.

No significant problems are anticipated during excavation. Conventional excavating equipment should be able to remove the soils down to anticipated founding level.

### 4.2.5 General Precaution for Shallow Foundation Construction

It is recommended that the following general guidelines that govern the construction of shallow foundation should be observed when work starts on the site:

- Over excavation beyond the depths stated should not be done.
- Ingress of water into the excavated foundation trench should be prevented if the stated bearing value at the founding depth is to be achieved. A layer of concrete blinding should therefore be provided within a trench once it has been excavated.

- 
- Adequate cover to the concrete should be allowed for the reinforcement bars to protect them from possible effect of corrosion.
  - The sides of foundation should be backfilled up to existing ground level as soon as they are cast.

**For proposed structures with foundation pressure exceeding the allowable bearing pressure stated above, Deep foundation should be considered.**

### **Deep Foundation**

#### **PILES**

Piles are special form of deep foundation employed in the transfer of structural loads which may be vertical or inclined loads, through relative weak and incompetent subsoil strata to stronger, more competent subsoil strata at depth. This is to ensure that a sufficient factor of safety against failure can be achieved and/ or that settlement occurring at the design loads is within tolerable limits.

#### **Pile Types**

The B.S. 8004: 1986(Presently CP 2004: 1972) Code of practice for foundations classified piles into 3 main categories and into which all various types fall. These can be summarized as follows:

**Large Displacement Piles** – Driven or Jacked Piles

**Small Displacement Piles** – All forms of small section driven, screwed or jacked piles e.g. open ended steel cased driven piles

**Non - Displacement Piles (or Replacement Piles)** – These are piles formed by boring or drilling by means of various methods e.g. hand augers or various forms of mechanical augers such as grab augers or spiral plates (continuous flight augers.)

Piles that could be adopted on the site to support the proposed building could be driven or bored.

Piles may be designed as friction piles, end bearing piles or a hybrid of both types.

**Type: Non - Displacement Piles (or Replacement Piles)**

**Depth: -10.00m**



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Find below working loads of piles terminated at depth -10.00m.

| <u>Pile diameter (mm)</u> | <u>Working load (KN)</u> |
|---------------------------|--------------------------|
| 400                       | 305                      |
| 450                       | 386                      |
| 600                       | 687                      |
| 800                       | 1222                     |

- **Toe bearing Capacity: 4053KN/m<sup>2</sup>**
- **Factor of safety adopted for Deep foundation analysis is 2.5**
- **It is essential that pile load test be perform to confirm the theoretical working loads stated above. Load test to a maximum of 1.5 times the stated pile capacity would be adequate on a working load.**

#### **4.2.6 General Precaution For deep Foundation Construction**

It is recommended that the following general guidelines that govern the construction of deep foundation should be observed when works starts on the site:

- Adequate reinforcement -with ample cover- should be provided for the piles.
- Care consideration should be given to the spacing of piles where group occur. A spacing of 2.5 to 3.0 times the diameter of the piles is usually adequate.
- The pile cap of ample dimensions should be constructed over individual piles and the pile groups so that piles that deviate from their intended positions can be accommodated.
- Pile cap should be deep enough to ensure full transfer of the load from the column to the cap in the punching shear and from the cap of the piles.
- Ground beam should be used to inter-connect the pile or pile cap so as to take care of out-of-balance moment resulting from wind effect at ground level both in normal and punching shear

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## **5.0 CONCLUSION**

Shallow Foundation could be considered for any ancillary facilities with foundation pressure not exceeding the allowable bearing capacity stated.

Shallow is restricted to the use of stiffened raft slab because it helps to minimize differential settlement.

For proposed structures with foundation pressure exceeding the allowable bearing pressure stated above, Deep foundation should be considered.

Despite an objective soil investigation and reporting, a poorly designed and/or constructed foundation may lead to structural failure if all other environmental conditions remain constant.

Best & Crompton Engineering Africa Ltd., therefore recommends that the design and construction of all foundation and earthwork be carried out by a competent company in accordance with good and strict engineering practice expected of a professional. The construction contractor shall be guided by reference Code of Practices such as; British Institution CP 2004, 1973: Code of Practice for Foundation and BS 6031: Code of Practice for Earth Works.

**For Best & Crompton Engineering Africa Ltd.,**

**(M.Nageswara Rao)**

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**APPENDIX**

**FIELD LOGS**

## BOREHOLE LOG

### SUBSOIL INVESTIGATION AT ALAKOTOMEJI BADAGRY SUBSTATION, LAGOS

#### BOREHOLE NO: 1

| Depth(m)  | Legend | Strata thickness | SPT Blows                        | Description of Strata                                       |
|---|--------|------------------|----------------------------------|---|
| 1.50<br>3.00<br>4.50  | Legend | (4.50)           | U4<br>N2<br>U4<br>U4<br>N4<br>N6 | <i>Soft to firm dark grey sandy CLAY</i>                    |
| 6.00<br>7.50<br>9.00  | Legend | (6.00)           | N12<br>N19<br>N26                | <i>Medium dense light grey silty SAND with fine gravels</i> |
| 10.50<br>12.00<br>13.50<br>15.00  | Legend | (4.50)           | N30<br>N34                       | <i>Dense light grey silty SAND</i>                          |
| <b>N- Number of blows      U4- Undisturbed sample      U4*- Undisturbed sample abortive</b> |        |                  |                                  |   |

## BOREHOLE LOG

### SUBSOIL INVESTIGATION AT ALAKOTOMEJI BADAGRY SUBSTATION, LAGOS

#### BOREHOLE NO: 2

| Depth(m) | Legend | Strata thickness | SPT Blows | Description of Strata                              |
|----------|--------|------------------|-----------|--|
| 1.50     | Legend | (5.25)           | U4<br>N2  | <i>Soft to firm dark grey sandy CLAY</i>           |
| 3.00     |        |                  | N3        |  |
| 4.50     |        |                  | N5        |  |
| 6.00     | Legend | (3.75)           | N14       | <i>Medium dense dark grey silty SAND.</i>          |
| 7.50     |        |                  | N18       |  |
| 9.00     |        |                  | N23       |  |
| 10.50    | Legend | (6.00)           | N26       | <i>Medium dense to dense light grey silty SAND</i> |
| 12.00    |        |                  | N29       |  |
| 13.50    |        |                  | N31       |  |
| 15.00    |        |                  |           |  |

**N- Number of blows      U4- Undisturbed sample      U4\*- Undisturbed sample abortive**

## BOREHOLE LOG

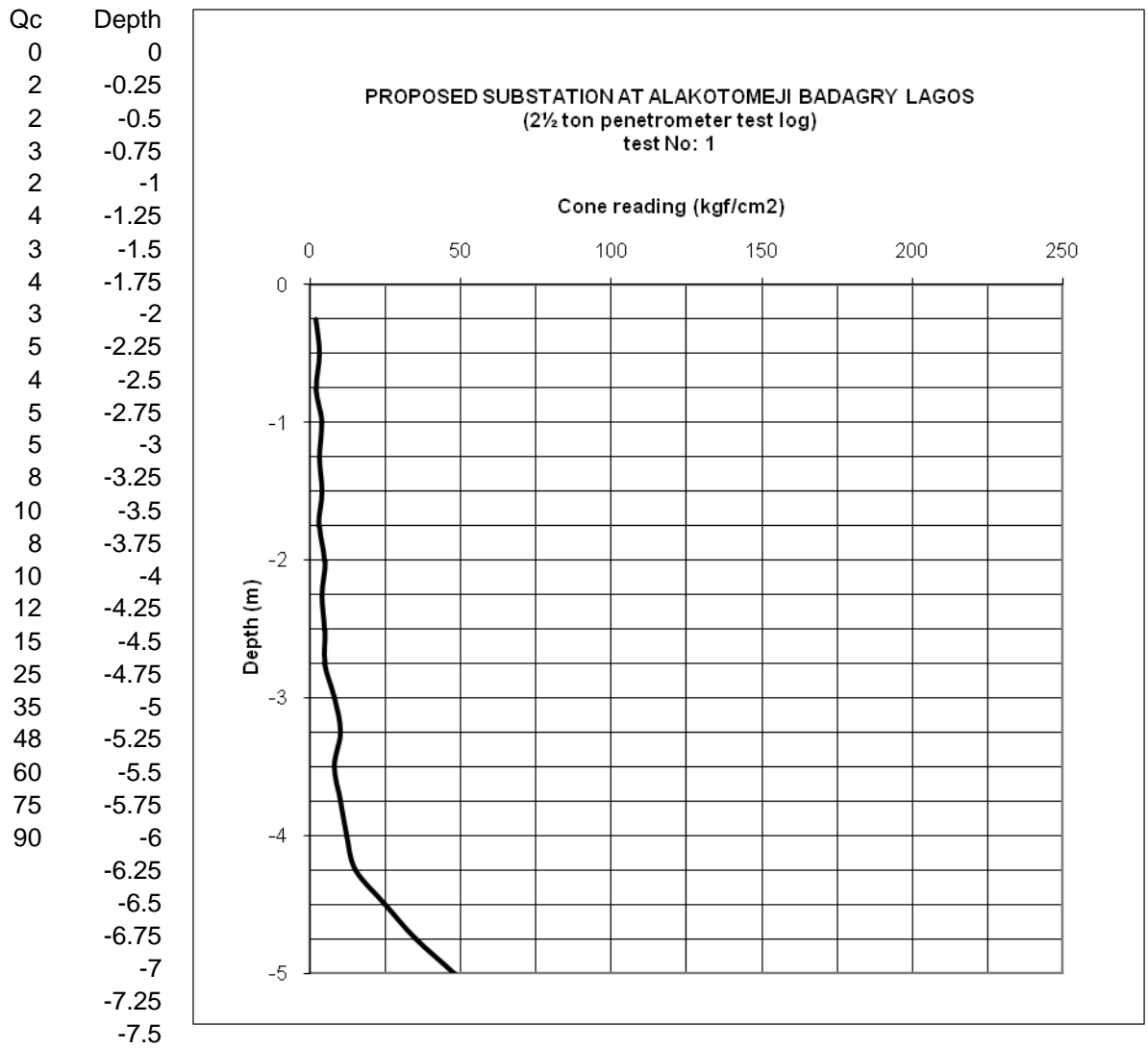
### SUBSOIL INVESTIGATION FOR ALAKOTOMEJI, BADAGRY, LAGOS STATE

#### BOREHOLE NO: BH 3

| Depth(m) | Legend | Strata thickness | SPT Blows | Description of Strata                              |  |
|----------|--------|------------------|-----------|--|--|
| 2.00     | Legend | (5.25)           | U4<br>N2  | <i>Soft to firm dark grey sandy CLAY</i>           |  |
| 4.00     |        |                  | U4<br>N3  |  |  |
| 6.00     |        |                  | U4<br>N5  |  |  |
| 8.00     |        |                  | N12       |  | <i>Medium dense dark grey silty SAND</i> |
| 10.00    |        |                  | N18       |  |  |
| 12.00    | N24    |                  |           |  |  |
| 14.00    | Legend | (8.75)           | N28       | <i>Medium dense to dense light grey silty SAND</i> |  |
| 16.00    |        |                  | N30       |  |  |
| 18.00    |        |                  | N32       |  |  |
| 20.00    |        |                  |           |  |  |

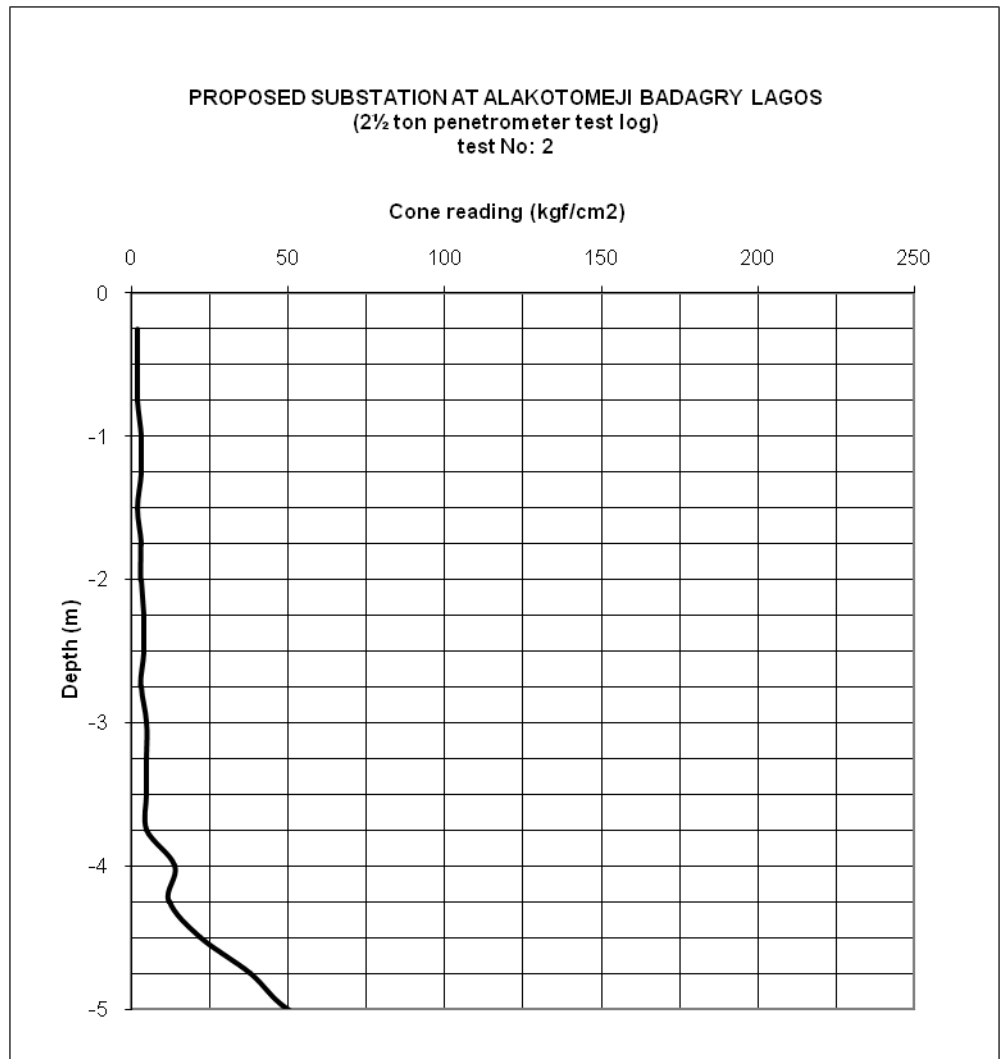
**N-Number of blows    U4 - Undisturbed Sample    U4\* - Undisturbed Sample abortive**

# PENETROMETER 1



## PENETROMETER 2

| Qc | Depth |
|----|-------|
| 0  | 0     |
| 2  | -0.25 |
| 2  | -0.5  |
| 2  | -0.75 |
| 2  | -1    |
| 3  | -1.25 |
| 3  | -1.5  |
| 2  | -1.75 |
| 3  | -2    |
| 3  | -2.25 |
| 4  | -2.5  |
| 4  | -2.75 |
| 3  | -3    |
| 5  | -3.25 |
| 5  | -3.5  |
| 5  | -3.75 |
| 5  | -4    |
| 14 | -4.25 |
| 12 | -4.5  |
| 22 | -4.75 |
| 38 | -5    |
| 50 | -5.25 |
| 72 | -5.5  |
| 72 | -5.75 |
| 94 | -6    |
|    | -6.25 |
|    | -6.5  |
|    | -6.75 |
|    | -7    |
|    | -7.25 |
|    | -7.5  |





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## SUMMARY OF LABORATORY TEST RESULTS

### ATTERBERG LIMIT TEST

| BOREHOLE/<br>SAMPLE NO | DEPTH<br>(m) | NATURAL<br>MOISTURE<br>CONTENT<br>(W <sub>c</sub> )% | LIQUID<br>LIMIT<br>(L.L) % | PLASTIC<br>LIMIT<br>(P.L) % | PLASTICITY<br>INDEX (P.I) % |
|------------------------|--------------|--|----------------------------|-----------------------------|-----------------------------|
| 1/2                    | 1.00         | 24.8   | 45                         | 8                           | 36                          |
| 1/4                    | 2.00         | 24.5   | 40                         | 10                          | 30                          |
| 1/6                    | 3.00         | 25.4   | 44                         | 14                          | 30                          |
| 2/2                    | 1.00         | 26.3   | 41                         | 9                           | 32                          |
| 2/4                    | 2.00         | 25.0   | 43                         | 14                          | 29                          |
| 2/6                    | 3.00         | 28.2   | 38                         | 15                          | 23                          |
| 3/2                    | 1.00         | 29.4   | 43                         | 8                           | 35                          |
| 3/4                    | 1.50         | 26.0   | 37                         | 10                          | 27                          |
| 3/6                    | 2.25         | 26.9   | 35                         | 13                          | 22                          |

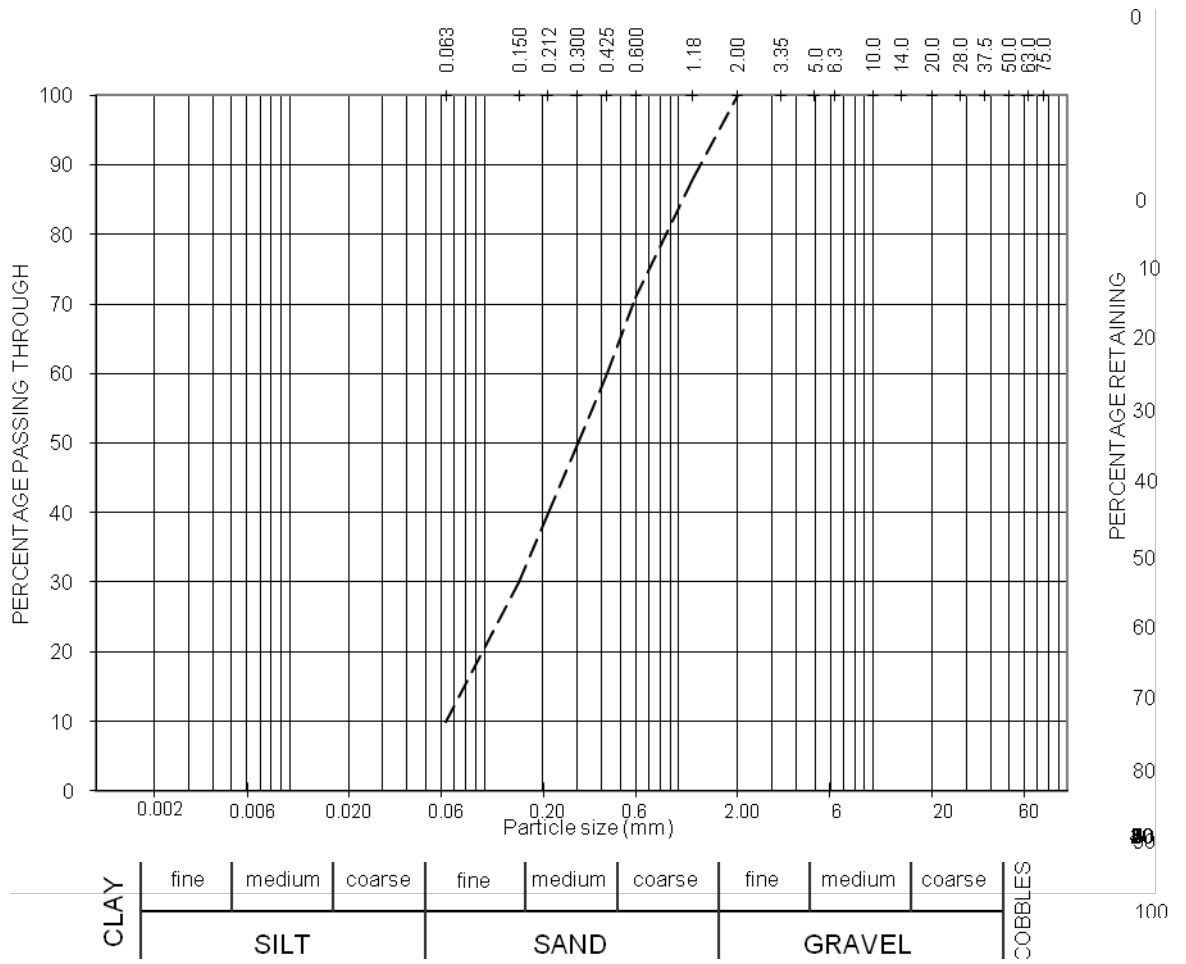
### QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

| BOREHOLE<br>/ SAMPLE<br>NO | DEPTH<br>(m) | NATURAL<br>MOISTURE<br>CONTENT<br>(W <sub>c</sub> )% | BULK<br>DENSITY<br>( $\gamma_b$ )<br>Mg/m <sup>3</sup> | UNDRAINED<br>COHESION<br>(C <sub>u</sub> ) KN/m <sup>2</sup> | ANGLE OF<br>INTERNAL<br>FRICTION |
|----------------------------|--------------|--|--|--|----------------------------------|
| 1/2                        | 1.00         | 24.8   | 1.570  | 10   | 5.0                              |
| 1/4                        | 2.00         | 24.5   | 1.610  | 17.5   | 8.0                              |
| 1/6                        | 3.00         | 25.4   | 1.640  | 25   | 11.0                             |
| 2/2                        | 1.00         | 26.3   | 1.510  | 12   | 6.0                              |
| 2/4                        | 2.00         | 25.0   | 1.590  | 18   | 10.0                             |
| 2/6                        | 3.00         | 28.2   | 1.680  | 27   | 12.0                             |
| 3/2                        | 1.00         | 29.4   | 1.560  | 10   | 5.0                              |

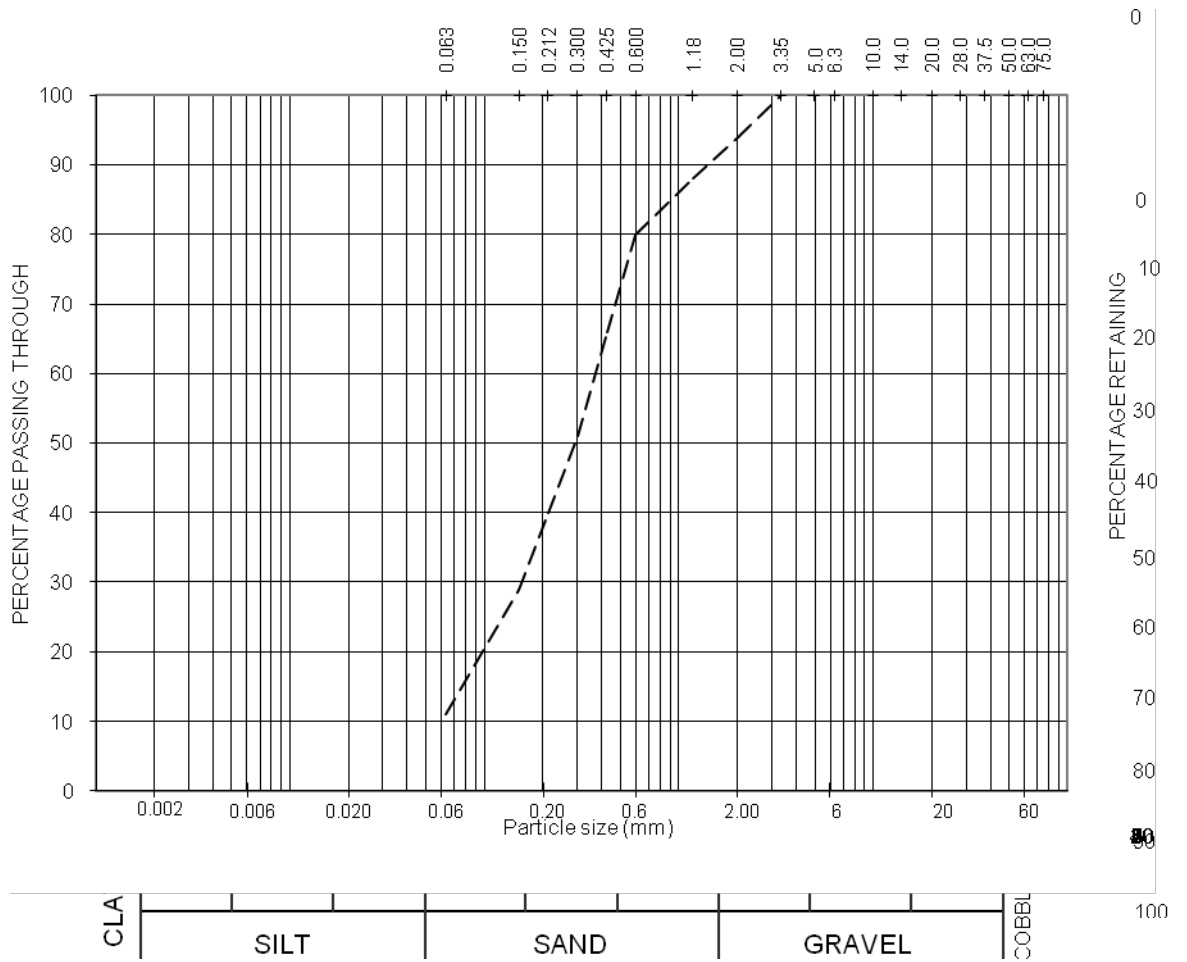
|            |             |             |              |             |             |
|------------|-------------|-------------|--------------|-------------|-------------|
| <b>3/4</b> | <b>2.00</b> | <b>26.0</b> | <b>1.620</b> | <b>15</b>   | <b>7.0</b>  |
| <b>3/6</b> | <b>3.00</b> | <b>26.9</b> | <b>1.650</b> | <b>25.5</b> | <b>10.0</b> |

### GRAIN SIZES DISTRIBUTION TEST

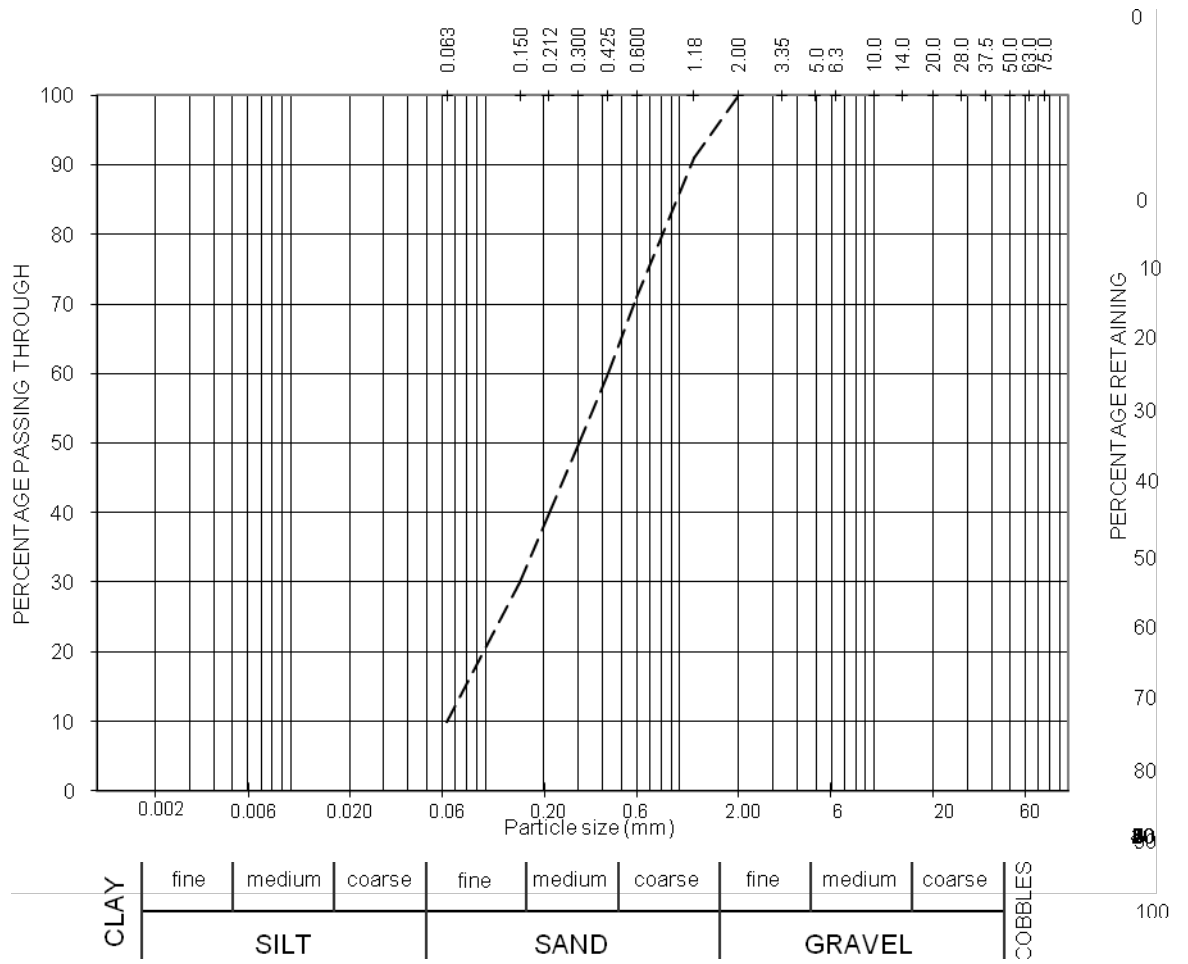
| BH No | Sample No | Depth (m) | Soil Type | Sieve sizes (mm) |      |     |      |     |       |     |       |      |       |       |
|-------|-----------|-----------|-----------|------------------|------|-----|------|-----|-------|-----|-------|------|-------|-------|
|       |           |           |           | 5                | 3.35 | 2   | 1.18 | 0.6 | 0.425 | 0.3 | 0.212 | 0.15 | 0.063 | 0.045 |
| 1     | 12        | 6.00      | S         |                  |      | 100 | 92   | 81  | 79    | 60  | 41    | 28   | 15    |       |
| 1     | 18        | 9.00      | S         |                  |      | 94  | 88   | 80  | 66    | 51  | 40    | 29   | 11    |       |
| 1     | 24        | 12.00     | S         |                  |      | 100 | 91   | 71  | 60    | 50  | 40    | 30   | 10    |       |
| 2     | 12        | 6.00      | S         |                  |      | 95  | 89   | 81  | 79    | 60  | 41    | 28   | 15    |       |
| 2     | 18        | 9.00      | S         |                  |      | 100 | 90   | 78  | 66    | 55  | 43    | 30   | 14    |       |
| 2     | 24        | 12.00     | S         |                  |      | 100 | 90   | 80  | 70    | 51  | 41    | 29   | 11    |       |
| 3     | 12        | 6.00      | S         |                  |      | 100 | 92   | 81  | 79    | 63  | 50    | 36   | 15    |       |
| 3     | 18        | 9.00      | S         |                  |      | 95  | 90   | 80  | 71    | 62  | 51    | 40   | 15    |       |
| 3     | 24        | 12.00     | S         |                  |      | 100 | 87   | 80  | 71    | 55  | 40    | 27   | 13    |       |



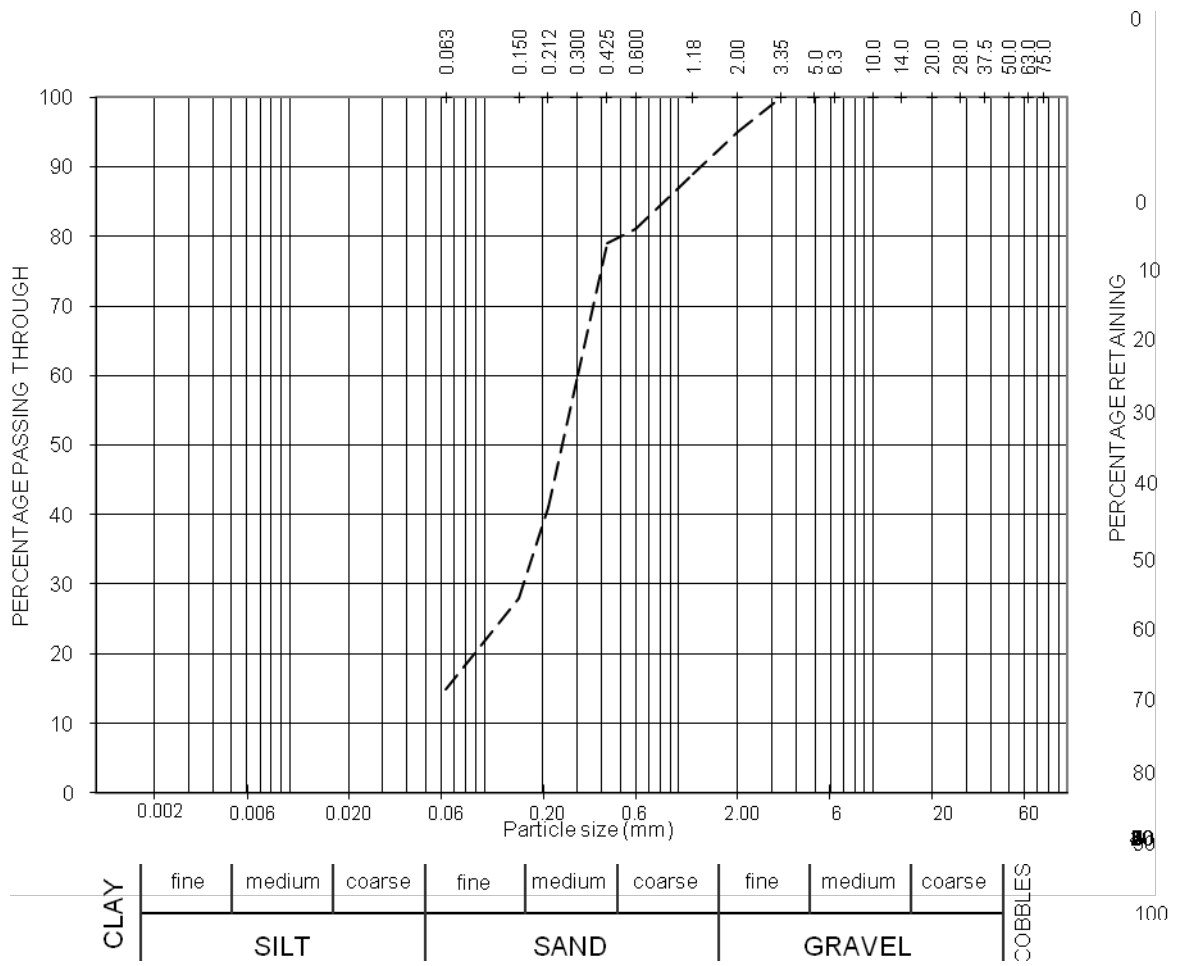
|             |              |                              |
|-------------|--------------|------------------------------|
| <b>BH 1</b> | <b>6.00m</b> | <b>Light grey silty SAND</b> |
|-------------|--------------|------------------------------|



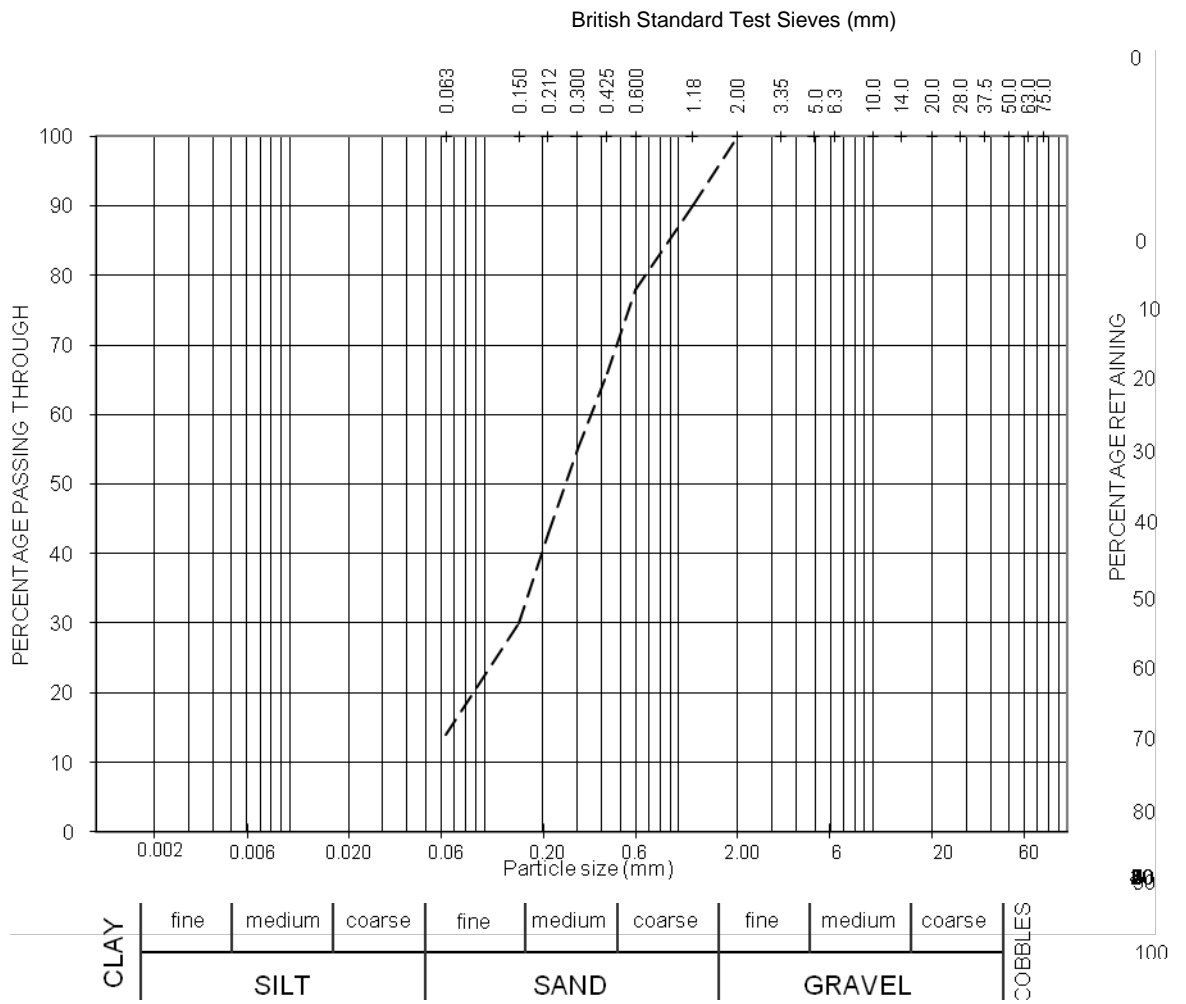
|             |              |                              |
|-------------|--------------|------------------------------|
| <b>BH 1</b> | <b>9.00m</b> | <b>Light grey silty SAND</b> |
|-------------|--------------|------------------------------|



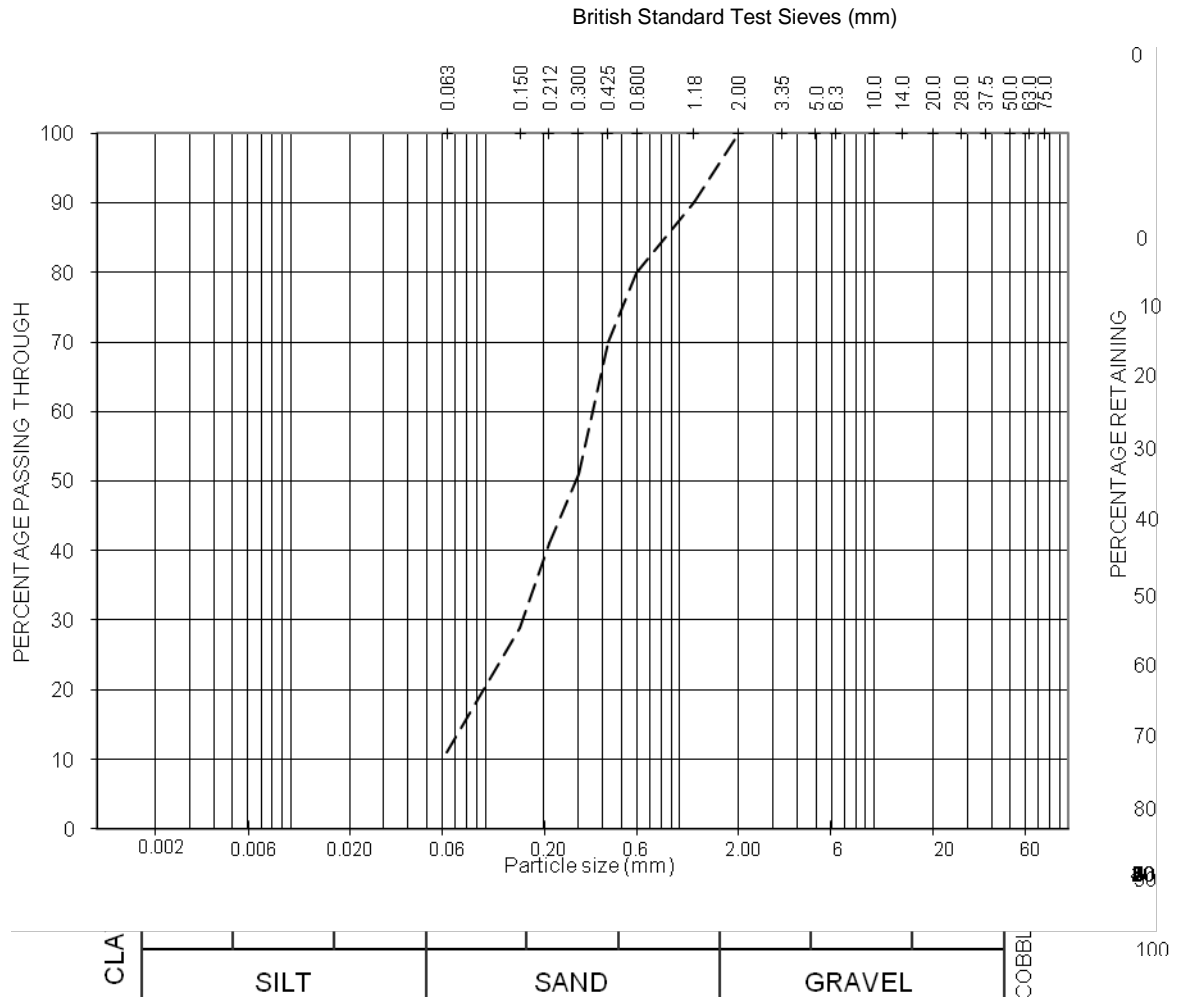
|             |               |                              |
|-------------|---------------|------------------------------|
| <b>BH 1</b> | <b>12.00m</b> | <b>Light grey silty SAND</b> |
|-------------|---------------|------------------------------|



|             |              |                             |
|-------------|--------------|-----------------------------|
| <b>BH 2</b> | <b>6.00m</b> | <b>Dark grey silty SAND</b> |
|-------------|--------------|-----------------------------|

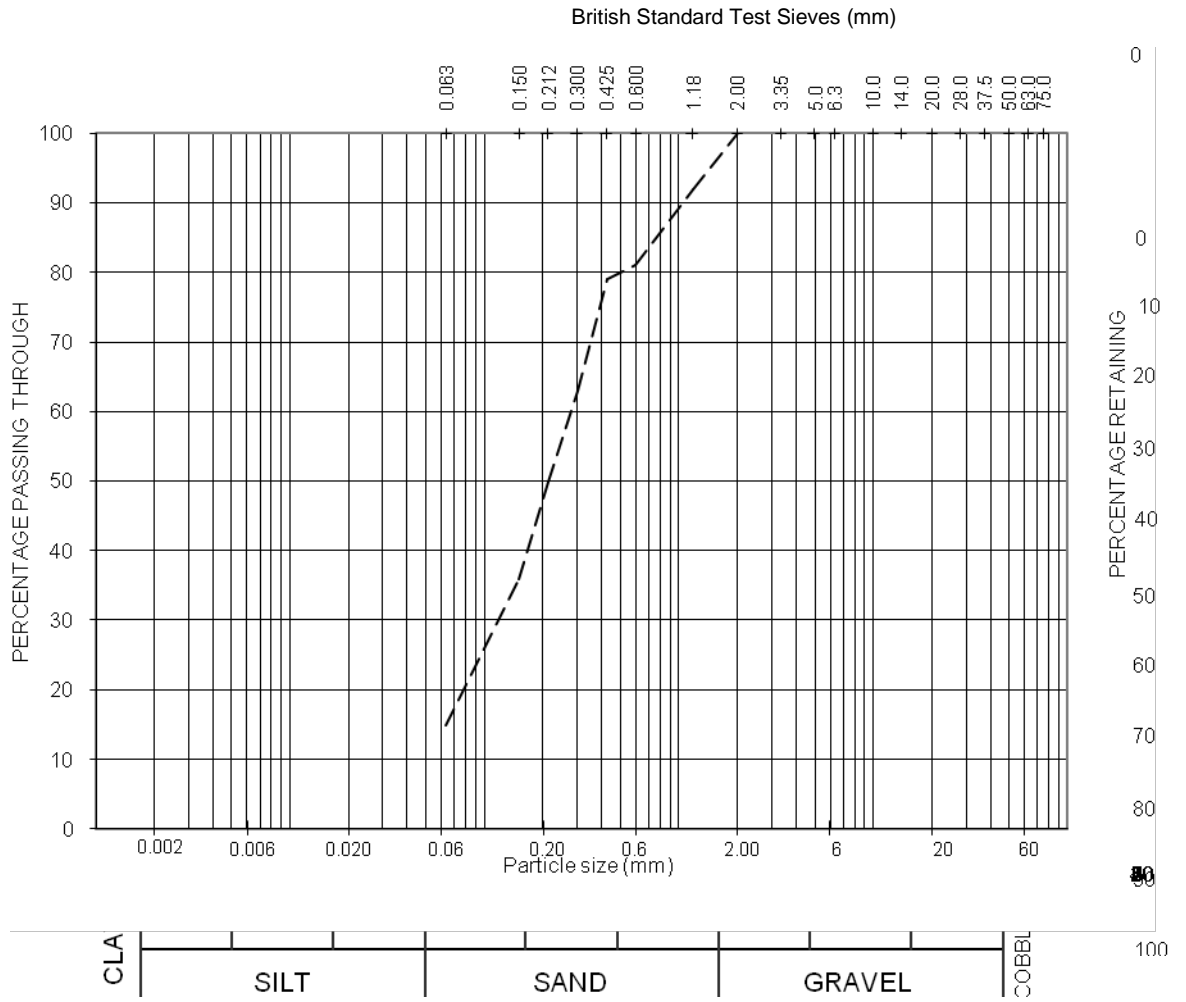


|             |              |                             |
|-------------|--------------|-----------------------------|
| <b>BH 2</b> | <b>9.00m</b> | <b>Dark grey silty SAND</b> |
|-------------|--------------|-----------------------------|

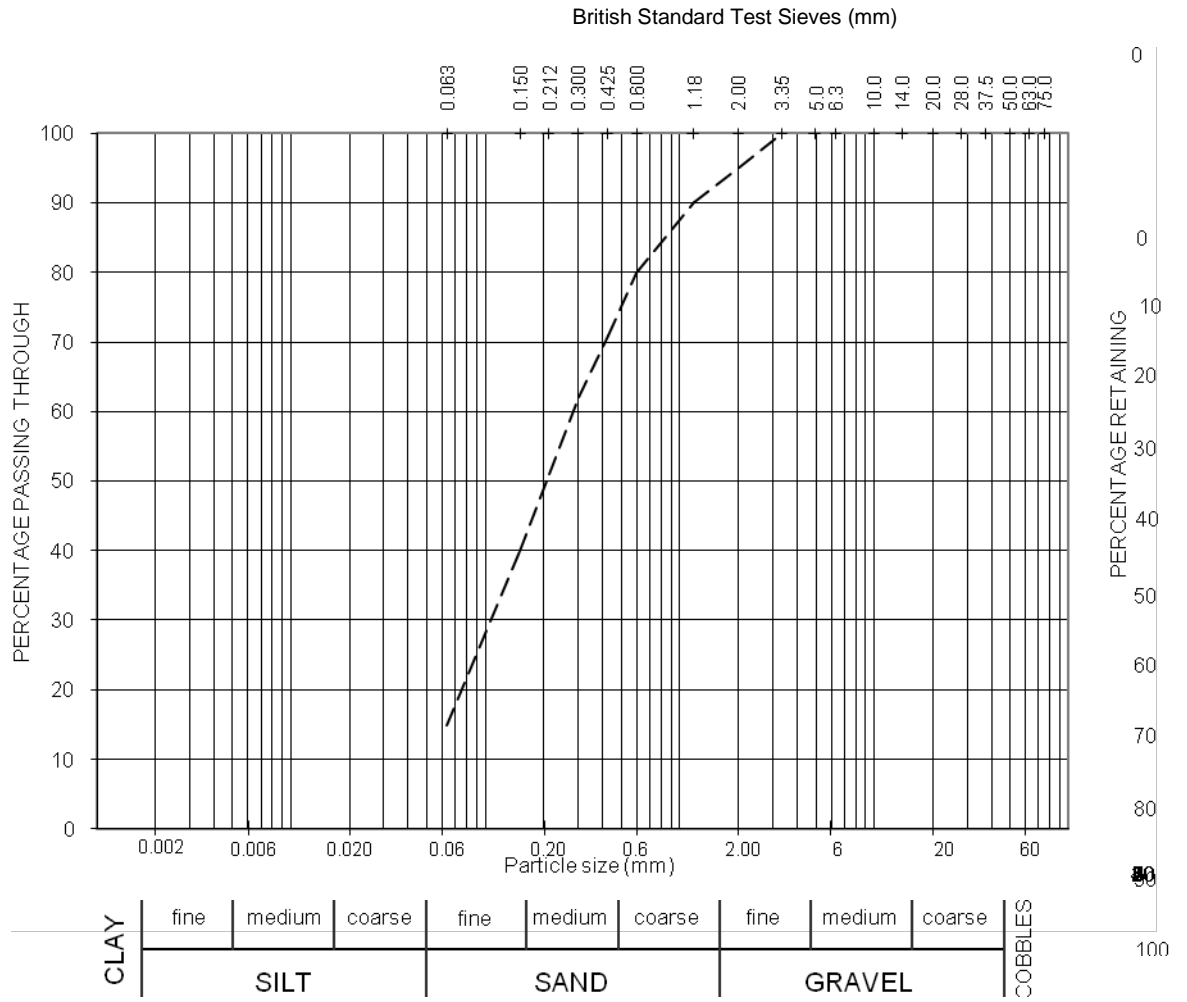


|             |               |                              |
|-------------|---------------|------------------------------|
| <b>BH 2</b> | <b>12.00m</b> | <b>Light grey silty SAND</b> |
|-------------|---------------|------------------------------|

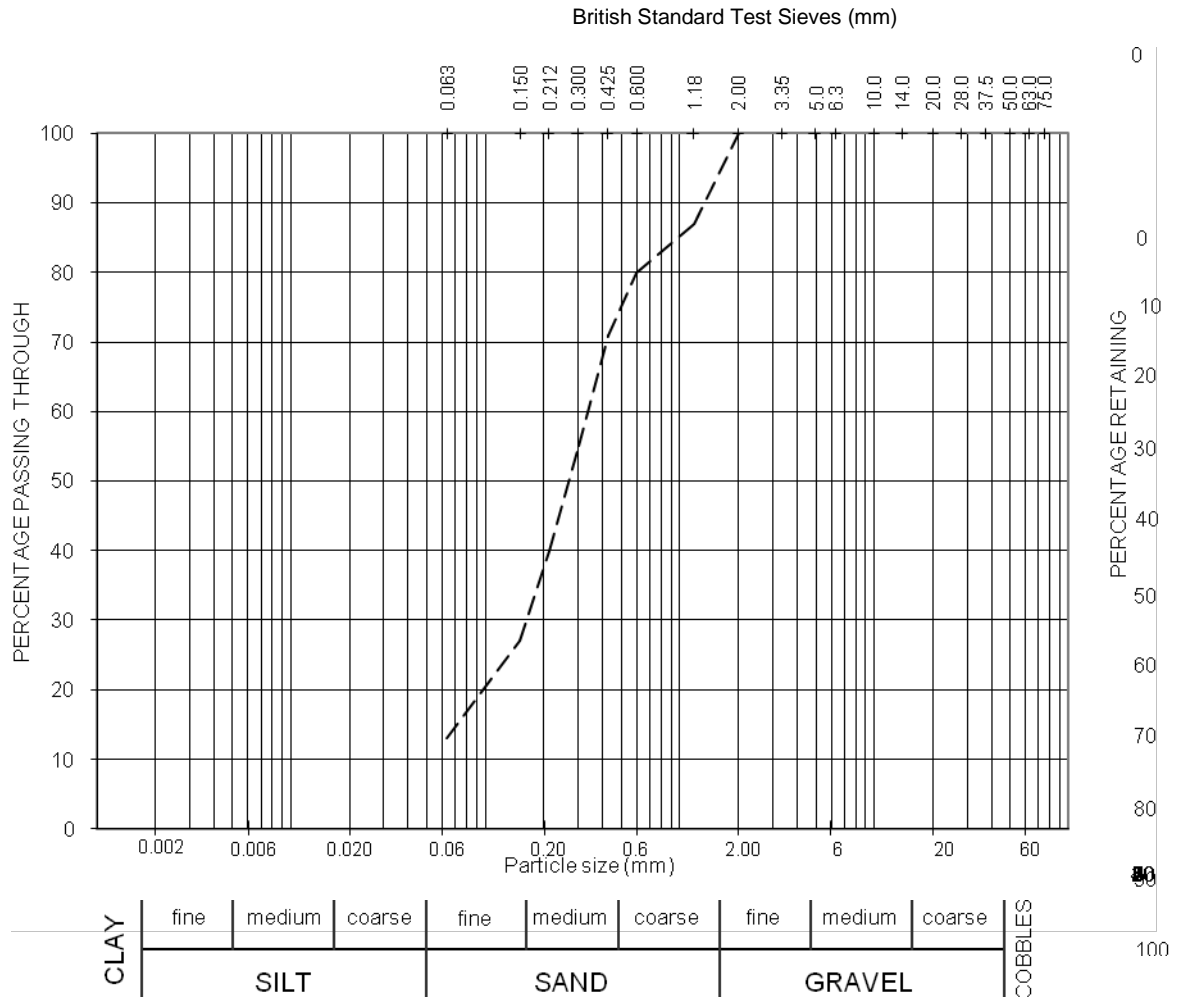




|             |              |                             |
|-------------|--------------|-----------------------------|
| <b>BH 3</b> | <b>6.00m</b> | <b>Dark grey silty SAND</b> |
|-------------|--------------|-----------------------------|



|             |              |                             |
|-------------|--------------|-----------------------------|
| <b>BH 3</b> | <b>9.00m</b> | <b>Dark grey silty SAND</b> |
|-------------|--------------|-----------------------------|



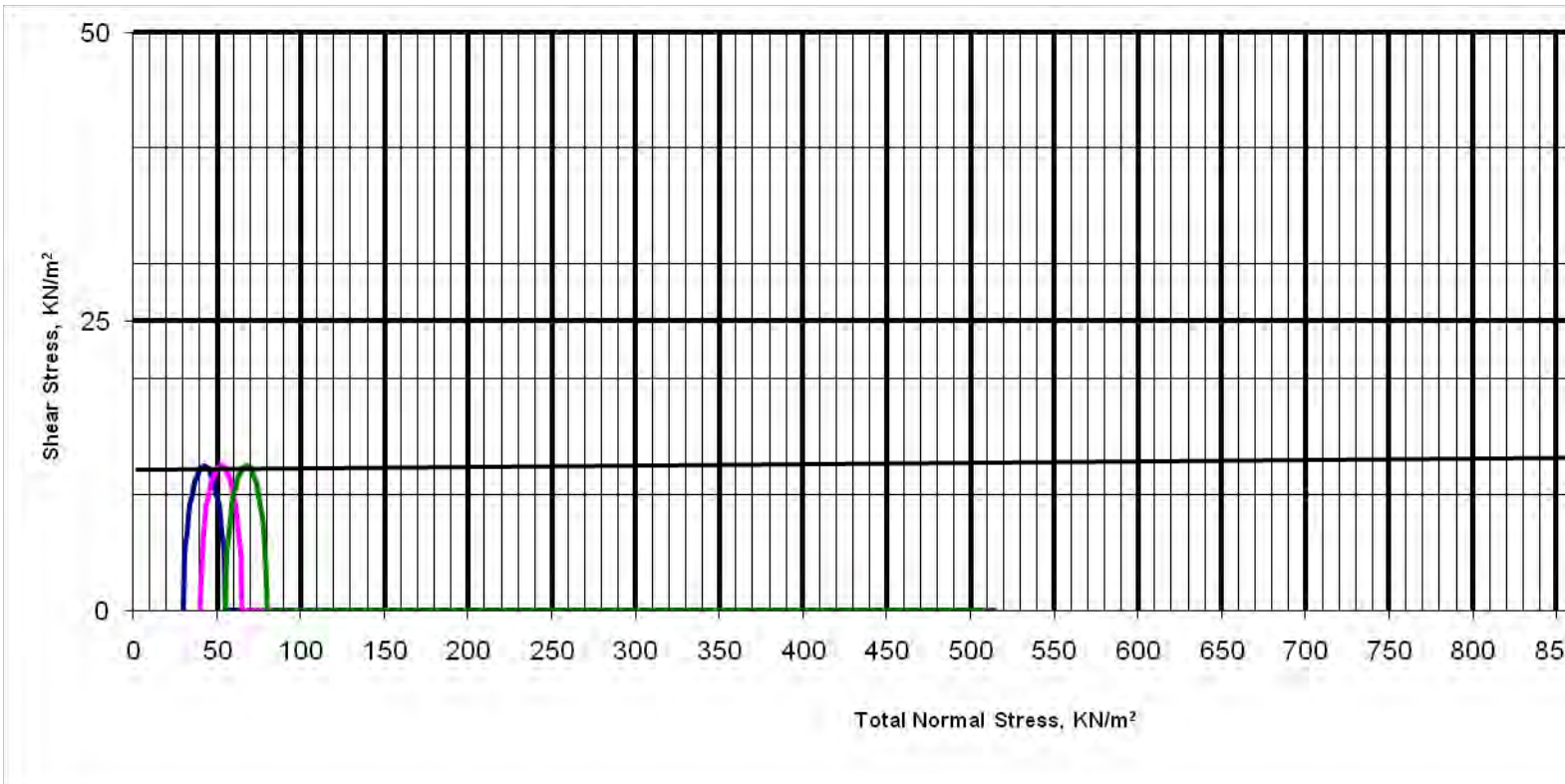
|             |               |                              |
|-------------|---------------|------------------------------|
| <b>BH 3</b> | <b>12.00m</b> | <b>Light grey silty SAND</b> |
|-------------|---------------|------------------------------|

BH 1

Sample: 2

Depth: 1.00m

|                         |         |
|-------------------------|---------|
| Undrained Cohesion      | 10KN/m2 |
| Angle of Friction (PHI) | 5deg    |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

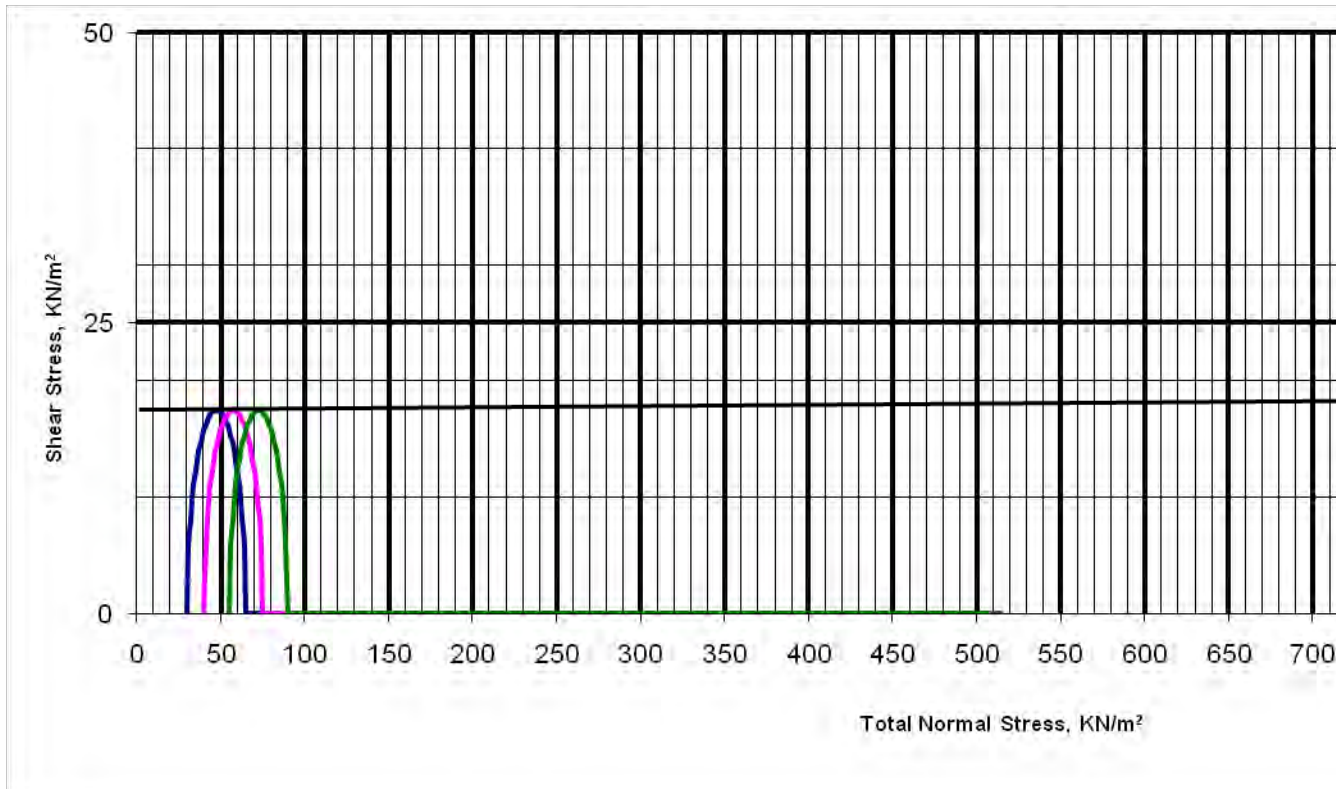
UNDRAINED TRIAXIAL TEST

BH 1

Sample: 4

Depth: 2.00m

|                         |                       |
|-------------------------|-----------------------|
| Undrained Cohesion      | 17.5KN/m <sup>2</sup> |
| Angle of Friction (PHI) | 8deg                  |



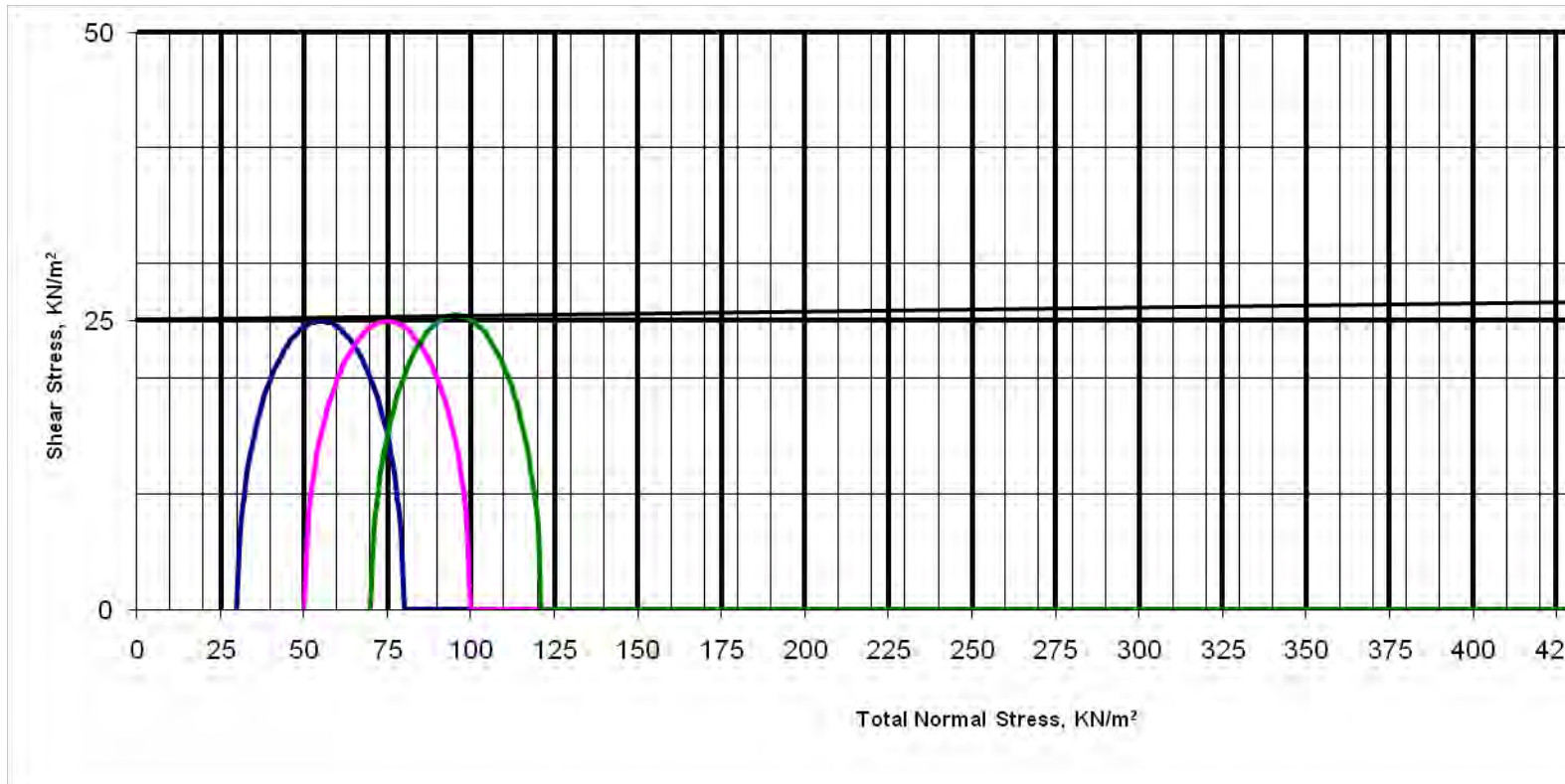
TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

BH 1

Sample: 6

Depth: 3.00m

|                         |                    |
|-------------------------|--------------------|
| Undrained Cohesion      | 25N/m <sup>2</sup> |
| Angle of Friction (PHI) | 11deg              |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

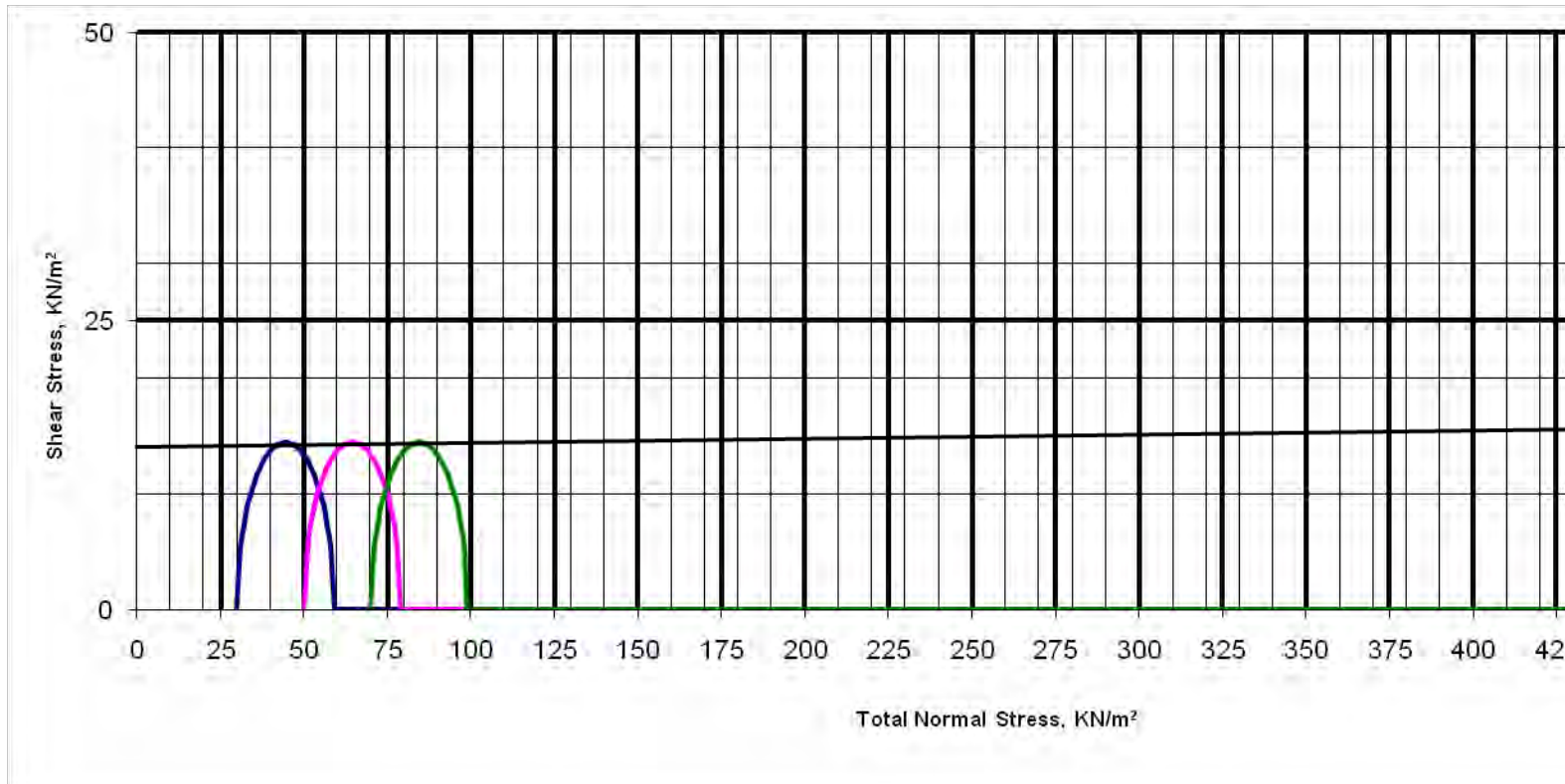
UNDRAINED TRIAXIAL  
TEST

BH 2

Sample: 2

Depth: 1.00m

|                         |                    |
|-------------------------|--------------------|
| Undrained Cohesion      | 12N/m <sup>2</sup> |
| Angle of Friction (PHI) | 6deg               |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

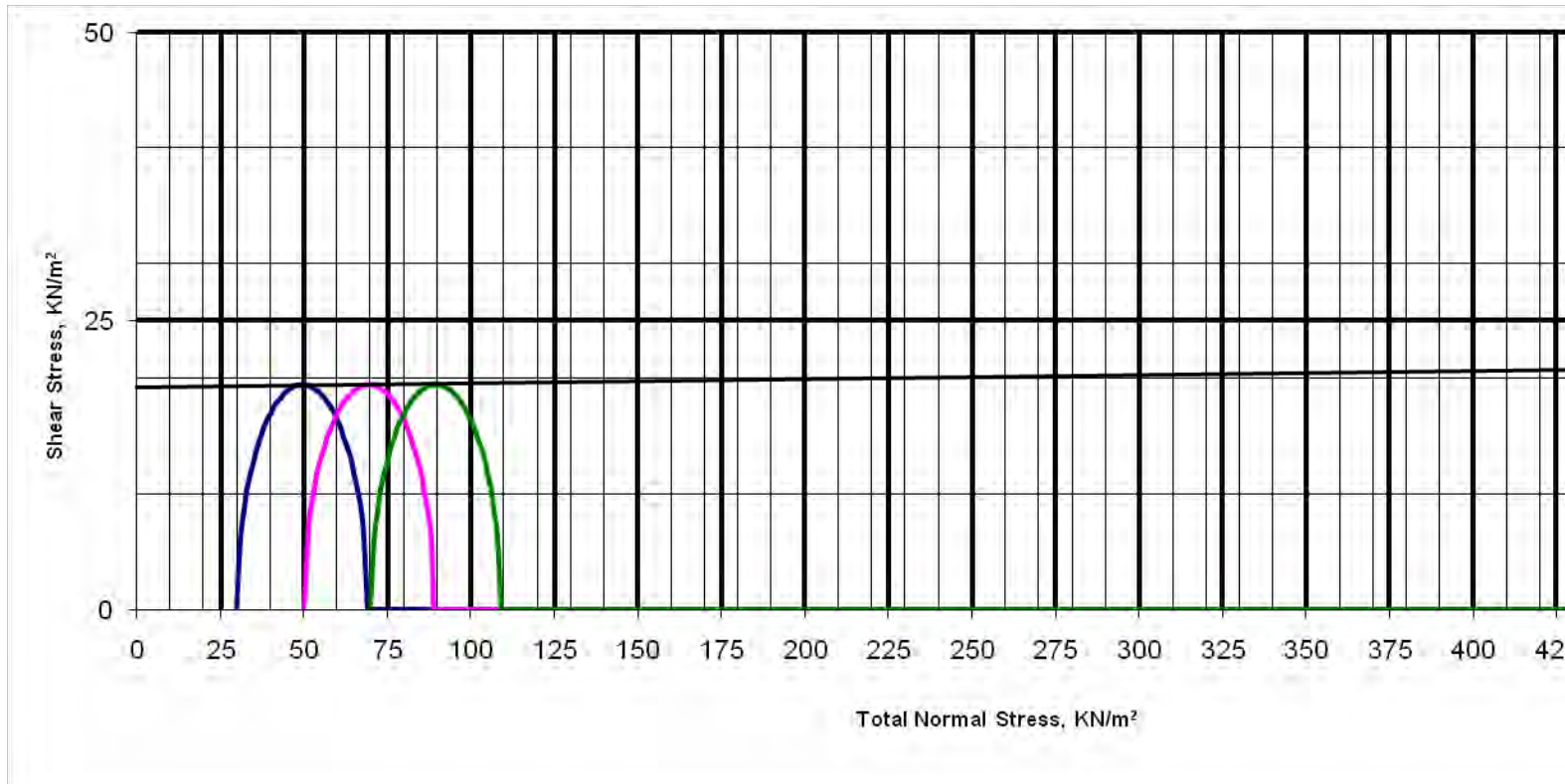
UNDRAINED TRIAXIAL TEST

BH 2

Sample: 4

Depth: 2.00m

|                         |                    |
|-------------------------|--------------------|
| Undrained Cohesion      | 18N/m <sup>2</sup> |
| Angle of Friction (PHI) | 10deg              |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

UNDRAINED TRIAXIAL  
TEST

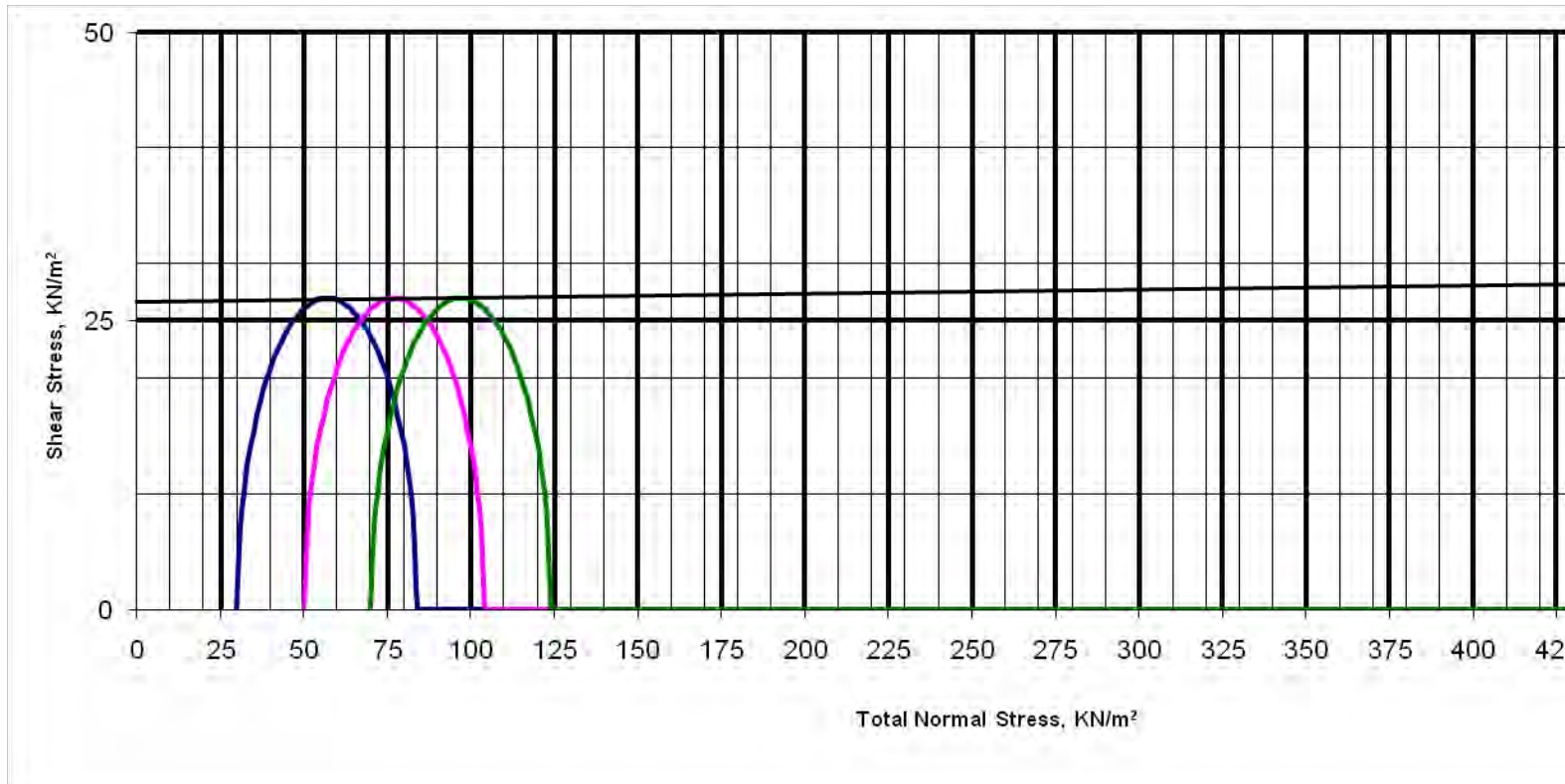


BH 2

Sample: 6

Depth: 3.00m

|                         |                    |
|-------------------------|--------------------|
| Undrained Cohesion      | 27N/m <sup>2</sup> |
| Angle of Friction (PHI) | 12deg              |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

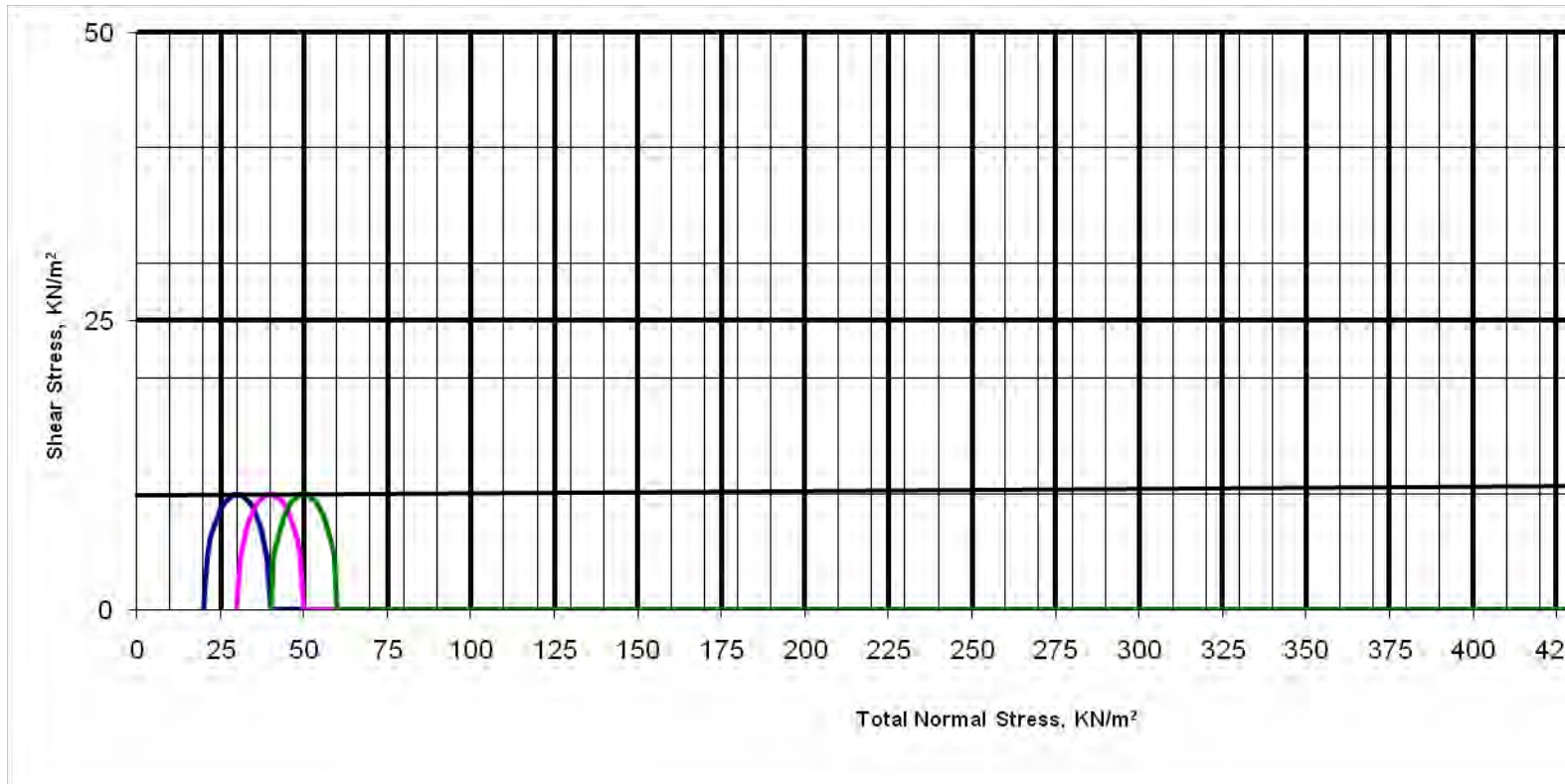
UNDRAINED TRIAXIAL  
TEST

BH 3

Sample: 2

Depth: 1.00m

|                         |                    |
|-------------------------|--------------------|
| Undrained Cohesion      | 10N/m <sup>2</sup> |
| Angle of Friction (PHI) | 5deg               |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

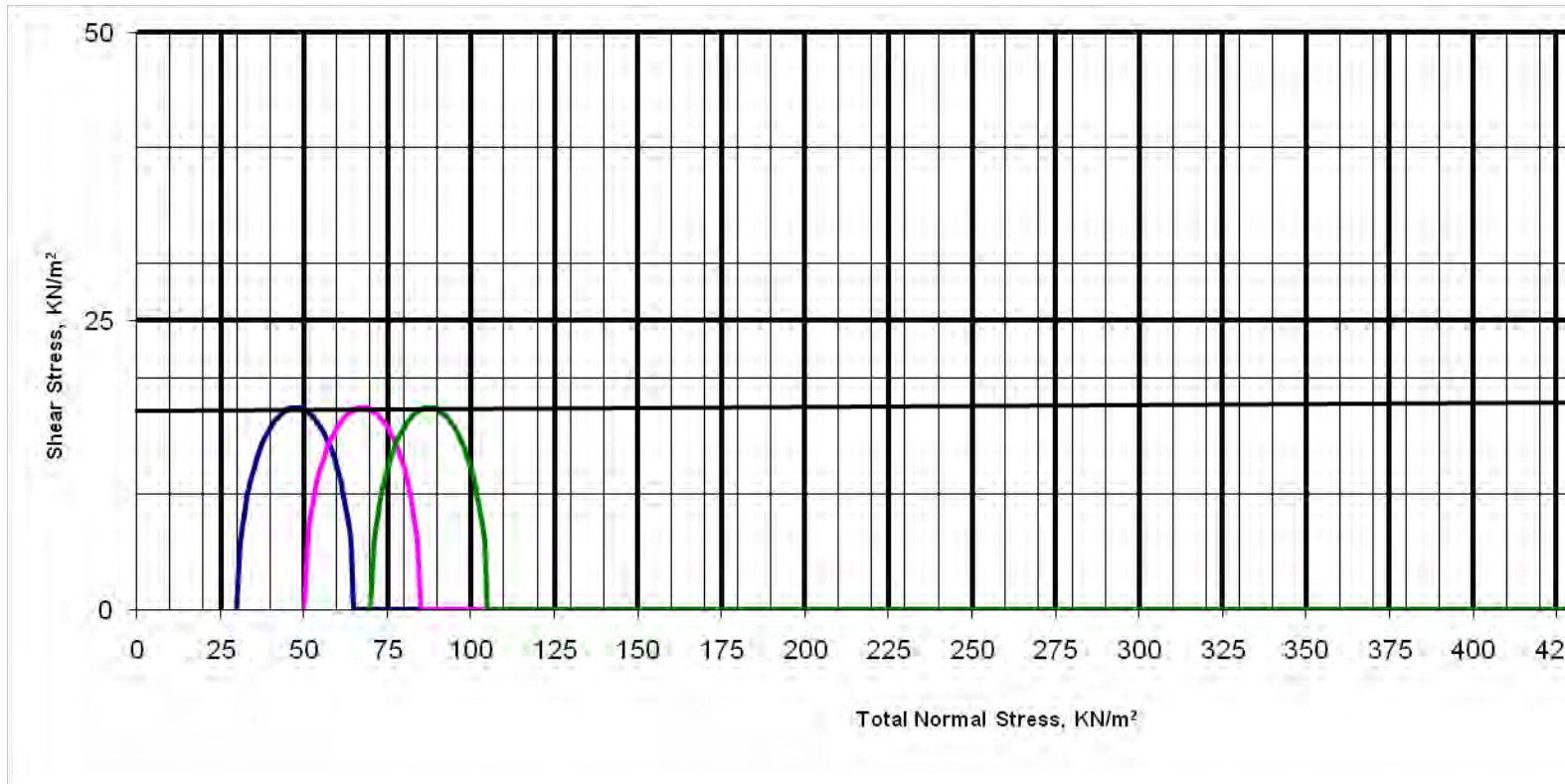
UNDRAINED TRIAXIAL  
TEST

BH 3

Sample: 4

Depth: 2.00m

|                         |                    |
|-------------------------|--------------------|
| Undrained Cohesion      | 15N/m <sup>2</sup> |
| Angle of Friction (PHI) | 7deg               |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

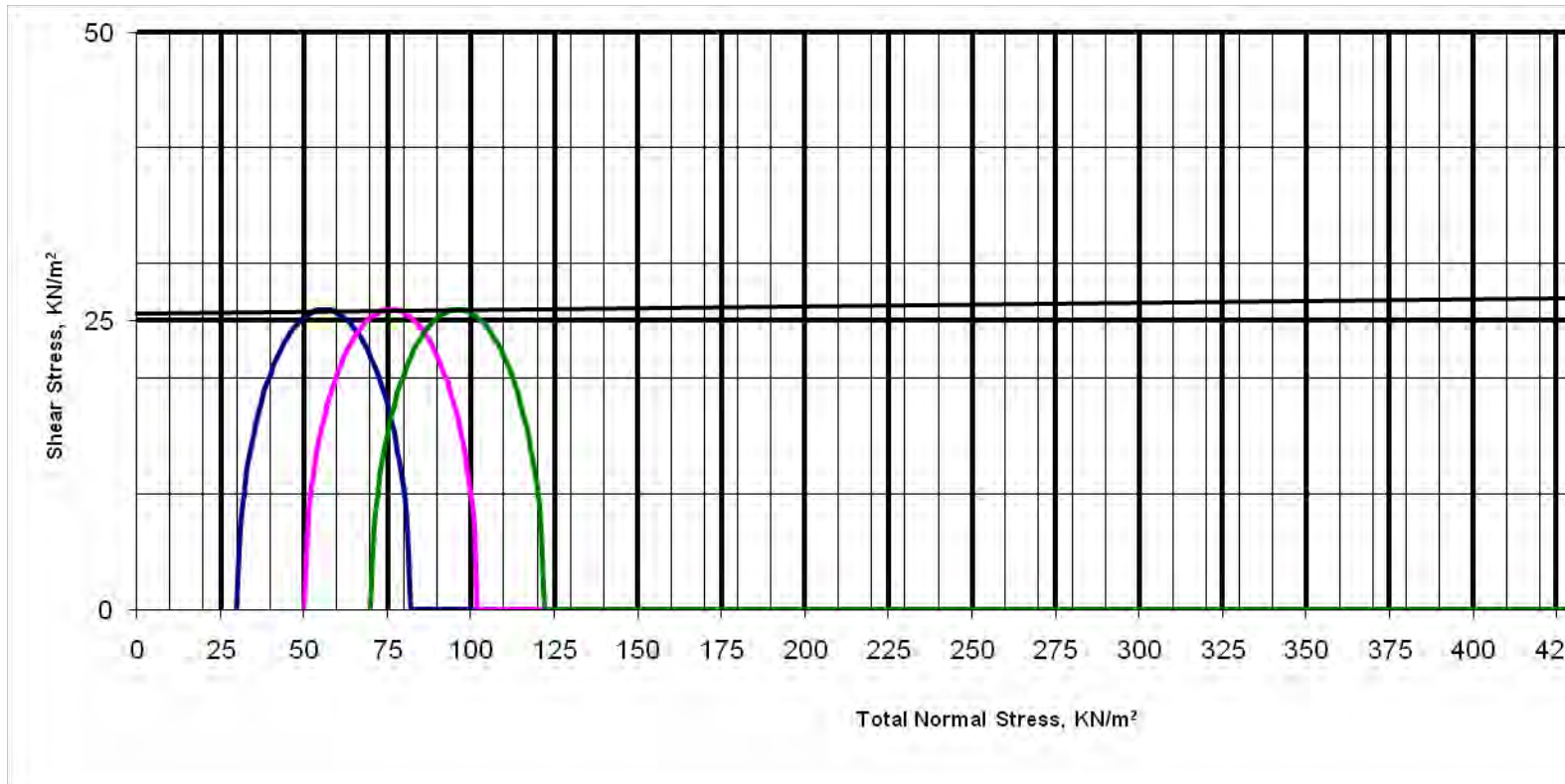
UNDRAINED TRIAXIAL  
TEST

BH 3

Sample: 6

Depth: 3.00m

|                         |                      |
|-------------------------|----------------------|
| Undrained Cohesion      | 25.5N/m <sup>2</sup> |
| Angle of Friction (PHI) | 10deg                |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

UNDRAINED TRIAXIAL TEST

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## NOTES RELATING TO THIS REPORT

### Introduction

These notes have been provided to amplify the geotechnical report in regard to classification methods, specialist field procedures and certain matters relating to the Discussion and Comments section. Not all, of course, are necessarily relevant to all reports.

Geotechnical reports are based on information gained from limited subsurface test boring and sampling, supplemented by knowledge of local geology and experience.

For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

### Description and Classification Methods

In general, descriptions cover the following properties - strength or density, colour, structure, soil or rock type and inclusions.

Soil types are described according to the predominating particle size, qualified by the grading of other particles present (e.g. sandy clay) on the following bases:

#### Soil Classification Particle Size

Clay less than 0.002 mm

Silt 0.002 to 0.06 mm

Sand 0.06 to 2.00 mm

Gravel 2.00 to 60.00 mm

Cohesive soils are classified on the basis of strength either by laboratory testing or engineering examination.

The strength terms are defined as follows.

| <b>Classification</b> | <b>Undrained Shear Strength kPa</b> |
|-----------------------|-------------------------------------|
| Very soft             | less than 12                        |
| Soft                  | 12—25                               |
| Firm                  | 25—50                               |
| Stiff                 | 50—100                              |
| Very stiff            | 100—200                             |
| Hard                  | Greater than 200                    |

Non-cohesive soils are classified on the basis of relative density, generally from the results of standard penetration tests (SPT) or Dutch cone Penetrometer tests (CPT) as below:

| <b>Relative Density</b> | <b>SPT “N” Value (blows/300 mm)</b> | <b>CPT Cone Value (qc — MPa)</b> |
|-------------------------|-------------------------------------|----------------------------------|
| Very loose              | less than 5                         | less than 2                      |
| Loose                   | 5—10                                | 2—5                              |
| Medium dense            | 10—30                               | 5—15                             |
| Dense                   | 30—50                               | 15—25                            |
| Very dense              | greater than 50                     | greater than 25                  |

Rock types are classified by their geological names. Where relevant, further information regarding rock classification is given on the following sheet.

### **Sampling**

Sampling is carried out during drilling to allow engineering examination (and laboratory testing where required) of the soil or rock. Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin walled sample tube into the soil and withdrawing with a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Details of the type and method of sampling are given in the report.

### **Standard Penetration Tests**

Standard penetration tests (abbreviated as SPT) are used mainly in non-cohesive soils, but occasionally also in cohesive soils as a means of determining density or strength and also of obtaining a relatively undisturbed sample.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the ‘N’ value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued. The test results are reported in the following form.

- 
- In the case where full penetration is obtained with successive blow counts for each 150 mm of say 4, 6 and 7 as 4, 6, 7 ~ N = 13
  - In the case where the test is discontinued short of full penetration, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as 15, 30/40 mm.

The results of the tests can be related empirically to the engineering properties of the soil.

Occasionally, the test method is used to obtain samples in 50 mm diameter thin walled sample tubes in clays. In such circumstances, the test results are shown on the bore logs in brackets.

### **Laboratory Testing**

Every care is taken with the report as it relates to interpretation of subsurface condition, discussion of geotechnical aspects and recommendations or suggestions for design and construction. However, the Company cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions — the potential for this will depend partly on bore spacing and sampling frequency.

### **Bore Logs**

The bore logs presented herein are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable, or possible to justify on economic grounds. In any case, the boreholes represent only a very small sample of the total subsurface profile.

- Changes in policy or interpretation of policy by statutory authorities
- The actions of contractors responding to commercial pressures.

If these occur, the Company will be pleased to assist with investigation or advice to resolve the matter.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes, the frequency of sampling and the possibility of other than 'straight line' variations between the boreholes.

---

### **Site Anomalies**

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, the Company requests that it immediately be notified. Most problems are much more readily resolved when conditions are exposed than at some later stage, well after the event.

### **Ground Water**

Where ground water levels are measured in boreholes, there are several potential problems;

### **Reproduction of Information for Contractual Purposes**

- In low permeability soils, ground water although present, may enter the hole slowly or perhaps not at all during the time it is left open. Attention is drawn to the document “Guidelines for the Provision of Geotechnical Information in Tender Documents”, published by the Institution of Engineers,
- A localised perched water table may lead to an erroneous indication of the true water table.

### **Site Inspection**

The Company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.



PREPARATORY SURVEY  
FOR  
TRANSMISSION POWER PROJECT  
IN THE  
FEDERAL REPUBLIC OF NIGERIA

PROPOSED 330/132KV SUBSTATION  
AT MAKOGI VILLAGE, MOUNTAIN TOP UNIVERSITY,  
OBAFEMI / OWODE LGA OGUN STATE.

**GEOTECHNICAL INVESTIGATION**

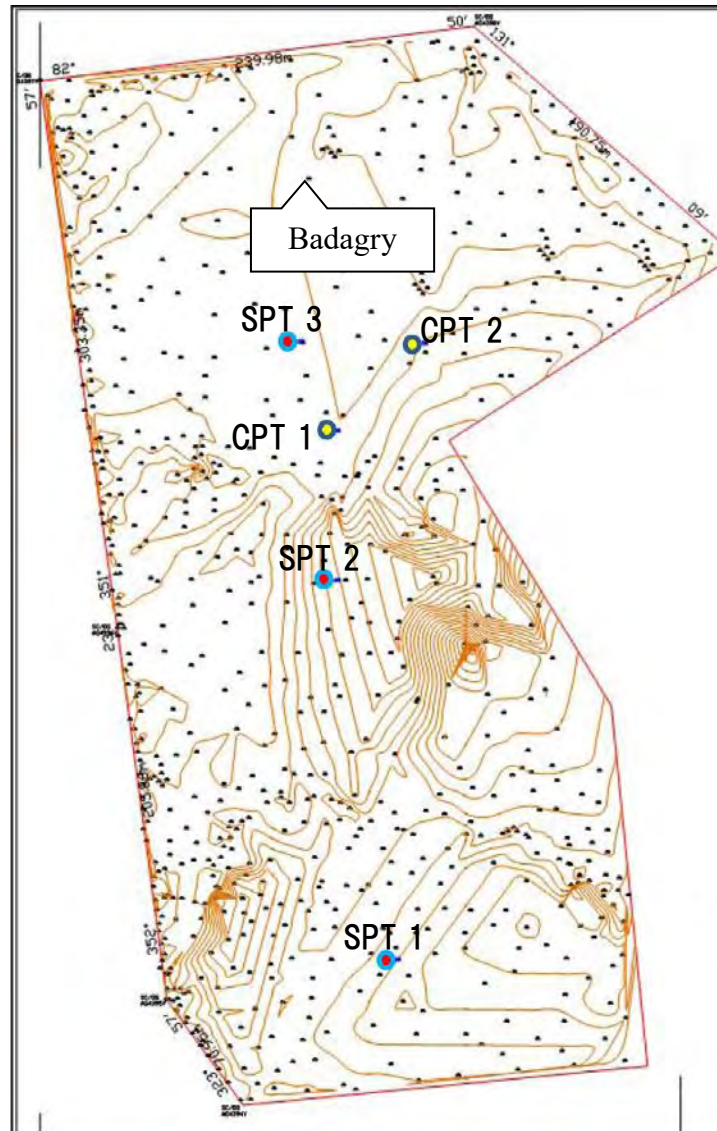
**2015 May**

**Yachiyo Engineering Co., Ltd.**

**BEST & CROMPTON ENGINEERING AFRICA LTD**



### Total Grid Plan



MFM Site Location Plan

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## **TABLE OF CONTENT**

1.0 INTRODUCTION

2.0 SITE ACCESSIBILITY

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3.1 FIELD WORK

3.2 ANALYSIS OF RESULTS

3.2.1 Geological Description

3.2.2 Subsoil Condition

3.2.3 Ground Water Condition

3.2.4 Site description and condition

4.0 DISCUSSION AND RECOMMENDATION

APPENDIX:

Borehole Log

Penetrometer test plotting

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## **1.0 INTRODUCTION**

The Client commissioned Best &Crompton Engineering Africa Ltd., to proceed with subsoil investigations at the proposed 330/132KV Substation at MAKOGI VILLAGE, MOUNTAIN TOP UNIVERSITY, OBAFEM/OWODE LGA, OGUN STATE. This report is a consequence of the soil investigation and analyses, which is presented in an objective and professional manner.

The purpose of the subsoil investigation and attendant report is as follows:

- Determine the subsoil and surface/groundwater conditions of the designated location.
- Evaluation of the subsoil stratigraphic sequence geotechnical/engineering properties of the soil and the subsequent effects on foundation design and construction.
- Analysis of the data/results of tests carried out on the soil samples obtained and provide recommendations on the fit-for-purpose type of foundation for the proposed structure.

## **2.0 SITE ACCESSIBILITY**

The sites are accessible through **Lagos – Ibadan expressway** to mention but a few.

## **3.0 DESCRIPTION OF WORK**

The soil investigation comprised of and carried out in three parts;

- Field Work: Test (2Nos. DCPTs and 3Nos. Borehole/SPT), Laboratory analysis and collation of the test results.

### **3.1 FIELD WORK**

The site works were carried out on January 2015.

The Scope of Work executed involved the performance of 2Nos. 2.5tons Dutch Cone Penetrometer Tests (DCPTs) to a depth of refusal and 3Nos Borehole/SPT.

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## **BOREHOLE**

This stage involved carrying out 1No borehole to a depth between 15.00m to 20.00m below the existing ground level as specified by the client.

## **DRILLING METHOD**

The tools are attached to the wire rope which is then operated by the winch. The tools are operated using percussive techniques to progress the borehole to depths between 15.00m to 20.00m. As the borehole progresses, temporary casing is installed to provide support to the borehole sides. In firm or stiff cohesive soils casing is sometimes not required, as the clay is self supporting. For the drilling of deeper boreholes it is sometimes necessary to commence the borehole at one diameter, and then reduce to a smaller diameter to deepen the borehole. This would normally require the use of two or more strings of casing. Where it is necessary to add water to advance the borehole, only potable water will be used and the only the minimum amount necessary will be used. The amount added will be recorded on the driller's log. SPT is taken at 1.5m interval

## **Sampling Method**

1. Ordinary disturbed samples were collected at changes of strata and as deemed fit for strata identification purposes, through visual inspection and classification tests.
2. Undisturbed 100mm diameter samples were collected from cohesive strata. The operation is effected through a "jarring arrangement". The arrangement allows 100mm I.D. by 450mm length-sampling tube complete with a cutting shoe to be driven by the weight of the string rod above the sampler with minimum disturbance of the sample. The number of blows recorded is that used to obtain the last 300mm of penetration by the driven weight referred to above.

## **DUTCH CONE PENETROMETER**

The apparatus consists of a cylindrical probe, of 1000mm<sup>2</sup> cross sectional area, and a conic head of apex angle of 60°. The probe is forced down through the soil at a steady rate of about 20mm/s in the closed position by exerting pressure force on outer sounding tube. If desired the point resistance and the resistance to side friction can be measured separately.

---

2Nos. static cone penetration tests were carried out using a 2.5tons capacity testing equipment (machine) on each site. The test involves advancing the cone into the ground slowly at a constant rate and the resistant to penetration measured at predetermined intervals of 0.25m depth. The tests were terminated at depths where the machine anchor legs lifted.

These tests were taken from the existing ground level down to depths refusal at each location.

The cone penetration test results are presented in a graphical form respectively in the Appendix to this Report.

## **3.2 ANALYSIS OF TEST RESULTS**

### **3.2.1 Geological Description**

Available geological record reveals that the investigated area is within the basement complex of Nigeria; it is characterized by crystalline rocks of Precambrian age. Rocks of granitic origin later intruded these rocks.

The sedimentary deposits found on top of the basement rock are product of the parent rocks that have undergone weathering and decomposition.

### **3.2.2 Subsoil Condition**

The subsoil condition of the site, based on the DCP and Borehole/SPT test carried out reveals predominantly cohesive soil as observed from the DCP Plot and the Borehole log.

Details of the subsoil characteristics encountered during the Penetrometer tests and Borehole/SPT are stated below:

---

**Subsoil Condition based on the field work.**

**Dutch Cone Penetrometer Test**

| <b><u>Depth (m)</u></b> | <b><u>Description of Stratum</u></b> |
|-------------------------|--------------------------------------|
| 0.00 to -2.00           | Firm to stiff cohesive soil.         |
| 2.00 to -4.00           | Stiff to hard cohesive soil.         |

**Geotechnical Properties**

| <b><u>Depth (m)</u></b> | <b><u>Geotechnical Properties</u></b>  |
|-------------------------|--|
| 0.00 to -2.00           | Moderate to good geotechnical properties, moderate to high shear strength and moderate to low compressibility potential. |
| 2.00 to -4.00           | Good geotechnical properties, high shear strength and low compressibility potential.                                     |

**Geotechnical Engineering Parameters**

| <b><i>Depth (m)</i></b>    | <b><i>P1(kgf/cm<sup>3</sup>)</i></b> | <b><i>P2(kgf/cm<sup>3</sup>)</i></b> |
|----------------------------|--------------------------------------|--------------------------------------|
| <b><i>0.00 – 2.00m</i></b> | <b><i>6 – 35</i></b>                 | <b><i>10 – 38</i></b>                |
| <b><i>2.00 – 4.00m</i></b> | <b><i>48 – 124</i></b>               | <b><i>50 – 115</i></b>               |

**Borehole/SPT 1**

| <b><u>Depth (m)</u></b> | <b><u>Description of Stratum</u></b>            |
|-------------------------|---|
| 0.00 to -3.00           | Firm to stiff yellowish grey sandy silty CLAY   |
| 3.00 to -7.50           | Stiff to hard light grey sandy silty CLAY.      |
| 7.50 to -15.00          | Hard light brown sandy silty CLAY with gravels. |

**Geotechnical Properties**

---

**Depth (m)****Geotechnical Properties**

0.00 to -3.00

Moderate to good geotechnical properties, moderate to high shear strength and low compressibility potential.

3.00 to -7.50

Good geotechnical properties, high shear strength and low compressibility potential.

7.50 to -15.00

Very good geotechnical properties, high shear strength and low compressibility potential.

**Geotechnical Engineering Parameters**

| <b><i>Depth (m)</i></b>     | <b><i>SPT Values</i></b> | <b><i>U4 Sample</i></b> |
|-----------------------------|--------------------------|-------------------------|
| <b><i>0.00 – 3.00m</i></b>  | <b><i>6 – 15</i></b>     | <b><i>Taken</i></b>     |
| <b><i>3.00 – 7.50m</i></b>  | <b><i>18 – 26</i></b>    | <b><i>Abortive</i></b>  |
| <b><i>7.50 – 15.00m</i></b> | <b><i>28 – 32</i></b>    | <b><i>Abortive</i></b>  |

**Borehole/SPT 2****Depth (m)****Description of Stratum**

0.00 to -2.25

Firm to stiff grey sandy silty CLAY

2.25 to -8.25

Stiff to hard light brown sandy silty CLAY.

8.25 to -15.00

Hard greyish brown silty CLAY with gravels.

**Geotechnical Properties**



---

**Depth (m)****Geotechnical Properties**

0.00 to -2.25

Moderate to good geotechnical properties, moderate to high shear strength and low compressibility potential.

2.25 to -8.25

Good geotechnical properties, high shear strength and low compressibility potential.

8.25 to -15.00

Very good geotechnical properties, high shear strength and low compressibility potential.

**Geotechnical Engineering Parameters**

| <b><i>Depth (m)</i></b>     | <b><i>SPT Values</i></b> | <b><i>U4 Sample</i></b> |
|-----------------------------|--------------------------|-------------------------|
| <b><i>0.00 – 2.25m</i></b>  | <b><i>5 – 13</i></b>     | <b><i>Taken</i></b>     |
| <b><i>2.25 – 8.25m</i></b>  | <b><i>15 – 30</i></b>    | <b><i>Abortive</i></b>  |
| <b><i>8.25 – 15.00m</i></b> | <b><i>30 – 33</i></b>    | <b><i>Abortive</i></b>  |

**Borehole/SPT 3****Depth (m)****Description of Stratum**

0.00 to -3.75

Firm to stiff light brown sandy silty CLAY

3.75 to -12.00

Stiff to hard greyish brown sandy silty CLAY.

12.00 to -20.00

Hard yellowish brown sandy silty CLAY.

**Geotechnical Properties**

---

**Depth (m)****Geotechnical Properties**

0.00 to -3.75

Moderate to good geotechnical properties, moderate to high shear strength and low compressibility potential.

3.75 to -12.00

Good geotechnical properties, high shear strength and low compressibility potential.

12.00 to -20.00

Very good geotechnical properties, high shear strength and low compressibility potential.

**Geotechnical Engineering Parameters**

| <i>Depth (m)</i>      | <i>SPT Values</i> | <i>U4 Sample</i> |
|-----------------------|-------------------|------------------|
| <i>0.00 – 3.75m</i>   | <i>5 – 14</i>     | <i>Taken</i>     |
| <i>3.75 – 12.00m</i>  | <i>12 – 27</i>    | <i>Abortive</i>  |
| <i>12.00 – 20.00m</i> | <i>30 – 33</i>    | <i>Abortive</i>  |

**3.2.4 Site description and condition**

The project site is an open piece of land. Structures around site show no sign of distress at the time of our investigation.

**3.2.5 Topography.**

The topography of the project site is nearly even topography.

**3.2.6 Vegetation.**

Vegetation around the project site area is mainly grasses and weeds.

**4.1 FOUNDATION DISCUSSION AND RECOMMENDATION****4.1.1 Proposed Development**

---

No structural detail of the proposed development was made available to us prior to the subsoil investigation, thus our recommendations are based on the Borehole and DCP tests carried out.

The geotechnical issues considered relevant to the proposed development include

- Soil bearing pressure
- Level of groundwater
- Recommendation of a suitable foundation type
- Excavation

#### **4.1.2 RECOMMENDATION**

The foundation type to be chosen for a particular structure depends largely on the followings;

- Loads to be transmitted
- Receiving soil strata
- Factor of safety against shear failure of the supporting soil must be adequate.
- Settlement should neither cause any unacceptable damage nor interfere with the function of the structure.

Foundations can be classified as shallow foundation or as deep foundation.

The choice between shallow foundation and deep foundation can be arrived at after careful consideration of the following elements.

1. The magnitude of the transmitted loads from the stratum,
2. The soil nature,
3. The economic aspects of the elements of the foundation work,
4. Problems concerning foundation construction.

#### **4.1.3 Allowable bearing pressure and foundation recommendation**

---

Allowable bearing pressure calculated in accordance with theoretical soil mechanics principle for depths are indicated below:

| <b>Differential Depth<br/>(m)</b> | <b>Allowable bearing<br/>Capacity (KN/m<sup>2</sup>)</b> |
|-----------------------------------|--|
| <b>0.00 – 0.50</b>                | <b>60</b>  |
| <b>0.50 – 1.00</b>                | <b>104</b>   |
| <b>1.00 – 1.50</b>                | <b>235</b>   |
| <b>1.50 – 2.00</b>                | <b>257</b>   |

### **FOUNDATION RECOMMENDATION**

#### **Shallow Foundation**

Shallow Foundation (Spread footing) is considered adequate for the proposed transmission substation on the project site.

#### **Groundwater**

Groundwater was not encountered during the subsoil investigation work

### **METHOD OF CALCULATING ALLOWABLE BEARING PRESSURE IN COHESIVE SOIL IS GIVEN BY:**

Method for calculating in Cohesive Soil is given by:

$q_{ult} = 5.14C_u + \gamma D$  (Prandtl method of estimating allowable bearing pressure)

$$q_a = q_{ult} / F.S \text{ (3) – For Shallow foundation}$$

Correlation between  $q_c$  and SPT (N – Values)

$$N = q_c / 2$$

$$q_a = 10N, \text{ or } 5.0N \text{ ( If Submerged)}$$

Correlation between  $q_c$  and  $C_u$

$$C_u = q_c / 20 \text{ (KN/m}^2\text{)}$$

$q_{ult} = c. N_c + q. N_q + 0.5. \gamma. B. N_\gamma$  (Terzaghi method of estimating allowable bearing pressure)

where:

$c$  = cohesion of soil

$\gamma$  = unit weight of soil

$q = \gamma. D_f$

$N_c, N_q, N_\gamma$  = Bearing capacity factor

#### 4.2.2 Settlement

Settlement for this allowable bearing pressure for each location stated above would not exceed **25mm**.

Our analysis on settlement is based on the method stated below

$$S = 1.1M_v \times 0.55q_n \times h$$

Where  $S$  = Total settlement

$M_v$  = Volume of compressibility potential

$q_n$  = net foundation base pressure

$h$  = depth of foundation

The table below shows the permissible settlement as per I.S Code.

| Soil type | Permissible total settlement |                   | Permissible differential settlement |                   |
|-----------|------------------------------|-------------------|-------------------------------------|-------------------|
|           | For isolated footings        | For raft footings | For isolated footings               | For raft footings |
| Sandy     | 4.0cm                        | 4.cm to 6.5cm     | 2.5cm                               | 2.5cm             |
| Clays     | 6.5cm                        | 6.5 to 10.0cm     | 4.0cm                               | 4.0cm             |

#### 4.2.3 Factor of Safety

Factor of safety of 3 was adopted for our estimation of allowable bearing pressure.

#### 4.2.4 Excavation

- 
- Excavation could be achieved using conventional excavating equipment.
  - Excavation support would not be required

Excavations deeper than 1.2m must be sloped. Temporary trench slope of 1 vertical to 1 horizontal are expected to remain stable through the fill and the native clay. Where there is insufficient space for open cut excavations, shoring or a trench liner box will be required.

If the soils are saturated at the time of construction, the condition of each soil type should be re-evaluated.

Stock piles, materials or any heavy equipment should be kept at least 5.0m from the upper edge of the excavation; All surface drainage must be directed away from any open excavations and trenches.

No significant problems are anticipated during excavation. Conventional excavating equipment should be able to remove the soils down to anticipated founding level.

#### **4.2.5 General Precaution for Shallow Foundation Construction**

It is recommended that the following general guidelines that govern the construction of shallow foundation should be observed when work starts on the site:

- Over excavation beyond the depths stated should not be done.
- Ingress of water into the excavated foundation trench should be prevented if the stated bearing value at the founding depth is to be achieved. A layer of concrete blinding should therefore be provided within a trench once it has been excavated.
- Adequate cover to the concrete should be allowed for the reinforcement bars to protect them from possible effect of corrosion.
- The sides of foundation should be backfilled up to existing ground level as soon as they are cast.

#### **5.0 CONCLUSION**

Shallow Foundation (Spread footing) is considered adequate for the proposed development on the project site.

---

Despite an objective soil investigation and reporting, a poorly designed and/or constructed foundation may lead to structural failure if all other environmental conditions remain constant.

Best & Crompton Engineering Africa Ltd., therefore recommends that the design and construction of all foundation and earthwork be carried out by a competent company in accordance with good and strict engineering practice expected of a professional. The construction contractor shall be guided by reference Code of Practices such as; British Institution CP 2004, 1973: Code of Practice for Foundation and BS 6031: Code of Practice for Earth Works.

**For Best & Crompton Engineering Africa Ltd.,**

**(M.Nageswara Rao)**

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**APPENDIX**

**FIELD LOGS**



## BOREHOLE LOG

SUBSOIL INVESTIGATION AT MAKOGI VILLAGE, MOUNTAIN TOP UNIVERSITY  
OGUN STATE

### BOREHOLE NO: 1

| Depth(m) | Legend | Strata thickness | SPT Blows         | Description of Strata                                     |
|----------|--------|------------------|-------------------|---|
| 1.50     |        | (3.00)           | U4<br>N6<br>U4    | <i>Firm to stiff yellowish grey sandy silty CLAY</i>      |
| 3.00     |        |                  | N15<br>U4         |   |
| 4.50     |        | (4.50)           | N18<br>U4*        | <i>Stiff to hard light grey sandy silty CLAY</i>          |
| 6.00     |        |                  | N21               |   |
| 7.50     |        |                  | N26               |   |
| 9.00     |        | (7.50)           | U4*               | <i>Hard light brown sandy silty CLAY<br/>with gravels</i> |
| 10.50    |        |                  | N28<br>N30<br>U4* |   |
| 12.00    |        |                  | N32               |   |
| 13.50    |        |                  |                   |   |
| 15.00    |        |                  |                   |   |

**N- Number of blows      U4- Undisturbed sample      U4\*- Undisturbed sample abortive**

## BOREHOLE LOG

SUBSOIL INVESTIGATION AT MAKOGI VILLAGE, MOUNTAIN TOP UNIVERSITY  
OGUN STATE

### BOREHOLE NO: 2

| Depth(m) | Legend | Strata thickness | SPT Blows | Description of Strata                             |
|----------|--------|------------------|-----------|---|
| 1.50     |        | (2.25)           | N5        | <i>Firm to stiff grey sandy silty CLAY</i>        |
| 3.00     |        | (6.00)           | N15       | <i>Stiff to hard light brown sandy silty CLAY</i> |
| 4.50     |        |                  | N22       |   |
| 6.00     |        |                  | N30       |   |
| 7.50     |        | (6.75)           | N30       | <i>Hard greyish brown sandy silty CLAY</i>        |
| 9.00     |        |                  | N33       |   |
| 10.50    |        |                  | N33       |   |
| 12.00    |        |                  | N33       |   |
| 13.50    |        |                  |           |   |
| 15.00    |        |                  |           |   |

**N-** Number of blows      **U4-** Undisturbed sample      **U4\*-** Undisturbed sample abortive

## BOREHOLE LOG

SUBSOIL INVESTIGATION AT MAKOGI VILLAGE, MOUNTAIN TOP UNIVERSITY

OGUN STATE

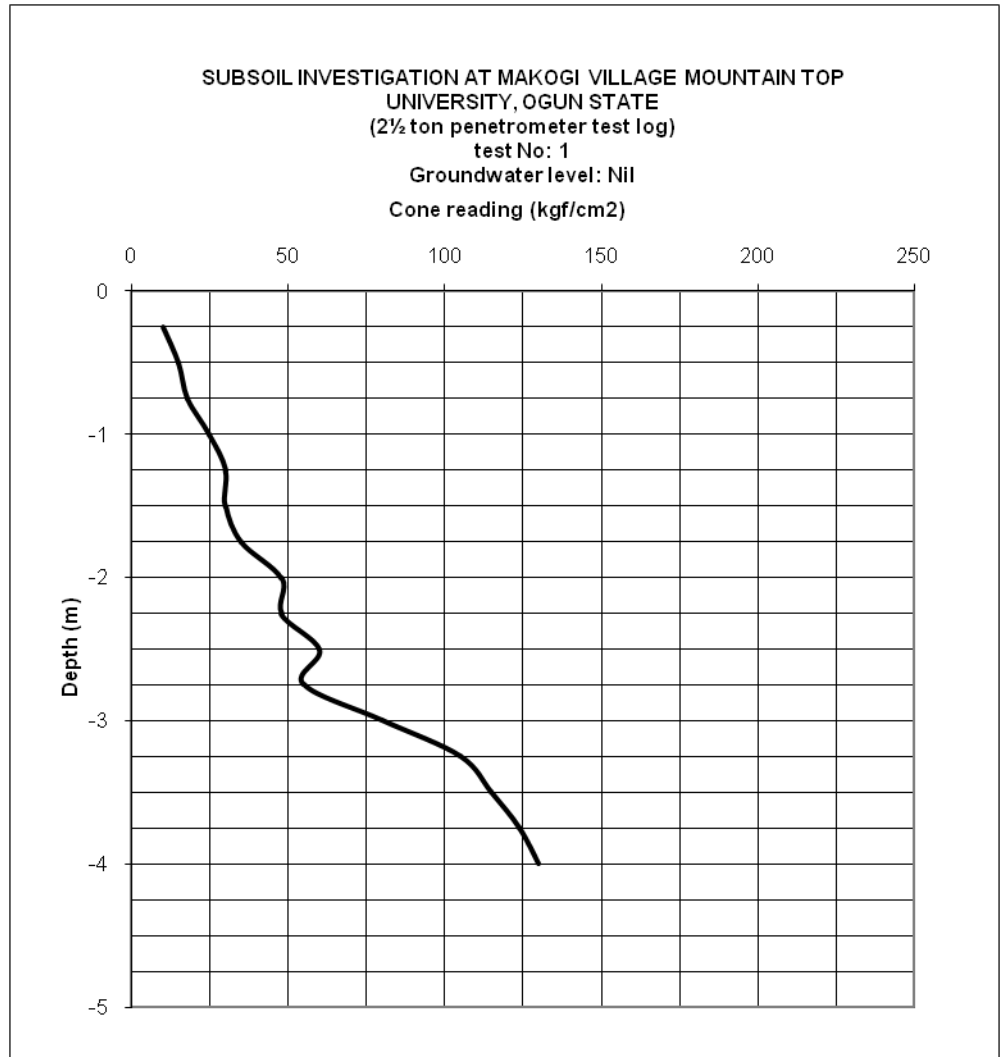
BOREHOLE NO: BH 3

| Depth(m) | Legend     | Strata thickness | SPT Blows             | Description of Strata                               |
|----------|------------|------------------|-----------------------|---|
| 2.00     |            | (3.75)           | U4<br>N5<br>U4<br>N14 | <i>Firm to stiff light brown sandy silty CLAY</i>   |
| 4.00     |            | (8.25)           | N12                   | <i>Stiff to hard greyish brown sandy silty CLAY</i> |
| 6.00     | U4*        |                  |                       |   |
| 8.00     | N20<br>U4* |                  |                       |   |
| 10.00    | N27        |                  |                       |   |
| 12.00    |            | (8.00)           | N30                   | <i>Hard yellowish brown sandysilty CLAY</i>         |
| 14.00    | U4*        |                  |                       |   |
| 16.00    | N33        |                  |                       |   |
| 18.00    | N33        |                  |                       |   |
| 20.00    |            |                  |                       |   |

**N- Number of blows    U4 - Undisturbed Sample    U4\* - Undisturbed Sample abortive**

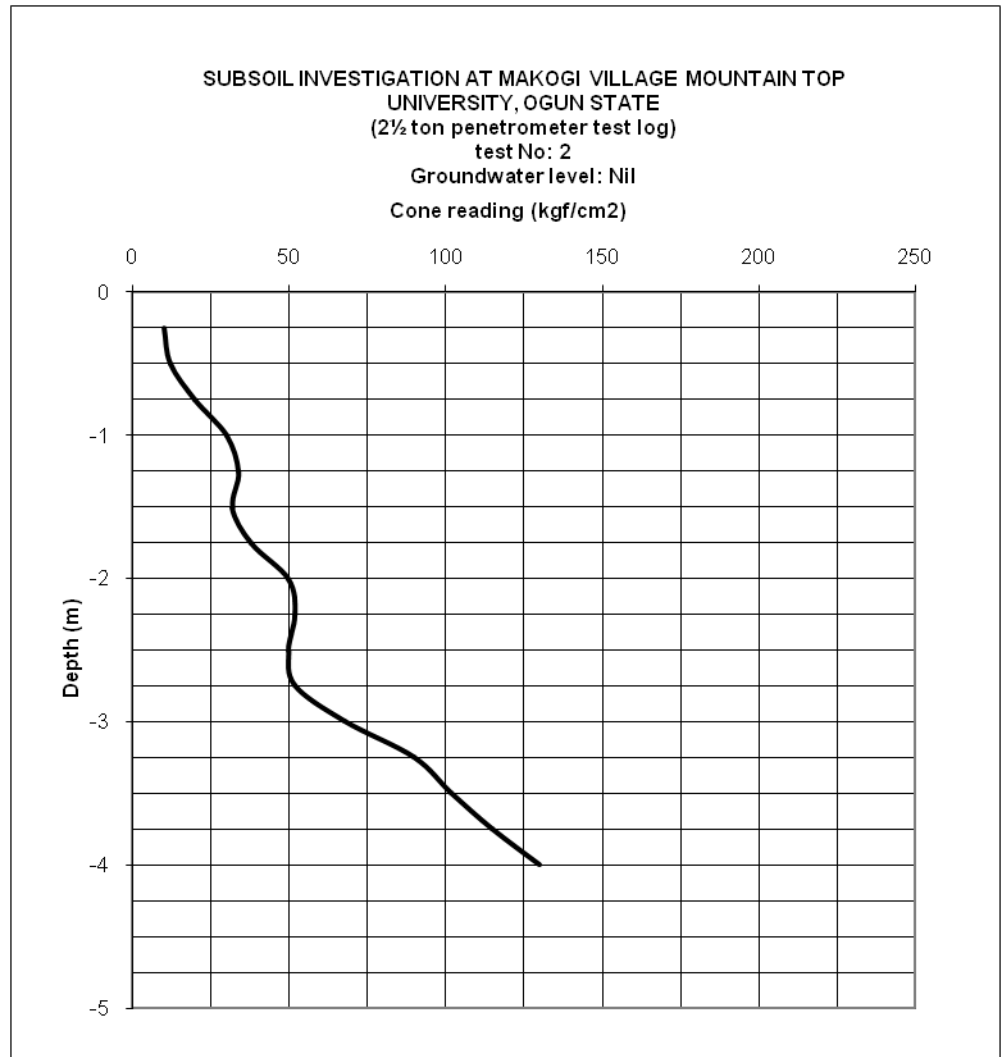
# PENETROMETER 1

| Qc  | Depth |
|-----|-------|
| 0   | 0     |
| 6   | -0.25 |
| 10  | -0.5  |
| 15  | -0.75 |
| 18  | -1    |
| 25  | -1.25 |
| 30  | -1.5  |
| 30  | -1.75 |
| 35  | -2    |
| 48  | -2.25 |
| 48  | -2.5  |
| 60  | -2.75 |
| 55  | -3    |
| 80  | -3.25 |
| 105 | -3.5  |
| 115 | -3.75 |
| 124 | -4    |
|     | -4.25 |
|     | -4.5  |
|     | -4.75 |
|     | -5    |
|     | -5.25 |
|     | -5.5  |
|     | -5.75 |
|     | -6    |
|     | -6.25 |
|     | -6.5  |
|     | -6.75 |
|     | -7    |
|     | -7.25 |
|     | -7.5  |



## PENETROMETER 2

| Qc  | Depth |
|-----|-------|
| 0   | 0     |
| 10  | -0.25 |
| 10  | -0.5  |
| 12  | -0.75 |
| 20  | -1    |
| 30  | -1.25 |
| 34  | -1.5  |
| 32  | -1.75 |
| 38  | -2    |
| 50  | -2.25 |
| 52  | -2.5  |
| 50  | -2.75 |
| 52  | -3    |
| 68  | -3.25 |
| 90  | -3.5  |
| 102 | -3.75 |
| 115 | -4    |
|     | -4.25 |
|     | -4.5  |
|     | -4.75 |
|     | -5    |
|     | -5.25 |
|     | -5.5  |
|     | -5.75 |
|     | -6    |
|     | -6.25 |
|     | -6.5  |
|     | -6.75 |
|     | -7    |
|     | -7.25 |
|     | -7.5  |



## SUMMARY OF LABORATORY TEST RESULTS

### ATTERBERG LIMIT TEST

| BOREHOLE/<br>SAMPLE NO | DEPTH<br>(m) | NATURAL<br>MOISTURE<br>CONTENT<br>(Wc)% | LIQUID<br>LIMIT<br>(L.L) % | PLASTIC<br>LIMIT<br>(P.L) % | PLASTICITY<br>INDEX (P.I) % |
|------------------------|--------------|---|----------------------------|-----------------------------|-----------------------------|
| 1/2                    | 1.00         | 17.8                                    | 32                         | 16                          | 16                          |
| 1/4                    | 2.00         | 21.5                                    | 37                         | 27                          | 20                          |
| 1/6                    | 3.00         | 23.4                                    | 40                         | 25                          | 15                          |
| 2/2                    | 1.00         | 19.3                                    | 37                         | 20                          | 17                          |
| 2/4                    | 2.00         | 19.0                                    | 25                         | 15.0                        | 10                          |
| 2/6                    | 3.00         | 18.2                                    | 30                         | 14                          | 16                          |
| 3/2                    | 1.00         | 19.4                                    | 33                         | 21.0                        | 12                          |
| 3/4                    | 1.50         | 19.0                                    | 30                         | 14.5                        | 15.5                        |
| 3/6                    | 2.25         | 20.9                                    | 35                         | 23.0                        | 12                          |

### QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

| BOREHOLE<br>/ SAMPLE<br>NO | DEPTH<br>(m) | NATURAL<br>MOISTURE<br>CONTENT<br>(Wc)% | BULK<br>DENSITY<br>( $\gamma_b$ )<br>Mg/m <sup>3</sup> | UNDRAINED<br>COHESION<br>(C <sub>u</sub> ) KN/m <sup>2</sup> | ANGLE OF<br>INTERNAL<br>FRICTION | CELL<br>PRESSURE<br>( $\sigma_3$ ) KN/m <sup>2</sup> | COMPRESSIVE<br>STRESS<br>(KN/m <sup>2</sup> ) |
|----------------------------|--------------|---|--|--|----------------------------------|--|---|
| 1/2                        | 1.00         | 17.8                                    | 1.800  | 61   | 7.0                              | 50   | 212   |
|                            |              |   |  |  |                                  | 100  | 228   |
|                            |              |   |  |  |                                  | 200  | 275   |
| 1/4                        | 2.00         | 21.5                                    | 1.910  | 180  | 10.0                             | 50   | 230   |
|                            |              |   |  |  |                                  | 100  | 245   |
|                            |              |   |  |  |                                  | 200  | 286   |
| 1/6                        | 3.00         | 23.4                                    | 2.120  | 263  | 12.0                             | 50   | 215   |
|                            |              |   |  |  |                                  | 100  | 229   |
|                            |              |   |  |  |                                  | 200  | 280   |
| 2/2                        | 1.00         | 19.3                                    | 1.980  | 65   | 6.0                              | 50   | 230   |
|                            |              |   |  |  |                                  | 100  | 242   |
|                            |              |   |  |  |                                  | 200  | 278   |
| 2/4                        | 2.00         | 19.0                                    | 2.102  | 145  | 11.0                             | 50   | 208   |
|                            |              |   |  |  |                                  | 100  | 218   |
|                            |              |   |  |  |                                  | 200  | 265   |
| 2/6                        | 3.00         | 18.2                                    | 2.180  | 280  | 14.0                             | 50   | 217   |
|                            |              |   |  |  |                                  | 100  | 257   |
|                            |              |   |  |  |                                  | 200  | 293   |
| 3/2                        | 1.00         | 19.4                                    | 1.960  | 70   | 5.0                              | 50   | 210   |
|                            |              |   |  |  |                                  | 100  | 230   |
|                            |              |   |  |  |                                  | 200  | 280   |

|            |             |             |              |            |             |                                       |  |
|------------|-------------|-------------|--------------|------------|-------------|---------------------------------------|--|
| <b>3/4</b> | <b>2.00</b> | <b>19.0</b> | <b>1.911</b> | <b>180</b> | <b>8.0</b>  | <b>50</b><br><b>100</b><br><b>200</b> | <b>222</b><br><b>248</b><br><b>290</b> |
| <b>3/6</b> | <b>3.00</b> | <b>20.9</b> | <b>2.210</b> | <b>275</b> | <b>11.0</b> | <b>50</b><br><b>100</b><br><b>200</b> | <b>221</b><br><b>250</b><br><b>291</b> |

### GRAIN SIZES DISTRIBUTION TEST

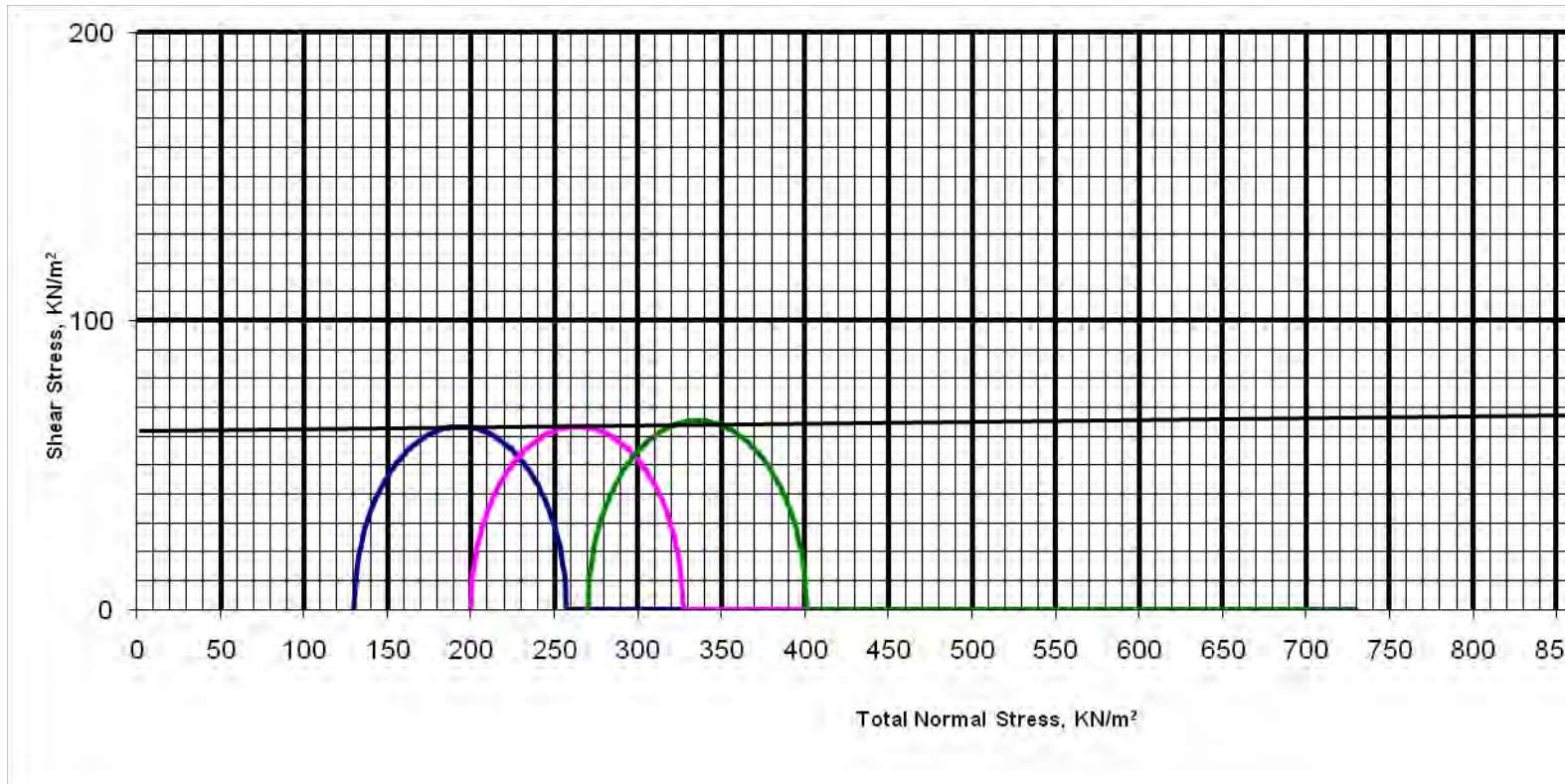
| BH No | Sample No | Depth (m) | Soil Type | Sieve sizes (mm) |      |     |      |     |       |     |       |      |       |       |
|-------|-----------|-----------|-----------|------------------|------|-----|------|-----|-------|-----|-------|------|-------|-------|
|       |           |           |           | 5                | 3.35 | 2   | 1.18 | 0.6 | 0.425 | 0.3 | 0.212 | 0.15 | 0.063 | 0.045 |
| 1     | 3         | 1.50      | C         |                  |      | 100 | 95   | 89  | 72    | 64  | 51    |      |       |       |
| 1     | 12        | 6.00      | C         |                  |      | 100 | 93   | 85  | 75    | 60  | 47    |      |       |       |
| 1     | 12        | 6.00      | C         |                  | 100  | 97  | 87   | 74  | 59    | 50  | 41    |      |       |       |
| 2     | 3         | 1.50      | C         |                  |      | 100 | 91   | 82  | 70    | 61  | 49    |      |       |       |
| 2     | 12        | 6.00      | C         |                  |      | 100 | 94   | 88  | 74    | 63  | 51    |      |       |       |
| 2     | 18        | 9.00      | C         |                  |      | 100 | 96   | 90  | 81    | 70  | 54    |      |       |       |
| 3     | 3         | 9.00      | S         |                  |      | 100 | 95   | 90  | 83    | 72  | 51    |      |       |       |
| 3     | 9         | 4.50      | S         |                  |      | 100 | 92   | 85  | 80    | 69  | 49    |      |       |       |
| 3     | 24        | 12.00     | S         |                  | 100  | 97  | 92   | 81  | 74    | 61  | 48    |      |       |       |

BH 1

Sample: 2

Depth: 1.00m

|                         |                     |
|-------------------------|---------------------|
| Undrained Cohesion      | 61KN/m <sup>2</sup> |
| Angle of Friction (PHI) | 7deg                |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

UNDRAINED TRIAXIAL  
TEST

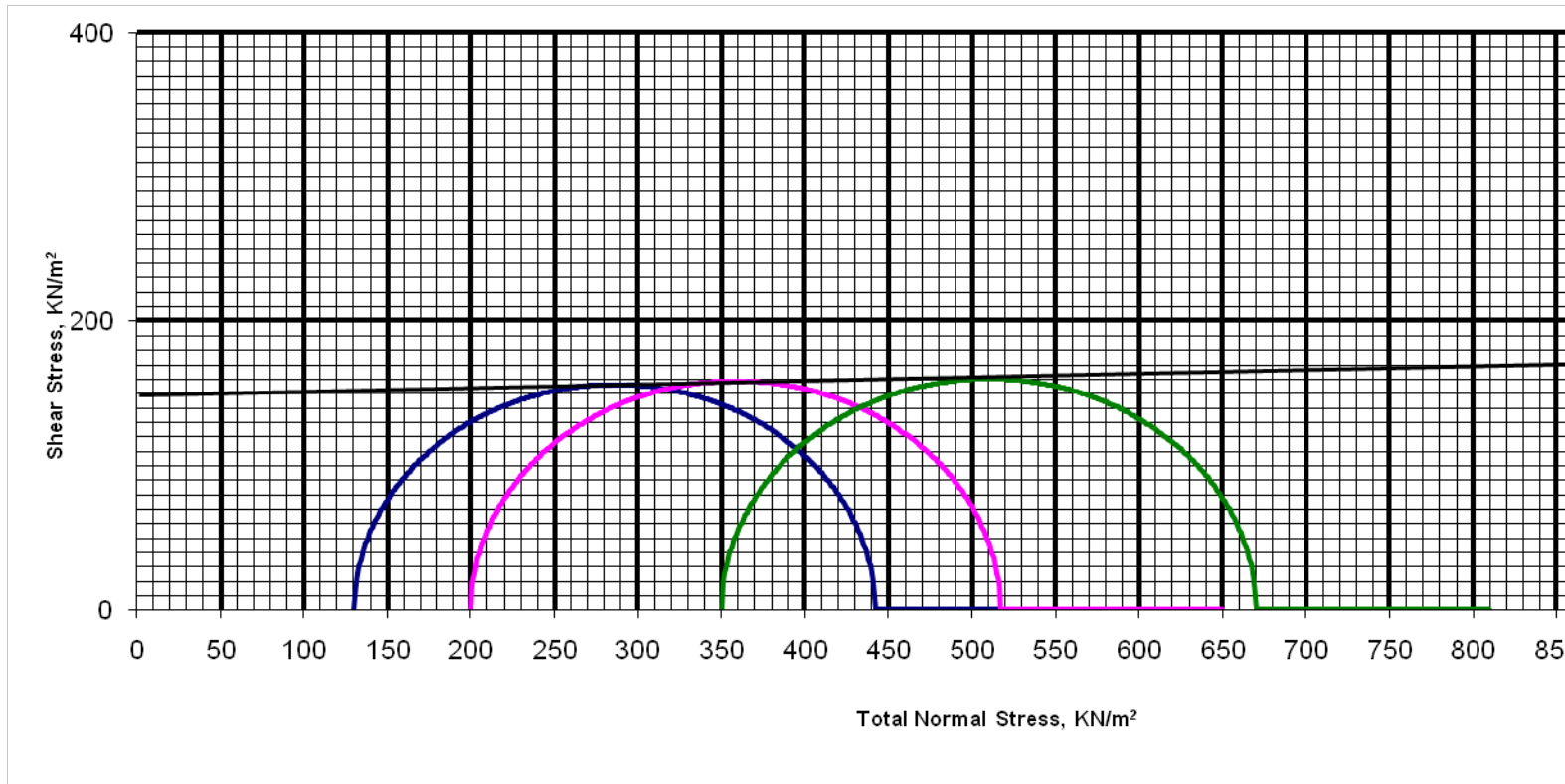


BH 1

Sample: 4

Depth: 2.00m

|                         |                      |
|-------------------------|----------------------|
| Undrained Cohesion      | 150KN/m <sup>2</sup> |
| Angle of Friction (PHI) | 10deg                |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

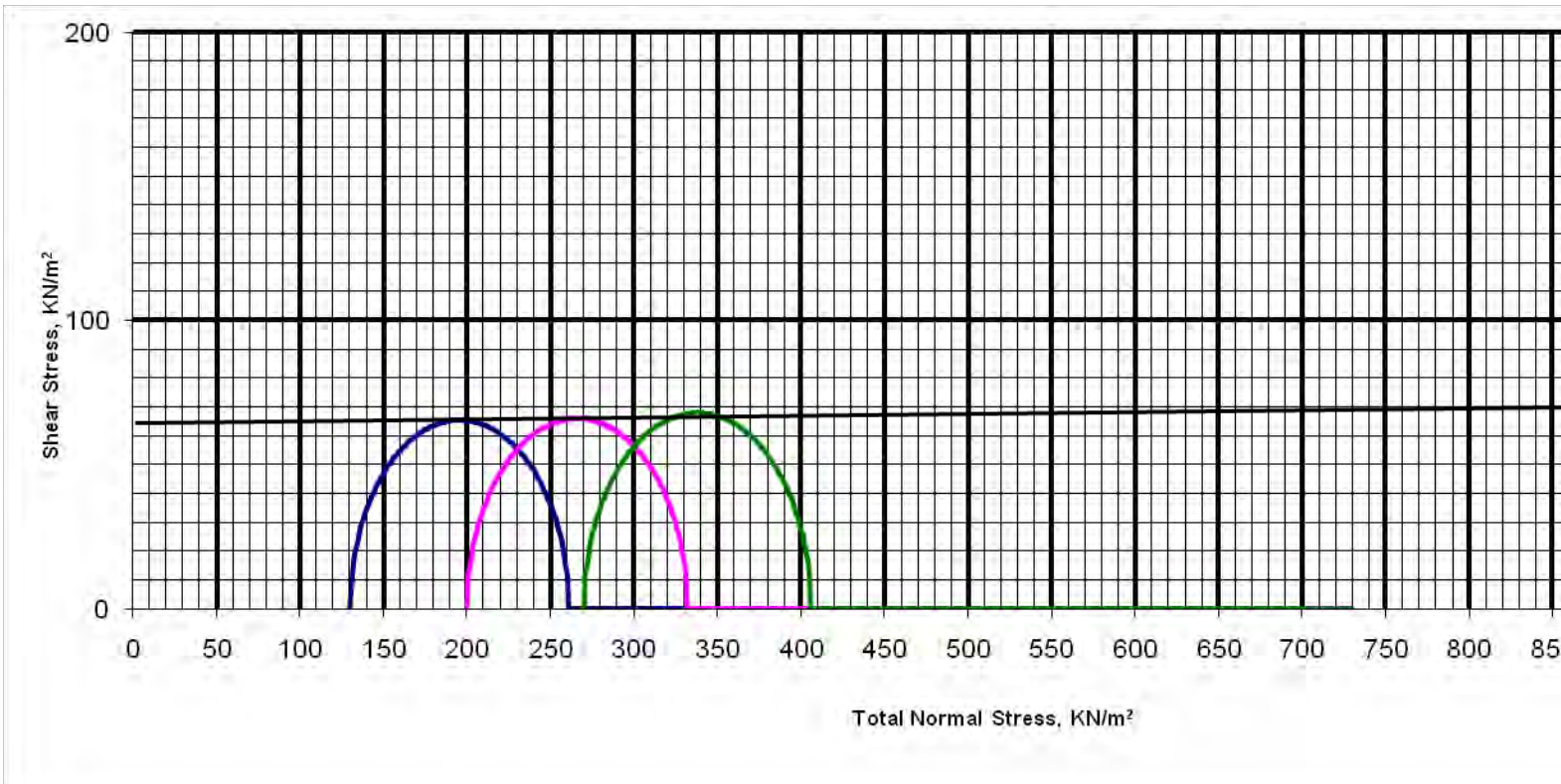
UNDRAINED TRIAXIAL TEST

BH 2

Sample: 2

Depth: 1.00m

|                         |                     |
|-------------------------|---------------------|
| Undrained Cohesion      | 65KN/m <sup>2</sup> |
| Angle of Friction (PHI) | 6deg                |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

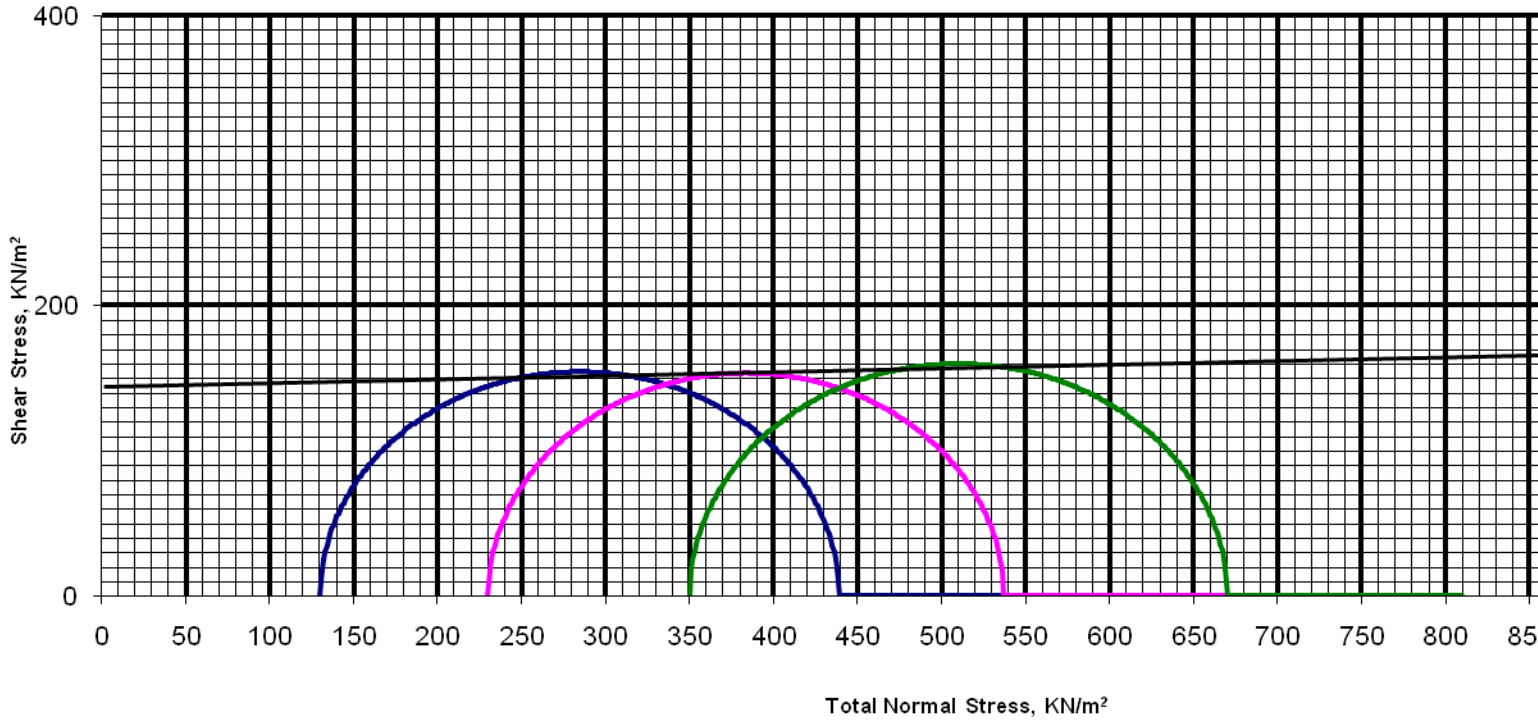
UNDRAINED TRIAXIAL TEST

BH 2

Sample: 4

Depth: 2.00m

|                         |                      |
|-------------------------|----------------------|
| Undrained Cohesion      | 145KN/m <sup>2</sup> |
| Angle of Friction (PHI) | 11deg                |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

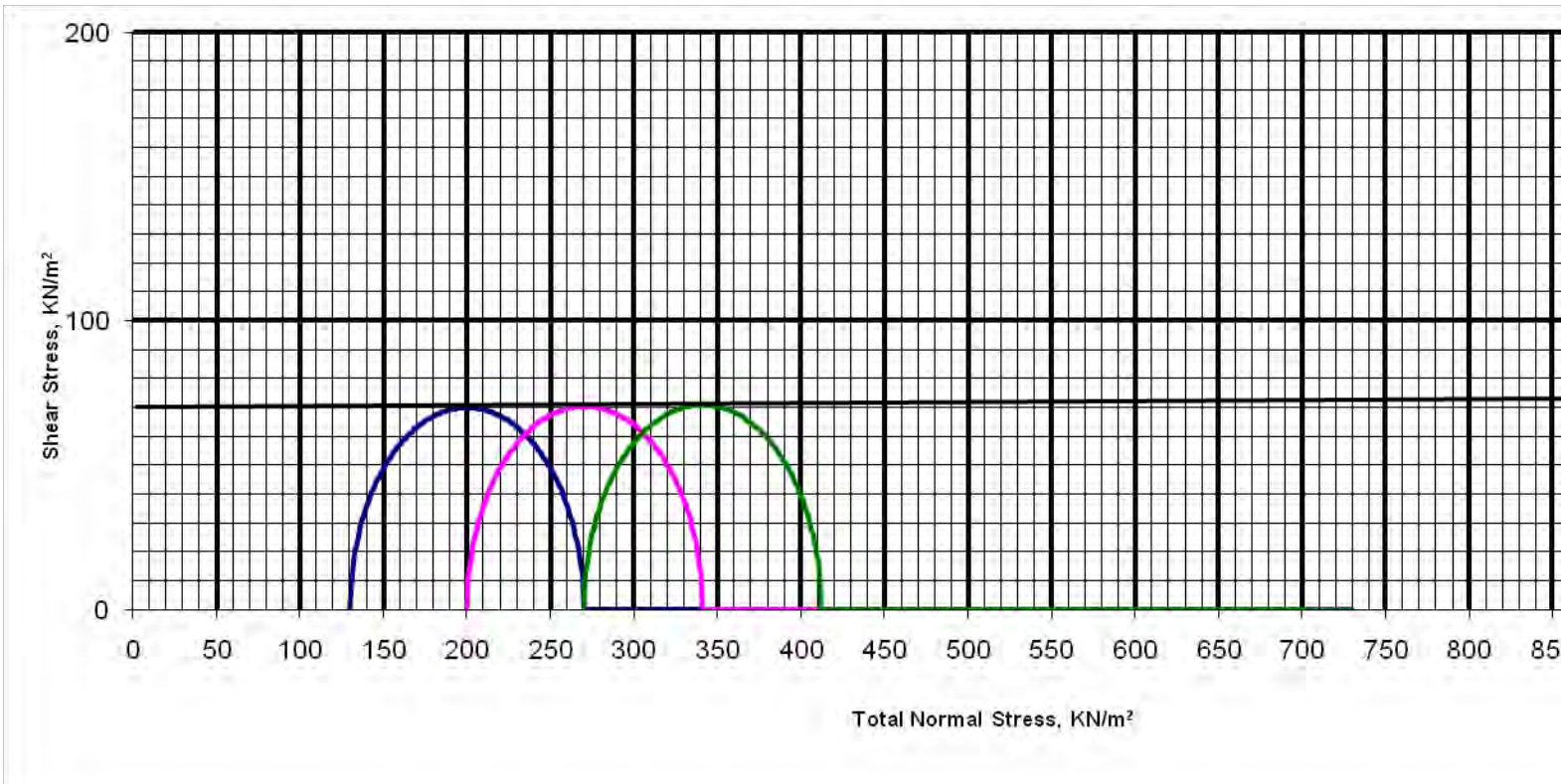
UNDRAINED TRIAXIAL TEST

BH 3

Sample: 2

Depth: 1.00m

|                         |                     |
|-------------------------|---------------------|
| Undrained Cohesion      | 70KN/m <sup>2</sup> |
| Angle of Friction (PHI) | 5deg                |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

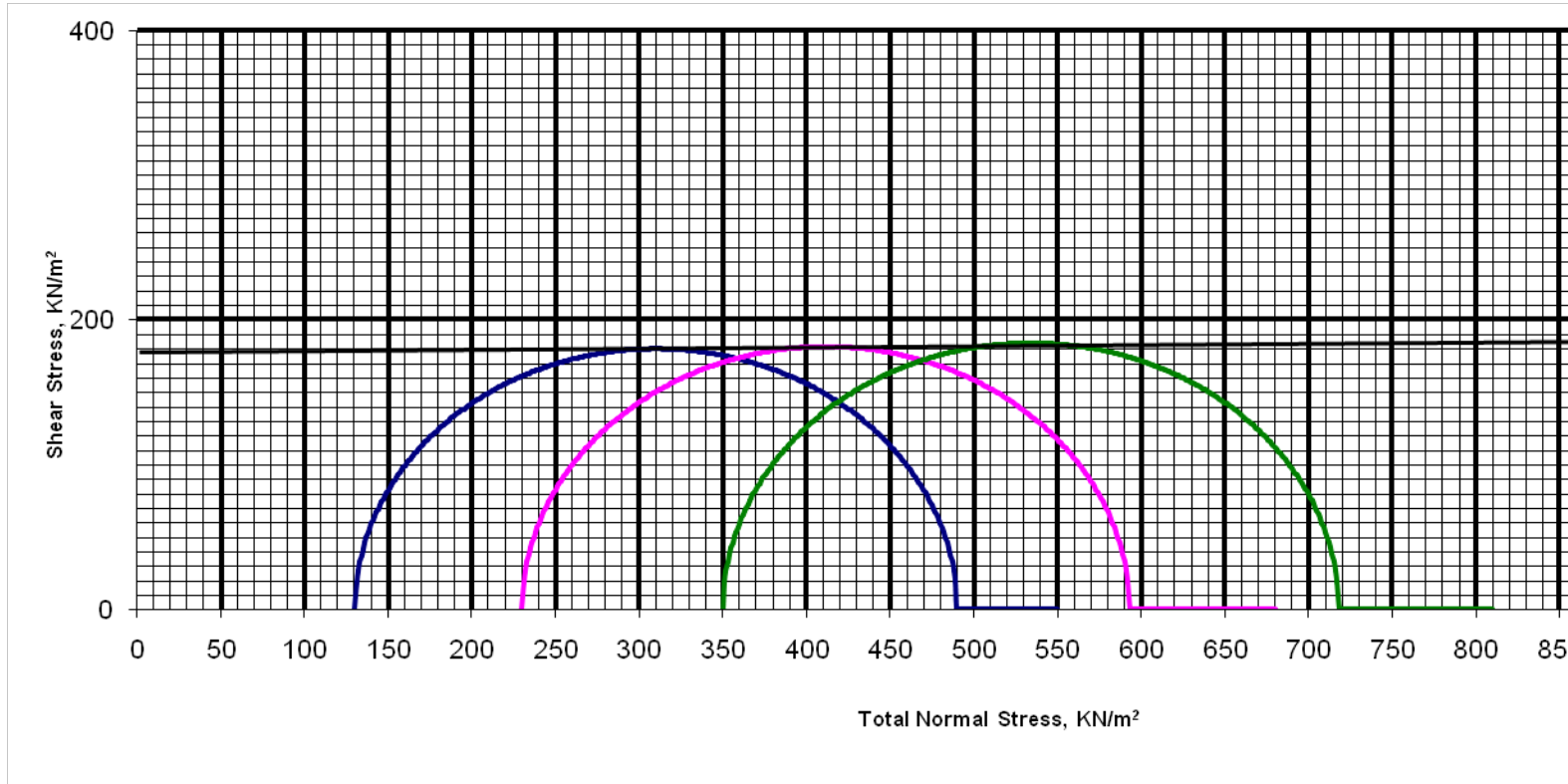
UNDRAINED TRIAXIAL TEST

BH 3

Sample: 4

Depth: 2.00m

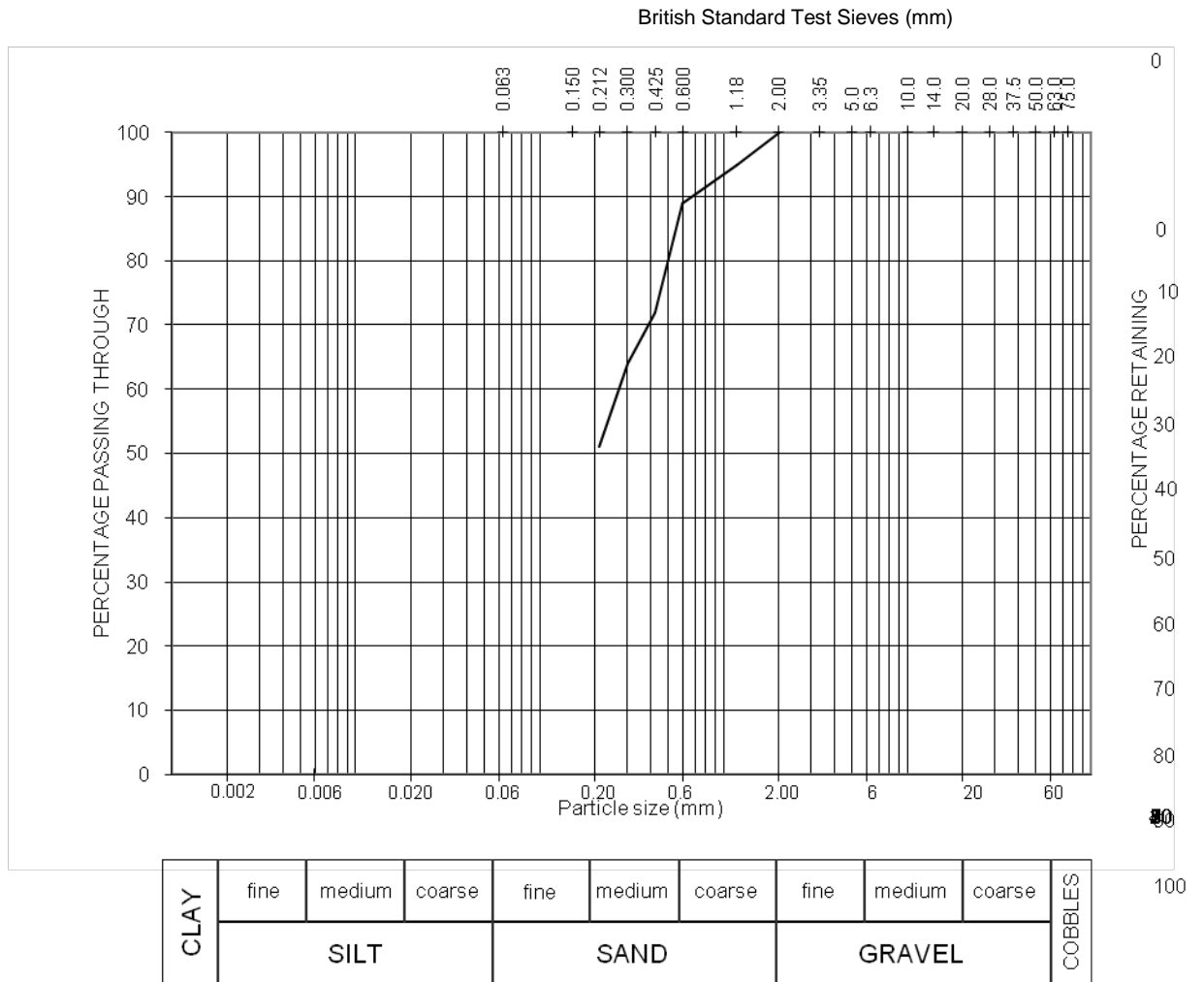
|                         |                      |
|-------------------------|----------------------|
| Undrained Cohesion      | 180KN/m <sup>2</sup> |
| Angle of Friction (PHI) | 8deg                 |



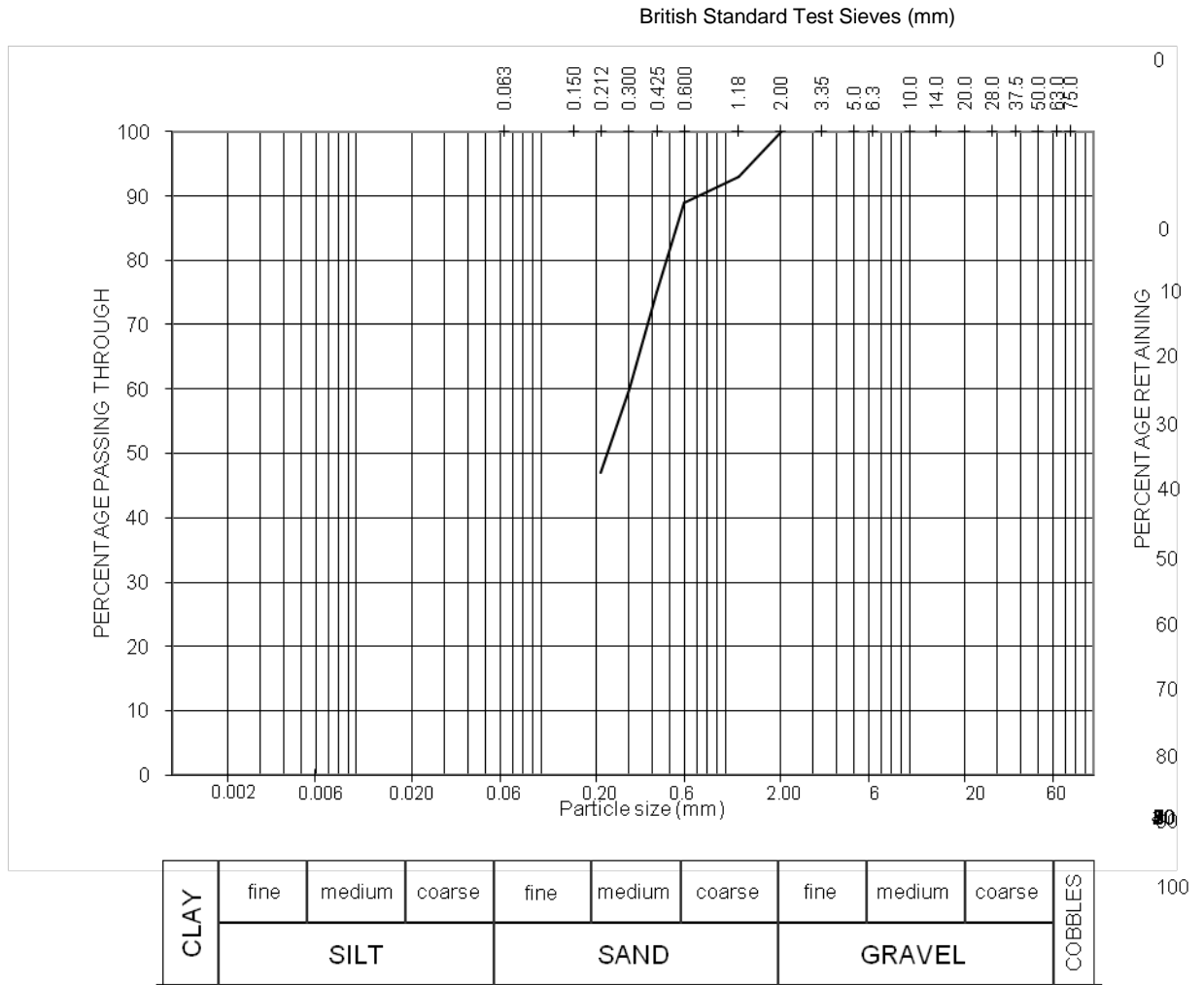
TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

UNDRAINED TRIAXIAL TEST

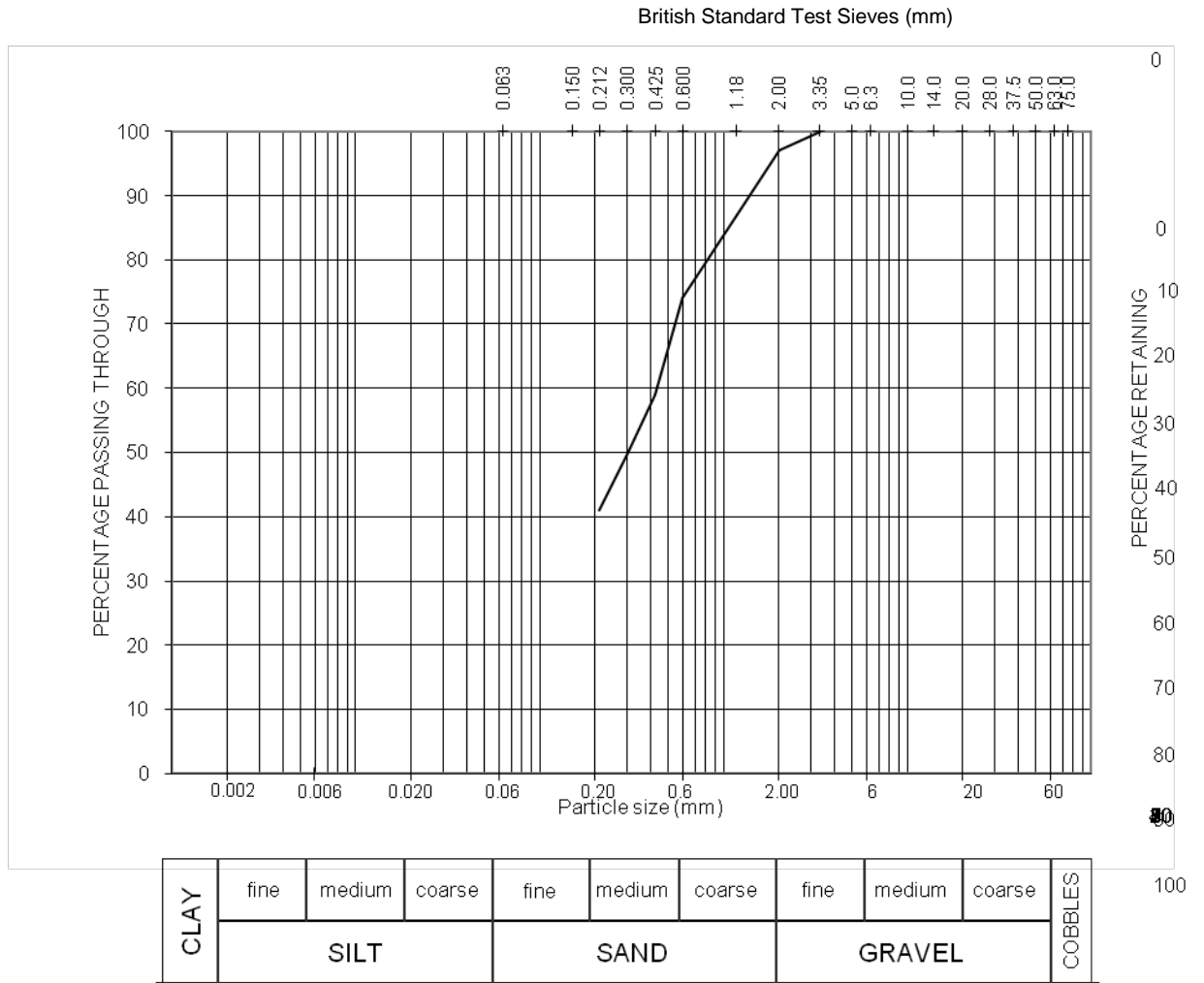
# Borehole 1



| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION              | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|---------------------------------|----------|----------|----------|------------|----|----|
| —     | 3      | 1.50m     | yellowish grey sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                                 |          |          |          |            | -  | -  |
| ..... |        |           |                                 |          |          |          |            | -  | -  |



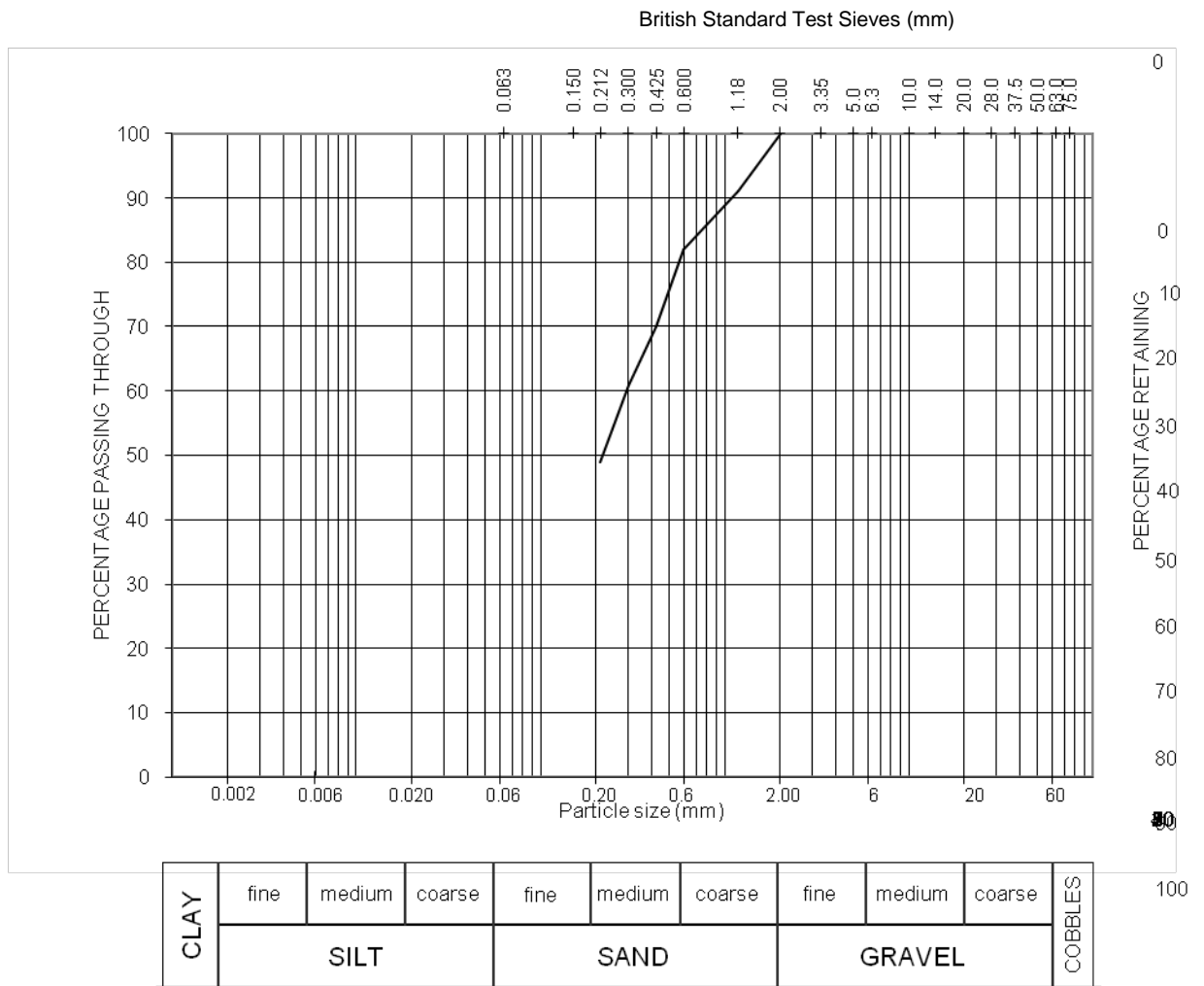
| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION          | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|-----------------------------|----------|----------|----------|------------|----|----|
| —     | 12     | 6.00m     | light grey sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                             |          |          |          |            | -  | -  |
| ..... |        |           |                             |          |          |          |            | -  | -  |



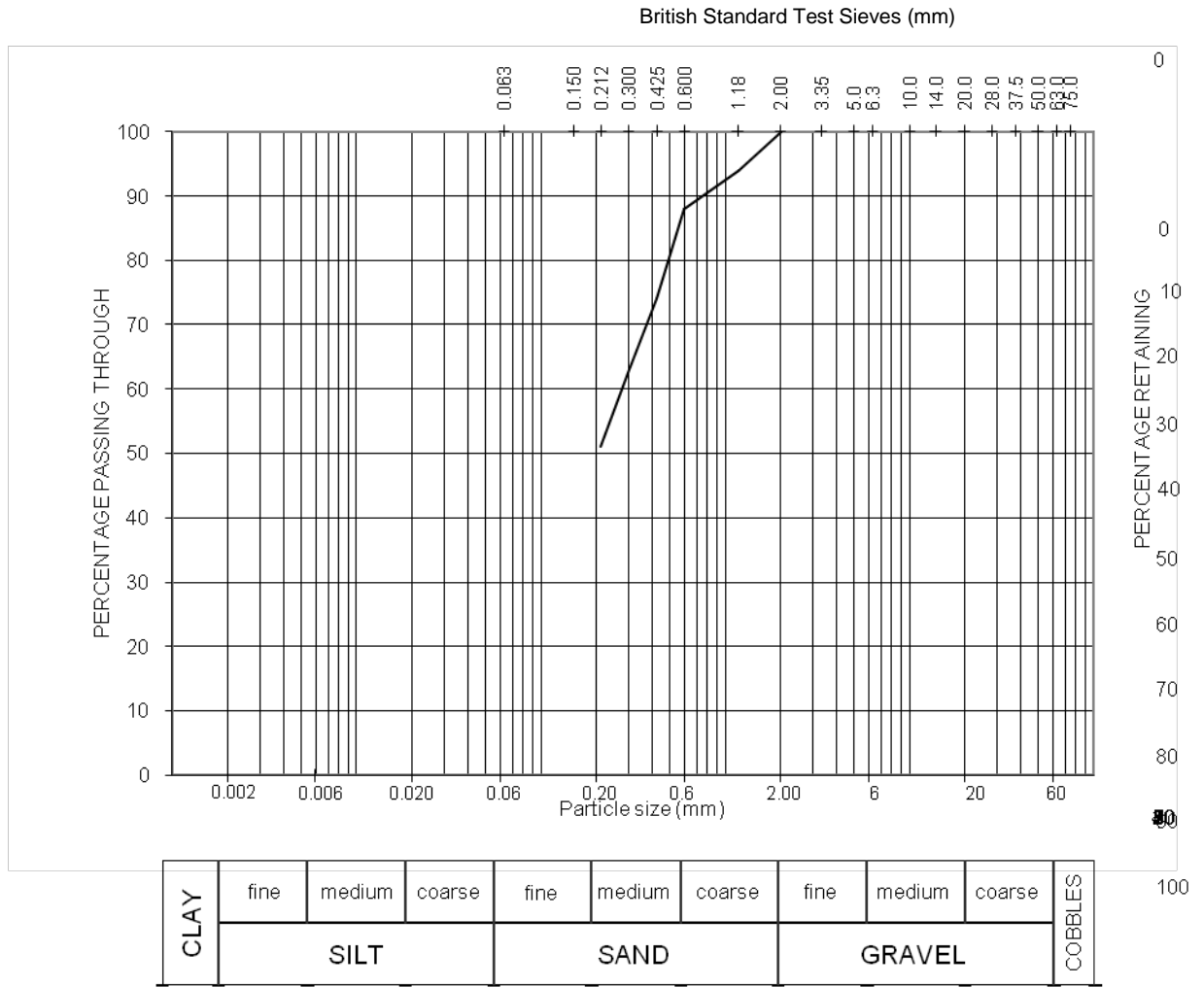
| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION                       | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--|----------|----------|----------|------------|----|----|
| —     | 21     | 10.50m    | light grey sandy silty CLAY with gravels |          |          |          |            | -  | -  |
| - - - |        |           |  |          |          |          |            | -  | -  |
| ..... |        |           |  |          |          |          |            | -  | -  |



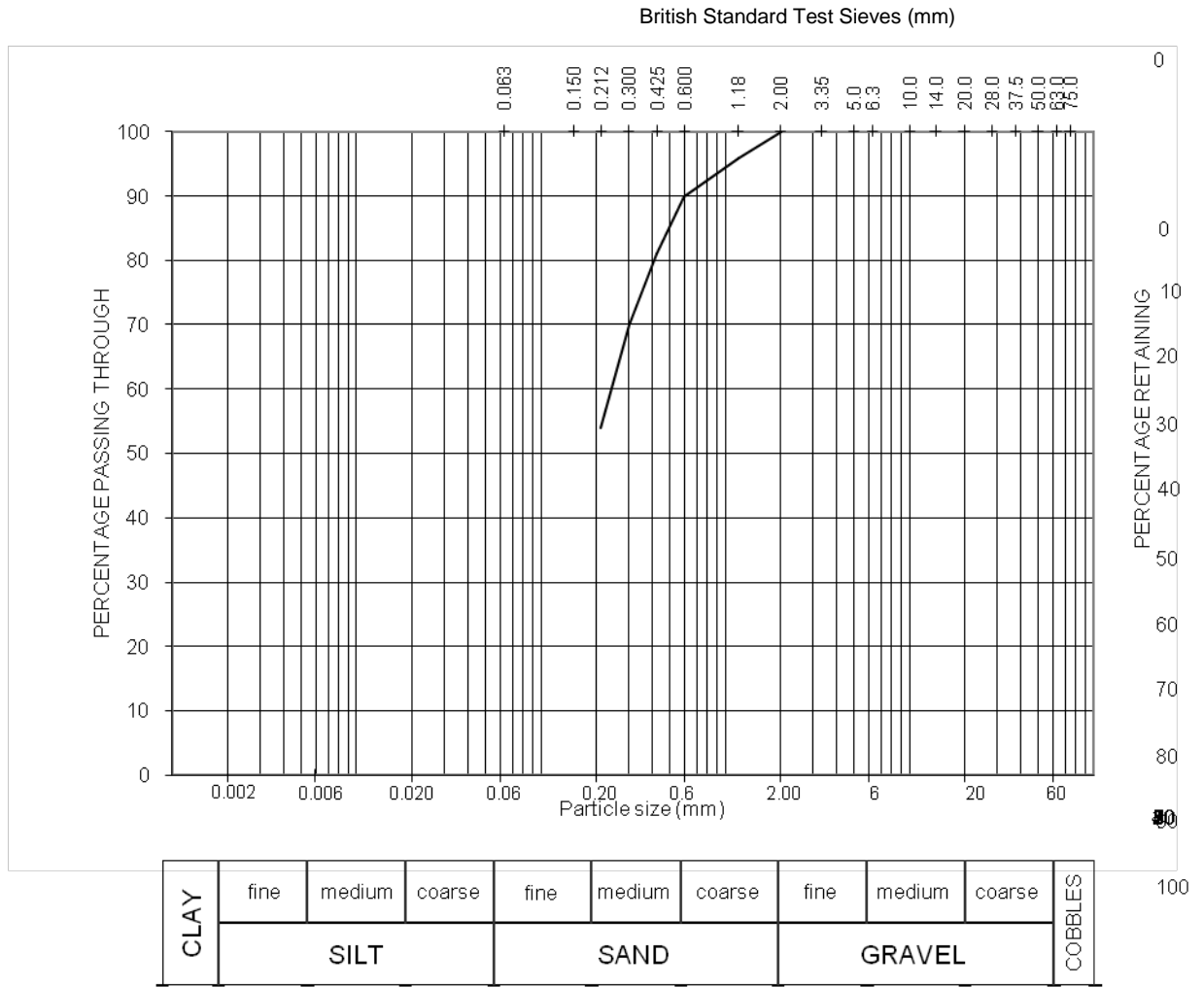
## Borehole 2



| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION          | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|-----------------------------|----------|----------|----------|------------|----|----|
| ——    | 3      | 1.50m     | light grey sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                             |          |          |          |            | -  | -  |
| ..... |        |           |                             |          |          |          |            | -  | -  |

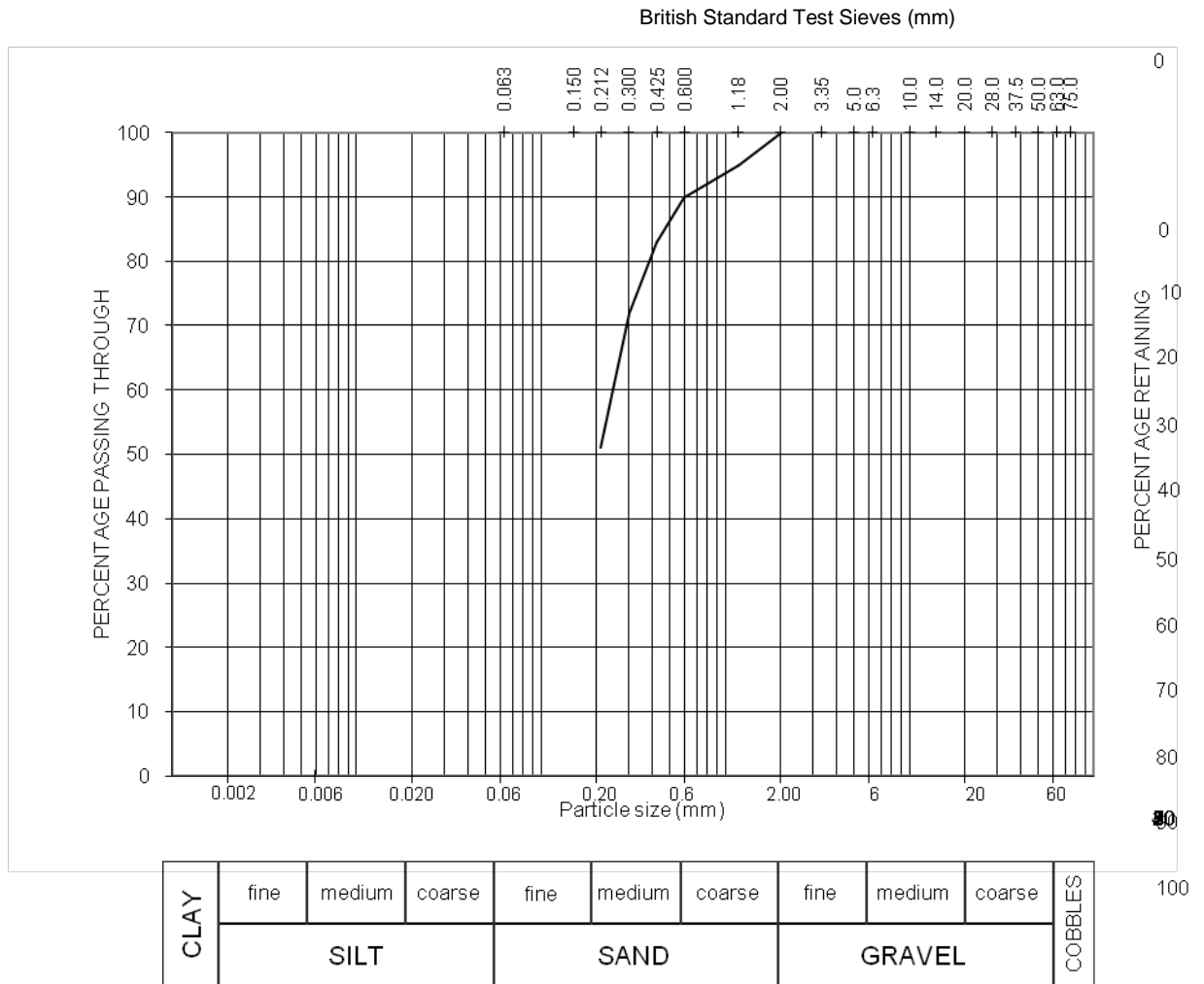


| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION           | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|------------------------------|----------|----------|----------|------------|----|----|
| —     | 15     | 7.50m     | light brown sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                              |          |          |          |            | -  | -  |
| ..... |        |           |                              |          |          |          |            | -  | -  |

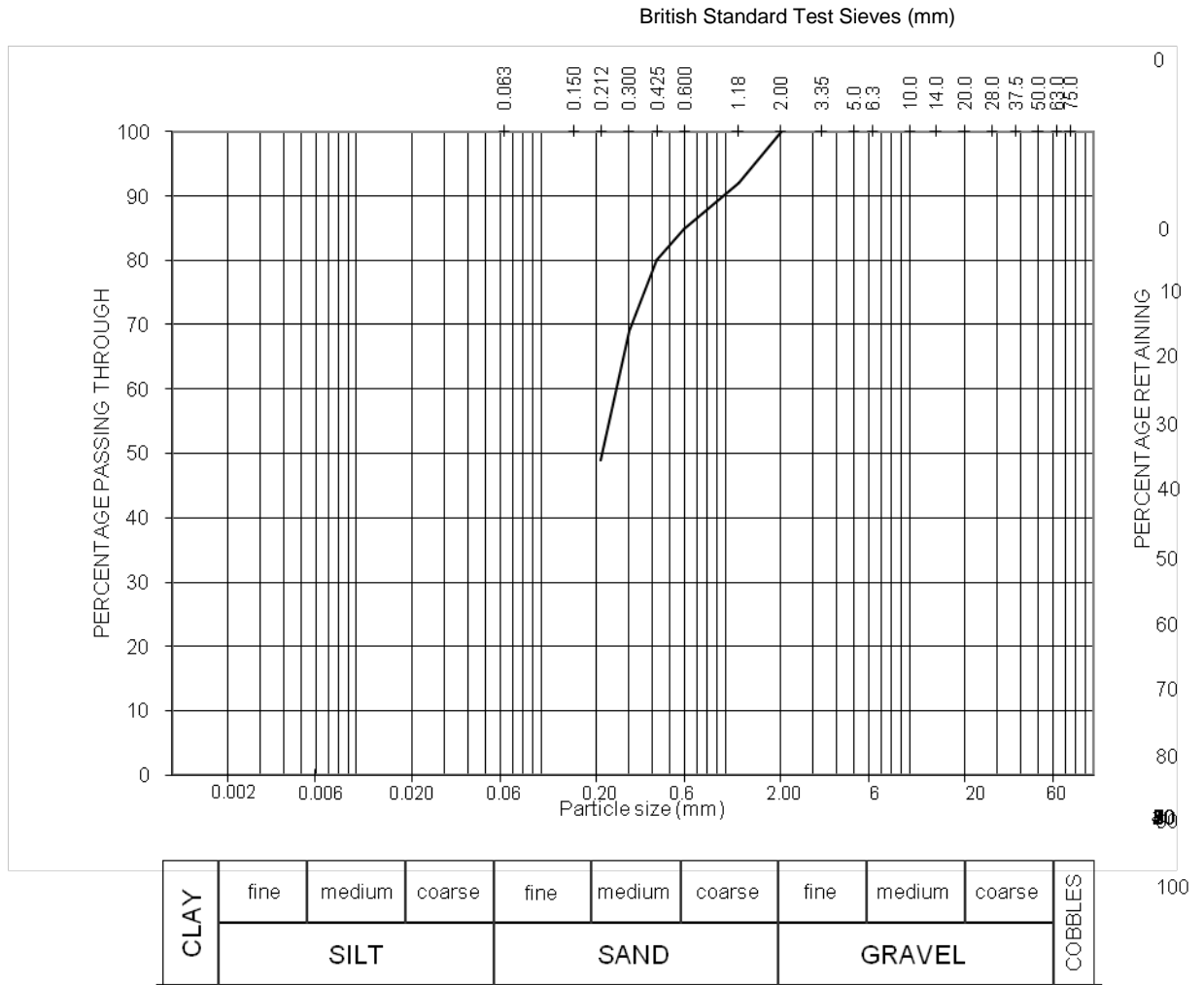


| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION          | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|-----------------------------|----------|----------|----------|------------|----|----|
| —     | 24     | 12.00m    | light grey sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                             |          |          |          |            | -  | -  |
| ..... |        |           |                             |          |          |          |            | -  | -  |

### Borehole 3

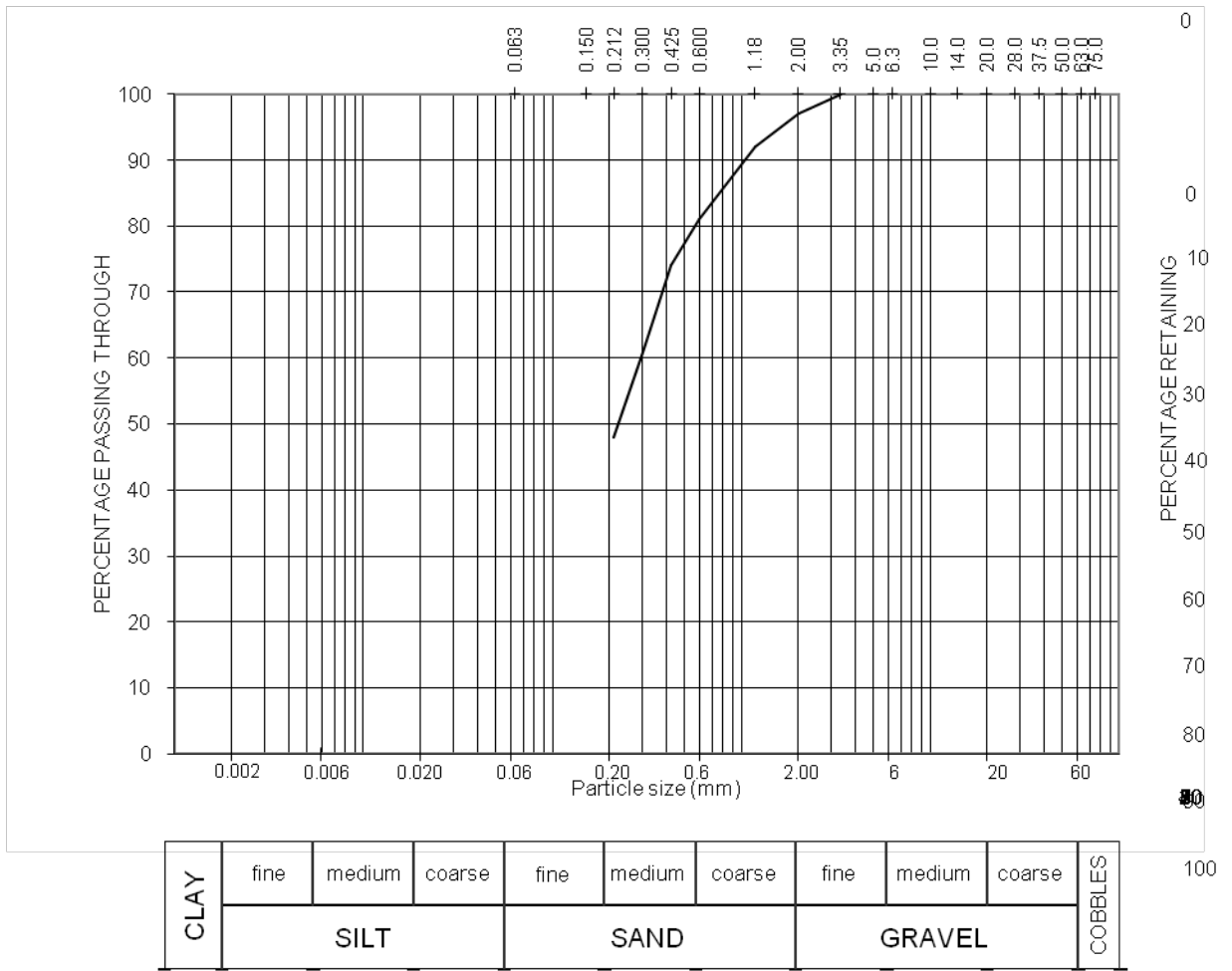


| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION           | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|------------------------------|----------|----------|----------|------------|----|----|
| —     | 3      | 1.50m     | light brown sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                              |          |          |          |            | -  | -  |
| ..... |        |           |                              |          |          |          |            | -  | -  |



| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION           | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|------------------------------|----------|----------|----------|------------|----|----|
| —     | 6      | 3.00m     | light brown sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                              |          |          |          |            | -  | -  |
| ..... |        |           |                              |          |          |          |            | -  | -  |

British Standard Test Sieves (mm)



| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION               | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|----------------------------------|----------|----------|----------|------------|----|----|
| —     | 24     | 12.00m    | yellowish brown sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                                  |          |          |          |            | -  | -  |
| ..... |        |           |                                  |          |          |          |            | -  | -  |

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## **NOTES RELATING TO THIS REPORT**

### **Introduction**

These notes have been provided to amplify the geotechnical report in regard to classification methods, specialist field procedures and certain matters relating to the Discussion and Comments section. Not all, of course, are necessarily relevant to all reports.

Geotechnical reports are based on information gained from limited subsurface test boring and sampling, supplemented by knowledge of local geology and experience.

For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Non-cohesive soils are classified on the basis of relative density, generally from the results of standard penetration tests (SPT) or Dutch cone Penetrometer tests (CPT) as below:

| <b>Relative Density</b> | <b>CPT Cone Value (qc — MPa)</b> |
|-------------------------|----------------------------------|
| Very loose              | less than 2                      |
| Loose                   | 2—5                              |
| Medium dense            | 5—15                             |
| Dense                   | 15—25                            |
| Very dense              | greater than 25                  |

### **Site Anomalies**

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, the Company requests that it immediately be notified. Most problems are much more readily resolved when conditions are exposed than at some later stage, well after the event.

### **Ground Water**

Where ground water levels are measured in boreholes, there are several potential problems;

### **Reproduction of Information for Contractual Purposes**

- In low permeability soils, ground water although present, may enter the hole slowly or perhaps not at all during the time it is left open. Attention is drawn to the document

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“Guidelines for the Provision of Geotechnical Information in Tender Documents”,  
published by the Institution of Engineers,

- A localised perched water table may lead to an erroneous indication of the true water table.

**Site Inspection**

The Company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.



PREPARATORY SURVEY  
FOR  
TRANSMISSION POWER PROJECT  
IN THE  
FEDERAL REPUBLIC OF NIGERIA

PROPOSED 330/132KV SUBSTATION  
AT NEW AGBARA SUBSTATION, AJEGUNLE  
VIA ATAN OTA, ADO ODO OTA LGA, OGUN STATE.

**GEOTECHNICAL INVESTIGATION**

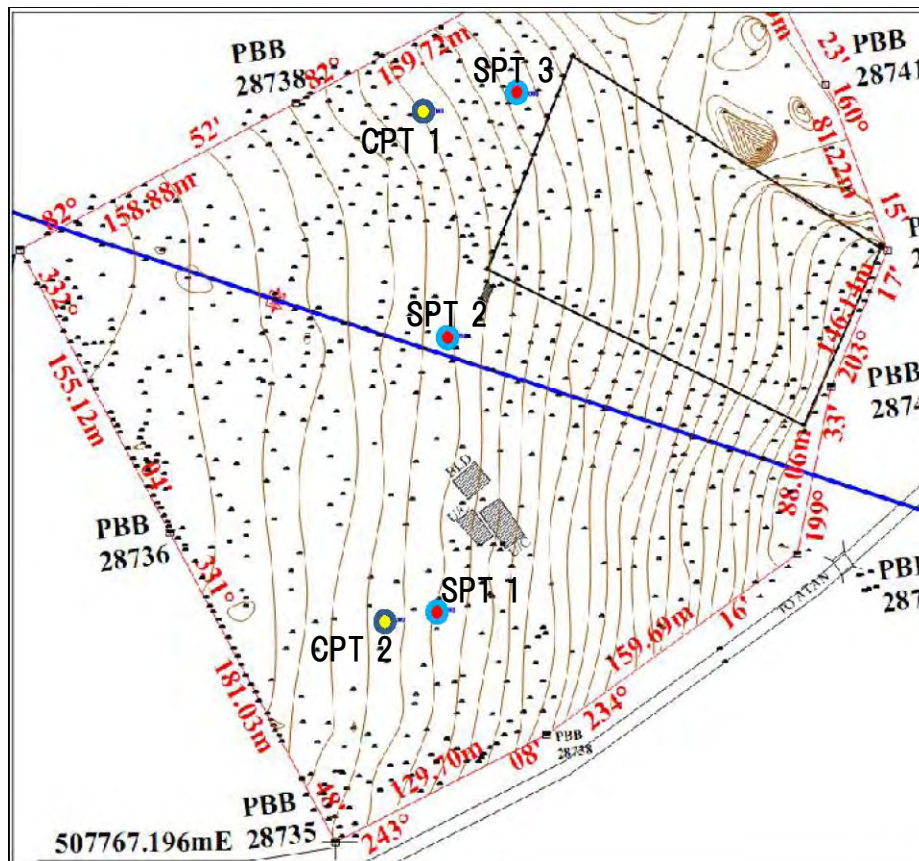
**2015 May**

**Yachiyo Engineering Co., Ltd.**

**BEST & CROMPTON ENGINEERING AFRICA LTD**



Total Grid Plan



New Agbara Site Location Plan

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## 1.0 INTRODUCTION

The Client commissioned Best & Crompton Engineering Africa Ltd., to proceed with subsoil investigations at the proposed 330/132KV Substation at New Agbara Substation. This report is a consequence of the soil investigation and analyses, which is presented in an objective and professional manner.

The purpose of the subsoil investigation and attendant report is as follows:

- Determine the subsoil and surface/groundwater conditions of the designated location.
- Evaluation of the subsoil stratigraphic sequence geotechnical/engineering properties of the soil and the subsequent effects on foundation design and construction.
- Analysis of the data/results of tests carried out on the soil samples obtained and provide recommendations on the fit-for-purpose type of foundation for the proposed structure.

## 2.0 SITE ACCESSIBILITY

The sites are accessible through **Atan Ota** to mention but a few.

## 3.0 DESCRIPTION OF WORK

The soil investigation comprised of and carried out in three parts;

- Field Work: Test (2Nos. DCPTs and 3Nos. Borehole/SPT), Laboratory analysis and collation of the test results.

### 3.1 FIELD WORK

The site works were carried out on January 2015.

The Scope of Work executed involved the performance of 2Nos. 2.5tons Dutch Cone Penetrometer Tests (DCPTs) to a depth of refusal and 3Nos Borehole/SPT.

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## **BOREHOLE**

This stage involved carrying out 1No borehole to a depth between 15.00m to 20.00m below the existing ground level as specified by the client.

## **DRILLING METHOD**

The tools are attached to the wire rope which is then operated by the winch. The tools are operated using percussive techniques to progress the borehole to depths between 15.00m to 20.00m. As the borehole progresses, temporary casing is installed to provided support to the borehole sides. In firm or stiff cohesive soils casing is sometimes not required, as the clay is self supporting. For the drilling of deeper boreholes it is sometimes necessary to commence the borehole at one diameter, and then reduce to a smaller diameter to deepen the borehole. This would normally require the use of two or more strings of casing. Where it is necessary to add water to advance the borehole, only potable water will be used and the only the minimum amount necessary will be used. The amount added will be recorded on the driller's log. SPT is taken at 1.5m interval

## **Sampling Method**

1. Ordinary disturbed samples were collected at changes of strata and as deemed fit for strata identification purposes, through visual inspection and classification tests.
2. Undisturbed 100mm diameter samples were collected from cohesive strata. The operation is effected through a "jarring arrangement". The arrangement allows 100mm I.D. by 450mm length-sampling tube complete with a cutting shoe to be driven by the weight of the string rod above the sampler with minimum disturbance of the sample. The number of blows recorded is that used to obtain the last 300mm of penetration by the driven weight referred to above.

## **DUTCH CONE PENETROMETER**

The apparatus consists of a cylindrical probe, of 1000mm<sup>2</sup> cross sectional area, and a conic head of apex angle of 60°. The probe is forced down through the soil at a steady rate of about 20mm/s in the closed position by exerting pressure force on outer

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sounding tube. If desired the point resistance and the resistance to side friction can be measured separately.

2Nos. static cone penetration tests were carried out using a 2.5tons capacity testing equipment (machine) on each site. The test involves advancing the cone into the ground slowly at a constant rate and the resistant to penetration measured at predetermined intervals of 0.25m depth. The tests were terminated at depths where the machine anchor legs lifted.

These tests were taken from the existing ground level down to depths refusal at each location.

The cone penetration test results are presented in a graphical form respectively in the Appendix to this Report.

## **3.2 ANALYSIS OF TEST RESULTS**

### **3.2.1 Geological Description**

Available geological record reveals that the investigated area is within the basement complex of Nigeria; it is characterized by crystalline rocks of Precambrian age. Rocks of granitic origin later intruded these rocks.

The sedimentary deposits found on top of the basement rock are product of the parent rocks that have undergone weathering and decomposition.

### **3.2.2 Subsoil Condition**

The subsoil condition of the site, based on the DCP and Borehole/SPT test carried out reveals predominantly cohesive soil as observed from the DCP Plot and the Borehole log.

Details of the subsoil characteristics encountered during the Penetrometer tests and Borehole/SPT are stated below:

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**Subsoil Condition based on the field work.**

**Dutch Cone Penetrometer Test**

| <b><u>Depth (m)</u></b> | <b><u>Description of Stratum</u></b> |
|-------------------------|--------------------------------------|
| 0.00 to –2.00           | Stiff to very stiff cohesive soil.   |

**Geotechnical Properties**

| <b><u>Depth (m)</u></b> | <b><u>Geotechnical Properties</u></b>  |
|-------------------------|--|
| 0.00 to –2.00           | Good geotechnical properties, high shear strength and low compressibility potential. |

**Geotechnical Engineering Parameters**

| <b><i>Depth (m)</i></b>    | <b><i>P1(kgf/cm<sup>3</sup>)</i></b> | <b><i>P2(kgf/cm<sup>3</sup>)</i></b> |
|----------------------------|--------------------------------------|--------------------------------------|
| <b><i>0.00 – 2.00m</i></b> | <b><i>25 – 130</i></b>               | <b><i>30 – 141</i></b>               |

**Borehole/SPT 1**

| <b><u>Depth (m)</u></b> | <b><u>Description of Stratum</u></b>   |
|-------------------------|--|
| 0.00 to –2.00           | Stiff to very stiff reddish brown sandy silty CLAY with 0.15m thick topsoil. |
| 2.00 to –9.00           | Very stiff to hard reddish brown sandy silty CLAY.                           |
| 9.00 to –15.00          | Hard grayish brown silty CLAY.   |

**Geotechnical Properties**

| <b><u>Depth (m)</u></b> | <b><u>Geotechnical Properties</u></b>                 |
|-------------------------|---|
| 0.00 to –2.00           | Good geotechnical properties, high shear strength and |

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|                |   |
|----------------|---|
|                | low compressibility potential.  |
| 2.00 to –9.00  | Good geotechnical properties, high shear strength and low compressibility potential.      |
| 9.00 to –15.00 | Very good geotechnical properties, high shear strength and low compressibility potential. |

### **Geotechnical Engineering Parameters**

| <b><i>Depth (m)</i></b>     | <b><i>SPT Values</i></b> | <b><i>U4 Sample</i></b> |
|-----------------------------|--------------------------|-------------------------|
| <b><i>0.00 – 2.00m</i></b>  | <b><i>14</i></b>         | <b><i>Taken</i></b>     |
| <b><i>2.00 – 9.00m</i></b>  | <b><i>16 – 21</i></b>    | <b><i>Abortive</i></b>  |
| <b><i>9.00 – 15.00m</i></b> | <b><i>24 – 31</i></b>    | <b><i>Abortive</i></b>  |

### **Borehole/SPT 2**

| <b><u>Depth (m)</u></b> | <b><u>Description of Stratum</u></b>               |
|-------------------------|--|
| 0.00 to –1.50           | Very stiff reddish brown sandy silty CLAY          |
| 1.50 to –11.00          | Very stiff to hard reddish brown sandy silty CLAY. |
| 11.00 to –20.00         | Hard reddish brown sandy CLAY with gravels.        |

### **Geotechnical Properties**

| <b><u>Depth (m)</u></b> | <b><u>Geotechnical Properties</u></b>   |
|-------------------------|---|
| 0.00 to –2.00           | Good geotechnical properties, high shear strength and low compressibility potential.      |
| 2.00 to –9.00           | Good geotechnical properties, high shear strength and low compressibility potential.      |
| 9.00 to –15.00          | Very good geotechnical properties, high shear strength and low compressibility potential. |



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## Geotechnical Engineering Parameters

| <i>Depth (m)</i>      | <i>SPT Values</i> | <i>U4 Sample</i> |
|-----------------------|-------------------|------------------|
| <i>0.00 – 1.50m</i>   | <i>18</i>         | <i>Taken</i>     |
| <i>1.50 – 11.00m</i>  | <i>17 – 24</i>    | <i>Abortive</i>  |
| <i>11.00 – 20.00m</i> | <i>21 – 30</i>    | <i>Abortive</i>  |

### **Borehole/SPT 3**

#### **Depth (m)**

#### **Description of Stratum**

0.00 to –3.00

Stiff to very stiff light brown silty CLAY

3.00 to –8.00

Very stiff to hard reddish brown silty CLAY.

9.00 to –15.00

Hard reddish brown silty CLAY with gravels.

### **Geotechnical Properties**

#### **Depth (m)**

#### **Geotechnical Properties**

0.00 to –3.00

Good geotechnical properties, high shear strength and low compressibility potential.

3.00 to –8.00

Good geotechnical properties, high shear strength and low compressibility potential.

9.00 to –15.00

Very good geotechnical properties, high shear strength and low compressibility potential.

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## Geotechnical Engineering Parameters

| <i>Depth (m)</i>     | <i>SPT Values</i> | <i>U4 Sample</i> |
|----------------------|-------------------|------------------|
| <i>0.00 – 3.00m</i>  | <i>15 – 19</i>    | <i>Taken</i>     |
| <i>3.00 – 8.00m</i>  | <i>18 – 25</i>    | <i>Abortive</i>  |
| <i>8.00 – 15.00m</i> | <i>23 – 30</i>    | <i>Abortive</i>  |

### 3.2.4 Site description and condition

The project site is an open piece of land with presence of powerline extension. Structures around site show no sign of distress at the time of our investigation.

### 3.2.5 Topography.

The topography of the project site is undulating topography.

### 3.2.6 Vegetation.

Vegetation around the project site area is mainly grasses and weeds.

## 4.1 FOUNDATION DISCUSSION AND RECOMMENDATION

### 4.1.1 Proposed Development

No structural detail of the proposed development was made available to us prior to the subsoil investigation, thus our recommendations are based on the DCP test carried out.

The geotechnical issues considered relevant to the proposed development include

- Soil bearing pressure

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- Level of groundwater
  - Recommendation of a suitable foundation type
  - Excavation

#### **4.1.2 RECOMMENDATION**

The foundation type to be chosen for a particular structure depends largely on the followings;

- Loads to be transmitted
- Receiving soil strata
- Factor of safety against shear failure of the supporting soil must be adequate.
- Settlement should neither cause any unacceptable damage nor interfere with the function of the structure.

Foundations can be classified as shallow foundation or as deep foundation.

The choice between shallow foundation and deep foundation can be arrived at after careful consideration of the following elements.

1. The magnitude of the transmitted loads from the stratum,
2. The soil nature,
3. The economic aspects of the elements of the foundation work,
4. Problems concerning foundation construction.

#### **4.1.3 Allowable bearing pressure and foundation recommendation**

Allowable bearing pressure calculated in accordance with theoretical soil mechanics principle for depths are indicated below:

| <b>Differential Depth<br/>(m)</b> | <b>Allowable bearing<br/>Capacity (KN/m<sup>2</sup>)</b> |
|-----------------------------------|--|
| <b>0.00 – 0.50</b>                | <b>156</b>   |
| <b>0.50 – 1.00</b>                | <b>214</b>   |
| <b>1.00 – 1.50</b>                | <b>402</b>   |

**FOUNDATION RECOMMENDATION****Shallow Foundation**

Shallow Foundation (Spread footing) is considered adequate for the proposed transmission substation on the project site.

**Groundwater**

Groundwater was not encountered during the subsoil investigation work

**METHOD OF CALCULATING ALLOWABLE BEARING PRESSURE IN COHESIVE SOIL IS GIVEN BY:**

Method for calculating in Cohesive Soil is given by:

$q_{ult} = 5.14C_u + \gamma D$  (Prandtl method of estimating allowable bearing pressure)

$$q_a = q_{ult} / F.S \text{ (3) – For Shallow foundation}$$

Correlation between  $q_c$  and SPT (N – Values)

$$N = q_c / 2$$

$$q_a = 10N, \text{ or } 5.0N \text{ ( If Submerged)}$$

Correlation between  $q_c$  and  $C_u$

$$C_u = q_c / 20 \text{ (KN/m}^2\text{)}$$

$q_{ult} = c. N_c + q. N_q + 0.5. \gamma. B. N_y$  (Terzaghi method of estimating allowable bearing pressure)

where:

$c$  = cohesion of soil

$\gamma$  = unit weight of soil

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$$q = y \cdot D_f$$

$N_c, N_q, N_y$  = Bearing capacity factor

#### 4.2.2 Settlement

Settlement for this allowable bearing pressure for each location stated above would not exceed **25mm**.

Our analysis on settlement is based on the method stated below

$$S = 1.1M_v \times 0.55q_n \times h$$

Where S = Total settlement

$M_v$  = Volume of compressibility potential

$q_n$  = net foundation base pressure

$h$  = depth of foundation

The table below shows the permissible settlement as per I.S Code.

| Soil type | Permissible total settlement |                   | Permissible differential settlement |                   |
|-----------|------------------------------|-------------------|-------------------------------------|-------------------|
|           | For isolated footings        | For raft footings | For isolated footings               | For raft footings |
| Sandy     | 4.0cm                        | 4.cm to 6.5cm     | 2.5cm                               | 2.5cm             |
| Clays     | 6.5cm                        | 6.5 to 10.0cm     | 4.0cm                               | 4.0cm             |

#### 4.2.3 Factor of Safety

Factor of safety of 3 was adopted for our estimation of allowable bearing pressure.

#### 4.2.4 Excavation

- Excavation could be achieved using conventional excavating equipment.

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- Excavation support would not be required

Excavations deeper than 1.2m must be sloped. Temporary trench slope of 1 vertical to 1 horizontal are expected to remain stable through the fill and the native clay. Where there is insufficient space for open cut excavations, shoring or a trench liner box will be required.

If the soils are saturated at the time of construction, the condition of each soil type should be re-evaluated.

Stock piles, materials or any heavy equipment should be kept at least 5.0m from the upper edge of the excavation; All surface drainage must be directed away from any open excavations and trenches.

No significant problems are anticipated during excavation. Conventional excavating equipment should be able to remove the soils down to anticipated founding level.

#### **4.2.5 General Precaution for Shallow Foundation Construction**

It is recommended that the following general guidelines that govern the construction of shallow foundation should be observed when work starts on the site:

- Over excavation beyond the depths stated should not be done.
- Ingress of water into the excavated foundation trench should be prevented if the stated bearing value at the founding depth is to be achieved. A layer of concrete blinding should therefore be provided within a trench once it has been excavated.
- Adequate cover to the concrete should be allowed for the reinforcement bars to protect them from possible effect of corrosion.
- The sides of foundation should be backfilled up to existing ground level as soon as they are cast.

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## **5.0 CONCLUSION**

Shallow Foundation (Spread footing) is considered adequate for the proposed development on the project site.

Despite an objective soil investigation and reporting, a poorly designed and/or constructed foundation may lead to structural failure if all other environmental conditions remain constant.

Best & Crompton Engineering Africa Ltd., therefore recommends that the design and construction of all foundation and earthwork be carried out by a competent company in accordance with good and strict engineering practice expected of a professional. The construction contractor shall be guided by reference Code of Practices such as; British Institution CP 2004, 1973: Code of Practice for Foundation and BS 6031: Code of Practice for Earth Works.

**For Best & Crompton Engineering Africa Ltd.,**

**(M.Nageswara Rao)**

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**APPENDIX**

**FIELD LOGS**



## BOREHOLE LOG

### SUBSOIL INVESTIGATION AT NEW AGBARA SUBSTATION

#### BOREHOLE NO: 1

| Depth(m) | Legend | Strata thickness | SPT Blows  | Description of Strata  |
|----------|--------|------------------|------------|--|
| 1.50     |        | (2.00)           | U4<br>N14  | <i>Stiff to very stiff reddish brown sandy silty CLAY with 0.15m thick topsoil</i> |
| 3.00     |        |                  | U4<br>N16  |  |
| 4.50     |        | (7.00)           | U4*<br>N18 | <i>Very stiff to hard reddish brown sandy silty CLAY</i>                           |
| 6.00     |        |                  |            |  |
| 7.50     |        |                  | U4*<br>N21 |  |
| 9.00     |        | (6.00)           | U4*<br>N24 | <i>Hard greyish brown silty CLAY</i>   |
| 10.50    |        |                  |            |  |
| 12.00    |        |                  | N28        |  |
| 13.50    |        |                  | N31        |  |
| 15.00    |        |                  |            |  |

**N- Number of blows      U4- Undisturbed sample      U4\*- Undisturbed sample abortive**

## BOREHOLE LOG

### SUBSOIL INVESTIGATION FOR NEW AGBARA SUBSTATION

#### BOREHOLE NO: BH 2

| Depth(m)   | Legend | Strata thickness | SPT Blows  | Description of Strata                                    |
|--|--------|------------------|------------|--|
| 2.00   |        | (1.50)           | U4<br>N18  | <i>Very stiff reddish brown sandy silty CLAY</i>         |
| 4.00   |        | (9.50)           | U4<br>N17  | <i>Very stiff to hard reddish brown sandy silty CLAY</i> |
| 6.00   |        |                  | U4*<br>N20 |  |
| 8.00   |        |                  | U4*<br>N24 |  |
| 10.00  |        |                  |            |  |
| 12.00  |        | (9.00)           | N21        | <i>Hard reddish brown sandy CLAY with gravels</i>        |
| 14.00  |        |                  | U4*        |  |
| 16.00  |        |                  | N25        |  |
| 18.00  |        |                  | N30        |  |
| 20.00  |        |                  |            |  |
| <b>N-Number of blows    U4 - Undisturbed Sample    U4* - Undisturbed Sample abortive</b> |        |                  |            |  |

## BOREHOLE LOG

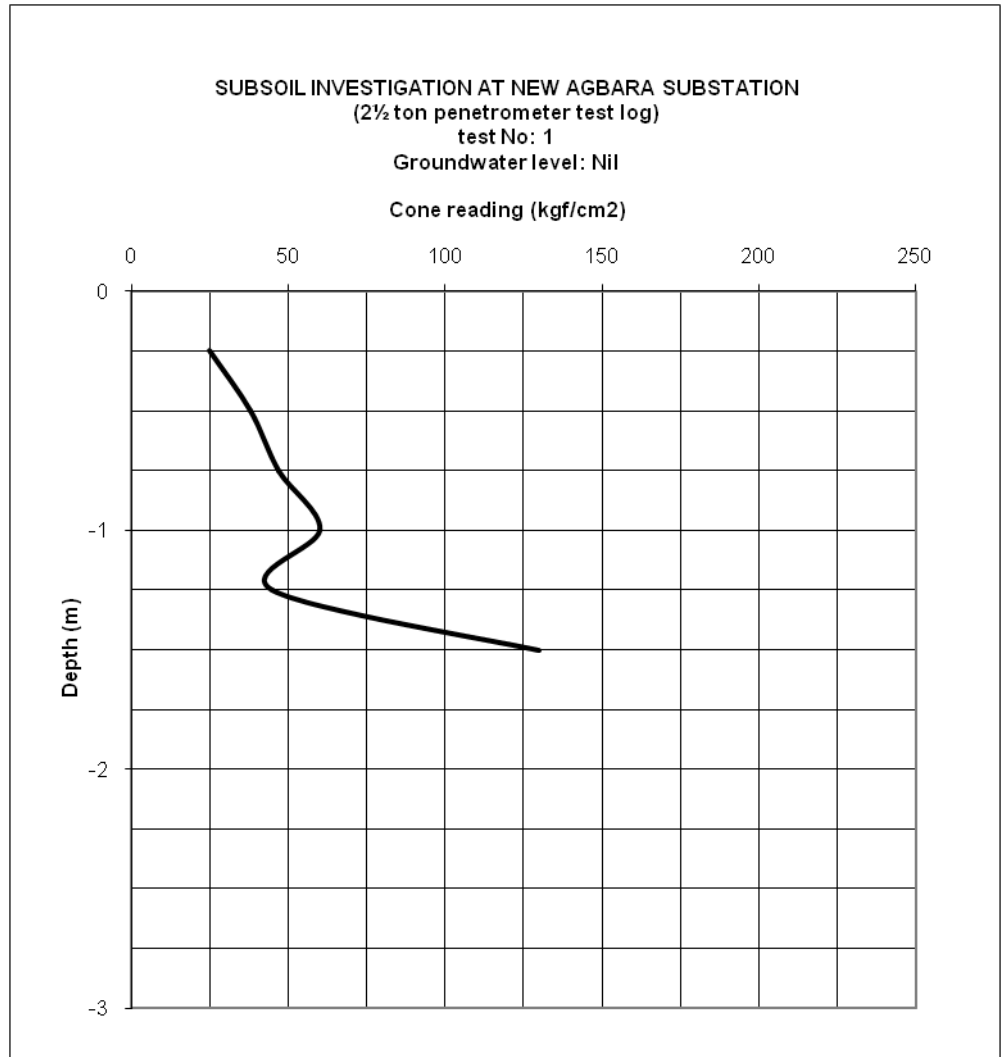
### SUBSOIL INVESTIGATION AT NEW AGBARA SUBSTATION

#### BOREHOLE NO: 3

| Depth(m)                  | Legend | Strata thickness              | SPT Blows                               | Description of Strata                              |
|---------------------------|--------|-------------------------------|---|--|
| 1.50                      |        | (3.00)                        | U4<br>N15                               | <i>Stiff to very stiff light brown silty CLAY</i>  |
| 3.00                      |        |                               | U4<br>N19                               |  |
| 4.50                      |        | (5.00)                        | N18                                     | <i>Very stiff to hard reddish brown silty CLAY</i> |
| 6.00                      |        |                               | U4*<br>N22                              |  |
| 7.50                      |        |                               | N25<br>U4*                              |  |
| 9.00                      |        |                               | N23<br>U4*                              |  |
| 10.50                     |        | (7.00)                        | N27                                     | <i>Hard reddish brown silty CLAY with gravels</i>  |
| 12.00                     |        |                               |   |  |
| 13.50                     |        |                               | N30                                     |  |
| 15.00                     |        |                               |   |  |
| <b>N- Number of blows</b> |        | <b>U4- Undisturbed sample</b> | <b>U4*- Undisturbed sample abortive</b> |  |

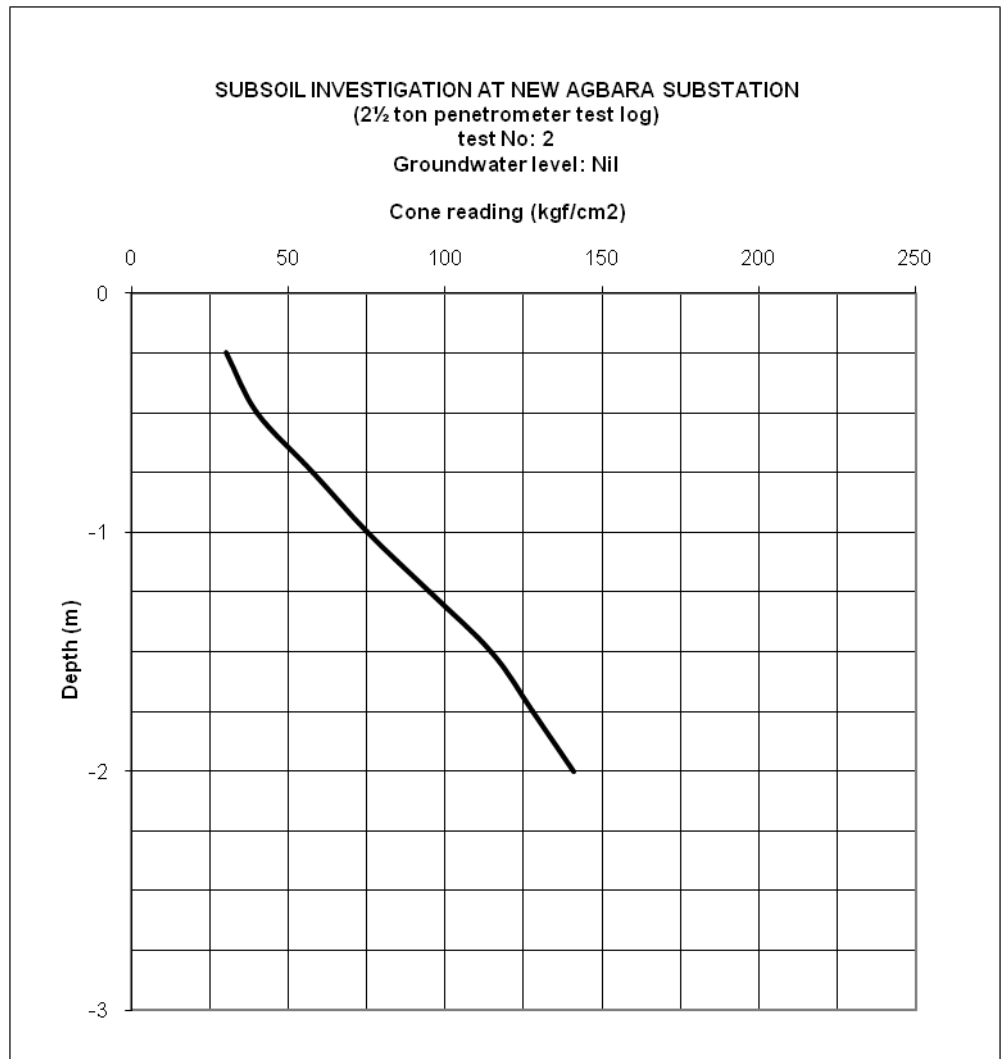
# PENETROMETER 1

| Qc  | Depth |
|-----|-------|
| 0   | 0     |
| 25  | -0.25 |
| 38  | -0.5  |
| 47  | -0.75 |
| 60  | -1    |
| 45  | -1.25 |
| 130 | -1.5  |
|     | -1.75 |
|     | -2    |
|     | -2.25 |
|     | -2.5  |
|     | -2.75 |
|     | -3    |
|     | -3.25 |
|     | -3.5  |
|     | -3.75 |
|     | -4    |
|     | -4.25 |
|     | -4.5  |
|     | -4.75 |
|     | -5    |
|     | -5.25 |
|     | -5.5  |
|     | -5.75 |
|     | -6    |
|     | -6.25 |
|     | -6.5  |
|     | -6.75 |
|     | -7    |
|     | -7.25 |
|     | -7.5  |



## PENETROMETER 2

| Qc  | Depth |
|-----|-------|
| 0   | 0     |
| 30  | -0.25 |
| 40  | -0.5  |
| 58  | -0.75 |
| 75  | -1    |
| 95  | -1.25 |
| 115 | -1.5  |
| 128 | -1.75 |
| 141 | -2    |
|     | -2.25 |
|     | -2.5  |
|     | -2.75 |
|     | -3    |
|     | -3.25 |
|     | -3.5  |
|     | -3.75 |
|     | -4    |
|     | -4.25 |
|     | -4.5  |
|     | -4.75 |
|     | -5    |
|     | -5.25 |
|     | -5.5  |
|     | -5.75 |
|     | -6    |
|     | -6.25 |
|     | -6.5  |
|     | -6.75 |
|     | -7    |
|     | -7.25 |
|     | -7.5  |
|     | -7.75 |



## SUMMARY OF LABORATORY TEST RESULTS

### ATTERBERG LIMIT TEST

| BOREHOLE/<br>SAMPLE NO | DEPTH<br>(m) | NATURAL<br>MOISTURE<br>CONTENT<br>(Wc)% | LIQUID<br>LIMIT<br>(L.L) % | PLASTIC<br>LIMIT<br>(P.L) % | PLASTICITY<br>INDEX (P.I) % |
|------------------------|--------------|---|----------------------------|-----------------------------|-----------------------------|
| 1/2                    | 1.00         | 18.0                                    | 29                         | 15                          | 14                          |
| 1/4                    | 2.00         | 21.3                                    | 27                         | 20                          | 7                           |
| 1/6                    | 3.00         | 22.3                                    | 28                         | 21                          | 7                           |
| 2/2                    | 1.00         | 18.3                                    | 30                         | 14                          | 16                          |
| 2/4                    | 2.00         | 20.1                                    | 24                         | 14.0                        | 10                          |
| 2/6                    | 3.00         | 22.2                                    | 28                         | 14                          | 14                          |
| 3/2                    | 1.00         | 18.8                                    | 30                         | 21.0                        | 9                           |
| 3/4                    | 2.00         | 20.0                                    | 31                         | 20                          | 11                          |
| 3/6                    | 3.00         | 23.9                                    | 33                         | 23.0                        | 10                          |

### QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

| BOREHOLE<br>/ SAMPLE<br>NO | DEPTH<br>(m) | NATURAL<br>MOISTURE<br>CONTENT<br>(Wc)% | BULK<br>DENSITY<br>( $\gamma_b$ )<br>Mg/m <sup>3</sup> | UNDRAINED<br>COHESION<br>(Cu) KN/m <sup>2</sup> | ANGLE OF<br>INTERNAL<br>FRICTION | CELL<br>PRESSURE<br>( $\sigma_3$ ) KN/m <sup>2</sup> | COMPRESSIVE<br>STRESS<br>(KN/m <sup>2</sup> ) |
|----------------------------|--------------|---|--|---|----------------------------------|--|---|
| 1/2                        | 1.00         | 18.0                                    | 2.100  | 125   | 6.0                              | 50   | 212   |
|                            |              |   |  |   |                                  | 100  | 228   |
|                            |              |   |  |   |                                  | 200  | 275   |
| 1/4                        | 2.00         | 21.3                                    | 2.440  | 235   | 8.0                              | 50   | 230   |
|                            |              |   |  |   |                                  | 100  | 245   |
|                            |              |   |  |   |                                  | 200  | 286   |
| 1/6                        | 3.00         | 22.3                                    | 2.730  | 475   | 11.0                             | 50   | 215   |
|                            |              |   |  |   |                                  | 100  | 229   |
|                            |              |   |  |   |                                  | 200  | 280   |
| 2/2                        | 1.00         | 18.3                                    | 2.060  | 112   | 6.0                              | 50   | 230   |
|                            |              |   |  |   |                                  | 100  | 242   |
|                            |              |   |  |   |                                  | 200  | 278   |
| 2/4                        | 2.00         | 20.1                                    | 2.342  | 213   | 9.0                              | 50   | 208   |
|                            |              |   |  |   |                                  | 100  | 218   |
|                            |              |   |  |   |                                  | 200  | 265   |
| 2/6                        | 3.00         | 22.2                                    | 2.570  | 451   | 12.0                             | 50   | 217   |
|                            |              |   |  |   |                                  | 100  | 257   |
|                            |              |   |  |   |                                  | 200  | 293   |
| 3/2                        | 1.00         | 18.8                                    | 2.002  | 118   | 8.0                              | 50   | 210   |
|                            |              |   |  |   |                                  | 100  | 230   |
|                            |              |   |  |   |                                  | 200  | 280   |

|            |             |             |              |            |             |                                       |  |
|------------|-------------|-------------|--------------|------------|-------------|---------------------------------------|--|
| <b>3/4</b> | <b>2.00</b> | <b>20.0</b> | <b>2.311</b> | <b>242</b> | <b>11.0</b> | <b>50</b><br><b>100</b><br><b>200</b> | <b>222</b><br><b>248</b><br><b>290</b> |
| <b>3/6</b> | <b>3.00</b> | <b>23.9</b> | <b>2.456</b> | <b>483</b> | <b>13.0</b> | <b>50</b><br><b>100</b><br><b>200</b> | <b>221</b><br><b>250</b><br><b>291</b> |

### GRAIN SIZES DISTRIBUTION TEST

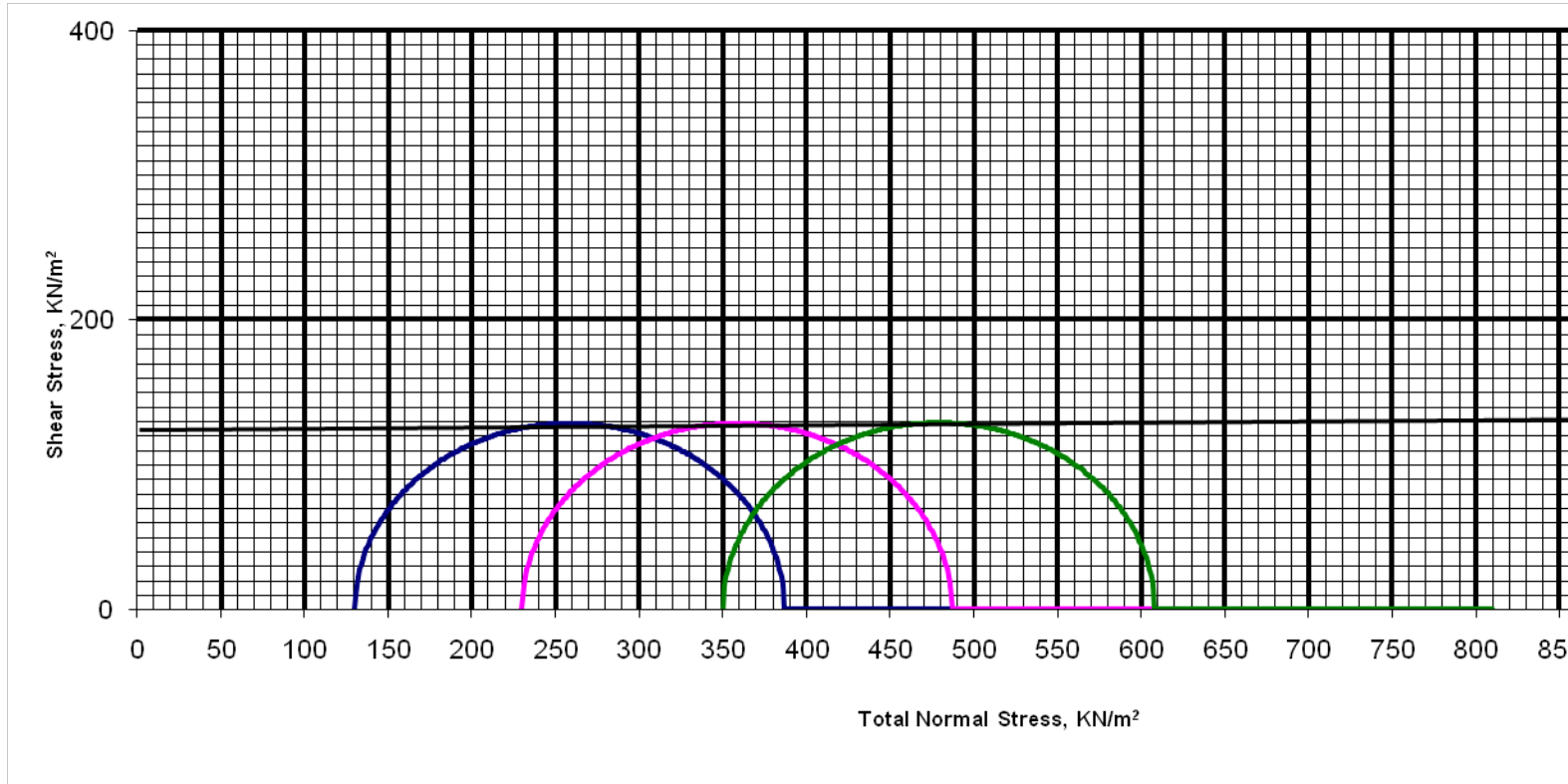
| BH No | Sample No | Depth (m) | Soil Type | Sieve sizes (mm) |      |     |      |     |       |     |       |      |       |       |
|-------|-----------|-----------|-----------|------------------|------|-----|------|-----|-------|-----|-------|------|-------|-------|
|       |           |           |           | 5                | 3.35 | 2   | 1.18 | 0.6 | 0.425 | 0.3 | 0.212 | 0.15 | 0.063 | 0.045 |
| 1     | 3         | 1.50      | C         |                  |      | 100 | 97   | 90  | 84    | 72  | 59    |      |       |       |
| 1     | 6         | 3.00      | C         |                  |      | 100 | 95   | 88  | 80    | 68  | 51    |      |       |       |
| 1     | 21        | 10.50     | C         |                  |      | 100 | 94   | 85  | 78    | 70  | 55    |      |       |       |
| 2     | 6         | 3.00      | C         |                  |      | 100 | 96   | 91  | 82    | 70  | 52    |      |       |       |
| 2     | 15        | 7.50      | C         |                  |      | 100 | 97   | 90  | 79    | 72  | 60    |      |       |       |
| 2     | 30        | 15.00     | C         |                  | 100  | 90  | 81   | 72  | 63    | 52  | 44    |      |       |       |
| 3     | 3         | 9.00      | S         |                  |      | 100 | 98   | 92  | 81    | 71  | 59    |      |       |       |
| 3     | 9         | 4.50      | S         |                  |      | 100 | 95   | 88  | 79    | 67  | 44    |      |       |       |
| 3     | 24        | 12.00     | S         |                  | 100  | 89  | 80   | 70  | 60    | 51  | 42    |      |       |       |

BH 1

Sample: 2

Depth: 1.00m

|                         |                      |
|-------------------------|----------------------|
| Undrained Cohesion      | 125KN/m <sup>2</sup> |
| Angle of Friction (PHI) | 6deg                 |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

UNDRAINED TRIAXIAL TEST

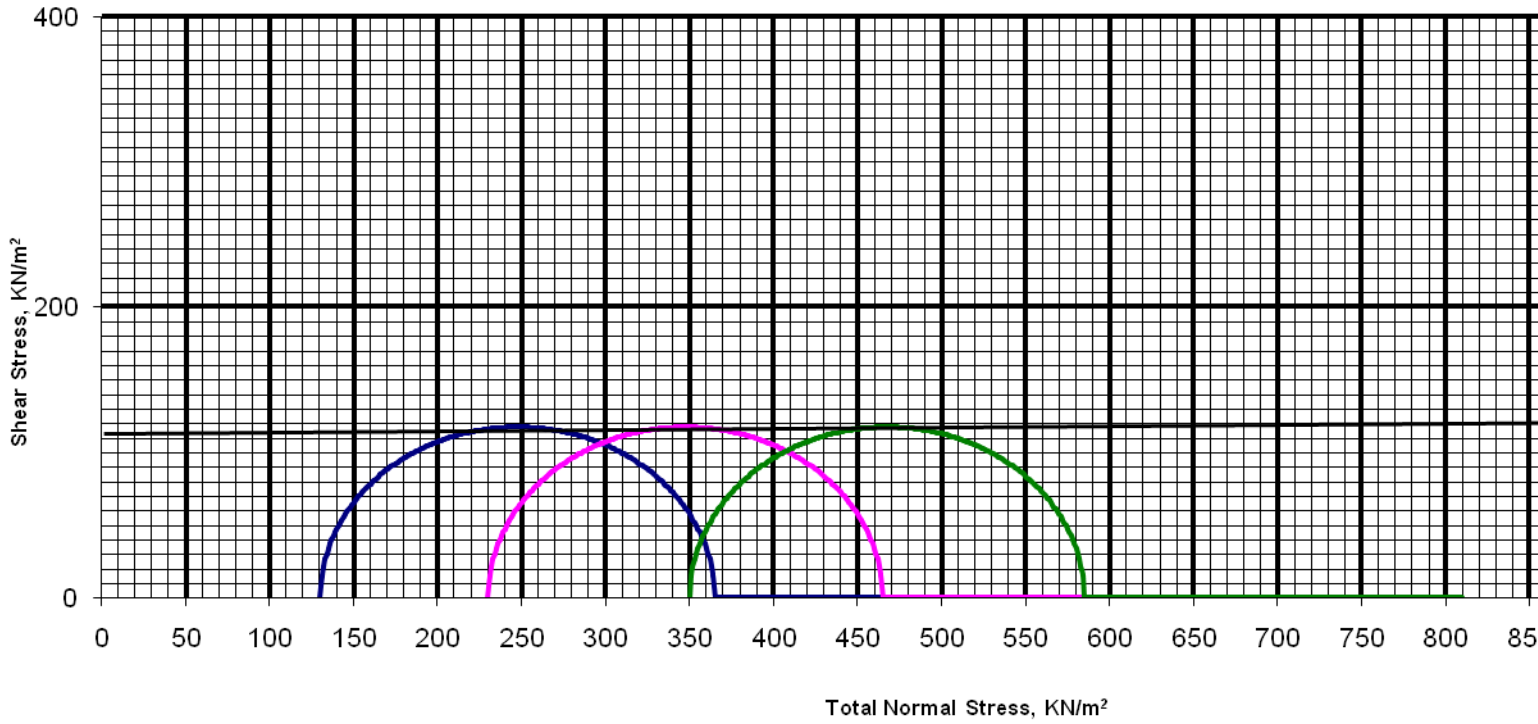


BH 2

Sample: 2

Depth: 1.00m

|                         |                      |
|-------------------------|----------------------|
| Undrained Cohesion      | 112KN/m <sup>2</sup> |
| Angle of Friction (PHI) | deg                  |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

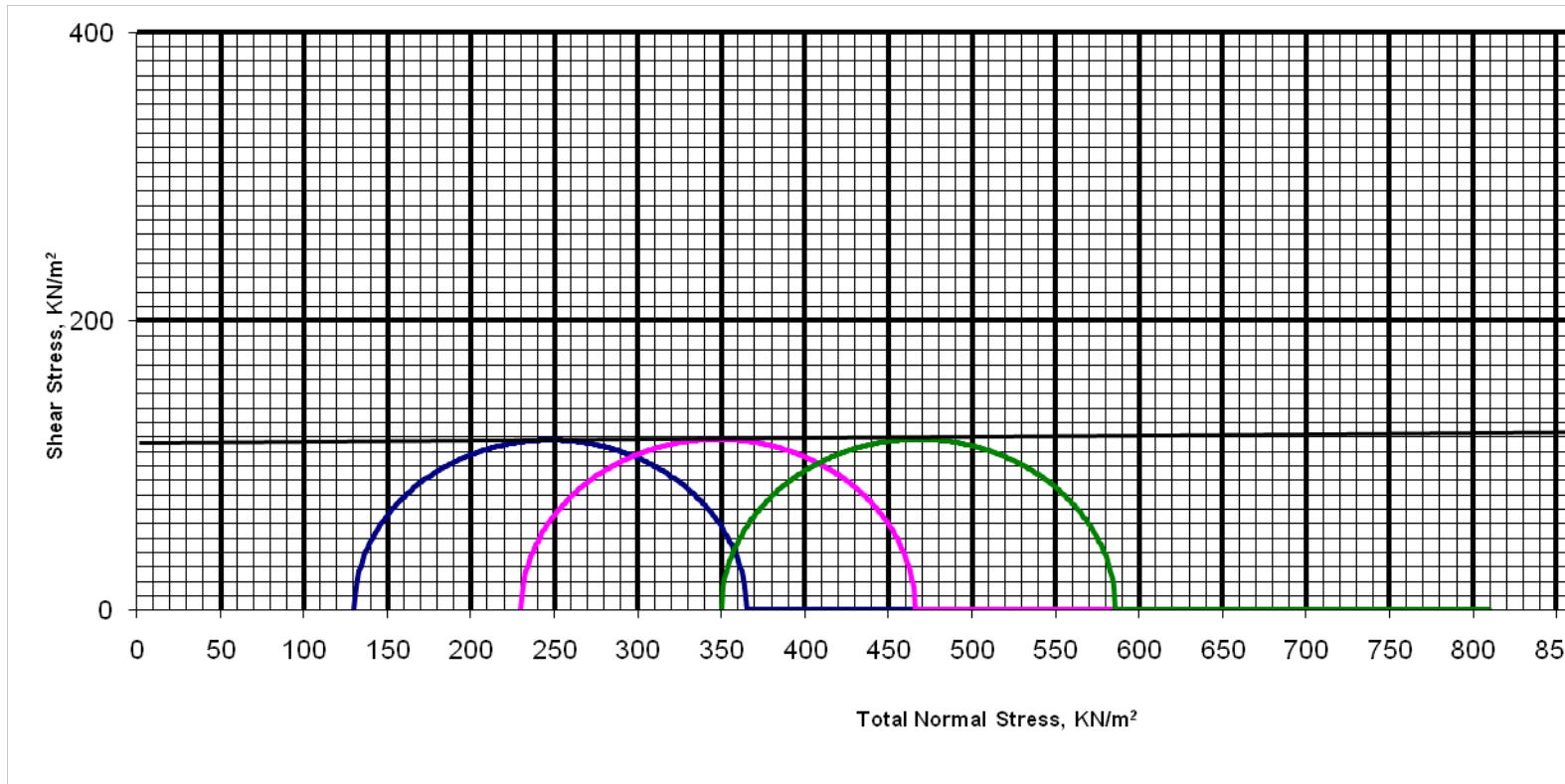
UNDRAINED TRIAXIAL TEST

BH 3

Sample: 2

Depth: 1.00m

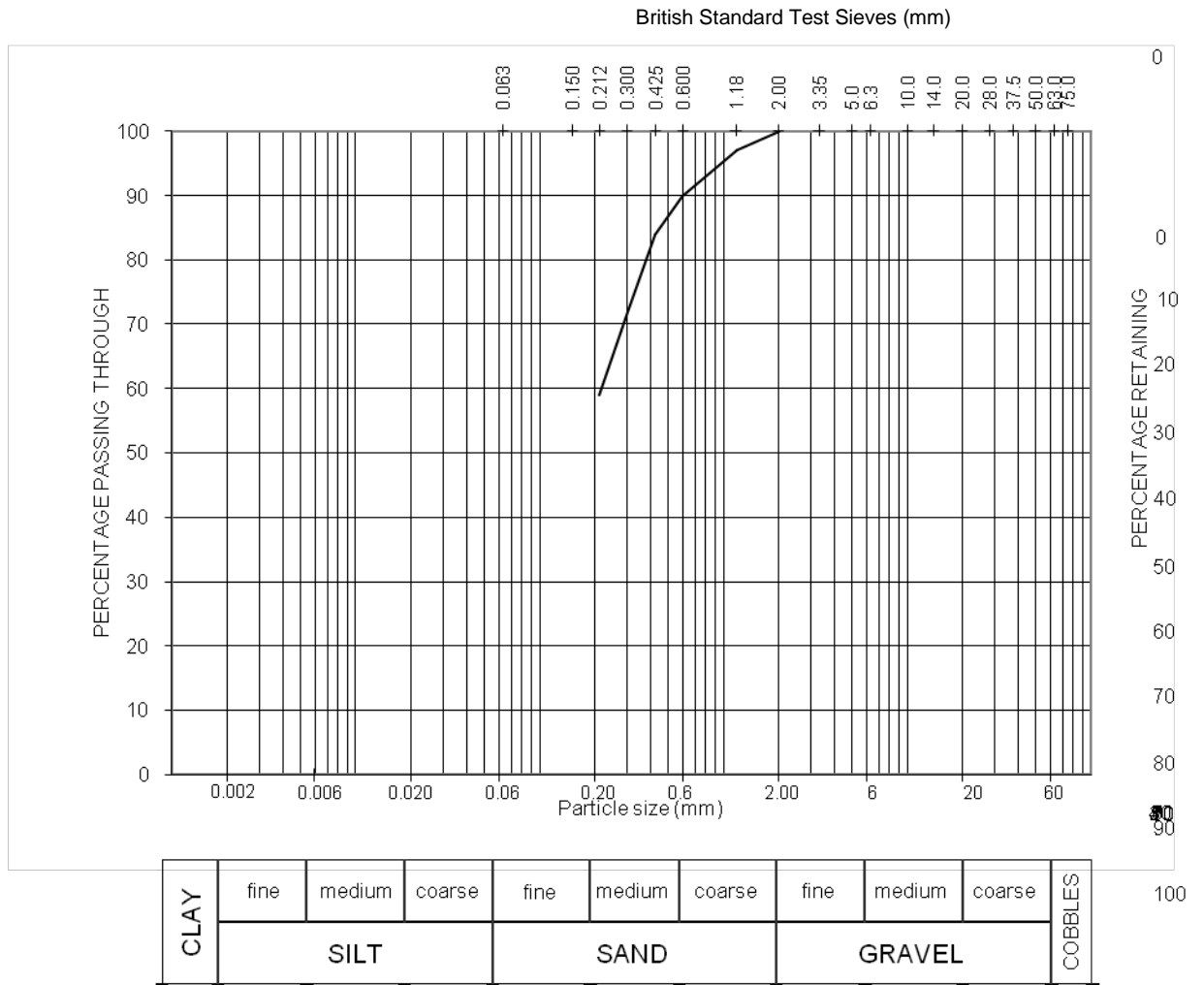
|                         |                      |
|-------------------------|----------------------|
| Undrained Cohesion      | 118KN/m <sup>2</sup> |
| Angle of Friction (PHI) | 8deg                 |



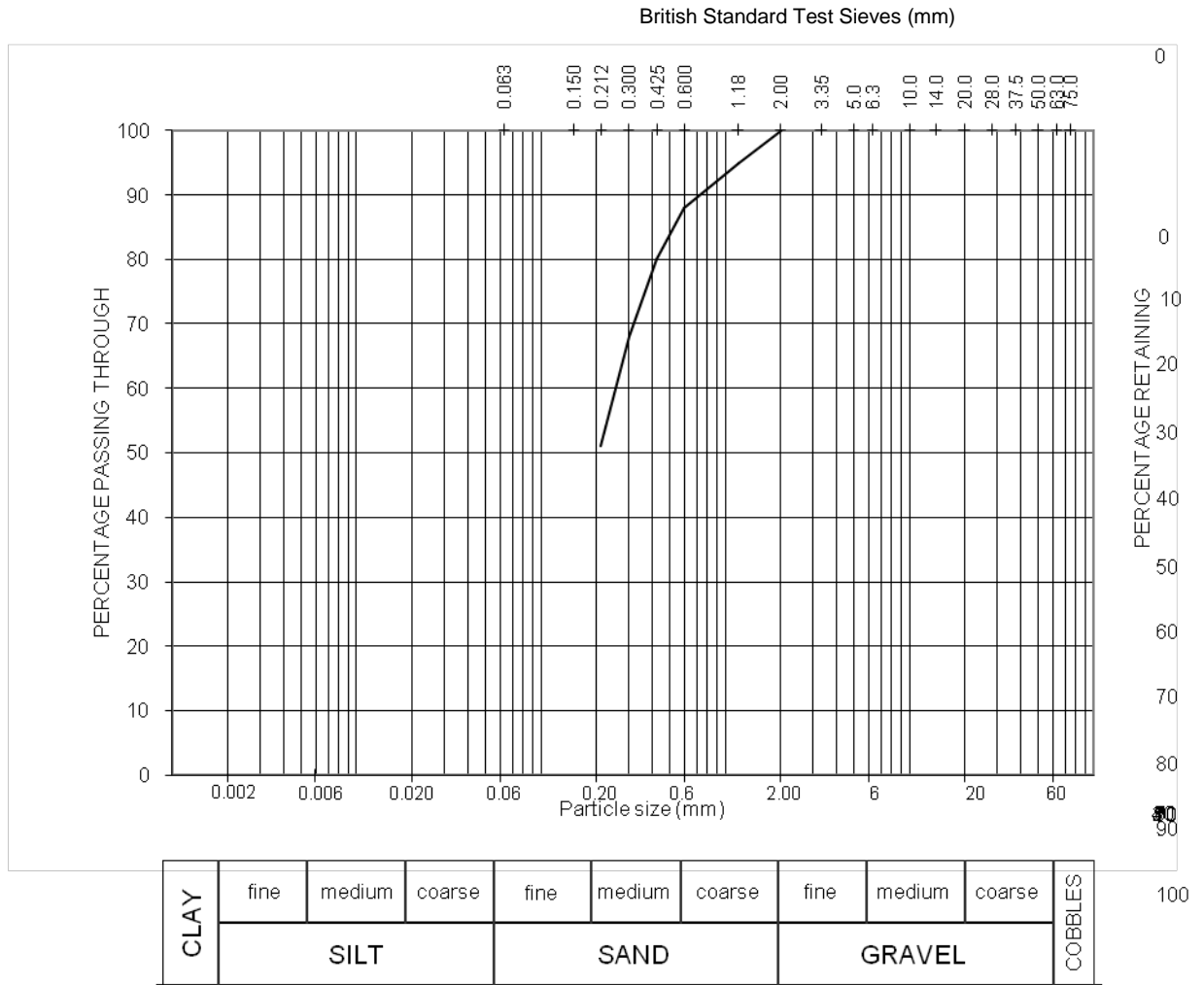
TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

UNDRAINED TRIAXIAL TEST

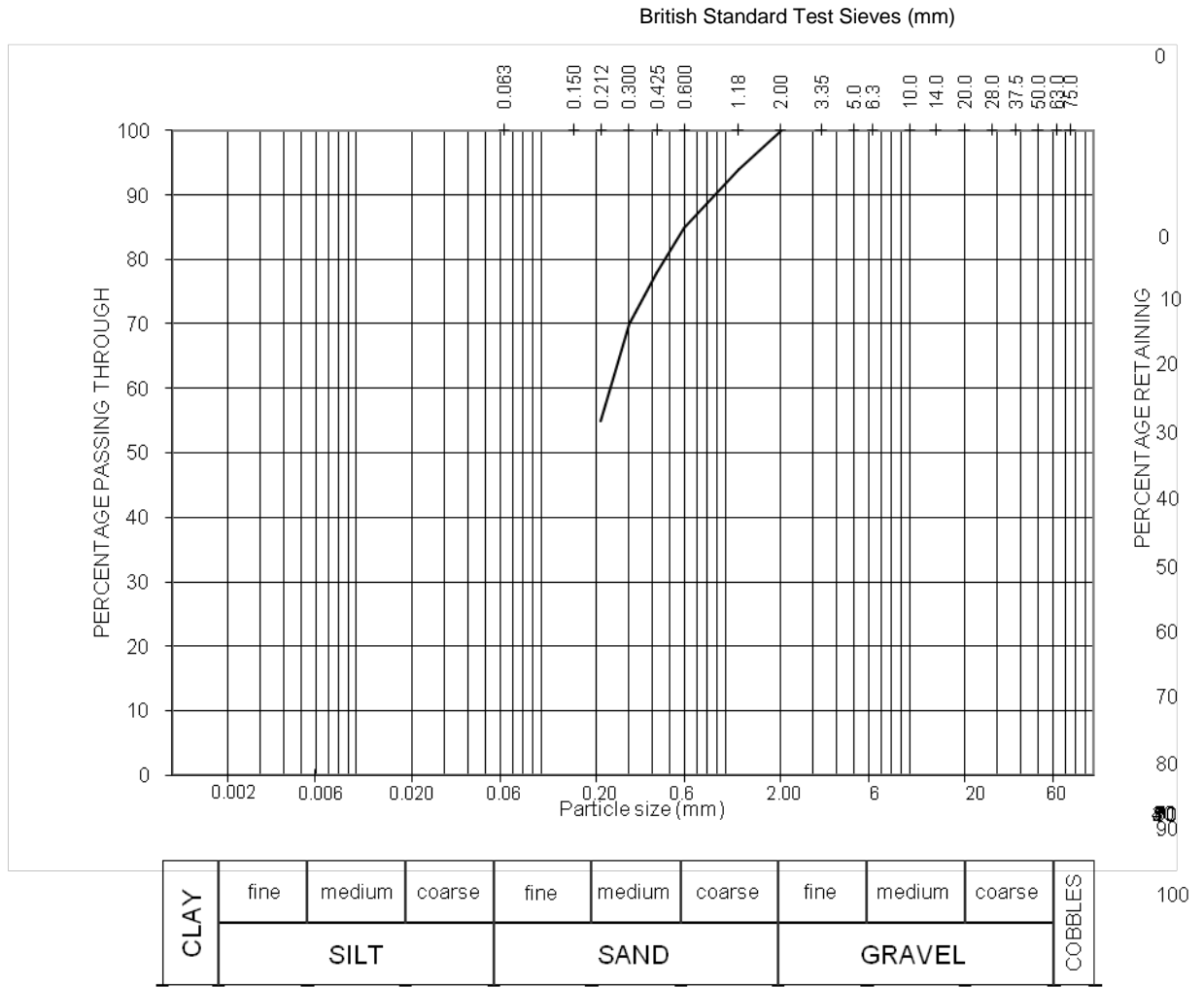
# BOREHOLE 1



| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION             | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--------------------------------|----------|----------|----------|------------|----|----|
| —     | 3      | 1.50m     | Reddish brown sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                                |          |          |          |            | -  | -  |
| ..... |        |           |                                |          |          |          |            | -  | -  |

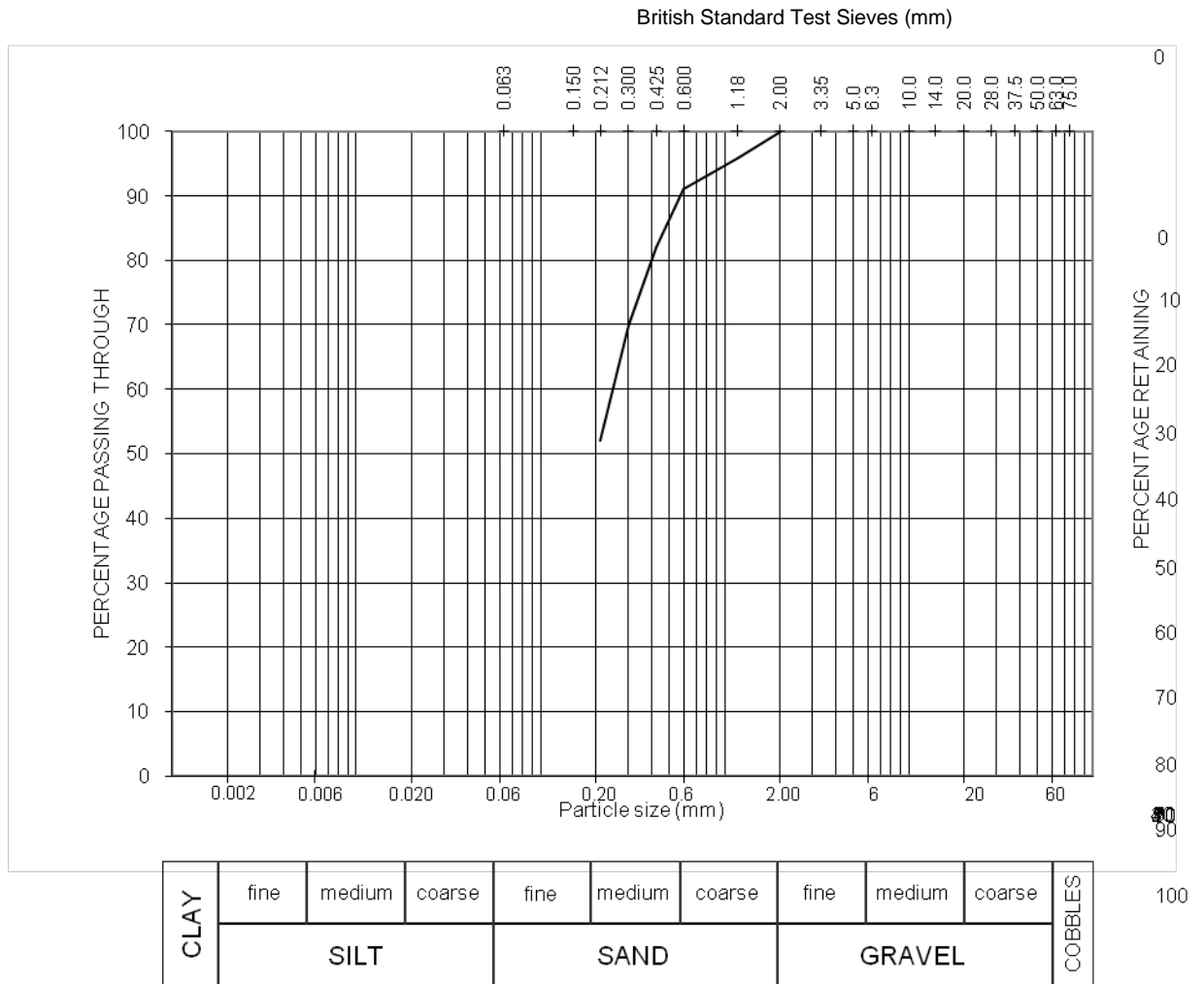


| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION             | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--------------------------------|----------|----------|----------|------------|----|----|
| —     | 6      | 3.00m     | Reddish brown sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                                |          |          |          |            | -  | -  |
| ..... |        |           |                                |          |          |          |            | -  | -  |

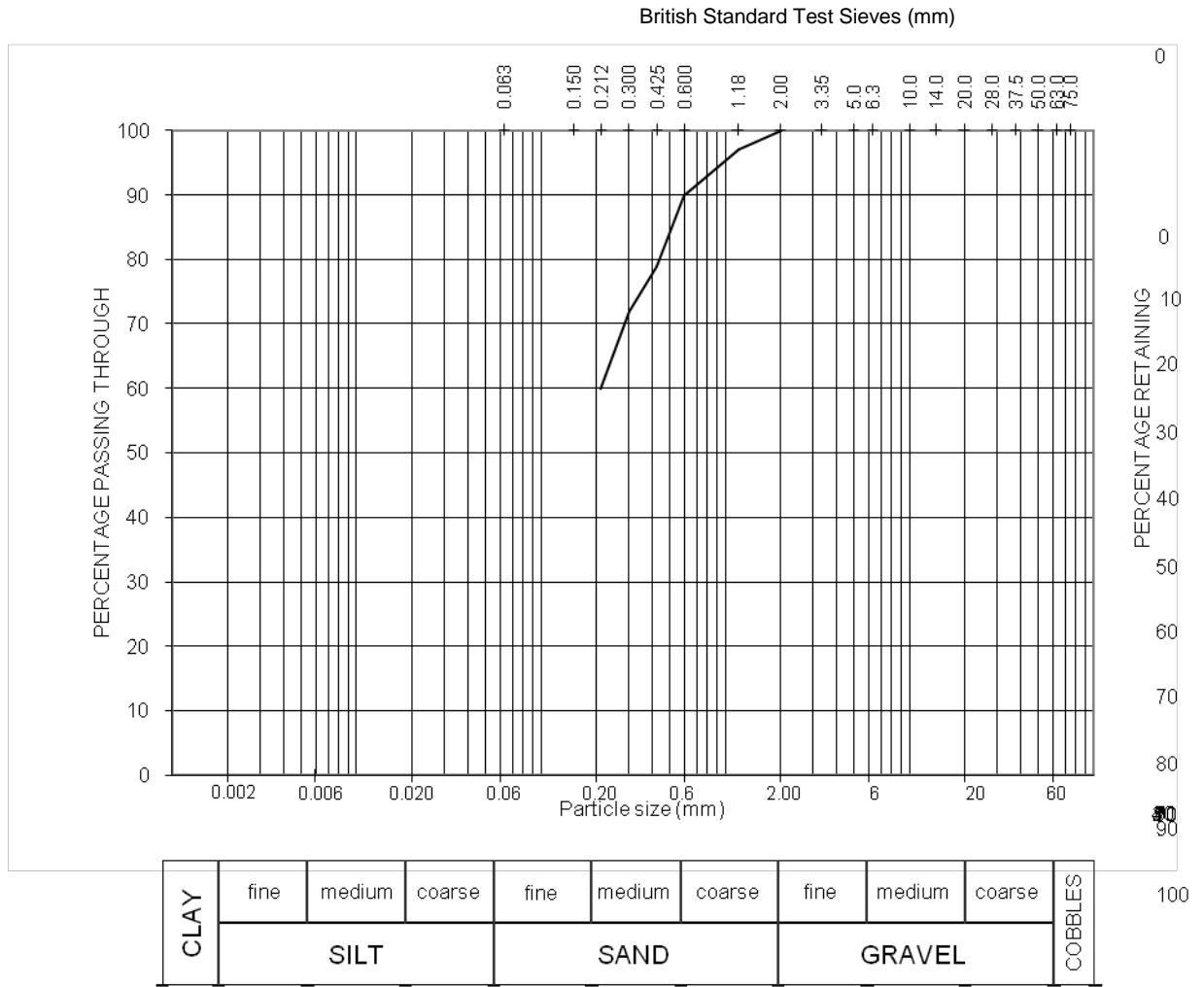


| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION             | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--------------------------------|----------|----------|----------|------------|----|----|
| —     | 21     | 10.50m    | Reddish brown sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                                |          |          |          |            | -  | -  |
| ..... |        |           |                                |          |          |          |            | -  | -  |

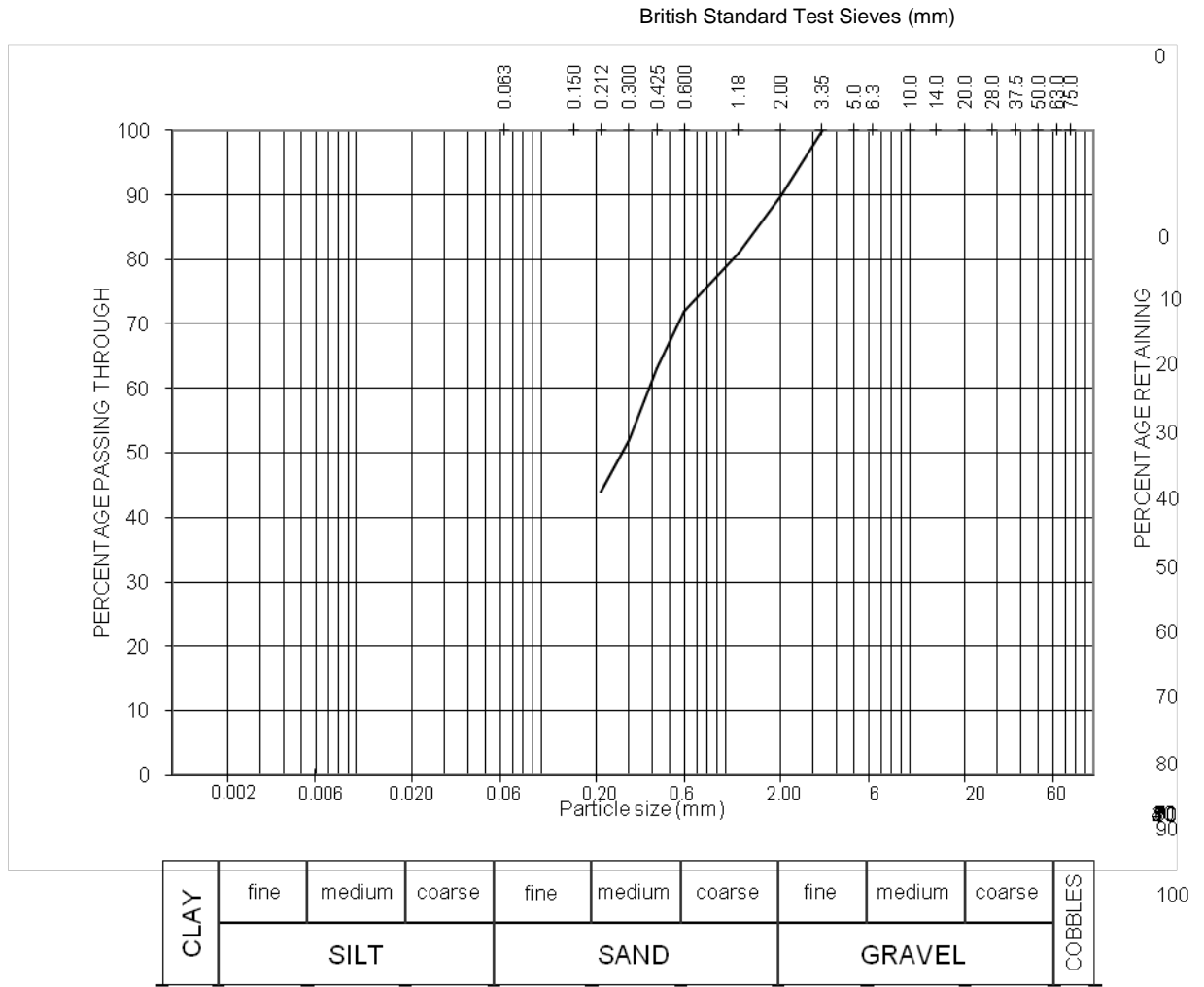
## BOREHOLE 2



| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION             | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--------------------------------|----------|----------|----------|------------|----|----|
| —     | 6      | 3.00m     | Reddish brown sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                                |          |          |          |            | -  | -  |
| ..... |        |           |                                |          |          |          |            | -  | -  |

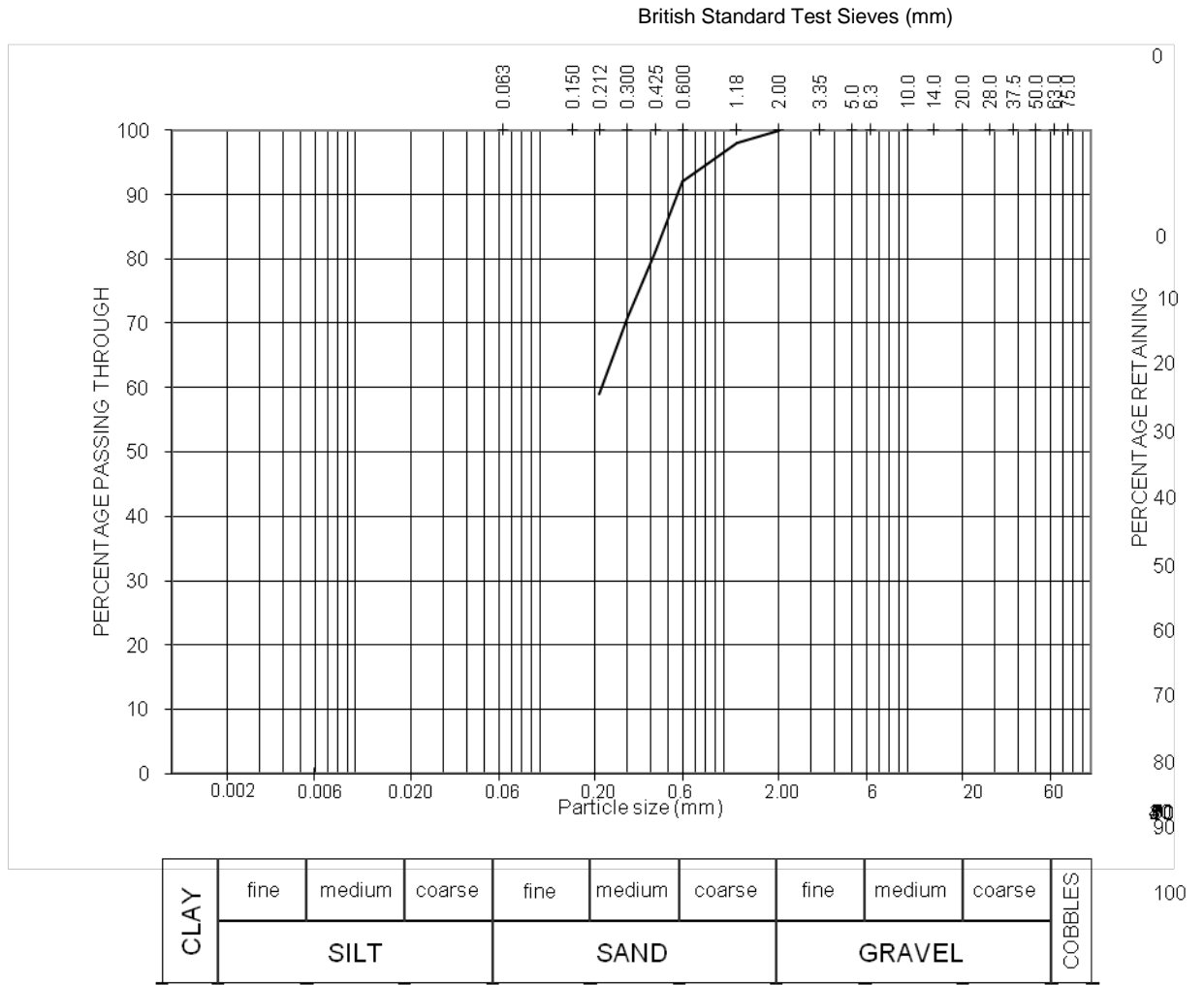


| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION             | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--------------------------------|----------|----------|----------|------------|----|----|
| —     | 15     | 7.50m     | Reddish brown sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                                |          |          |          |            | -  | -  |
| ..... |        |           |                                |          |          |          |            | -  | -  |

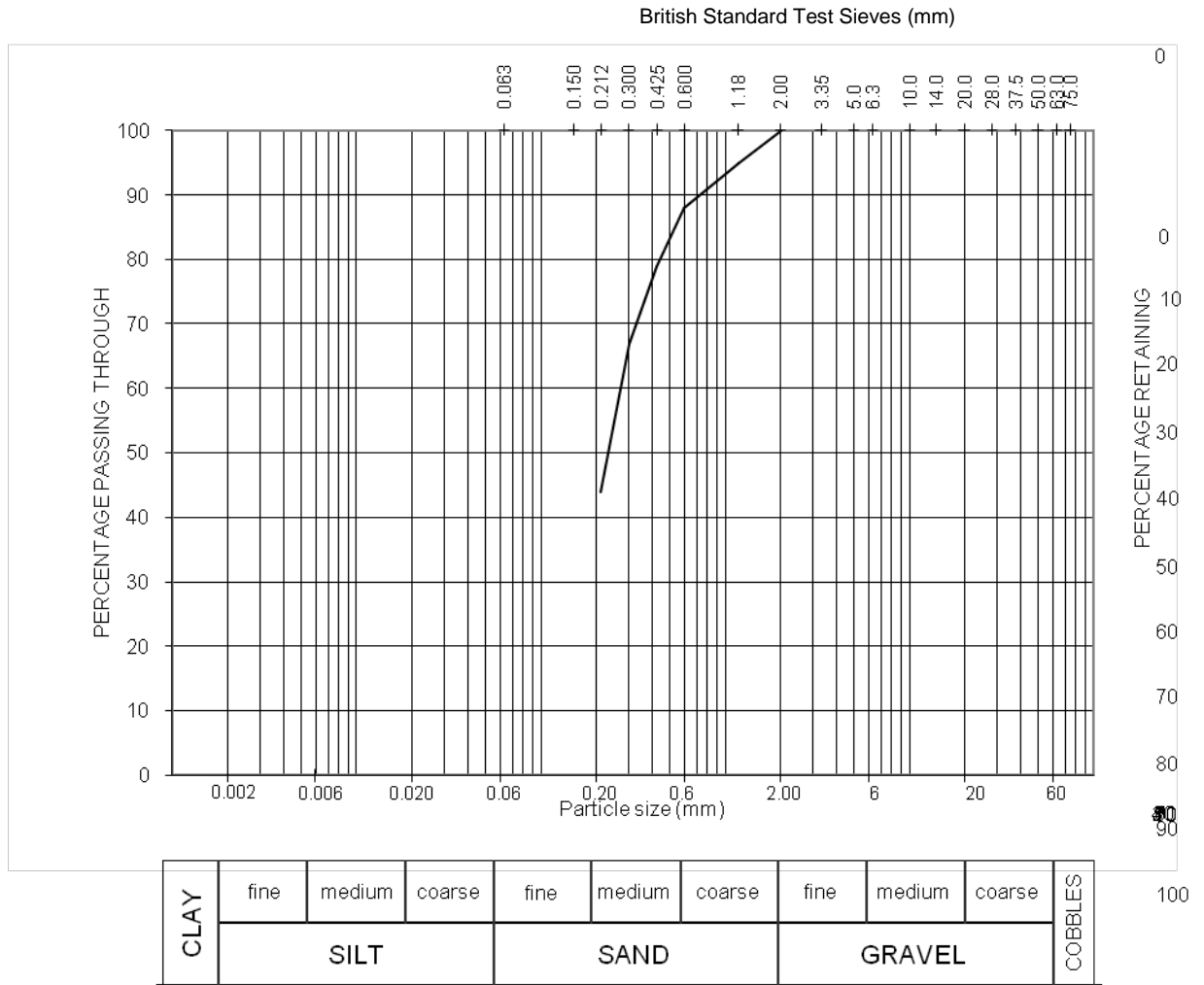


| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION                          | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|---|----------|----------|----------|------------|----|----|
| —     | 30     | 15.00m    | Greyish brown sandy silty CLAY with gravels |          |          |          |            | -  | -  |
| - - - |        |           |   |          |          |          |            | -  | -  |
| ..... |        |           |   |          |          |          |            | -  | -  |

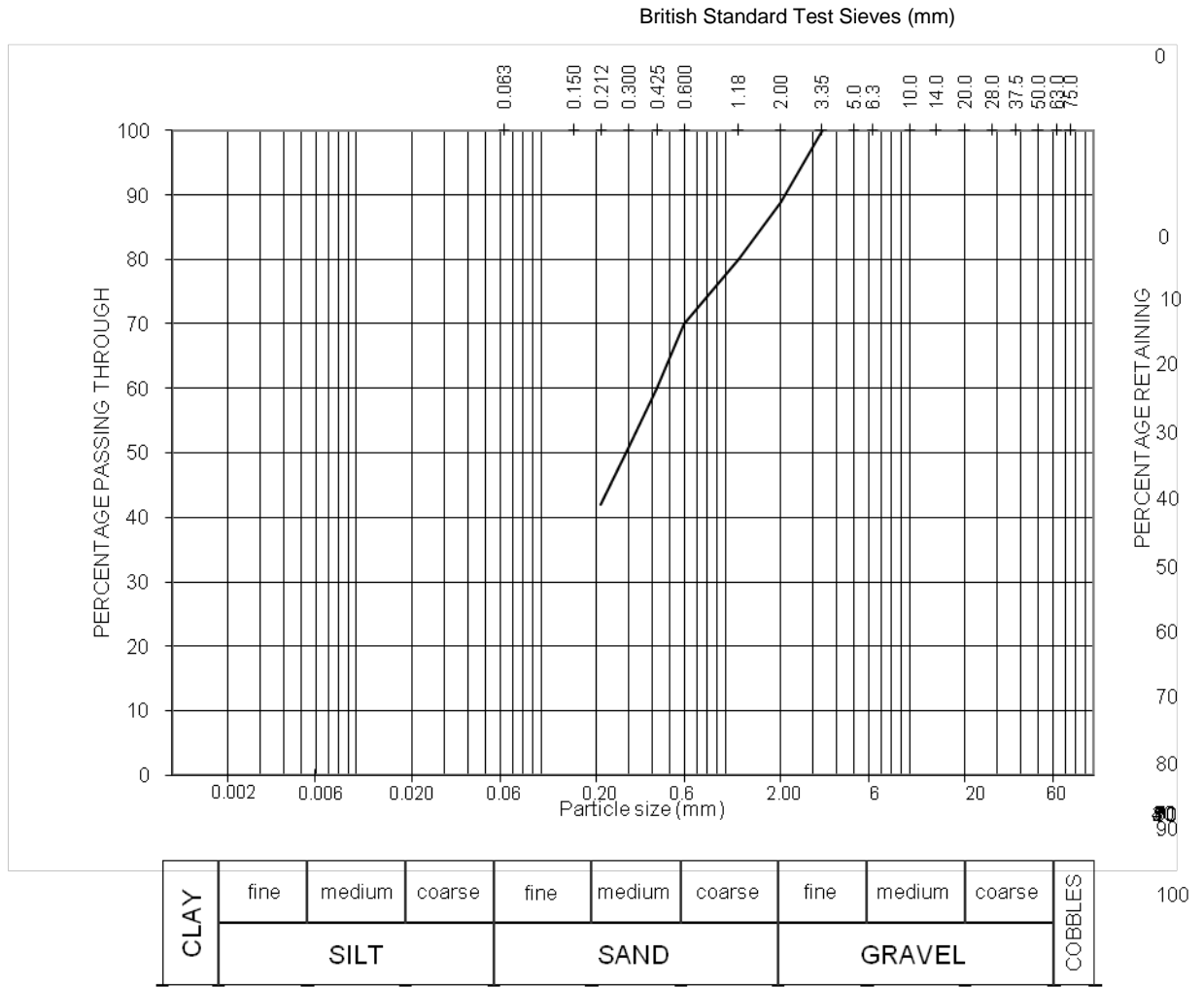




| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION       | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--------------------------|----------|----------|----------|------------|----|----|
| —     | 5      | 2.25m     | Reddish brown silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                          |          |          |          |            | -  | -  |
| ..... |        |           |                          |          |          |          |            | -  | -  |



| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION       | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--------------------------|----------|----------|----------|------------|----|----|
| —     | 12     | 6.00m     | Reddish brown silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                          |          |          |          |            | -  | -  |
| ..... |        |           |                          |          |          |          |            | -  | -  |



| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION       | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--------------------------|----------|----------|----------|------------|----|----|
| —     | 24     | 12.00m    | Reddish brown silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                          |          |          |          |            | -  | -  |
| ..... |        |           |                          |          |          |          |            | -  | -  |

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## **NOTES RELATING TO THIS REPORT**

### **Introduction**

These notes have been provided to amplify the geotechnical report in regard to classification methods, specialist field procedures and certain matters relating to the Discussion and Comments section. Not all, of course, are necessarily relevant to all reports.

Geotechnical reports are based on information gained from limited subsurface test boring and sampling, supplemented by knowledge of local geology and experience.

For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Non-cohesive soils are classified on the basis of relative density, generally from the results of standard penetration tests (SPT) or Dutch cone Penetrometer tests (CPT) as below:

| <b>Relative Density</b> | <b>CPT Cone Value (qc — MPa)</b> |
|-------------------------|----------------------------------|
| Very loose              | less than 2                      |
| Loose                   | 2—5                              |
| Medium dense            | 5—15                             |
| Dense                   | 15—25                            |
| Very dense              | greater than 25                  |

### **Site Anomalies**

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, the Company requests that it immediately be notified. Most problems are much more readily resolved when conditions are exposed than at some later stage, well after the event.

### **Ground Water**

Where ground water levels are measured in boreholes, there are several potential problems;

### **Reproduction of Information for Contractual Purposes**

- In low permeability soils, ground water although present, may enter the hole slowly or perhaps not at all during the time it is left open. Attention is drawn to the document

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“Guidelines for the Provision of Geotechnical Information in Tender Documents”,  
published by the Institution of Engineers,

- A localised perched water table may lead to an erroneous indication of the true water table.

**Site Inspection**

The Company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

PREPARATORY SURVEY  
FOR  
TRANSMISSION POWER PROJECT  
IN THE  
FEDERAL REPUBLIC OF NIGERIA

PROPOSED 330/132KV SUBSTATION  
AT OGIJO SUBSTATION, ALADO/LIKOSI/AGORA  
SAGAMU LGA, OGUN STATE.

**GEOTECHNICAL INVESTIGATION**

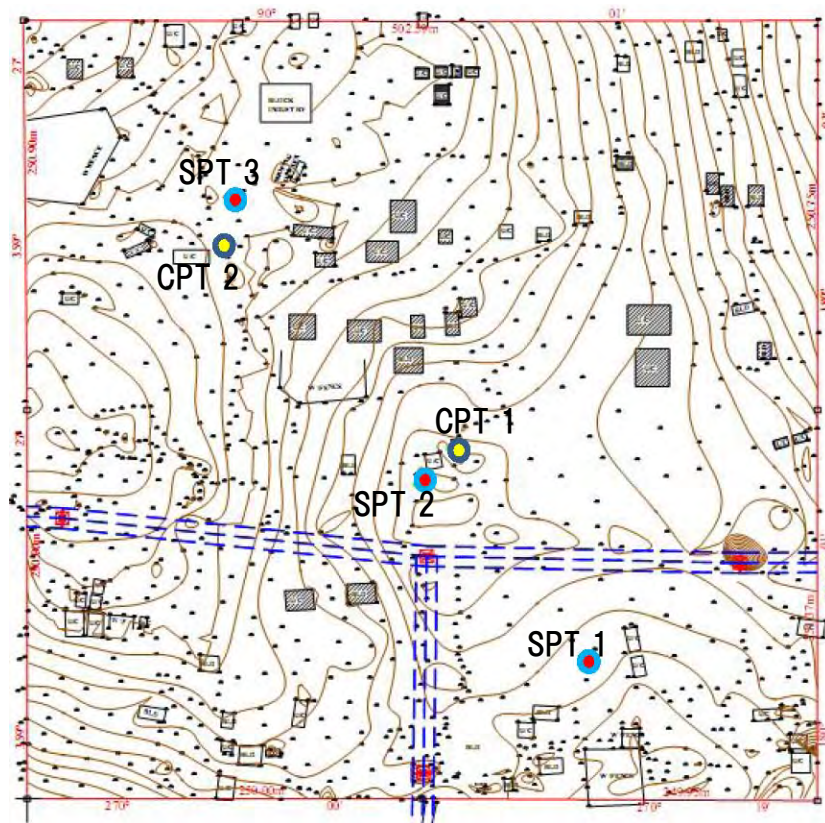
**2015 May**

**Yachiyo Engineering Co., Ltd.**

**BEST & CROMPTON ENGINEERING AFRICA LTD**



**Total Grid Plan**



**Ogijo Site Location Plan**

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2.0 SITE ACCESSIBILITY

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3.2 ANALYSIS OF RESULTS

3.2.1 Geological Description

3.2.2 Subsoil Condition

3.2.3 Ground Water Condition

3.2.4 Site description and condition

4.0 DISCUSSION AND RECOMMENDATION

APPENDIX:

Borehole Log

Penetrometer test plotting



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## **1.0 INTRODUCTION**

The Client commissioned Best & Crompton Engineering Africa Ltd., to proceed with subsoil investigations at the proposed 330/132KV Substation at Ogijo Substation.

This report is a consequence of the soil investigation and analyses, which is presented in an objective and professional manner.

The purpose of the subsoil investigation and attendant report is as follows:

- Determine the subsoil and surface/groundwater conditions of the designated location.
- Evaluation of the subsoil stratigraphic sequence geotechnical/engineering properties of the soil and the subsequent effects on foundation design and construction.
- Analysis of the data/results of tests carried out on the soil samples obtained and provide recommendations on the fit-for-purpose type of foundation for the proposed structure.

## **2.0 SITE ACCESSIBILITY**

The sites are accessible through **Sagamu** to mention but a few.

## **3.0 DESCRIPTION OF WORK**

The soil investigation comprised of and carried out in three parts;

- Field Work: Test (2Nos. DCPTs and 3Nos. Borehole/SPT), Laboratory analysis and collation of the test results.

### **3.1 FIELD WORK**

The site works were carried out on January 2015.

The Scope of Work executed involved the performance of 2Nos. 2.5tons Dutch Cone Penetrometer Tests (DCPTs) to a depth of refusal and 3Nos Borehole/SPT.

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## **BOREHOLE**

This stage involved carrying out 1No borehole to a depth between 15.00m to 20.00m below the existing ground level as specified by the client.

## **DRILLING METHOD**

The tools are attached to the wire rope which is then operated by the winch. The tools are operated using percussive techniques to progress the borehole to depths between 15.00m to 20.00m. As the borehole progresses, temporary casing is installed to provide support to the borehole sides. In firm or stiff cohesive soils casing is sometimes not required, as the clay is self supporting. For the drilling of deeper boreholes it is sometimes necessary to commence the borehole at one diameter, and then reduce to a smaller diameter to deepen the borehole. This would normally require the use of two or more strings of casing. Where it is necessary to add water to advance the borehole, only potable water will be used and the only the minimum amount necessary will be used. The amount added will be recorded on the driller's log. SPT is taken at 1.5m interval

## **Sampling Method**

1. Ordinary disturbed samples were collected at changes of strata and as deemed fit for strata identification purposes, through visual inspection and classification tests.
2. Undisturbed 100mm diameter samples were collected from cohesive strata. The operation is effected through a "jarring arrangement". The arrangement allows 100mm I.D. by 450mm length-sampling tube complete with a cutting shoe to be driven by the weight of the string rod above the sampler with minimum disturbance of the sample. The number of blows recorded is that used to obtain the last 300mm of penetration by the driven weight referred to above.

## **DUTCH CONE PENETROMETER**

The apparatus consists of a cylindrical probe, of 1000mm<sup>2</sup> cross sectional area, and a conic head of apex angle of 60°. The probe is forced down through the soil at a steady rate of about 20mm/s in the closed position by exerting pressure force on

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outer sounding tube. If desired the point resistance and the resistance to side friction can be measured separately.

2Nos. static cone penetration tests were carried out using a 2.5tons capacity testing equipment (machine) on each site. The test involves advancing the cone into the ground slowly at a constant rate and the resistant to penetration measured at predetermined intervals of 0.25m depth. The tests were terminated at depths where the machine anchor legs lifted.

These tests were taken from the existing ground level down to depths refusal at each location.

The cone penetration test results are presented in a graphical form respectively in the Appendix to this Report.

## **3.2 ANALYSIS OF TEST RESULTS**

### **3.2.1 Geological Description**

Available geological record reveals that the investigated area is within the basement complex of Nigeria; it is characterized by crystalline rocks of Precambrian age. Rocks of granitic origin later intruded these rocks.

The sedimentary deposits found on top of the basement rock are product of the parent rocks that have undergone weathering and decomposition.

### **3.2.2 Subsoil Condition**

The subsoil condition of the site, based on the DCP and Borehole/SPT test carried out reveals predominantly cohesive soil as observed from the DCP Plot and the Borehole log.

Details of the subsoil characteristics encountered during the Penetrometer tests and Borehole/SPT are stated below:

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**Subsoil Condition based on the field work.**

**Dutch Cone Penetrometer Test**

| <b><u>Depth (m)</u></b> | <b><u>Description of Stratum</u></b> |
|-------------------------|--------------------------------------|
| 0.00 to –1.00           | Firm cohesive soil.                  |
| 1.00 to –4.00           | Stiff to hard cohesive soil.         |

**Geotechnical Properties**

| <b><u>Depth (m)</u></b> | <b><u>Geotechnical Properties</u></b>   |
|-------------------------|---|
| 0.00 to –1.00           | Moderate geotechnical properties, moderate shear strength and moderate compressibility potential. |
| 1.00 to –4.00           | Good geotechnical properties, high shear strength and low compressibility potential.              |

**Geotechnical Engineering Parameters**

| <b><i>Depth (m)</i></b>    | <b><i>P1(kgf/cm<sup>3</sup>)</i></b> | <b><i>P2(kgf/cm<sup>3</sup>)</i></b> |
|----------------------------|--------------------------------------|--------------------------------------|
| <b><i>0.00 – 1.00m</i></b> | <b><i>6 – 16</i></b>                 | <b><i>6 – 17</i></b>                 |
| <b><i>1.00 – 4.00m</i></b> | <b><i>24 – 129</i></b>               | <b><i>25 – 130</i></b>               |

**Borehole/SPT 1**

| <b><u>Depth (m)</u></b> | <b><u>Description of Stratum</u></b>                        |
|-------------------------|---|
| 0.00 to –3.00           | Firm to stiff grayish brown to reddish brown lateritic CLAY |
| 3.00 to –8.00           | Stiff to very stiff reddish brown lateritic CLAY.           |
| 8.00 to –14.00          | Very stiff to hard reddish brown sandy silty CLAY with      |

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gravels.

14.00 to –.20.00 Hard grayish brown lateritic CLAY.

### **Geotechnical Properties**

#### **Depth (m)**

#### **Geotechnical Properties**

0.00 to –.3.00

Moderate to good geotechnical properties, moderate to high shear strength and low compressibility potential.

3.00 to –.8.00

Good geotechnical properties, high shear strength and low compressibility potential.

8.00 to –.14.00

Very good geotechnical properties, high shear strength and low compressibility potential.

14.00 to –.20.00

Very good geotechnical properties, high shear strength and low compressibility potential.

### **Geotechnical Engineering Parameters**

| <b><i>Depth (m)</i></b>      | <b><i>SPT Values</i></b> | <b><i>U4 Sample</i></b> |
|------------------------------|--------------------------|-------------------------|
| <b><i>0.00 – 3.00m</i></b>   | <b><i>5 – 13</i></b>     | <b><i>Taken</i></b>     |
| <b><i>3.00 – 8.00m</i></b>   | <b><i>15 – 22</i></b>    | <b><i>Abortive</i></b>  |
| <b><i>8.00 – 14.00m</i></b>  | <b><i>24 – 32</i></b>    | <b><i>Abortive</i></b>  |
| <b><i>14.00 – 20.00m</i></b> | <b><i>31 – 36</i></b>    | <b><i>Abortive</i></b>  |

### **Borehole/SPT 2**

#### **Depth (m)**

#### **Description of Stratum**

0.00 to –.4.00

Firm to stiff light brown to reddish brown sandy silty CLAY

4.00 to –.9.00

Very stiff greyish brown lateritic CLAY.

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9.00 to –.15.00            Hard reddish brown silty CLAY with gravels.

### **Geotechnical Properties**

#### **Depth (m)**

#### **Geotechnical Properties**

0.00 to –.4.00

Moderate to good geotechnical properties, moderate to high shear strength and low compressibility potential.

4.00 to –.9.00

Good geotechnical properties, high shear strength and low compressibility potential.

9.00 to –.15.00

Very good geotechnical properties, high shear strength and low compressibility potential.

### **Geotechnical Engineering Parameters**

| <b><i>Depth (m)</i></b>     | <b><i>SPT Values</i></b> | <b><i>U4 Sample</i></b> |
|-----------------------------|--------------------------|-------------------------|
| <b><i>0.00 – 4.00m</i></b>  | <b><i>4 – 14</i></b>     | <b><i>Taken</i></b>     |
| <b><i>4.00 – 9.00m</i></b>  | <b><i>17 – 21</i></b>    | <b><i>Abortive</i></b>  |
| <b><i>9.00 – 15.00m</i></b> | <b><i>26 – 31</i></b>    | <b><i>Abortive</i></b>  |

### **Borehole/SPT 3**

#### **Depth (m)**

#### **Description of Stratum**

0.00 to –.3.00

Firm to stiff greyish brown sandy CLAY

3.00 to –.8.00

Very stiff reddish brown sandy CLAY.

8.00 to –.15.00

Hard reddish brown lateritic CLAY.

---

## Geotechnical Properties

| <b><u>Depth (m)</u></b> | <b><u>Geotechnical Properties</u></b>  |
|-------------------------|--|
| 0.00 to –.3.00          | Moderate to good geotechnical properties, moderate to high shear strength and low compressibility potential. |
| 3.00 to –.8.00          | Good geotechnical properties, high shear strength and low compressibility potential.                         |
| 8.00 to –.15.00         | Very good geotechnical properties, high shear strength and low compressibility potential.                    |

## Geotechnical Engineering Parameters

| <b><i>Depth (m)</i></b>     | <b><i>SPT Values</i></b> | <b><i>U4 Sample</i></b> |
|-----------------------------|--------------------------|-------------------------|
| <b><i>0.00 – 3.00m</i></b>  | <b><i>4 – 12</i></b>     | <b><i>Taken</i></b>     |
| <b><i>3.00 – 8.00m</i></b>  | <b><i>15 – 20</i></b>    | <b><i>Abortive</i></b>  |
| <b><i>8.00 – 15.00m</i></b> | <b><i>22 – 30</i></b>    | <b><i>Abortive</i></b>  |

### 3.2.4 Site description and condition

The project site is an open piece of land with presence of powerline extension. Structures around site show no sign of distress at the time of our investigation.

### 3.2.5 Topography.

The topography of the project site is nearly even topography.

### 3.2.6 Vegetation.

---

Vegetation around the project site area is mainly grasses and weeds.

## **4.1 FOUNDATION DISCUSSION AND RECOMMENDATION**

### **4.1.1 Proposed Development**

No structural detail of the proposed development was made available to us prior to the subsoil investigation, thus our recommendations are based on the Borehole and DCP tests carried out.

The geotechnical issues considered relevant to the proposed development include

- Soil bearing pressure
- Level of groundwater
- Recommendation of a suitable foundation type
- Excavation

### **4.1.2 RECOMMENDATION**

The foundation type to be chosen for a particular structure depends largely on the followings;

- Loads to be transmitted
- Receiving soil strata
- Factor of safety against shear failure of the supporting soil must be adequate.
- Settlement should neither cause any unacceptable damage nor interfere with the function of the structure.

Foundations can be classified as shallow foundation or as deep foundation.

The choice between shallow foundation and deep foundation can be arrived at after careful consideration of the following elements.

1. The magnitude of the transmitted loads from the stratum,
2. The soil nature,



- 
3. The economic aspects of the elements of the foundation work,
  4. Problems concerning foundation construction.

#### **4.1.3 Allowable bearing pressure and foundation recommendation**

Allowable bearing pressure calculated in accordance with theoretical soil mechanics principle for depths are indicated below:

| <b>Differential Depth<br/>(m)</b> | <b>Allowable bearing<br/>Capacity (KN/m<sup>2</sup>)</b> |
|-----------------------------------|--|
| <b>0.00 – 0.50</b>                | <b>60</b>  |
| <b>0.50 – 1.00</b>                | <b>115</b>   |
| <b>1.00 – 1.50</b>                | <b>215</b>   |
| <b>1.50 – 2.00</b>                | <b>320</b>   |

#### **FOUNDATION RECOMMENDATION**

##### **Shallow Foundation**

Shallow Foundation (Spread footing) is considered adequate for the proposed transmission substation on the project site.

##### **Groundwater**

Groundwater was not encountered during the subsoil investigation work

#### **METHOD OF CALCULATING ALLOWABLE BEARING PRESSURE IN COHESIVE SOIL IS GIVEN BY:**

Method for calculating in Cohesive Soil is given by:

$q_{ult} = 5.14C_u + \sum D$  (Prandtl method of estimating allowable bearing pressure)

$$q_a = q_{ult}/F.S \text{ (3) – For Shallow foundation}$$

Correlation between  $q_c$  and SPT (N – Values)

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$$N = q_c / 2$$

$$q_a = 10N, \text{ or } 5.0N \text{ ( If Submerged)}$$

**Correlation between  $q_c$  and  $C_u$**

$$C_u = q_c / 20 \text{ (KN/m}^2\text{)}$$

**$q_{ult} = c \cdot N_c + q \cdot N_q + 0.5 \cdot \gamma \cdot B \cdot N_\gamma$  (Terzaghi method of estimating allowable bearing pressure)**

**where:**

**c = cohesion of soil**

**$\gamma$  = unit weight of soil**

**$q = \gamma \cdot D_f$**

**$N_c, N_q, N_\gamma$  = Bearing capacity factor**

**4.2.2 Settlement**

Settlement for this allowable bearing pressure for each location stated above would not exceed **25mm**.

Our analysis on settlement is based on the method stated below

$$S = 1.1M_v \times 0.55q_n \times h$$

Where S = Total settlement

$M_v$  = Volume of compressibility potential

$q_n$  = net foundation base pressure

$h$  = depth of foundation

The table below shows the permissible settlement as per I.S Code.

| Soil type | Permissible total settlement |                   | Permissible differential settlement |                   |
|-----------|------------------------------|-------------------|-------------------------------------|-------------------|
|           | For isolated                 | For raft footings | For isolated                        | For raft footings |
|           |                              |                   |                                     |                   |

|       |          |               |          |       |
|-------|----------|---------------|----------|-------|
|       | footings |               | footings |       |
| Sandy | 4.0cm    | 4.cm to 6.5cm | 2.5cm    | 2.5cm |
| Clays | 6.5cm    | 6.5 to 10.0cm | 4.0cm    | 4.0cm |

### 4.2.3 Factor of Safety

Factor of safety of 3 was adopted for our estimation of allowable bearing pressure.

### 4.2.4 Excavation

- Excavation could be achieved using conventional excavating equipment.
- Excavation support would not be required

Excavations deeper than 1.2m must be sloped. Temporary trench slope of 1 vertical to 1 horizontal are expected to remain stable through the fill and the native clay. Where there is insufficient space for open cut excavations, shoring or a trench liner box will be required.

If the soils are saturated at the time of construction, the condition of each soil type should be re-evaluated.

Stock piles, materials or any heavy equipment should be kept at least 5.0m from the upper edge of the excavation; All surface drainage must be directed away from any open excavations and trenches.

No significant problems are anticipated during excavation. Conventional excavating equipment should be able to remove the soils down to anticipated founding level.

### 4.2.5 General Precaution for Shallow Foundation Construction

It is recommended that the following general guidelines that govern the construction of shallow foundation should be observed when work starts on the site:

- Over excavation beyond the depths stated should not be done.
- Ingress of water into the excavated foundation trench should be prevented if the stated bearing value at the founding depth is to be achieved. A layer of

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concrete blinding should therefore be provided within a trench once it has been excavated.

- Adequate cover to the concrete should be allowed for the reinforcement bars to protect them from possible effect of corrosion.
- The sides of foundation should be backfilled up to existing ground level as soon as they are cast.

## **5.0 CONCLUSION**

Shallow Foundation (Spread footing) is considered adequate for the proposed development on the project site.

Despite an objective soil investigation and reporting, a poorly designed and/or constructed foundation may lead to structural failure if all other environmental conditions remain constant.

Best & Crompton Engineering Africa Ltd., therefore recommends that the design and construction of all foundation and earthwork be carried out by a competent company in accordance with good and strict engineering practice expected of a professional. The construction contractor shall be guided by reference Code of Practices such as; British Institution CP 2004, 1973: Code of Practice for Foundation and BS 6031: Code of Practice for Earth Works.

**For Best & Crompton Engineering Africa Ltd.,**

**(M.Nageswara Rao)**

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**APPENDIX**

**FIELD LOGS**

## BOREHOLE LOG

### SUBSOIL INVESTIGATION FOR OGJO SUBSTATION

#### BOREHOLE NO: BH 1

| Depth(m) | Legend | Strata thickness | SPT Blows | Description of Strata  |
|----------|--------|------------------|-----------|--|
| 2.00     |        | (3.00)           | N5        | <i>Firm to stiff greyish brown to reddish brown lateritic CLAY</i>             |
|          |        |                  | N13       |  |
| 4.00     |        | (5.00)           | N15       | <i>Stiff to very stiff reddish brown lateritic CLAY with traces of gravels</i> |
| 6.00     |        |                  | N22       |  |
| 8.00     |        | (6.00)           | N24       | <i>Very stiff to hard reddish brown sandy silty CLAY with gravels</i>          |
| 10.00    |        |                  | N32       |  |
| 12.00    |        |                  | (6.00)    | N31  |
| 14.00    | N36    |                  |           |  |
| 16.00    |        |                  |           |  |
| 18.00    |        |                  |           |  |
| 20.00    |        |                  |           |  |

**N- Number of blows    U4 - Undisturbed Sample    U4\* - Undisturbed Sample abortive**

**BOREHOLE LOG**  
**SUBSOIL INVESTIGATION AT NEW AGBARA SUBSTATION**

**BOREHOLE NO: 2**

| Depth(m) | Legend | Strata thickness | SPT Blows | Description of Strata  |
|----------|--------|------------------|-----------|--|
| 1.50     |        |                  | U4<br>N4  | <i>Firm to stiff light brown to reddish brown sandy silty CLAY</i> |
| 3.00     |        |                  | U4<br>N14 |  |
| 4.50     |        |                  | N17       | <i>Very stiff greyish brown lateritic CLAY</i>                     |
| 6.00     |        |                  | U4*       |  |
| 7.50     |        |                  | N21       |  |
| 9.00     |        |                  | U4*       | <i>Hard reddish brown silty CLAY with gravels</i>                  |
| 10.50    |        |                  | N26       |  |
| 12.00    |        |                  | U4*       |  |
| 13.50    |        |                  | N31       |  |
| 15.00    |        |                  |           |  |

**N- Number of blows      U4- Undisturbed sample      U4\*- Undisturbed sample abortive**

**BOREHOLE LOG**  
**SUBSOIL INVESTIGATION AT OGIJO SUBSTATION**

**BOREHOLE NO: 3**

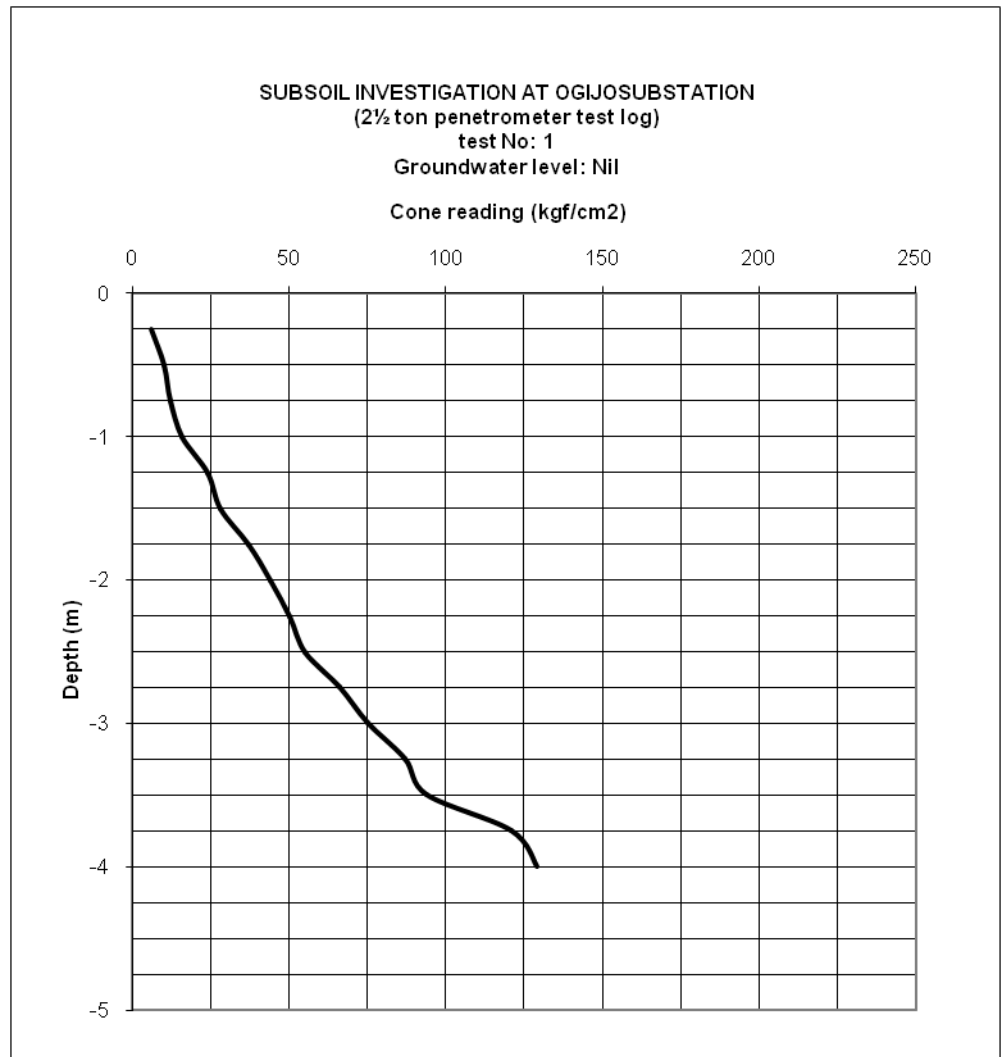
| Depth(m) | Legend | Strata thickness | SPT Blows | Description of Strata                            |
|----------|--------|------------------|-----------|--|
| 1.50     |        | (3.00)           | N4        | <i>Firm to stiff greyish brown sandy CLAY</i>    |
| 3.00     |        |                  | N12       |  |
| 4.50     |        |                  | N15       |  |
| 6.00     |        | (5.00)           | N20       | <i>Very stiff reddish brown sandy silty CLAY</i> |
| 7.50     |        |                  | N22       |  |
| 9.00     |        |                  | N30       |  |
| 10.50    |        | (7.00)           | N30       | <i>Hard reddish brown lateritic CLAY</i>         |
| 12.00    |        |                  |           |  |
| 13.50    |        |                  |           |  |
| 15.00    |        |                  |           |  |

**N- Number of blows      U4- Undisturbed sample      U4\*- Undisturbed sample abortive**



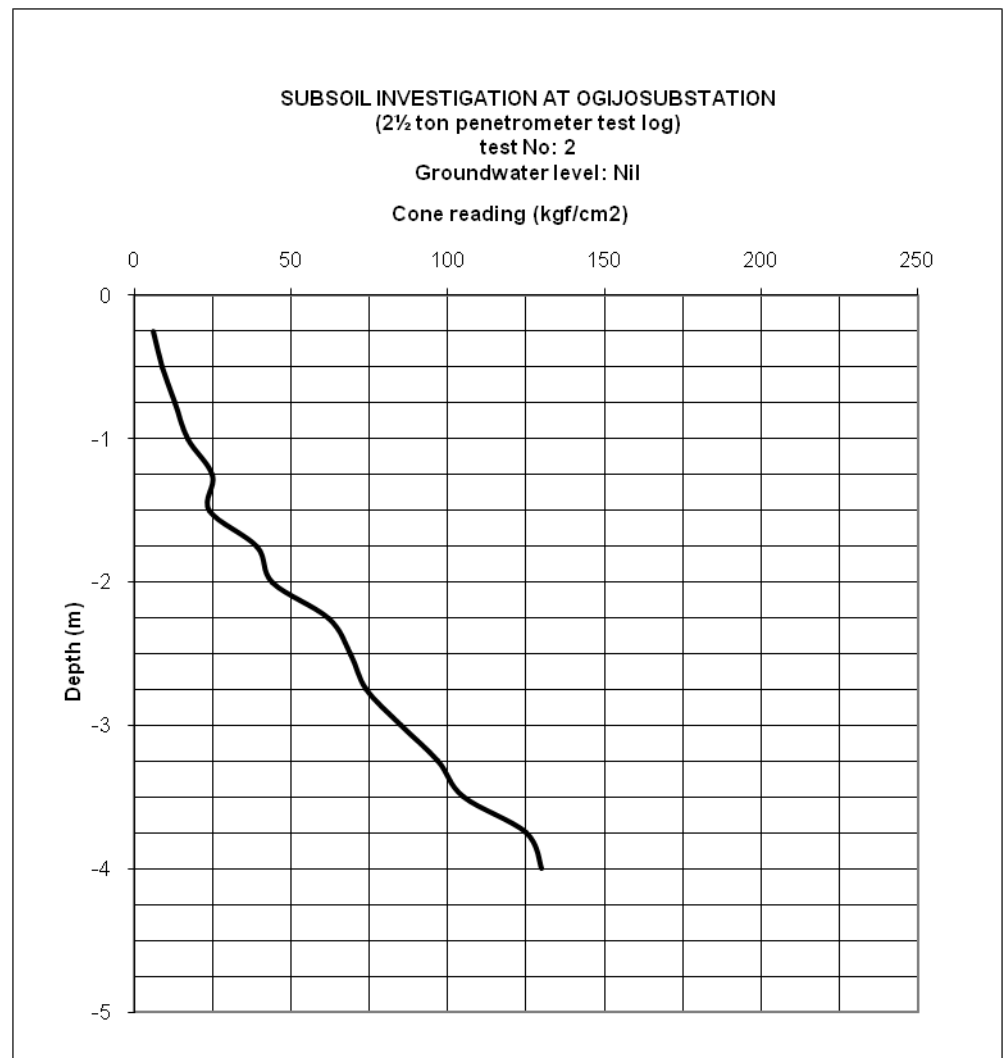
# PENETROMETER 1

| Qc  | Depth |
|-----|-------|
| 0   | 0     |
| 6   | -0.25 |
| 10  | -0.5  |
| 12  | -0.75 |
| 16  | -1    |
| 24  | -1.25 |
| 28  | -1.5  |
| 37  | -1.75 |
| 44  | -2    |
| 50  | -2.25 |
| 55  | -2.5  |
| 66  | -2.75 |
| 75  | -3    |
| 87  | -3.25 |
| 94  | -3.5  |
| 121 | -3.75 |
| 129 | -4    |
|     | -4.25 |
|     | -4.5  |
|     | -4.75 |
|     | -5    |
|     | -5.25 |
|     | -5.5  |
|     | -5.75 |
|     | -6    |
|     | -6.25 |
|     | -6.5  |
|     | -6.75 |
|     | -7    |
|     | -7.25 |
|     | -7.5  |



## PENETROMETER 2

| Qc  | Depth |
|-----|-------|
| 0   | 0     |
| 6   | -0.25 |
| 9   | -0.5  |
| 13  | -0.75 |
| 17  | -1    |
| 25  | -1.25 |
| 24  | -1.5  |
| 39  | -1.75 |
| 44  | -2    |
| 62  | -2.25 |
| 69  | -2.5  |
| 74  | -2.75 |
| 85  | -3    |
| 97  | -3.25 |
| 105 | -3.5  |
| 125 | -3.75 |
| 130 | -4    |
|     | -4.25 |
|     | -4.5  |
|     | -4.75 |
|     | -5    |
|     | -5.25 |
|     | -5.5  |
|     | -5.75 |
|     | -6    |
|     | -6.25 |
|     | -6.5  |
|     | -6.75 |
|     | -7    |
|     | -7.25 |
|     | -7.5  |



## SUMMARY OF LABORATORY TEST RESULTS

### ATTERBERG LIMIT TEST

| BOREHOLE/<br>SAMPLE NO | DEPTH<br>(m) | NATURAL<br>MOISTURE<br>CONTENT<br>(Wc)% | LIQUID<br>LIMIT<br>(L.L) % | PLASTIC<br>LIMIT<br>(P.L) % | PLASTICITY<br>INDEX (P.I) % |
|------------------------|--------------|---|----------------------------|-----------------------------|-----------------------------|
| 1/2                    | 1.00         | 18.8                                    | 29                         | 16                          | 13                          |
| 1/4                    | 2.00         | 20.0                                    | 36                         | 26                          | 10                          |
| 1/6                    | 3.00         | 21.3                                    | 39                         | 25                          | 14                          |
| 2/2                    | 1.00         | 19.9                                    | 28                         | 18                          | 10                          |
| 2/4                    | 2.00         | 22.0                                    | 27                         | 17.0                        | 10                          |
| 2/6                    | 3.00         | 19.45                                   | 31                         | 20                          | 11                          |
| 3/2                    | 1.00         | 21.3                                    | 34                         | 23.0                        | 11                          |
| 3/4                    | 1.50         | 21.4                                    | 28                         | 14                          | 14                          |
| 3/6                    | 2.25         | 20.5                                    | 30                         | 23.0                        | 7                           |

### QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

| BOREHOLE<br>/ SAMPLE<br>NO | DEPTH<br>(m) | NATURAL<br>MOISTURE<br>CONTENT<br>(Wc)% | BULK<br>DENSITY<br>( $\gamma_b$ )<br>Mg/m <sup>3</sup> | UNDRAINED<br>COHESION<br>(Cu) KN/m <sup>2</sup> | ANGLE OF<br>INTERNAL<br>FRICTION | CELL<br>PRESSURE<br>( $\epsilon_3$ ) KN/m <sup>2</sup> | COMPRESSIVE<br>STRESS<br>(KN/m <sup>2</sup> ) |
|----------------------------|--------------|---|--|---|----------------------------------|--|---|
| 1/2                        | 1.00         | 18.8                                    | 1.990  | 70  | 9.0                              | 50   | 212   |
|                            |              |   |  |   |                                  | 100  | 228   |
|                            |              |   |  |   |                                  | 200  | 275   |
| 1/4                        | 2.00         | 20.0                                    | 2.110  | 187   | 12.0                             | 50   | 230   |
|                            |              |   |  |   |                                  | 100  | 245   |
|                            |              |   |  |   |                                  | 200  | 286   |
| 1/6                        | 3.00         | 21.3                                    | 2.440  | 283   | 16.0                             | 50   | 215   |
|                            |              |   |  |   |                                  | 100  | 229   |
|                            |              |   |  |   |                                  | 200  | 280   |
| 2/2                        | 1.00         | 19.9                                    | 1.955  | 74  | 5.0                              | 50   | 230   |
|                            |              |   |  |   |                                  | 100  | 242   |
|                            |              |   |  |   |                                  | 200  | 278   |
| 2/4                        | 2.00         | 22.0                                    | 2.202  | 177   | 10.0                             | 50   | 208   |
|                            |              |   |  |   |                                  | 100  | 218   |
|                            |              |   |  |   |                                  | 200  | 265   |
| 2/6                        | 3.00         | 19.45                                   | 2.460  | 280   | 13.0                             | 50   | 217   |
|                            |              |   |  |   |                                  | 100  | 257   |
|                            |              |   |  |   |                                  | 200  | 293   |
| 3/2                        | 1.00         | 21.3                                    | 1.920  | 82  | 8.0                              | 50   | 210   |
|                            |              |   |  |   |                                  | 100  | 230   |
|                            |              |   |  |   |                                  | 200  | 280   |

|            |             |             |              |            |             |            |            |
|------------|-------------|-------------|--------------|------------|-------------|------------|------------|
| <b>3/4</b> | <b>2.00</b> | <b>21.4</b> | <b>2.311</b> | <b>162</b> | <b>11.0</b> | <b>50</b>  | <b>222</b> |
|            |             |             |              |            |             | <b>100</b> | <b>248</b> |
|            |             |             |              |            |             | <b>200</b> | <b>290</b> |
| <b>3/6</b> | <b>3.00</b> | <b>20.5</b> | <b>2.533</b> | <b>300</b> | <b>15.0</b> | <b>50</b>  | <b>221</b> |
|            |             |             |              |            |             | <b>100</b> | <b>250</b> |
|            |             |             |              |            |             | <b>200</b> | <b>291</b> |

### GRAIN SIZES DISTRIBUTION TEST

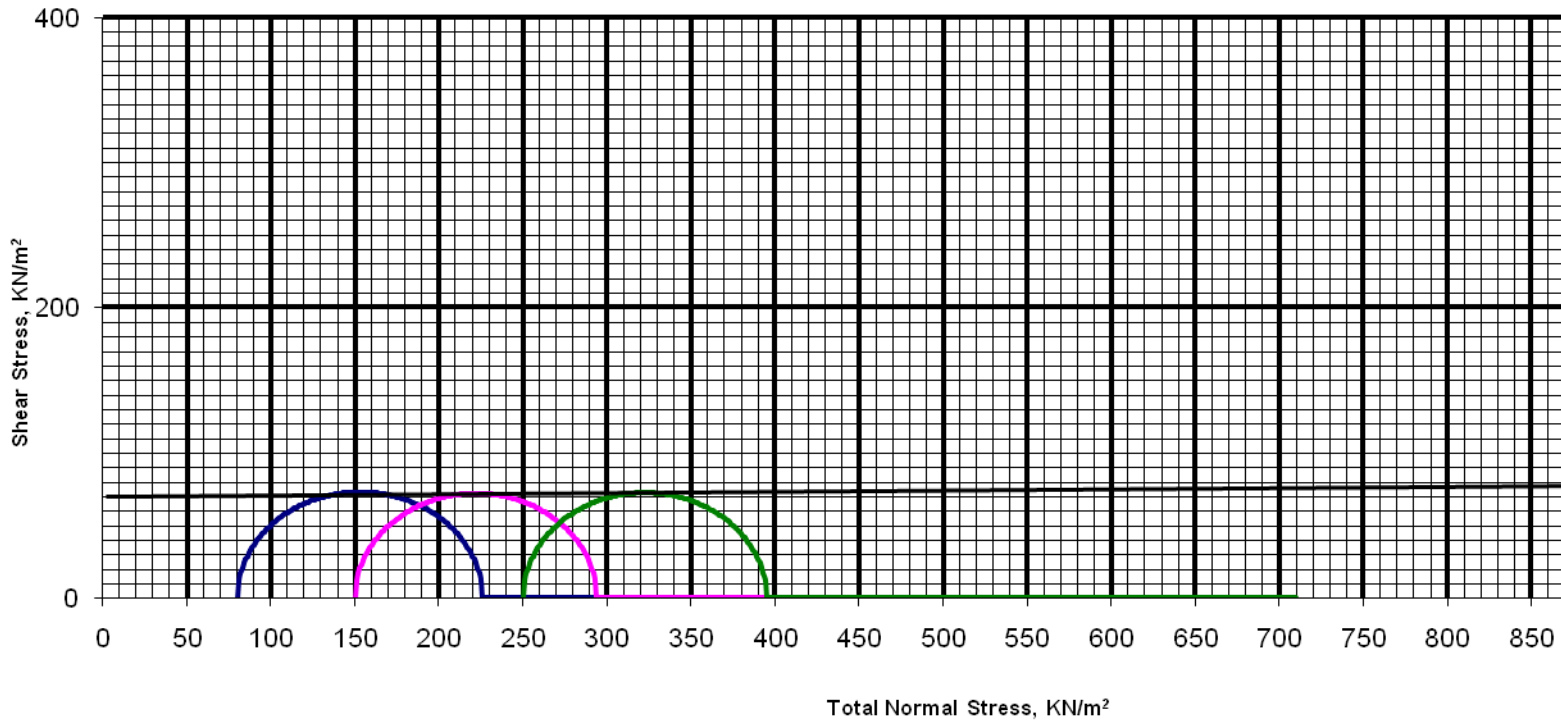
| BH No | Sample No | Depth (m) | Soil Type | Sieve sizes (mm) |      |     |      |     |       |     |       |      |       |       |
|-------|-----------|-----------|-----------|------------------|------|-----|------|-----|-------|-----|-------|------|-------|-------|
|       |           |           |           | 5                | 3.35 | 2   | 1.18 | 0.6 | 0.425 | 0.3 | 0.212 | 0.15 | 0.063 | 0.045 |
| 1     | 3         | 1.50      | C         |                  |      | 100 | 98   | 85  | 70    | 66  | 56    |      |       |       |
| 1     | 12        | 6.00      | C         |                  |      | 100 | 99   | 90  | 81    | 76  | 60    |      |       |       |
| 1     | 18        | 9.00      | C         |                  |      | 100 | 97   | 92  | 86    | 74  | 63    |      |       |       |
| 2     | 3         | 1.50      | C         |                  |      | 100 | 97   | 91  | 83    | 77  | 66    |      |       |       |
| 2     | 12        | 6.00      | C         |                  |      | 100 | 99   | 90  | 81    | 74  | 60    |      |       |       |
| 2     | 18        | 9.00      | C         |                  |      | 100 | 96   | 89  | 80    | 72  | 61    |      |       |       |
| 3     | 3         | 1.50      | S         |                  |      | 100 | 98   | 91  | 82    | 70  | 59    |      |       |       |
| 3     | 9         | 4.50      | S         |                  |      | 100 | 95   | 88  | 81    | 73  | 60    |      |       |       |
| 3     | 24        | 12.00     | S         |                  |      | 100 | 94   | 86  | 77    | 69  | 54    |      |       |       |

BH 1

Sample: 2

Depth: 1.00m

|                         |                     |
|-------------------------|---------------------|
| Undrained Cohesion      | 70KN/m <sup>2</sup> |
| Angle of Friction (PHI) | 9deg                |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

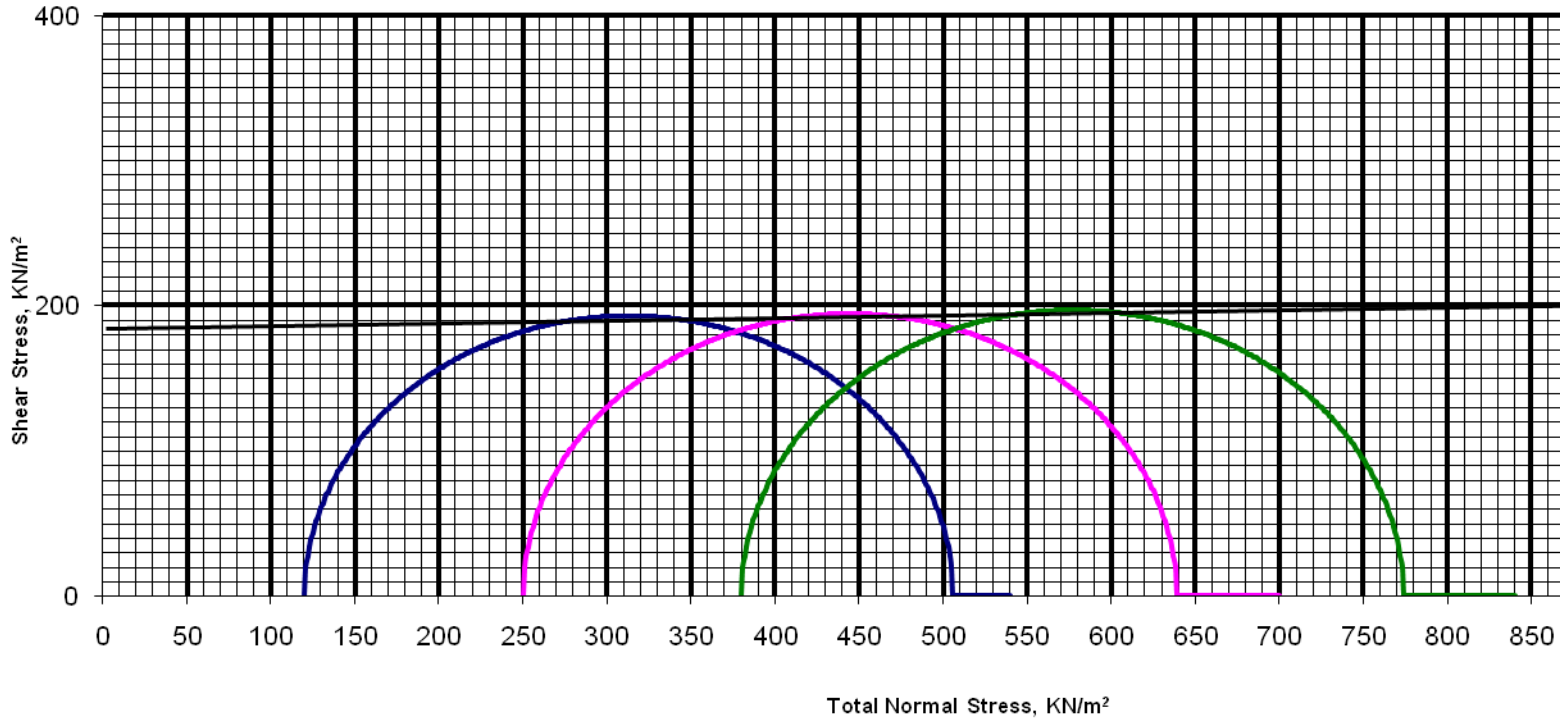
UNDRAINED TRIAXIAL TEST

BH 1

Sample: 4

Depth: 2.00m

|                         |                      |
|-------------------------|----------------------|
| Undrained Cohesion      | 187KN/m <sup>2</sup> |
| Angle of Friction (PHI) | 12deg                |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

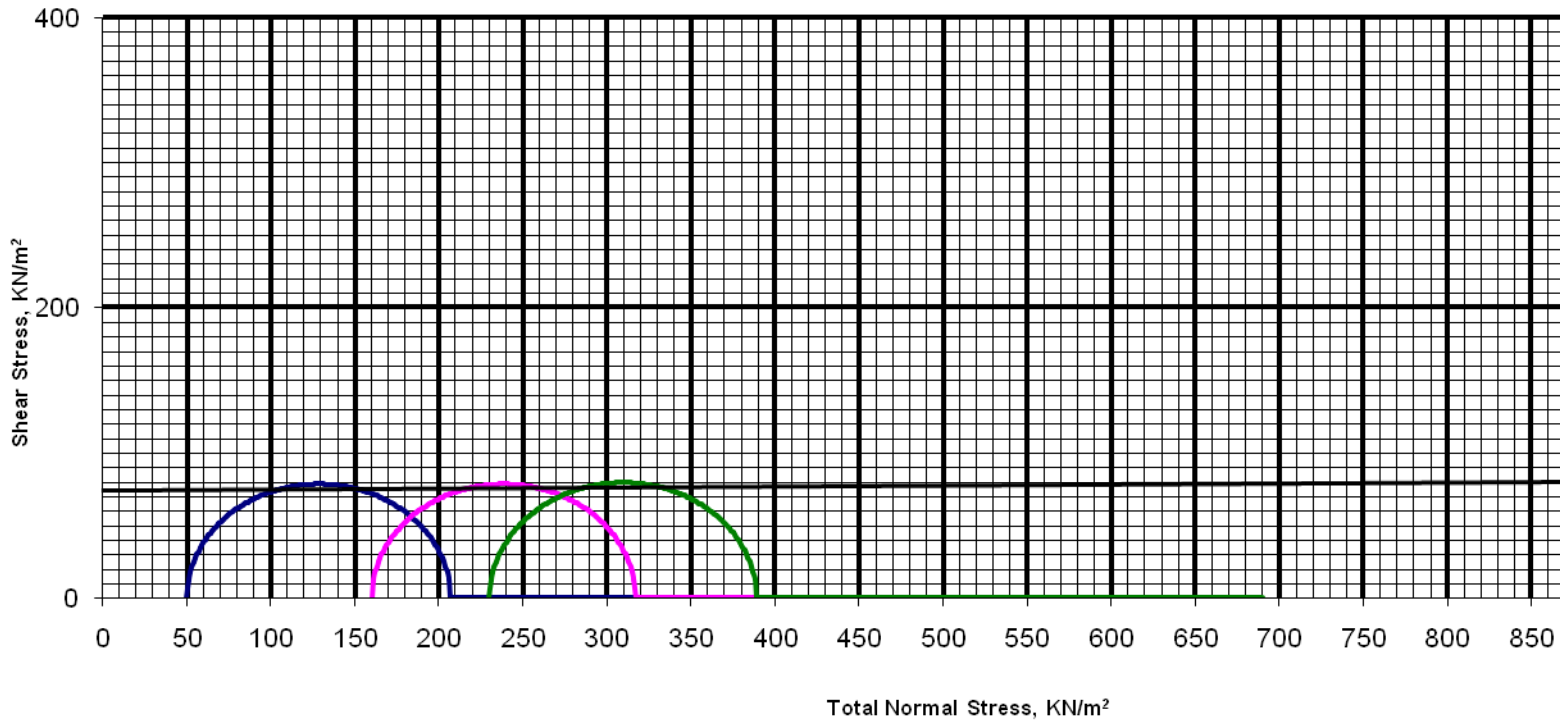
UNDRAINED TRIAXIAL TEST

BH 2

Sample: 2

Depth: 1.00m

|                         |                     |
|-------------------------|---------------------|
| Undrained Cohesion      | 74KN/m <sup>2</sup> |
| Angle of Friction (PHI) | 5deg                |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

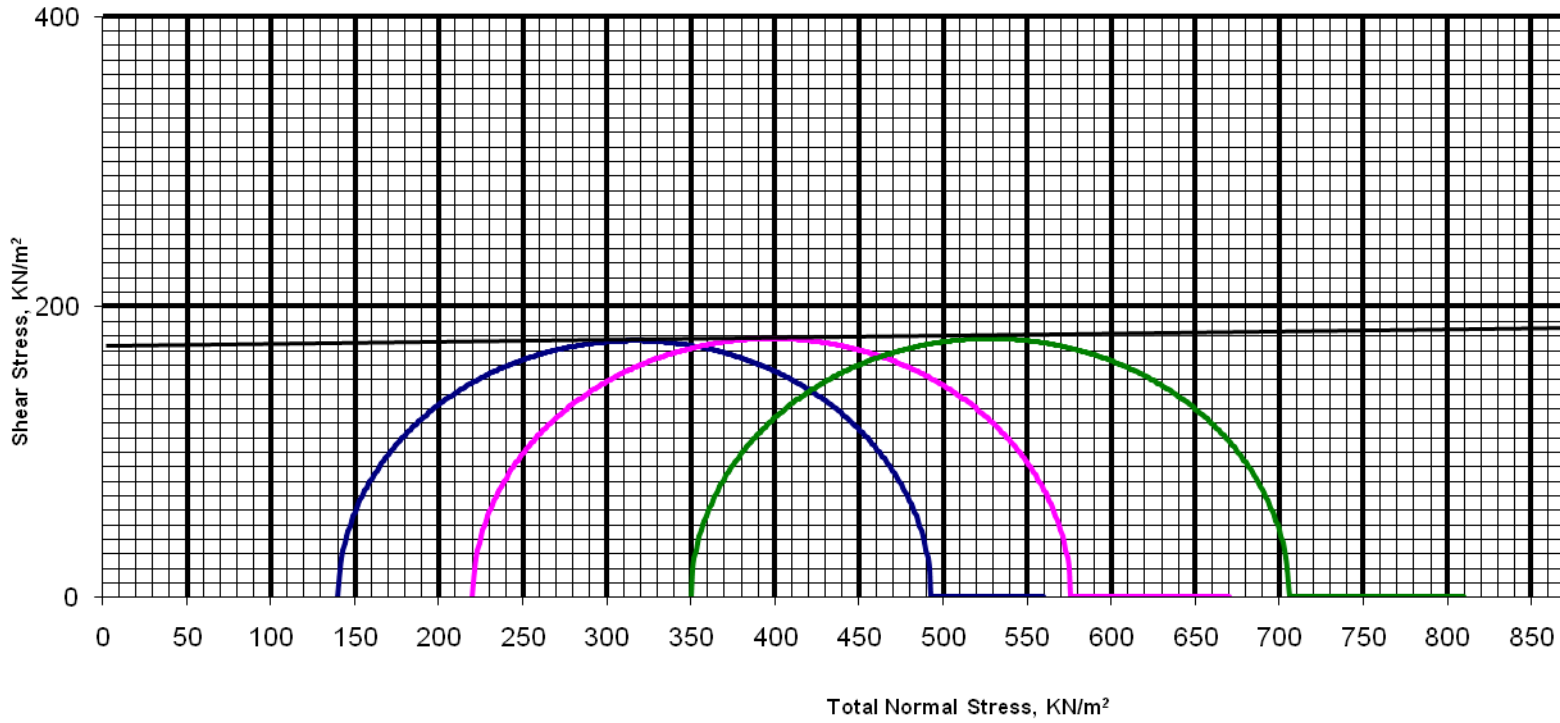
UNDRAINED TRIAXIAL TEST

BH 2

Sample: 4

Depth: 4.00m

|                         |                      |
|-------------------------|----------------------|
| Undrained Cohesion      | 177KN/m <sup>2</sup> |
| Angle of Friction (PHI) | 10deg                |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

UNDRAINED TRIAXIAL TEST

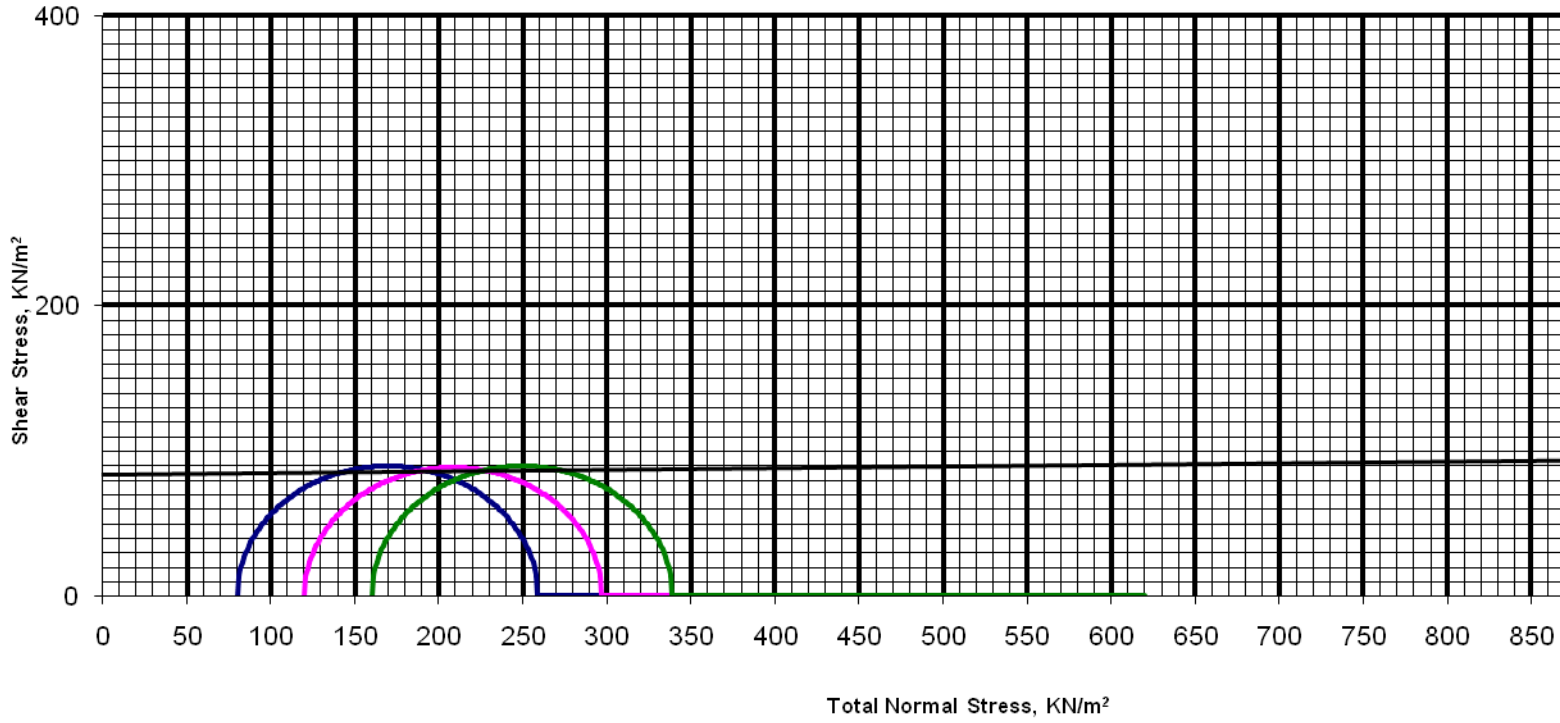


BH 3

Sample: 2

Depth: 1.00m

|                         |                     |
|-------------------------|---------------------|
| Undrained Cohesion      | 82KN/m <sup>2</sup> |
| Angle of Friction (PHI) | 8deg                |



TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

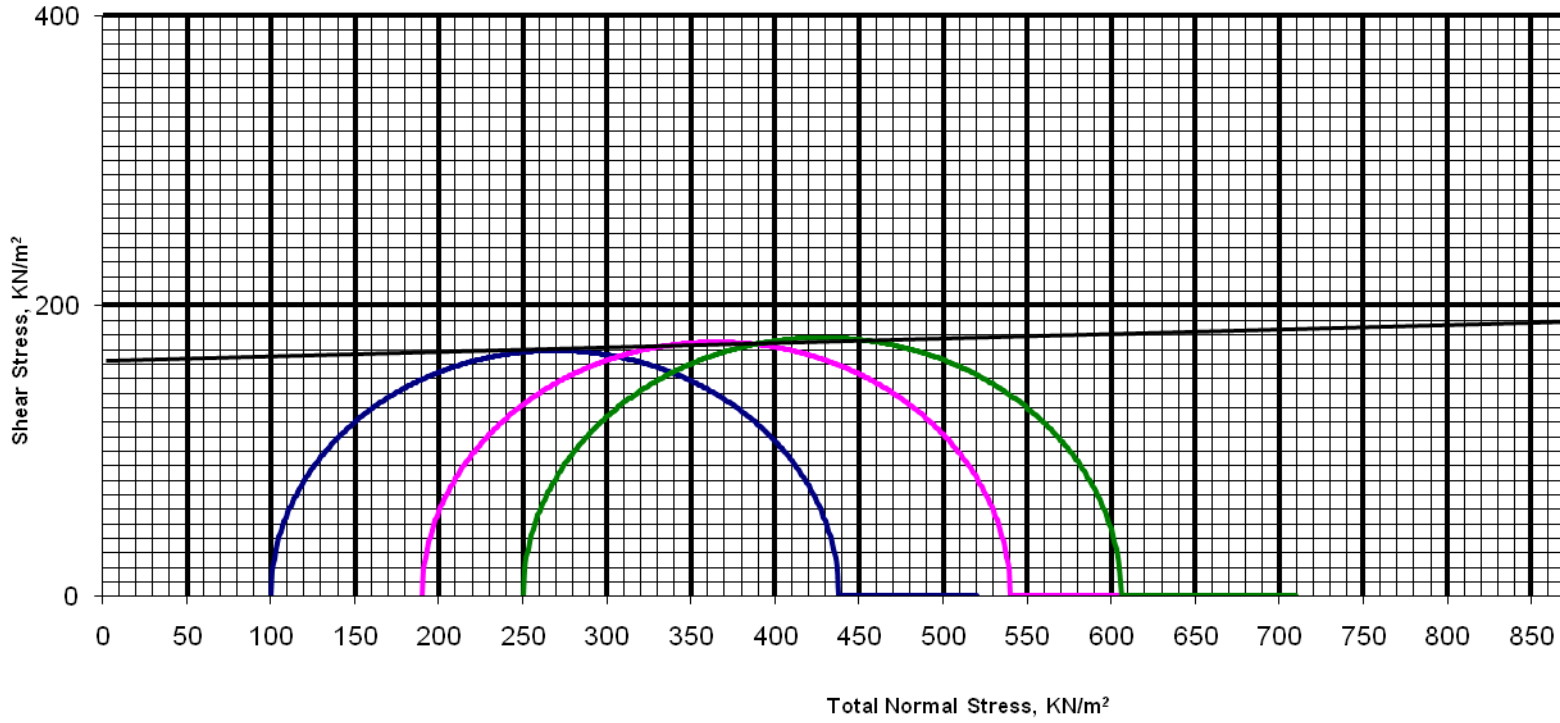
UNDRAINED TRIAXIAL TEST

BH 3

Sample: 4

Depth: 2.00m

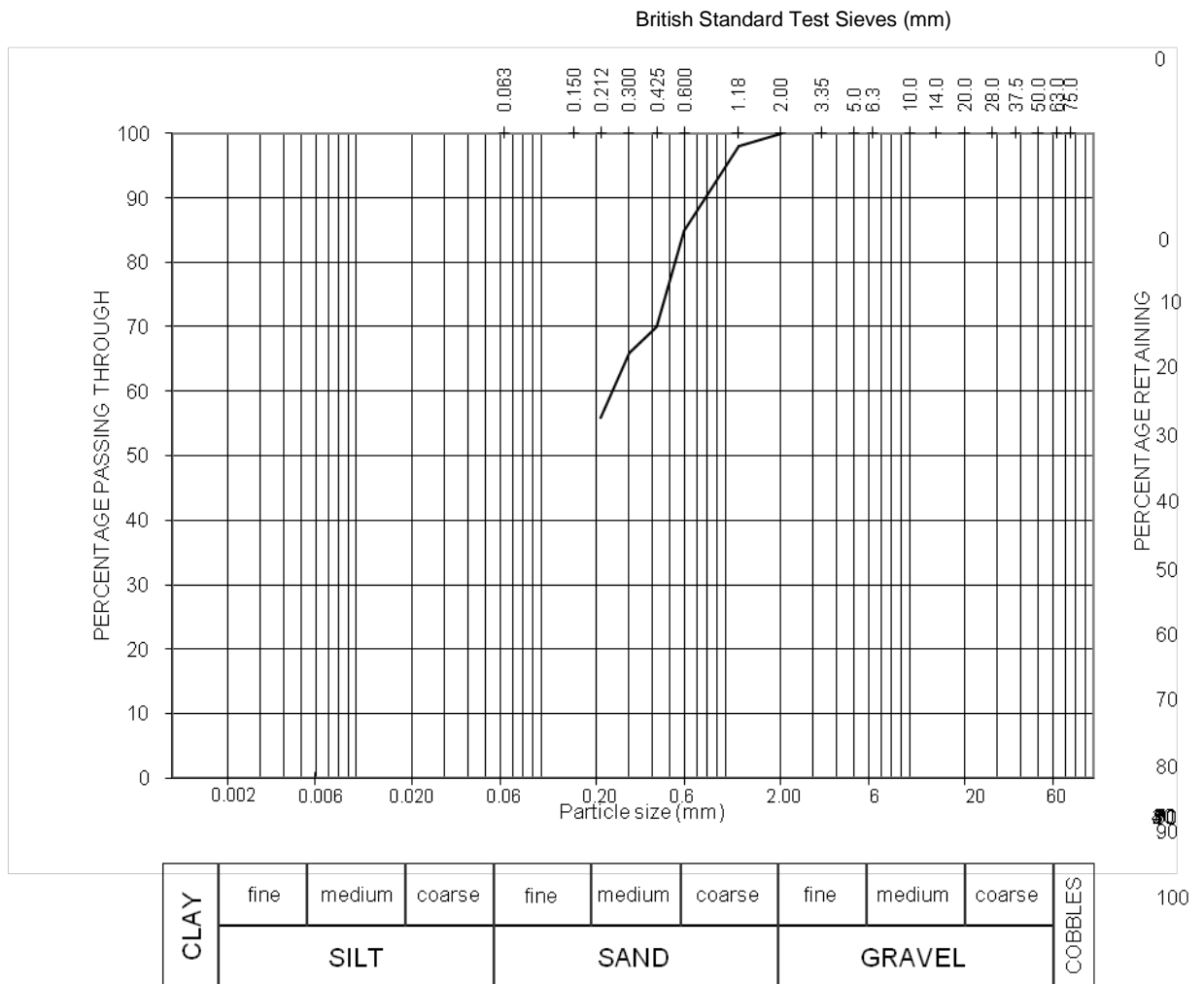
|                         |                      |
|-------------------------|----------------------|
| Undrained Cohesion      | 162KN/m <sup>2</sup> |
| Angle of Friction (PHI) | 11deg                |



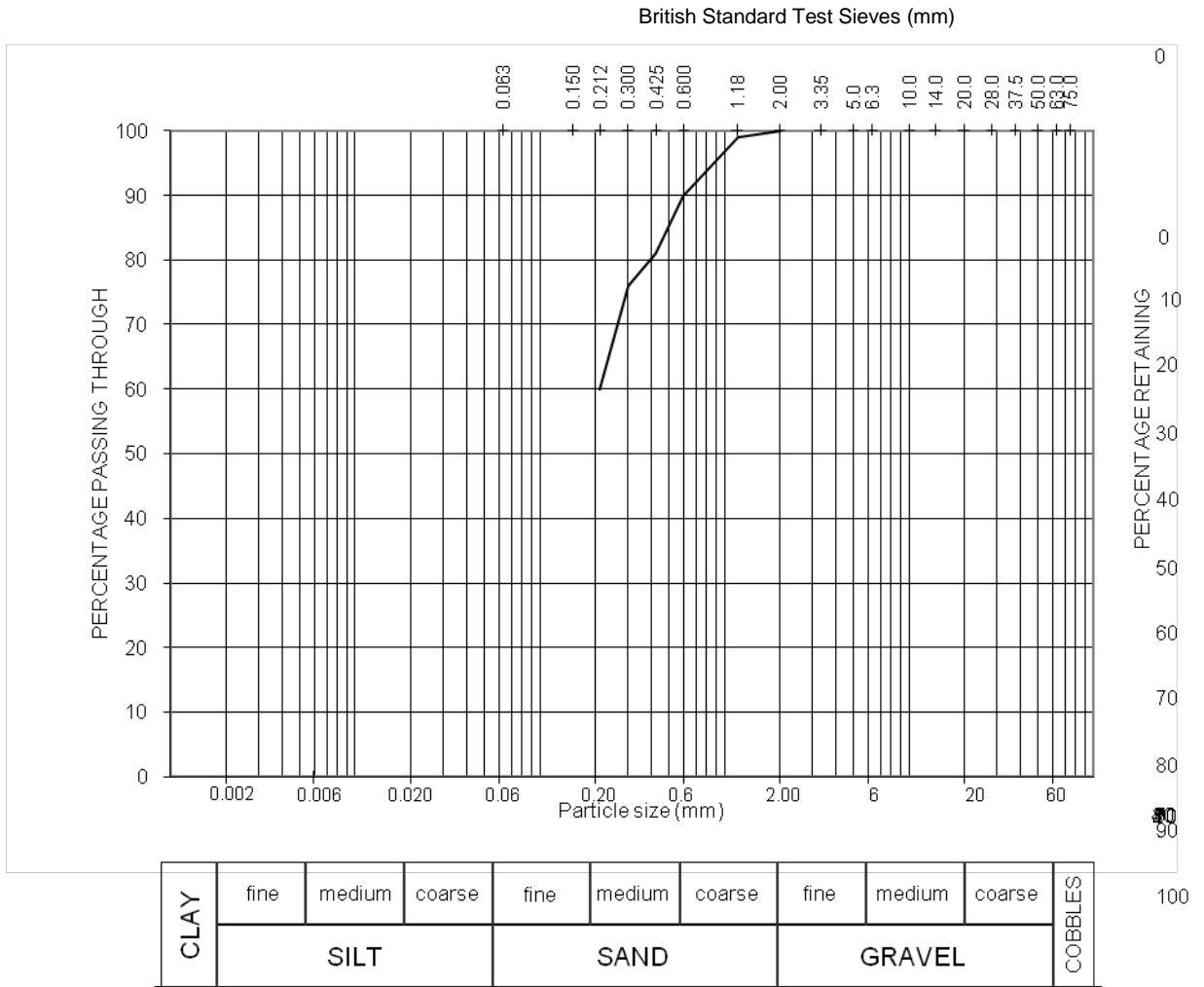
TEST CARRIED OUT IN ACCORDANCE WITH BS 1377

UNDRAINED TRIAXIAL TEST

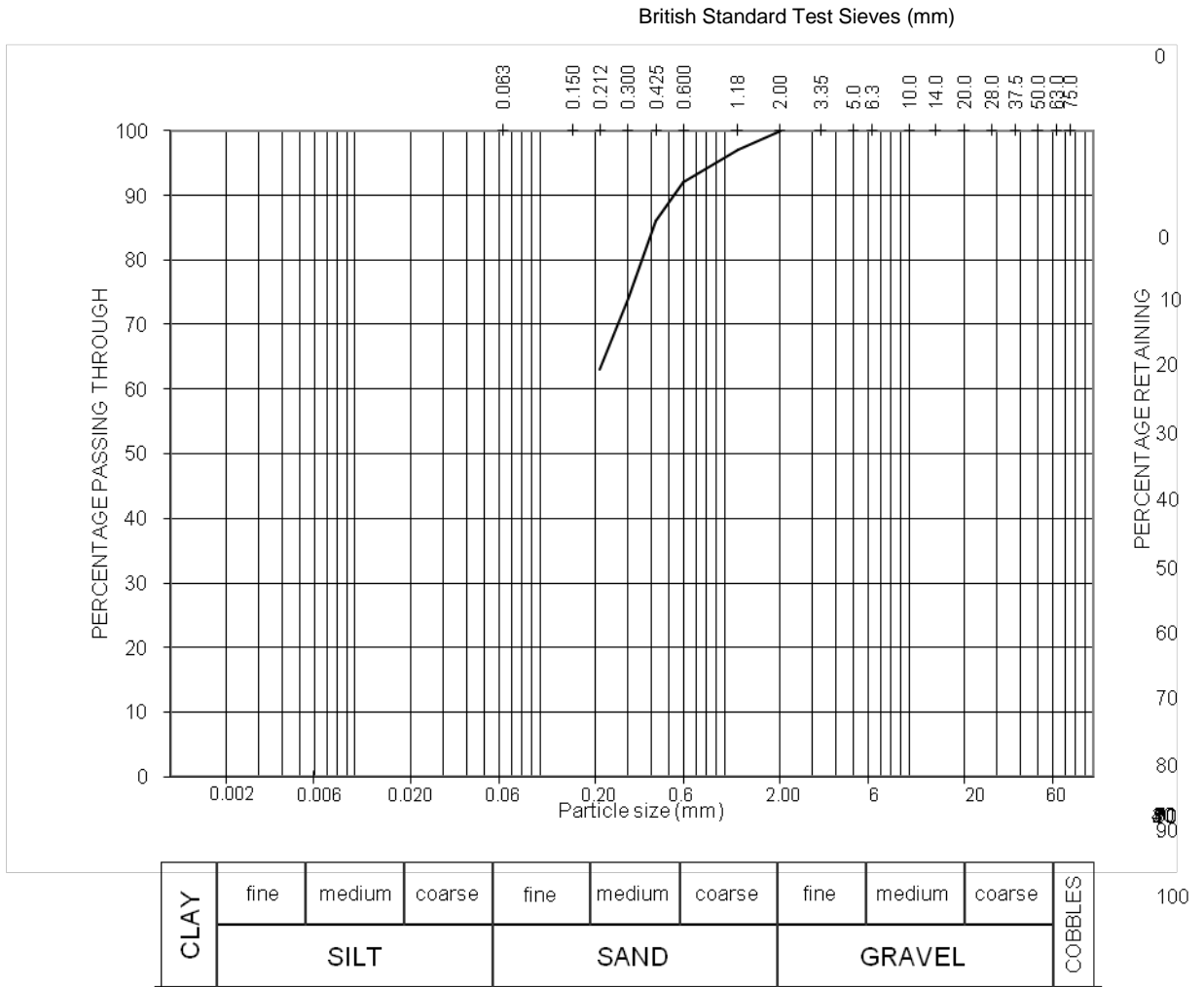
# BOREHOLE 1



| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION     | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|------------------------|----------|----------|----------|------------|----|----|
| —     | 3      | 1.50m     | Brown sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                        |          |          |          |            | -  | -  |
| ..... |        |           |                        |          |          |          |            | -  | -  |

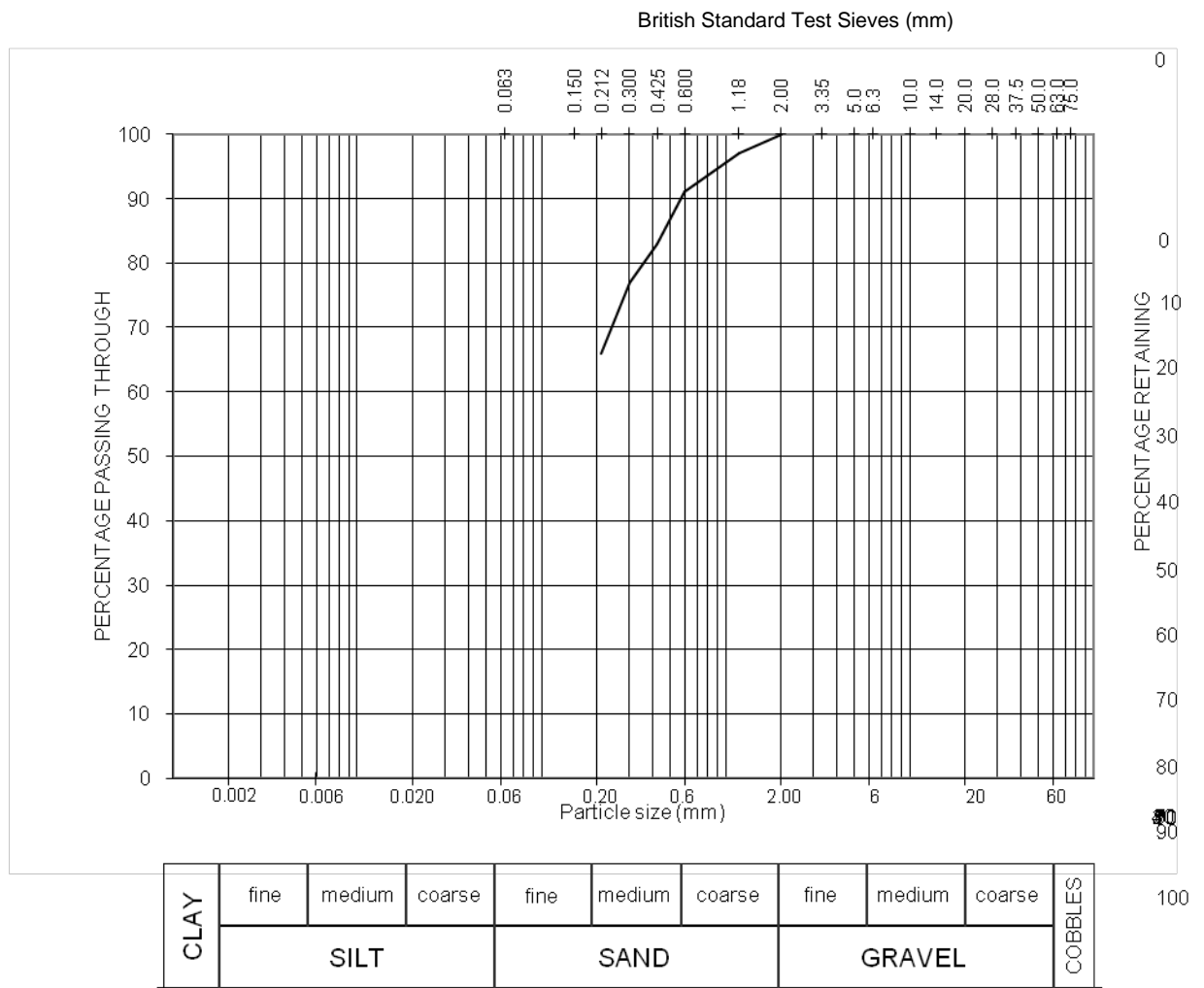


| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION             | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--------------------------------|----------|----------|----------|------------|----|----|
| —     | 6      | 3.00m     | Reddish brown sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                                |          |          |          |            | -  | -  |
| ..... |        |           |                                |          |          |          |            | -  | -  |

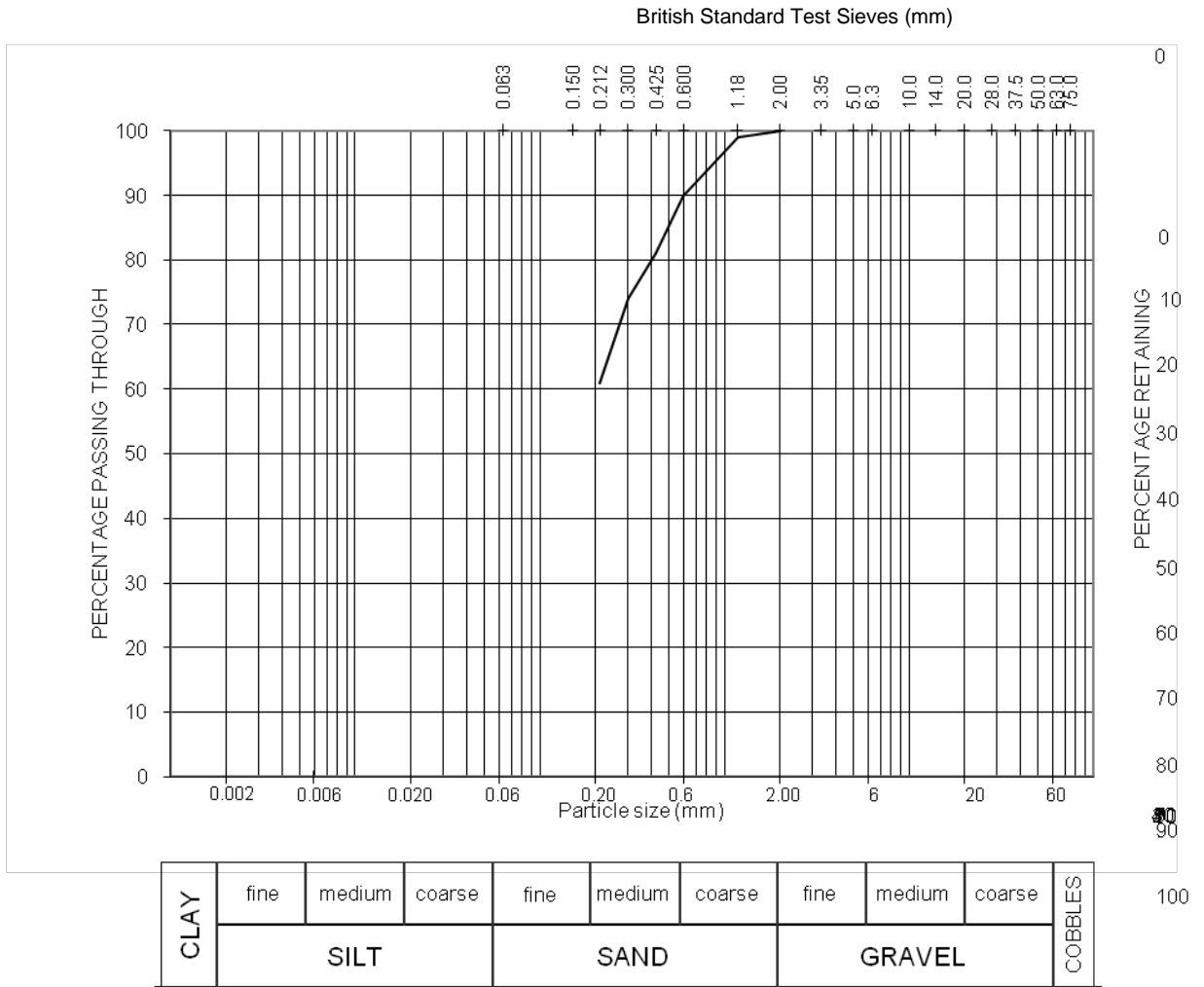


| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION             | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--------------------------------|----------|----------|----------|------------|----|----|
| —     | 18     | 9.00m     | Reddish brown sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                                |          |          |          |            | -  | -  |
| ..... |        |           |                                |          |          |          |            | -  | -  |

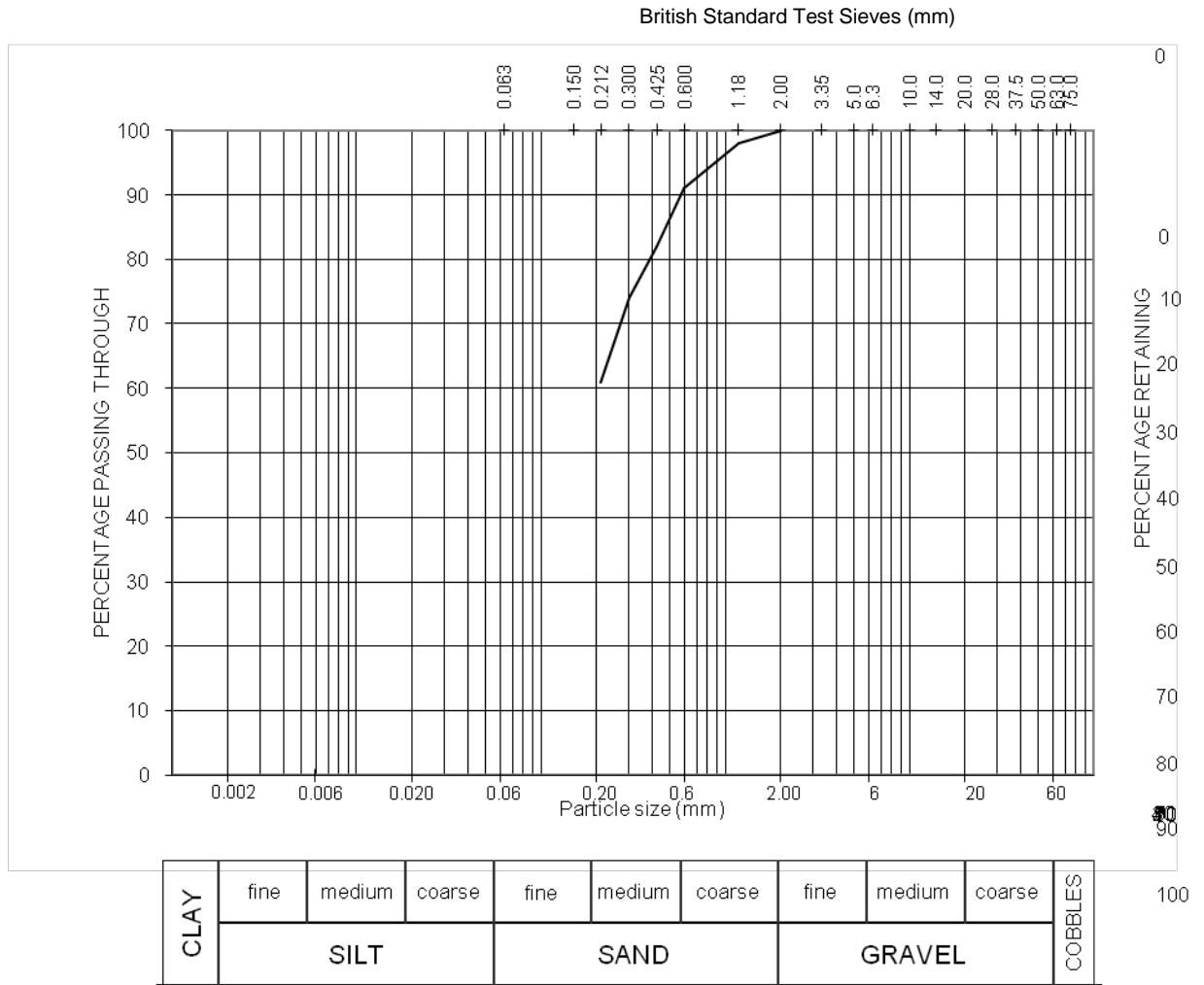
# BOREHOLE 2



| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION             | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--------------------------------|----------|----------|----------|------------|----|----|
| —     | 3      | 1.50m     | Greyish brown sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                                |          |          |          |            | -  | -  |
| ..... |        |           |                                |          |          |          |            | -  | -  |



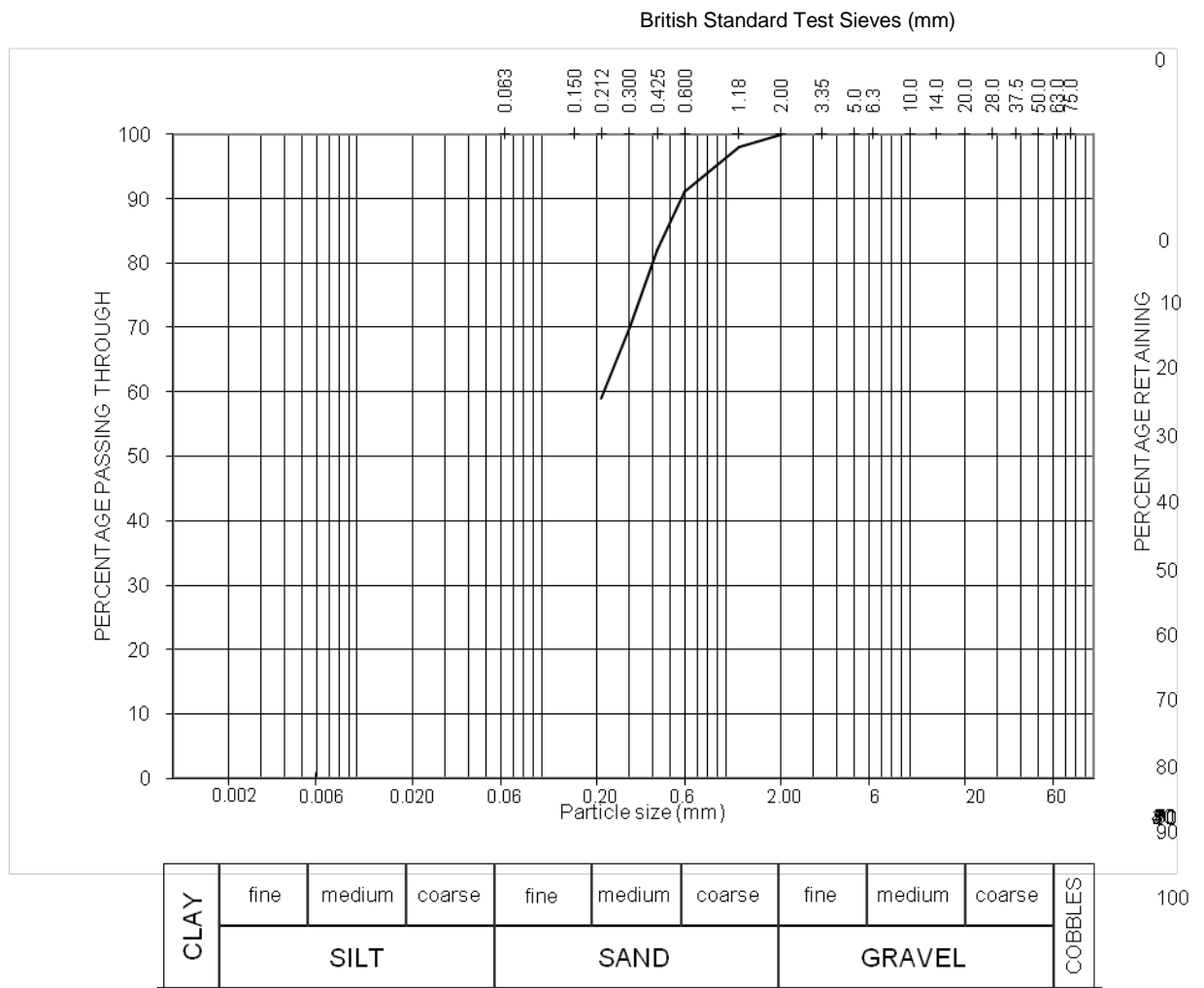
| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION             | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--------------------------------|----------|----------|----------|------------|----|----|
| —     | 12     | 6.00m     | Reddish brown sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                                |          |          |          |            | -  | -  |
| ..... |        |           |                                |          |          |          |            | -  | -  |



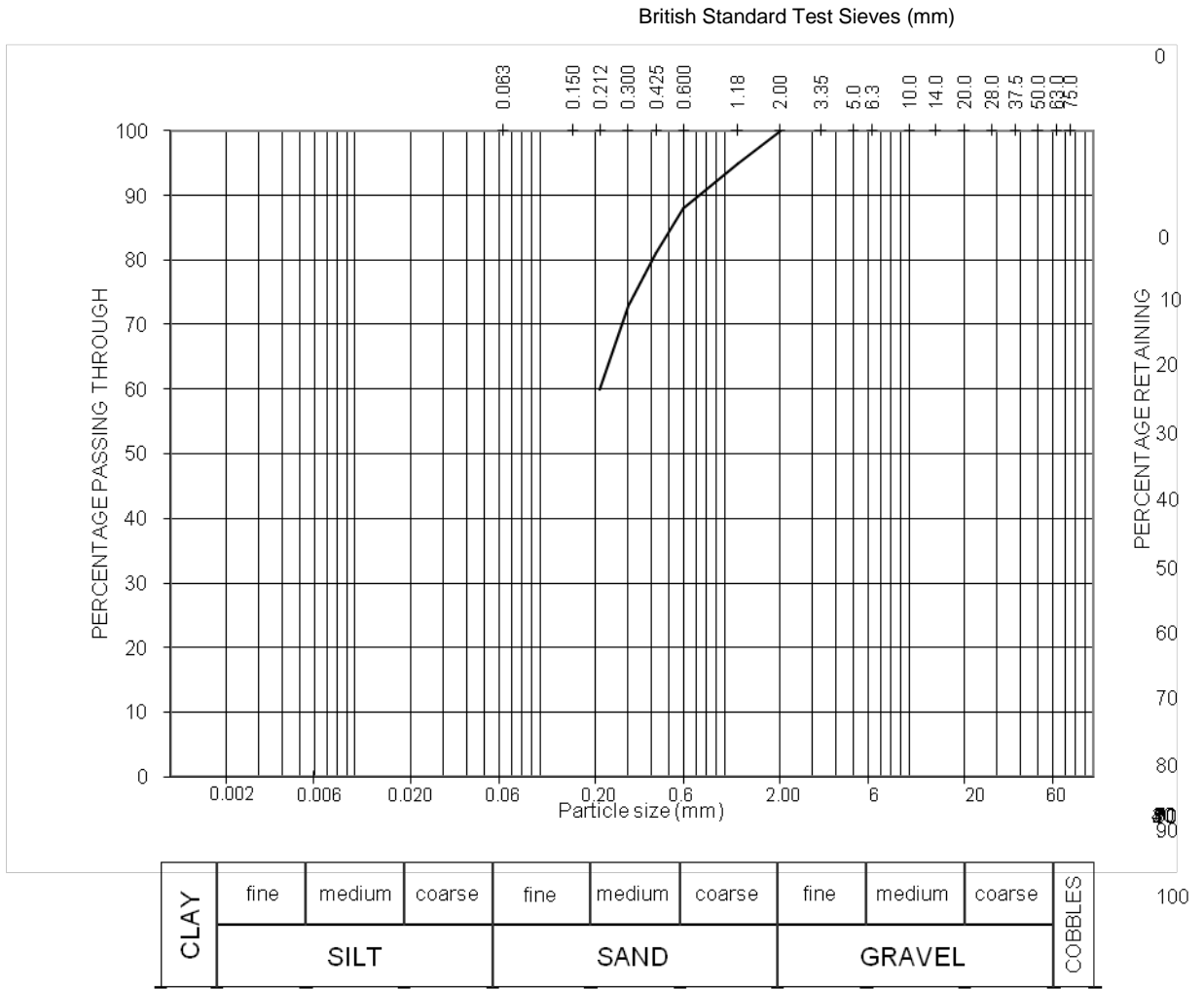
| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION             | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--------------------------------|----------|----------|----------|------------|----|----|
| —     | 18     | 9.00m     | Reddish brown sandy silty CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                                |          |          |          |            | -  | -  |
| ..... |        |           |                                |          |          |          |            | -  | -  |



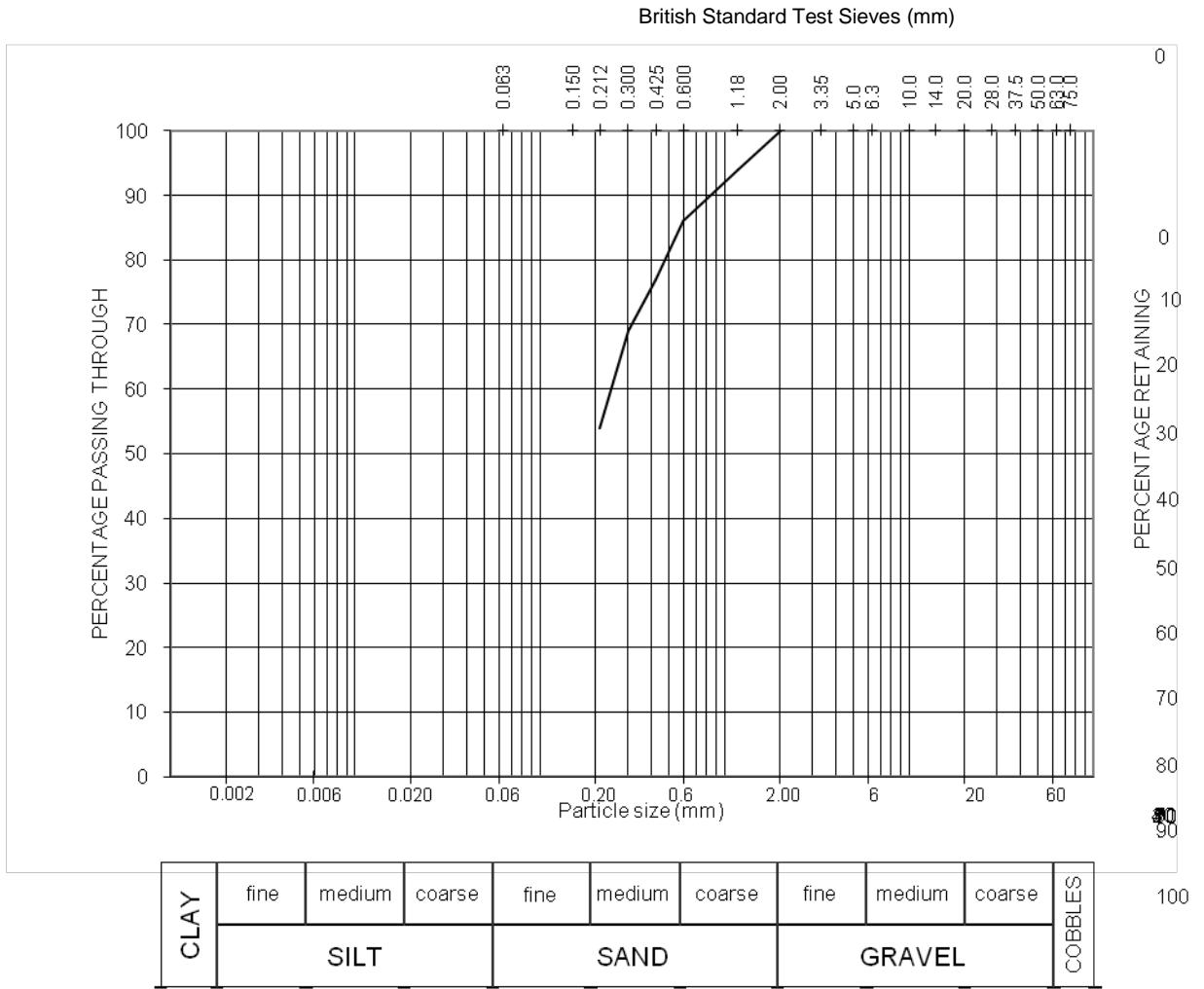
# BOREHOLE 3



| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION     | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|------------------------|----------|----------|----------|------------|----|----|
| —     | 3      | 1.50m     | Light brown sandy CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                        |          |          |          |            | -  | -  |
| ..... |        |           |                        |          |          |          |            | -  | -  |



| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION       | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--------------------------|----------|----------|----------|------------|----|----|
| —     | 9      | 4.50m     | Reddish brown sandy CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                          |          |          |          |            | -  | -  |
| ..... |        |           |                          |          |          |          |            | -  | -  |



| CURVE | SAMPLE | DEPTH [m] | SAMPLE DESCRIPTION       | CLAY [%] | SILT [%] | SAND [%] | GRAVEL [%] | Cu | Cc |
|-------|--------|-----------|--------------------------|----------|----------|----------|------------|----|----|
| —     | 24     | 12.50m    | Reddish brown sandy CLAY |          |          |          |            | -  | -  |
| - - - |        |           |                          |          |          |          |            | -  | -  |
| ..... |        |           |                          |          |          |          |            | -  | -  |

---

## **PNOTES RELATING TO THIS REPORT**

### **Introduction**

These notes have been provided to amplify the geotechnical report in regard to classification methods, specialist field procedures and certain matters relating to the Discussion and Comments section. Not all, of course, are necessarily relevant to all reports.

Geotechnical reports are based on information gained from limited subsurface test boring and sampling, supplemented by knowledge of local geology and experience.

For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Non-cohesive soils are classified on the basis of relative density, generally from the results of standard penetration tests (SPT) or Dutch cone Penetrometer tests (CPT) as below:

| <b>Relative Density</b> | <b>CPT Cone Value (qc — MPa)</b> |
|-------------------------|----------------------------------|
| Very loose              | less than 2                      |
| Loose                   | 2—5                              |
| Medium dense            | 5—15                             |
| Dense                   | 15—25                            |
| Very dense              | greater than 25                  |

### **Site Anomalies**

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, the Company requests that it immediately be notified. Most problems are much more readily resolved when conditions are exposed than at some later stage, well after the event.

### **Ground Water**

Where ground water levels are measured in boreholes, there are several potential problems;

### **Reproduction of Information for Contractual Purposes**

- In low permeability soils, ground water although present, may enter the hole slowly or perhaps not at all during the time it is left open. Attention is drawn to the document

---

“Guidelines for the Provision of Geotechnical Information in Tender Documents”,  
published by the Institution of Engineers,

- A localised perched water table may lead to an erroneous indication of the true water table.

### **Site Inspection**

The Company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

# REPORT OF SOIL INVESTIGATION FOR THE LAGOS AND OGUN STATE TRANSMISSION AND ASSOCIATED SUBSTATION PROJECT



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## 1.0 INTRODUCTION

### 1.1 Background

Yachiyo Engineering Co., Ltd [YEC] requested EEMS Limited to perform the soil investigations work for the Lagos and Ogun State Transmission Project in Nigeria. This is the report of the requested study, which covered two substations and the entire transmission line route.

### 1.2 Scope of Work

The scope of works comprises of the following as contained in the terms of reference.

- Percussion drilling (Standard Penetration Test) at 26No points along the transmission line and two substations of Ejio and Redeem;
- Conduct Cone Penetrometer Tests (CPT);
- Detailed laboratory tests on samples obtained from the sampling process in the percussion drilling test;
- Preparation and submission of a factual and interpretative geotechnical report with foundation recommendations.
- Standard Penetration Test (SPT) covered the following;
  - ✓ 15 Hot spots and 5 typical spots for Transmission line in Lot 1, 2 and 3.
  - ✓ Typical depth of boring test is 10 m each, except for soft ground such as lagoon and swamp it extends to 20 m, number of boring is one only in lagoon area and swamp area each, laboratory test is also included.
  - ✓ Three points each at Ejio substaion and Redeem substation, and boring depth of 20m
- Dynamic Corn Penetration Test (CPT) cover only Ejio substaion and Reddem substation, two(2) points at each substation at a depth of 3m each.
- Laboratory analysis to cover
  - ✓ Grain size analysis (sieve+Hydrometer)
  - ✓ Atterberg's limits (Liquid Limits, plastic limits and shrinkage limit)
  - ✓ Water Natural Content (moisture)
  - ✓ Specific Gravity
  - ✓ Sodium Chloride Concentration
  - ✓ Triaxial Compression Test
  - ✓ Direct shear (disturbed sample)
  - ✓ Conosolidation (Oedometer)

### 1.3 Objectives

- a) To conduct Standard Penetration Tests (SPT) at every 1.5m depth interval, to a depth of 10.0m or refusal;
- b) To conduct cone Penetrometer Tests (CPT) up to refusal;
- c) To evaluate the bearing capacity of soils from the Standard Penetration Tests for foundation of the structures;
- d) To obtain samples from boreholes for laboratory analyses;
- e) To obtain soil strength parameters from laboratory tests;
- f) Calculate values of bearing capacity of soils from the laboratory parameters.

The field work was carried out in September 2018.

This entails the use of mechanized percussion drilling equipment as well as sampling materials. A total of 26 Nos test bores were drilled up to the depth of refusal at the locations of proposed project. The breakdown of points investigated includes 20Nos along the transmission line and 3Nos each for Ejio and Redeem. Cone penetrometer Tests were carried out at four (4Nos) points along the location. Samples were recovered at different depths in the 26Nos test bores.

The samples were carefully identified and preserved for the purpose of laboratory tests and analyses.

### 1.4 Summary of Findings

The overburden along the proposed locations is comprised predominantly of clayey sand, silty sand, fine sand, sharp sand, silty clay, clayey silt, stiff clay, sandy clay, dense sand, laterite, lateritic clay, concretionary laterite and weathered rock. These were proved within total explored depth of 2.1 – 9.6m in all the test borings.

The specific types of formation observed are shown in Table 1.1:

**Table 1.1 Stratigraphy**

| Depth (m) | General Lithology  |
|-----------|--|
| 0.0 – 0.6 | Silty sand, clayey silt, lateritic clay, laterite, silty clay  |
| 1.5 – 2.1 | Clayey sand, laterite, concretionary laterite, silty sand, lateritic clay, sharp sand, clayey silt, silty clay, sandy clay, clay         |
| 3.0 – 3.6 | Clayey sand, lateritic clay, clay, stiff clay, concretionary laterite, dense sand, clayey sand, sandy clay, fine sand, laterite          |
| 4.5 – 5.1 | Weathered rock, laterite, silty sand, concretionary laterite, fine sand, silty clay, lateritic clay, highly weathered rock               |
| 6.0 – 6.6 | Weathered rock, laterite, silty sand, sharp sand, silty clay, lateritic clay, stiff clay, sharp sand, dense sand, concretionary laterite |
| 7.5 – 8.1 | Sandy clay, laterite, concretionary laterite, dense clay, sharp sand, stiff clay, silty clay   |
| 9.0 – 9.6 | Concretionary laterite, dense sand, dense clay, laterite, sandy clay   |

## **2.0 GEOMORPHOLOGY**

### **2.1. Geology**

The geology is comprised of thin to fairly thick clayey sand, silty sand, fine sand, sharp sand, silty clay, clayey silt, stiff clay, sandy clay, dense sand, laterite, lateritic clay and concretionary laterite materials underlain by weathered rock.

### **2.2. Topography**

The sites are located on fairly level terrain in Ogun and Lagos States.

## 3.0 GEOTECHNICAL INVESTIGATIONS

### 3.1. Percussion Drilling

Twenty-six deep boreholes were drilled using the mechanized cathead percussion drilling rig with HW (4") casing in the overburden. The test borings were drilled to depths of 2.1 – 9.6m using the drilling technique. In each test bore, samples were taken at 1.5m intervals.

Standard Penetration Test (SPT) was conducted at 1.5m interval. The sampling procedure consisted of driving a standard split spoon and U-tube samplers as set forth in ASTM D1586-92-1990. Samples recovered from the borings, as outlined above, were visually classified and geologically logged. After these, they were taken to the laboratory for determination of the parameters outlined in section 4.0.

### 3.2 Standard Penetration Test Procedure

Standard Penetration Tests are conducted at specified depths by driving the test split spoon into the soil stratum. In this test a 56mm diameter split spoon sampler is driven into soil stratum of 450mm by repeated blows of hammer weight of 65kg falling through 760mm height. This system is powered by means of a mechanized CAT head engine.

Boreholes are drilled using a percussion dynamic drilling method. During the boring operation, undisturbed samples are taken at 1.5m depth interval and when changes in strata of soils are encountered. Samples of 150mm diameter and 350mm long open drive tube are employed to recover the intact cohesive soils from the maximum boreholes. The sampling tube is then driven into the cohesive soil by a drop hammer weight of 65kg to maximum possible depth of penetration. The full tube is then rotated to shear the cohesive soil at the cutting edge. Sample recovery is facilitated by the use of sampling tube from which the collected samples are recovered by suction of the non- return air valve in the sampling head.

All the samples recovered from the boreholes are carefully examined, identified and classified in the field.

### 3.3 N - Value

The major piece of data obtained from the Standard Penetration Test is the N-Value. The N-Value is the number of hammer blows required to drive the sampling tube through a stratum of soil 0.15m thick. Successive N-Values are recorded until a thickness of 0.6m is completely penetrated, after which recording of another set of N-values commences. These blows are recorded on data sheets for each test bore drilled.

The N-Value is a direct and reasonably accurate measure of the strength of a soil stratum, and is a reliable figure from which **Ultimate Bearing Capacity** of soils can be calculated empirically.

### **3.4 Termination of Test Boreholes**

Termination of percussion drilling test boreholes is based on two major governing conditions;

- Encountering refusal (absolute inability of the sampling tube to penetrate a sufficiently hard stratum even after repeated hammer blows numbering 50 or more);
- Attainment of a specified depth in a test bore (as expressly dictated by laid-out terms of agreement prior to commencement of the investigations). These are 10 m along the line route except typical swamp around Badagry, 20m for the two substations and along swampy sections of the line around Badagry.

Termination of a Standard Penetration Test Borehole will occur when any of the above conditions is met, in any particular order (whichever happens first).

### **3.5 Dutch Cone Penetrometer Tests**

The penetrometer tests were carried out using the 2½-ton testing equipment.

The tests were terminated when the end and side resistance against the cone and the rods made the testing machine anchors to yield within the subsoil encountered near the ground surface.

The basic principle of the penetrometer test is that a rod is pushed into the ground and the resistance on the tip (cone) of the rod is measured by a hydraulic system.

The cone, with a cross-sectional area of  $1000\text{mm}^2$  and a cone apex angle of  $60^\circ$ , is pushed to the required depth, at an approximate rate of 20mm/s, in the closed position by exerting pressure on the outer sounding tube. The force on the cone is then measured while the cone is pushed downward by means of the inner pressure rod independently of the outer sounding tube.

This procedure is repeated at regular intervals of every 0.20m depth.

All the results of the field tests are presented in data and graphical forms in the appendix to this report.

## **4.0 LABORATORY TESTING.**

Laboratory classification and strength tests were carried out on the undisturbed and disturbed samples obtained from the boreholes to improve on the field identification and classification tests. The tests carried out include:

- Moisture Content Determination;
- Particle Size Distribution Tests;
- pH Value of Water in Soils;
- Sulphate Content of Water in Soils;
- Direct Shear test;
- Unconfined Compression/Consolidation test;
- Specific Gravity Test;
- Bulk Density Test.

The details of laboratory tests are presented in Table 4.1. Other tests carried out include: pH value of water in soils; Sulphate Content; and Chloride Content;

## 5.0 ANALYSIS OF BEARING CAPACITY

5.1. The allowable bearing pressure imposed by a foundation is a function of characteristics of the shear strength of the soil as well as the depth and dimension of the foundation. The bearing capacities for selected boring locations calculated from the laboratory direct shear tests conducted on undisturbed samples at various depths, is illustrated as follows:

SA1@2.1m

$$Q_{\text{Ultimate}} = CN_c + \gamma D (N_q - 1) + \frac{1}{2} \gamma B N_\gamma$$

Where  $C = 8\text{kN/m}^2$ ,  $\phi = 15^\circ$ ,  $\gamma = 21.11\text{kN/m}^3$ ,  $B = 2\text{m}$ ,  $D = 2.1\text{m}$ .

The Bearing capacity coefficients; (shallow foundations)

$$N_c = 11, N_q = 4, N_\gamma = 1$$

$$\text{Therefore, } q_{\text{ult}} = (8 \times 11) + (21.11 \times 2.1 \times 3) + (0.5 \times 21.11 \times 2 \times 1)$$

$$= 88 + 132.993 + 21.11$$

$$= \underline{\underline{242.103\text{kN/m}^2}}$$

Factor of safety = 2.5

$$q_{\text{allow}} = \underline{\underline{96.84\text{kN/m}^2}}$$

The values of Ultimate Bearing Pressures derived from the SPT results obtained are presented below:

**Table 5.1 Bearing Capacity Values from Field Results (N Values)**

| Boring Number | Depth (m) | N-Value | Ultimate Bearing Capacity (kN/m <sup>2</sup> ) | Allowable Bearing Capacity – Factored by 2.5 (kN/m <sup>2</sup> ) |
|---------------|-----------|---------|--|---|
| SA1           | 0.6       | 4       | <b>40</b>                                      | <b>16</b>   |
|               | 2.1       | 21      | <b>210</b>                                     | <b>84</b>   |
|               | 3.6       | 26      | <b>260</b>                                     | <b>104</b>  |
|               | 5.1       | 32      | <b>320</b>                                     | <b>128</b>  |
|               | 6.6       | 37      | <b>370</b>                                     | <b>148</b>  |
|               | 8.1       | 60      | <b>600</b>                                     | <b>240</b>  |
|               | 9.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
| SA2           | 0.6       | 3       | <b>30</b>                                      | <b>12</b>   |
|               | 2.1       | 56      | <b>560</b>                                     | <b>224</b>  |
|               | 3.6       | 82      | <b>820</b>                                     | <b>328</b>  |
|               | 5.1       | 100     | <b>1000</b>                                    | <b>400</b>  |
|               | 6.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
|               | 8.1       | 100     | <b>1000</b>                                    | <b>400</b>  |
| SA3           | 0.6       | 10      | <b>100</b>                                     | <b>40</b>   |
|               | 2.1       | 60      | <b>600</b>                                     | <b>240</b>  |

|  |     |     |             |            |
|--|-----|-----|-------------|------------|
|  | 3.6 | 84  | <b>840</b>  | <b>336</b> |
|  | 5.1 | 100 | <b>1000</b> | <b>400</b> |

**Table 5.1b: Bearing Capacity Values from Field Results (N Values)**

| Boring Number | Depth (m) | N-Value | Ultimate Bearing Capacity (kN/m <sup>2</sup> ) | Allowable Bearing Capacity – Factored by 2.5 (kN/m <sup>2</sup> ) |
|---------------|-----------|---------|--|---|
| SA4           | 0.6       | 10      | <b>100</b>                                     | <b>40</b>   |
|               | 2.1       | 21      | <b>210</b>                                     | <b>84</b>   |
|               | 3.6       | 34      | <b>340</b>                                     | <b>136</b>  |
|               | 5.1       | 90      | <b>900</b>                                     | <b>360</b>  |
|               | 6.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
| NA5           | 0.6       | 19      | <b>190</b>                                     | <b>76</b>   |
|               | 2.1       | 53      | <b>530</b>                                     | <b>212</b>  |
|               | 3.6       | 52      | <b>520</b>                                     | <b>208</b>  |
|               | 5.1       | 90      | <b>900</b>                                     | <b>360</b>  |
|               | 6.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
| SA6           | 0.6       | 69      | <b>690</b>                                     | <b>276</b>  |
|               | 2.1       | 25      | <b>250</b>                                     | <b>100</b>  |
|               | 3.6       | 31      | <b>310</b>                                     | <b>124</b>  |
|               | 5.1       | 100     | <b>1000</b>                                    | <b>400</b>  |
|               | 6.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
|               | 8.1       | 100     | <b>1000</b>                                    | <b>400</b>  |
| NA7           | 0.6       | 19      | <b>190</b>                                     | <b>76</b>   |
|               | 2.1       | 100     | <b>1000</b>                                    | <b>400</b>  |
|               | 3.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
| SA8           | 0.6       | 2       | <b>20</b>                                      | <b>8</b>  |
|               | 2.1       | 10      | <b>100</b>                                     | <b>40</b>   |
|               | 3.6       | 19      | <b>190</b>                                     | <b>76</b>   |
|               | 5.1       | 32      | <b>320</b>                                     | <b>128</b>  |
|               | 6.6       | 40      | <b>400</b>                                     | <b>160</b>  |
|               | 8.1       | 50      | <b>500</b>                                     | <b>200</b>  |
|               | 9.6       | 100     | <b>1000</b>                                    | <b>400</b>  |



**Table 5.1c: Bearing Capacity Values from Field Results (N Values)**

| Boring Number | Depth (m) | N-Value | Ultimate Bearing Capacity (kN/m <sup>2</sup> ) | Allowable Bearing Capacity – Factored by 2.5 (kN/m <sup>2</sup> ) |
|---------------|-----------|---------|--|---|
| NA9           | 0.6       | 26      | <b>260</b>                                     | <b>104</b>  |
|               | 2.1       | 29      | <b>290</b>                                     | <b>116</b>  |
|               | 3.6       | 93      | <b>930</b>                                     | <b>372</b>  |
|               | 5.1       | 100     | <b>1000</b>                                    | <b>400</b>  |
|               | 6.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
| SA10          | 0.6       | 9       | <b>90</b>                                      | <b>36</b>   |
|               | 2.1       | 48      | <b>480</b>                                     | <b>192</b>  |
|               | 3.6       | 62      | <b>620</b>                                     | <b>248</b>  |
|               | 5.1       | 67      | <b>670</b>                                     | <b>268</b>  |
|               | 6.6       | 87      | <b>870</b>                                     | <b>348</b>  |
|               | 8.1       | 100     | <b>1000</b>                                    | <b>400</b>  |
|               | 9.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
| SA11          | 0.6       | 3       | <b>30</b>                                      | <b>12</b>   |
|               | 2.1       | 20      | <b>200</b>                                     | <b>80</b>   |
|               | 3.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
|               | 5.1       | 100     | <b>1000</b>                                    | <b>400</b>  |
|               | 6.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
| SA12          | 0.6       | 4       | <b>40</b>                                      | <b>16</b>   |
|               | 2.1       | 2       | <b>20</b>                                      | <b>8</b>  |
|               | 3.6       | 2       | <b>20</b>                                      | <b>8</b>  |
|               | 5.1       | 42      | <b>420</b>                                     | <b>168</b>  |
|               | 6.6       | 46      | <b>460</b>                                     | <b>184</b>  |
|               | 8.1       | 100     | <b>1000</b>                                    | <b>400</b>  |
|               | 9.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
| NA13          | 0.6       | 4       | <b>40</b>                                      | <b>16</b>   |
|               | 2.1       | 30      | <b>300</b>                                     | <b>120</b>  |
|               | 3.6       | 100     | <b>1000</b>                                    | <b>400</b>  |

**Table 5.1d: Bearing Capacity Values from Field Results (N Values)**

| Boring Number | Depth (m) | N-Value | Ultimate Bearing Capacity (kN/m <sup>2</sup> ) | Allowable Bearing Capacity – Factored by 2.5 (kN/m <sup>2</sup> ) |
|---------------|-----------|---------|--|---|
| NA14          | 0.6       | 4       | <b>40</b>                                      | <b>16</b>   |
|               | 2.1       | 4       | <b>40</b>                                      | <b>16</b>   |
|               | 3.6       | 17      | <b>170</b>                                     | <b>68</b>   |
|               | 5.1       | 97      | <b>970</b>                                     | <b>388</b>  |
|               | 6.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
|               | 8.1       | 100     | <b>1000</b>                                    | <b>400</b>  |
| SA15          | 0.6       | 2       | <b>20</b>                                      | <b>8</b>  |
|               | 2.1       | 37      | <b>370</b>                                     | <b>148</b>  |
|               | 3.6       | 80      | <b>800</b>                                     | <b>320</b>  |
|               | 5.1       | 45      | <b>450</b>                                     | <b>180</b>  |
|               | 6.6       | 40      | <b>400</b>                                     | <b>160</b>  |
|               | 8.1       | 80      | <b>800</b>                                     | <b>320</b>  |
|               | 9.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
| SA16          | 0.6       | 2       | <b>20</b>                                      | <b>8</b>  |
|               | 2.1       | 12      | <b>120</b>                                     | <b>48</b>   |
|               | 3.6       | 34      | <b>340</b>                                     | <b>136</b>  |
|               | 5.1       | 100     | <b>1000</b>                                    | <b>400</b>  |
|               | 6.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
| SA17          | 0.6       | 2       | <b>20</b>                                      | <b>8</b>  |
|               | 2.1       | 6       | <b>60</b>                                      | <b>24</b>   |
|               | 3.6       | 11      | <b>110</b>                                     | <b>44</b>   |
|               | 5.1       | 49      | <b>490</b>                                     | <b>196</b>  |
|               | 6.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
|               | 8.1       | 100     | <b>1000</b>                                    | <b>400</b>  |

**Table 5.1e: Bearing Capacity Values from Field Results (N Values)**

| Boring Number | Depth (m) | N-Value | Ultimate Bearing Capacity (kN/m <sup>2</sup> ) | Allowable Bearing Capacity – Factored by 2.5 (kN/m <sup>2</sup> ) |
|---------------|-----------|---------|--|---|
|---------------|-----------|---------|--|---|

|      |     |     |             |            |
|------|-----|-----|-------------|------------|
| SA18 | 0.6 | 2   | <b>20</b>   | <b>8</b>   |
|      | 2.1 | 20  | <b>200</b>  | <b>80</b>  |
|      | 3.6 | 35  | <b>350</b>  | <b>140</b> |
|      | 5.1 | 50  | <b>500</b>  | <b>200</b> |
|      | 6.6 | 44  | <b>440</b>  | <b>176</b> |
|      | 8.1 | 100 | <b>1000</b> | <b>400</b> |
| SA19 | 0.6 | 2   | <b>20</b>   | <b>8</b>   |
|      | 2.1 | 17  | <b>170</b>  | <b>68</b>  |
|      | 3.6 | 11  | <b>110</b>  | <b>44</b>  |
|      | 5.1 | 100 | <b>1000</b> | <b>400</b> |
| SA20 | 0.6 | 3   | <b>30</b>   | <b>12</b>  |
|      | 2.1 | 4   | <b>40</b>   | <b>16</b>  |
|      | 3.6 | 17  | <b>170</b>  | <b>68</b>  |
|      | 5.1 | 41  | <b>410</b>  | <b>164</b> |
|      | 6.6 | 65  | <b>650</b>  | <b>260</b> |
|      | 8.1 | 100 | <b>1000</b> | <b>400</b> |

**Table 5.1f: Bearing Capacity Values from Field Results (N Values)**

| Boring Number       | Depth (m) | N-Value | Ultimate Bearing Capacity (kN/m <sup>2</sup> ) | Allowable Bearing Capacity – Factored by 2.5 (kN/m <sup>2</sup> ) |
|---------------------|-----------|---------|--|---|
| BH1 EJIO SUBSTATION | 0.6       | 6       | <b>60</b>                                      | <b>24</b>   |
|                     | 2.1       | 100     | <b>1000</b>                                    | <b>400</b>  |
|                     | 3.6       | 100     | <b>1000</b>                                    | <b>400</b>  |
| BH2 EJIO SUBSTATION | 0.6       | 9       | <b>90</b>                                      | <b>36</b>   |

|                       |     |     |             |            |
|-----------------------|-----|-----|-------------|------------|
|                       | 2.1 | 100 | <b>1000</b> | <b>400</b> |
| BH3 EJIO SUBSTATION   | 0.6 | 10  | <b>100</b>  | <b>40</b>  |
|                       | 2.1 | 100 | <b>1000</b> | <b>400</b> |
| BH1 REDEEM SUBSTATION | 0.6 | 13  | <b>130</b>  | <b>52</b>  |
|                       | 2.1 | 100 | <b>1000</b> | <b>400</b> |
| BH2 REDEEM SUBSTATION | 0.6 | 4   | <b>40</b>   | <b>16</b>  |
|                       | 2.1 | 14  | <b>140</b>  | <b>56</b>  |
|                       | 3.6 | 20  | <b>200</b>  | <b>80</b>  |
|                       | 5.1 | 100 | <b>1000</b> | <b>400</b> |
|                       | 6.6 | 100 | <b>1000</b> | <b>400</b> |
| BH3 REDEEM SUBSTATION | 0.6 | 4   | <b>40</b>   | <b>16</b>  |
|                       | 2.1 | 9   | <b>90</b>   | <b>36</b>  |
|                       | 3.6 | 15  | <b>150</b>  | <b>60</b>  |
|                       | 5.1 | 59  | <b>590</b>  | <b>236</b> |
|                       | 6.6 | 100 | <b>1000</b> | <b>400</b> |

## 6.0. ANALYSIS OF CONSOLIDATION SETTLEMENT

The Meyehorf's method is used to estimate the settlement of a footing on sand and is given by the relationship.

$$P = \frac{\Delta P \times B}{2 Cr}$$

Where  $\Delta P$  - The net foundation pressure increase which is simply the foundation loading less the value of vertical effective stress at foundation level ( $\delta v$ )

B - The least dimension of the footing

Cr - The average value of SPT over a depth below the footing equal to B

$$Cr = 400 \times N \text{ (kN/m}^2\text{)}$$

**at 0.0-0.6m**

$$\begin{aligned} \Delta P &= 40 - (9.62 \times 0.6) \\ &= 34.228 \text{ kN/m}^2 \end{aligned}$$

$$B = 2.0 \text{ m}$$

$$Cr = 400 \times 4 = 1600$$

$$P = \frac{34.228 \times 2}{1600 \times 2} = \frac{68.456}{3200}$$

$$= 21.39 \text{ mm}$$

**Table 6.1 Settlement of Foundation**

| Depth of layer Below Ground(m) | Net Foundation Pressure $\Delta P$ (kN/m <sup>2</sup> ) | The Average value of SPT Cr (kN/m <sup>2</sup> ) | Settlement (mm) |
|--------------------------------|---|--|-----------------|
| <b>0.00 – 0.6</b>              | <b>34.228</b>   | <b>1600</b>                                      | <b>21.39</b>    |

The average immediate settlement at 0.6m is 21.39mm which decreases with depth.

## 7.0 ANCILLARY TESTS

### Chemical Test Results

The chemical test results are shown in Table 7.1. These results indicate sulphate content of between 285.7 – 311.5mg/l and pH values ranging from 6.67 – 6.92. The pH value is considered slightly acidic while the sulphate content is considered moderate and within limit.

**Table 7.1 Results of Chemical Tests**

| Boring Location       | Chemical Results |                          |                         |                     | Remarks                   |
|-----------------------|------------------|--------------------------|-------------------------|---------------------|---------------------------|
|                       | pH Value         | Sulphate content (mg/kg) | Chloride Content (mg/l) | Organic Content (%) |                           |
| SA1                   | 6.87             | 287.3                    | 105.6                   | 0.873               | Within permissible limits |
| SA2                   | 6.81             | 300.2                    | 110.3                   | 0.875               | Within permissible limits |
| SA3                   | 6.80             | 305.7                    | 115.38                  | 0.875               | Within permissible limits |
| SA4                   | 6.79             | 312.6                    | 106.27                  | 0.885               | Within permissible limits |
| NA5                   | 6.76             | 307.3                    | 111.21                  | 0.893               | Within permissible limits |
| SA6                   | 6.81             | 310.8                    | 104.65                  | 0.876               | Within permissible limits |
| NA7                   | 6.75             | 309.5                    | 112.6                   | 0.872               | Within permissible limits |
| SA8                   | 6.82             | 289.0                    | 105.2                   | 0.883               | Within permissible limits |
| NA9                   | 6.82             | 297.2                    | 113.5                   | 0.901               | Within permissible limits |
| SA10                  | 6.80             | 295.6                    | 107.3                   | 0.826               | Within permissible limits |
| SA11                  | 6.88             | 299.1                    | 108.6                   | 0.873               | Within permissible limits |
| SA12                  | 6.87             | 300.2                    | 111.5                   | 0.885               | Within permissible limits |
| NA13                  | 6.89             | 288.9                    | 107.3                   | 0.886               | Within permissible limits |
| NA14                  | 6.92             | 302.6                    | 112.7                   | 0.879               | Within permissible limits |
| SA15                  | 6.76             | 310.2                    | 103.5                   | 0.886               | Within permissible limits |
| SA16                  | 6.67             | 311.5                    | 109.6                   | 0.859               | Within permissible limits |
| SA17                  | 6.80             | 295.2                    | 115.2                   | 0.902               | Within permissible limits |
| SA18                  | 6.82             | 286.4                    | 102.3                   | 0.868               | Within permissible limits |
| SA19                  | 6.87             | 285.7                    | 107.8                   | 0.912               | Within permissible limits |
| SA20                  | 6.75             | 302.8                    | 105.2                   | 0.826               | Within permissible limits |
| BH1 Ejio Substation   | 6.84             | 291.6                    | 103.6                   | 0.876               | Within permissible limits |
| BH2 Ejio Substation   | 6.88             | 310.6                    | 105.8                   | 0.835               | Within permissible limits |
| BH3 Ejio Substation   | 6.88             | 310.6                    | 109.7                   | 0.881               | Within permissible limits |
| BH1 Redeem Substation | 6.81             | 288.3                    | 110.6                   | 0.892               | Within permissible limits |
| BH2 Redeem Substation | 6.83             | 297.2                    | 111.2                   | 0.858               | Within permissible limits |
| BH3 Redeem Substation | 6.81             | 294.2                    | 112.3                   | 0.865               | Within permissible limits |

**Note:** (1) The values indicated are the average values. (2) The sulphate, chloride, carbonate and organic content in the soils is within the tolerable limit and not a threat to substructures. Therefore, the foundations could be constructed with normal Portland cement, with cement content not less than 380kg/m<sup>3</sup> and maximum water – cement ratio of 0.50.

## **8.0 DISCUSSIONS AND CONCLUSION**

### **8.1 Discussions**

The materials proved are predominantly clayey sand, silty sand, fine sand, sharp sand, silty clay, clayey silt, stiff clay, sandy clay, dense sand, laterite, lateritic clay, concretionary laterite and weathered rock at a depth of 2.1m – 9.6m.

The layer of materials encountered along the transmission line at the depths of 3.6m and 5.1m has a minimum bearing capacity of 8kN/m<sup>2</sup> and 128kN/m<sup>2</sup> respectively at a factor of safety of 2.5.

Also, the layer of materials encountered at Ejio substation at the depth of 2.1m has a minimum bearing capacity of 400kN/m<sup>2</sup> at a factor of 2.5.

The soil layer proved at the REDEEM substation at the depths of 2.1m, 3.6m and 5.1m have minimum bearing capacities of 36kN/m<sup>2</sup>, 60kN/m<sup>2</sup> and 236kN/m<sup>2</sup> respectively at a factor of safety of 2.5. Specific bearing capacities are contained in section 5 of this report.

Average consolidation settlement at 0.6m was calculated as 21.39mm, which reduces with depth.

From the CPT test (appendix F), the tip resistance,  $q_c$  at 2.0m ranges between 3 – 17MPa for Ejio substation and 1.6 – 11.0MPa for REDEEM substation.

### **8.2 Recommendations**

Considering the depth and nature of the overburden explored, and the bearing capacities of materials encountered, the foundation of structures along the proposed transmission Line in Ogun State and a small section in Badagry LGA of Lagos should be RAFT foundation at a depth of 3.0m.

The foundation of the structures within Ejio substation should be ISOLATED PAD foundation with ground beams at a depth of 2.0m. The ground beams are to cater for any possible differential settlement.

Finally, the foundation of the structures within Redeem substation should be RAFT foundation at a depth of 3.0m.

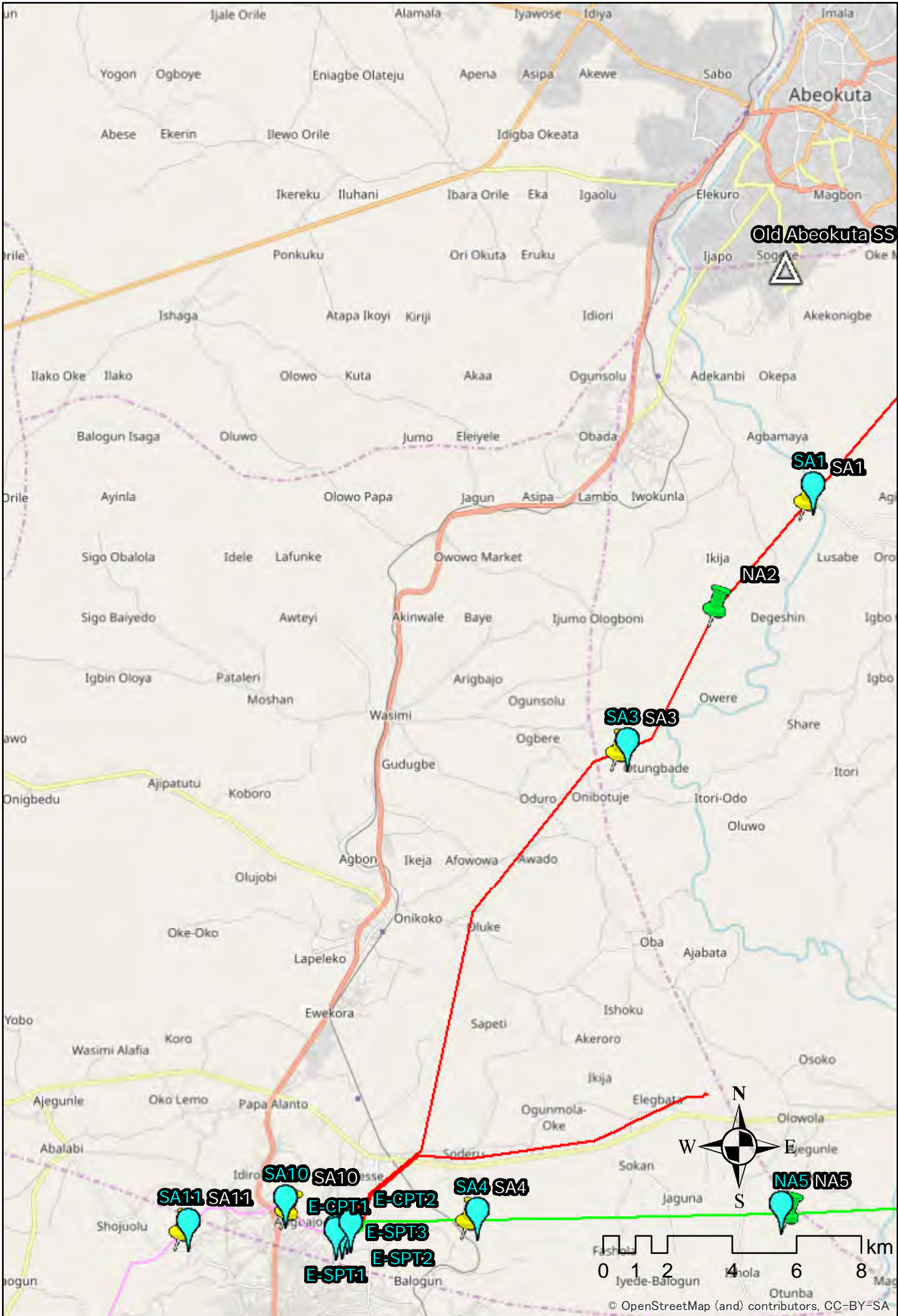
The chemical tests conducted on the samples of soils show sulphate content of 285.7 – 311.5mg/l and pH value of 6.67 – 6.92; this is considered slightly acidic soil with moderate sulphate content. Chloride, carbonate and organic contents were also found to be within tolerable limits, posing no imminent threat to substructures.

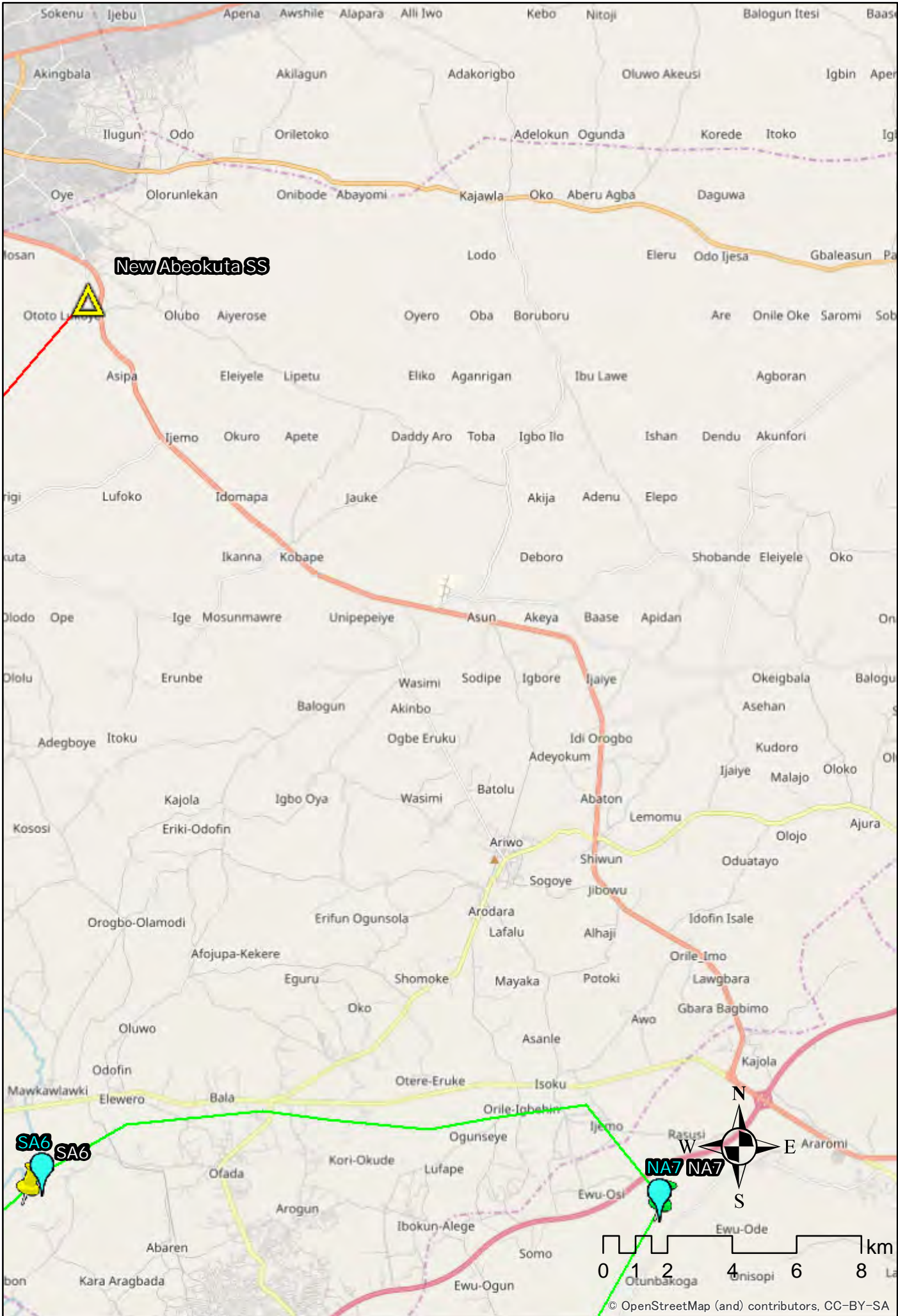
Therefore, normal Portland cement could be used for the construction of the foundation with cement content not less than 375kg/m<sup>3</sup> and maximum water – cement ratio of 0.50.

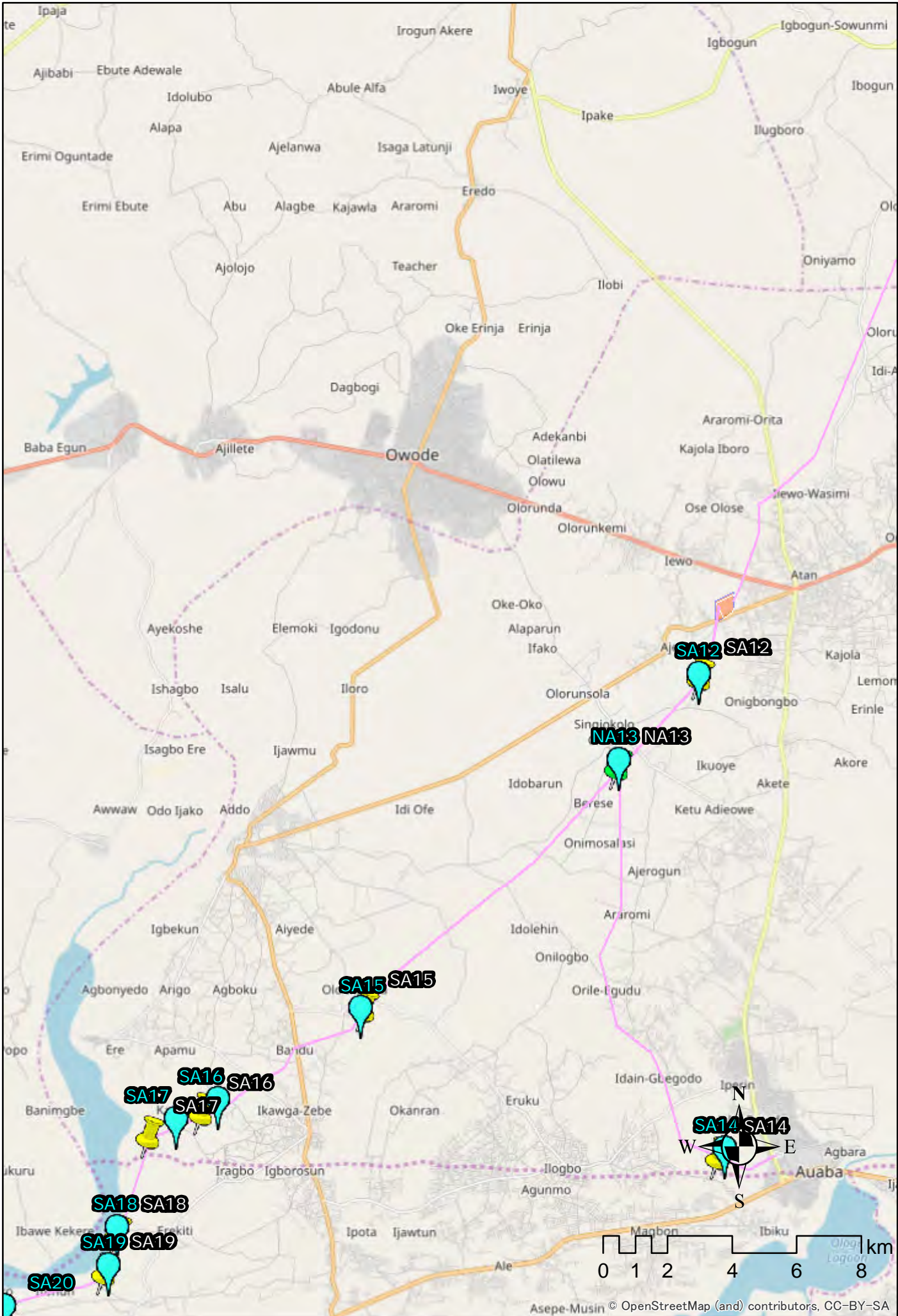
Despite an objective soil investigation and reporting, a poorly designed and/or constructed foundation may lead to structural failure if all other environmental factors remain constant. We therefore recommend that the design and construction of all foundation earthworks be carried out by a competent company in strict compliance with the best professional engineering codes of practice.

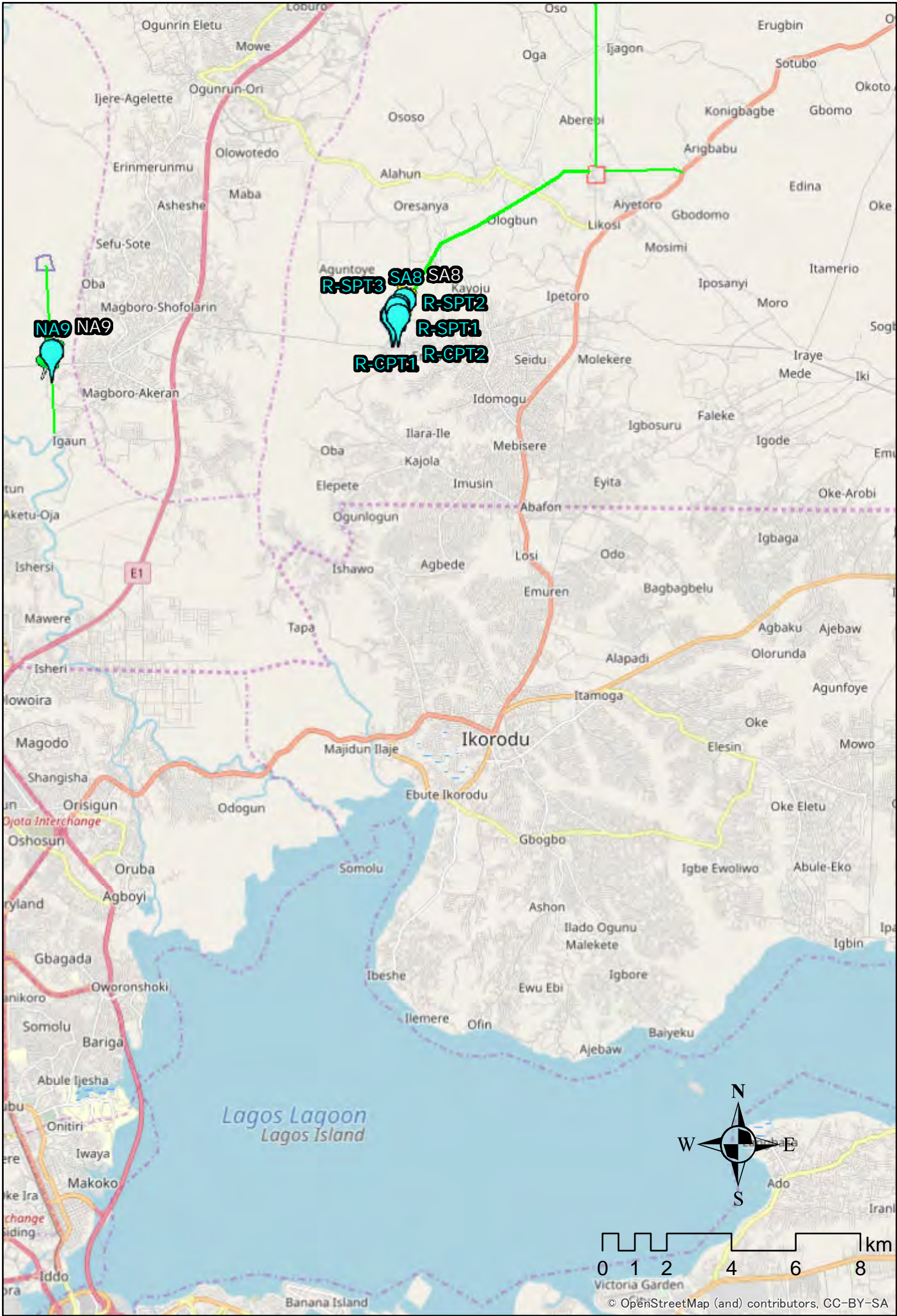












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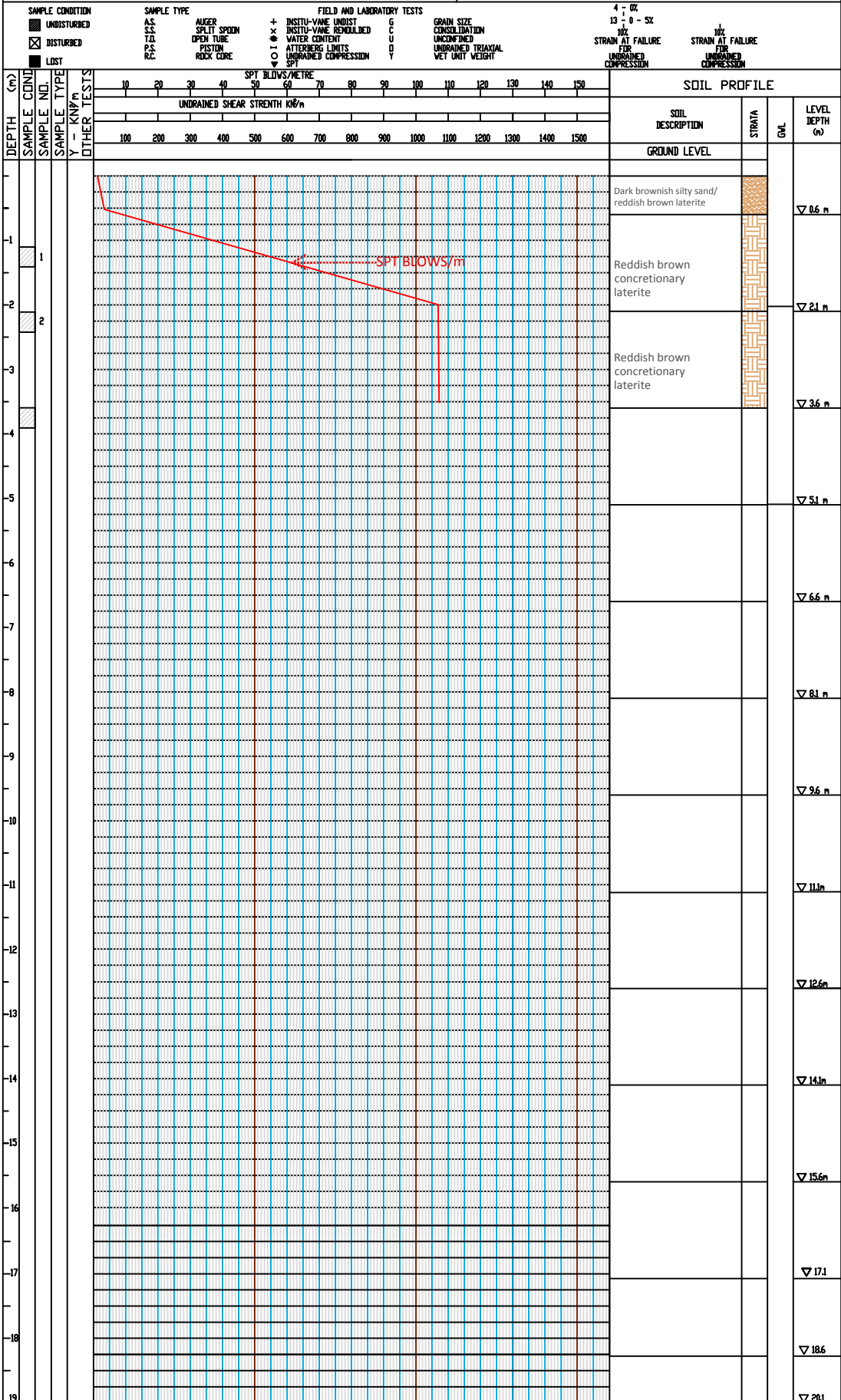
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: BH1 EJID SUBSTATION

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018





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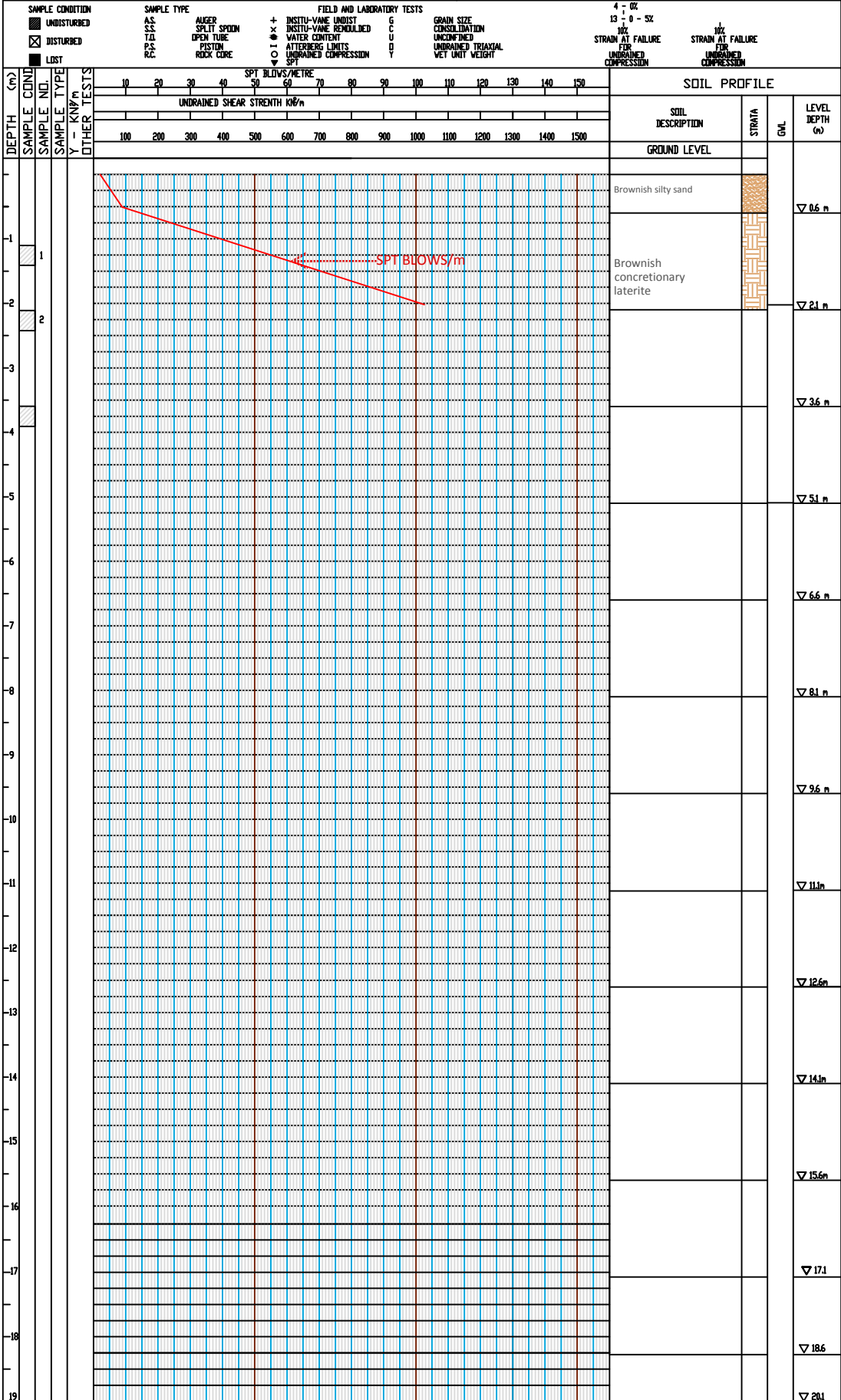
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: BH2 EJID SUBSTATION

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018





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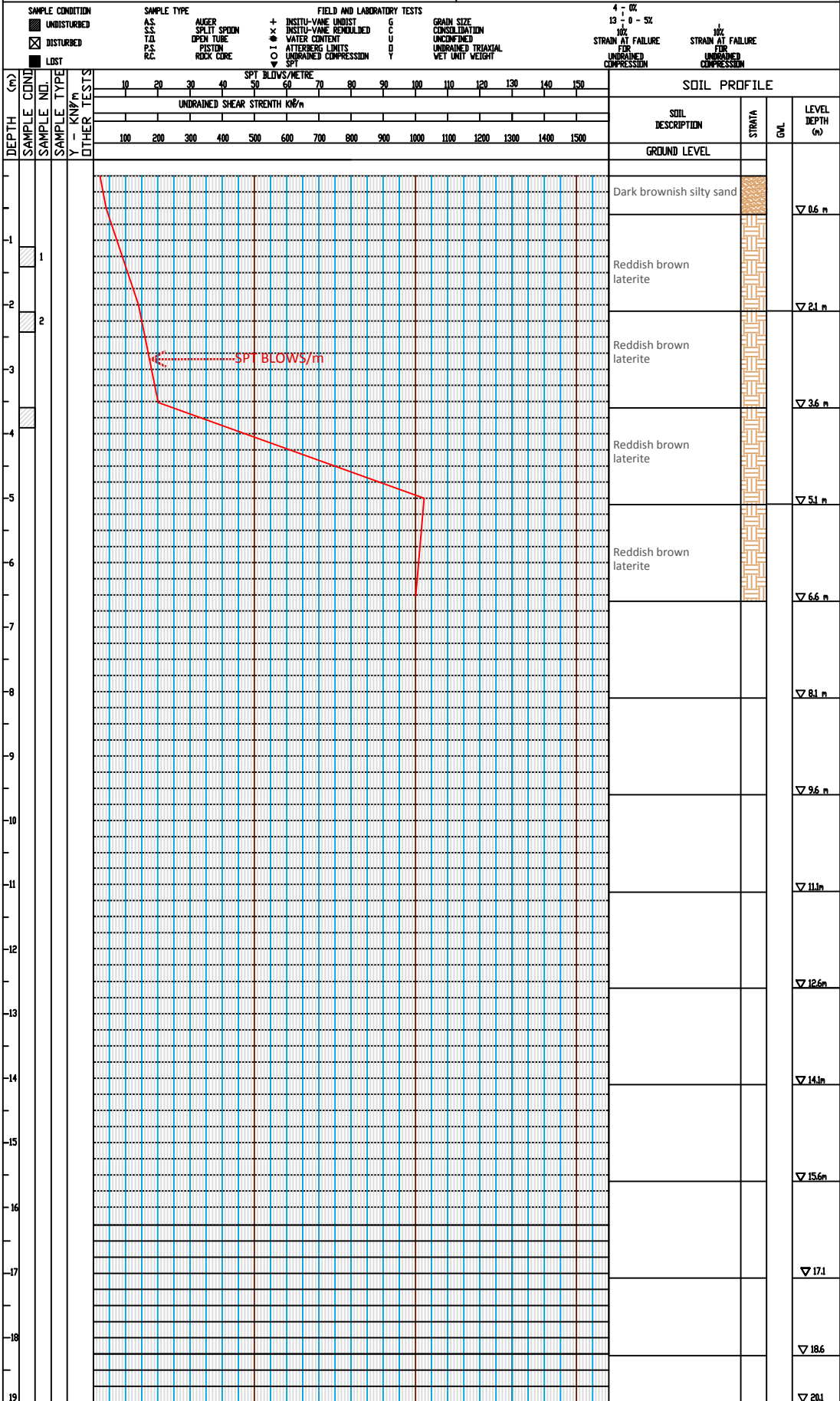
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: BH2 RCCG SUBSTATION

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018



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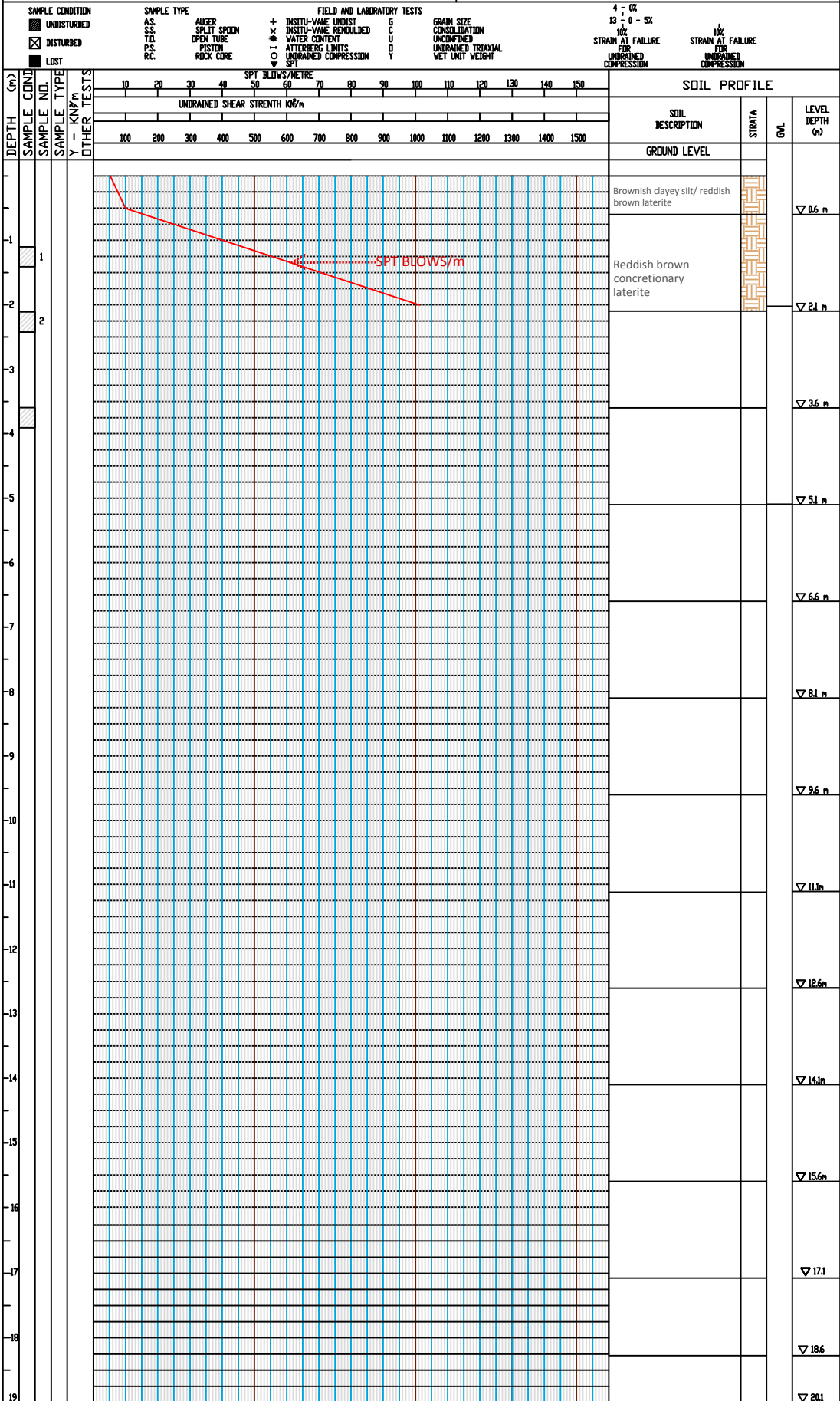
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: BHZ EJID SUBSTATION

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018



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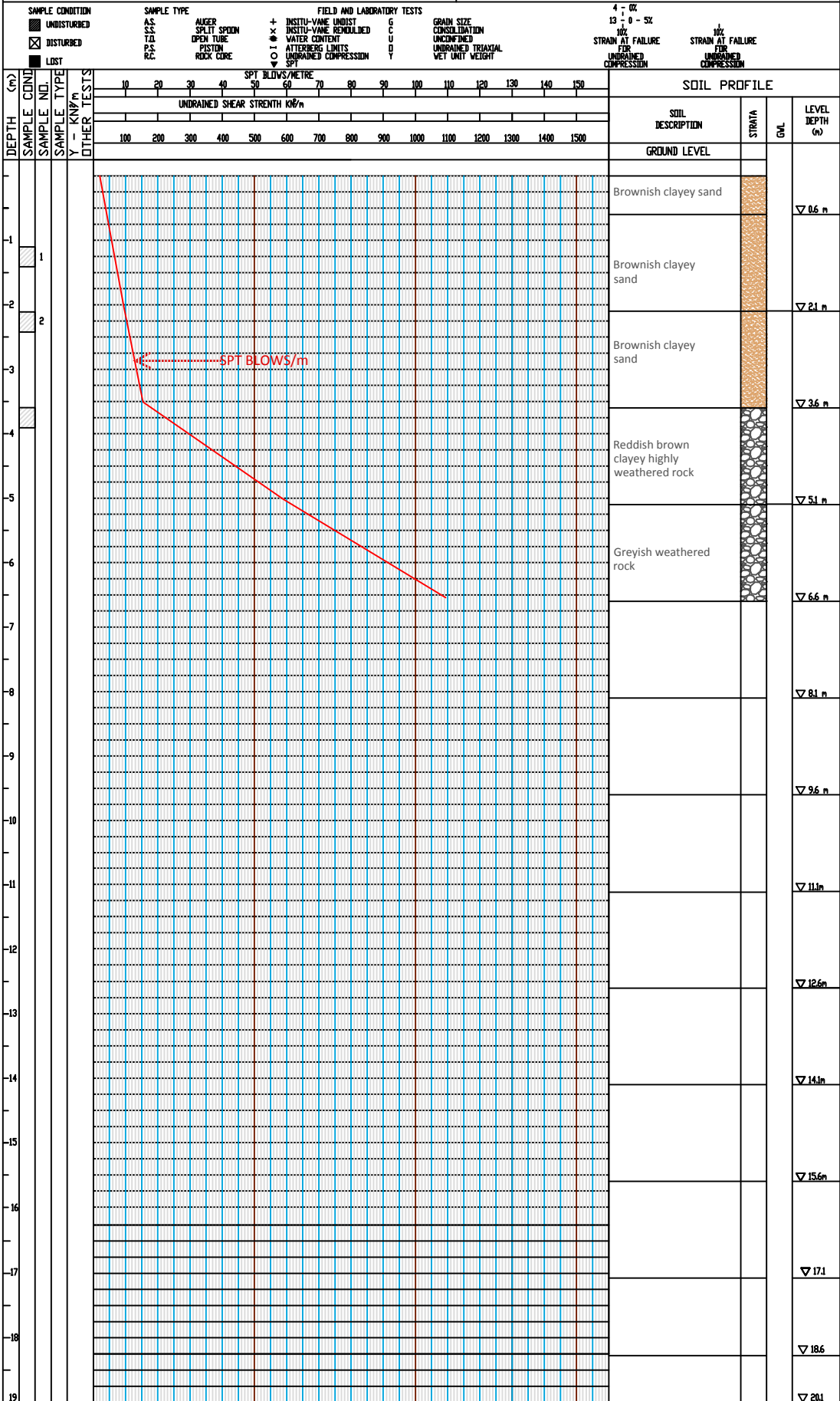
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: BH3 RCCG SUBSTATION

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018





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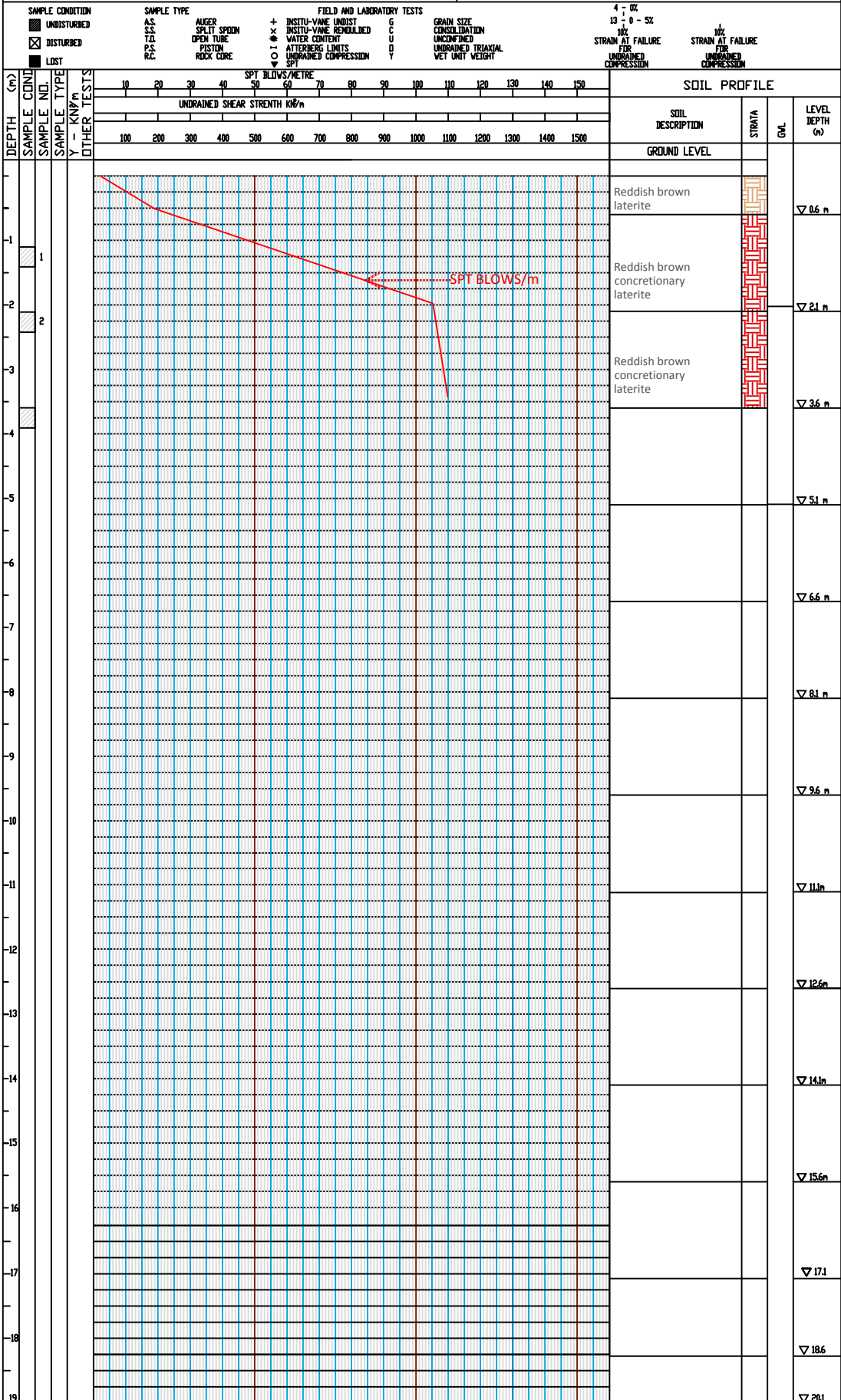
FIGURE: APPENDIX B

PROJECT: PROP. TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: NA7

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018



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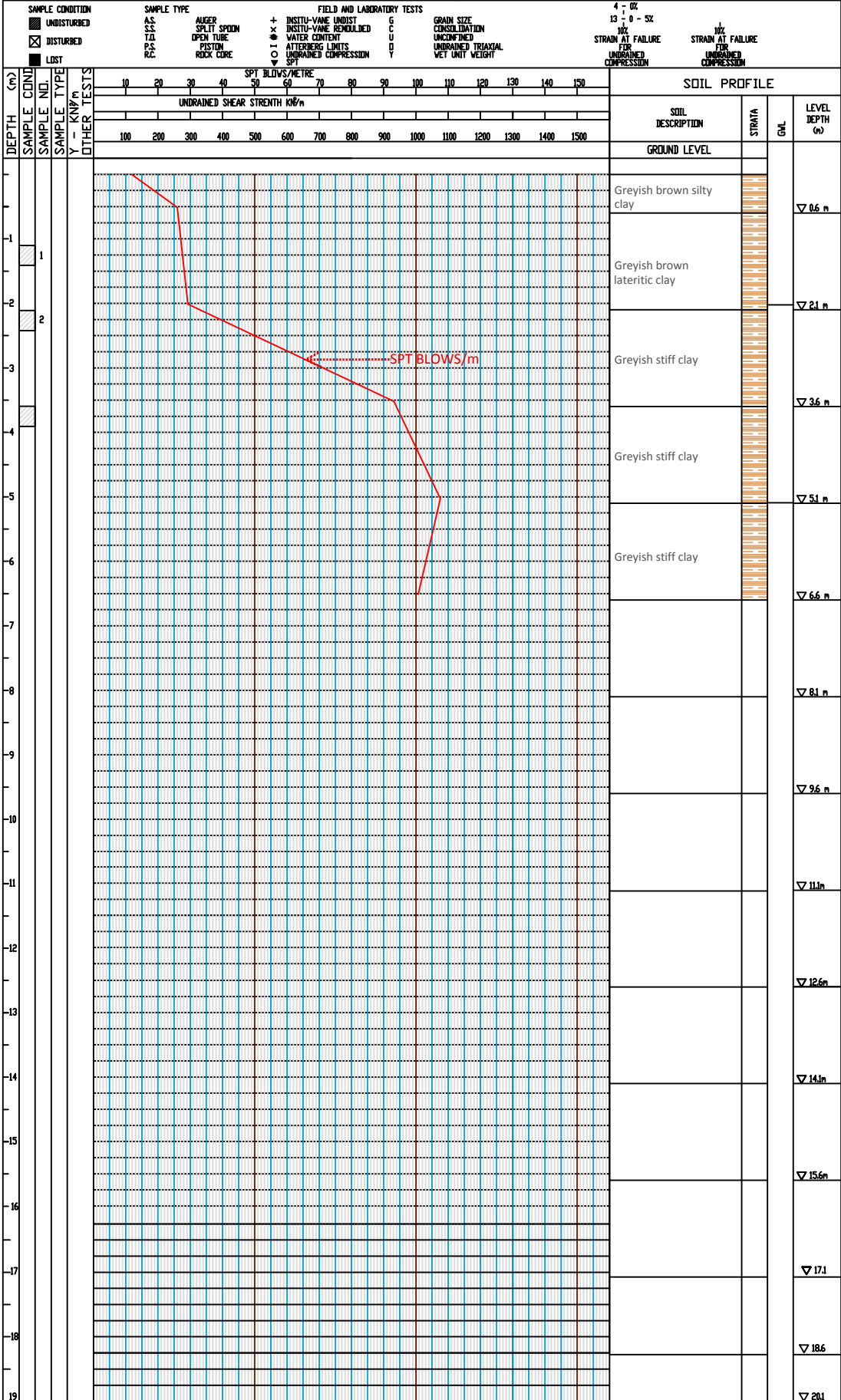
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: NA9

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018



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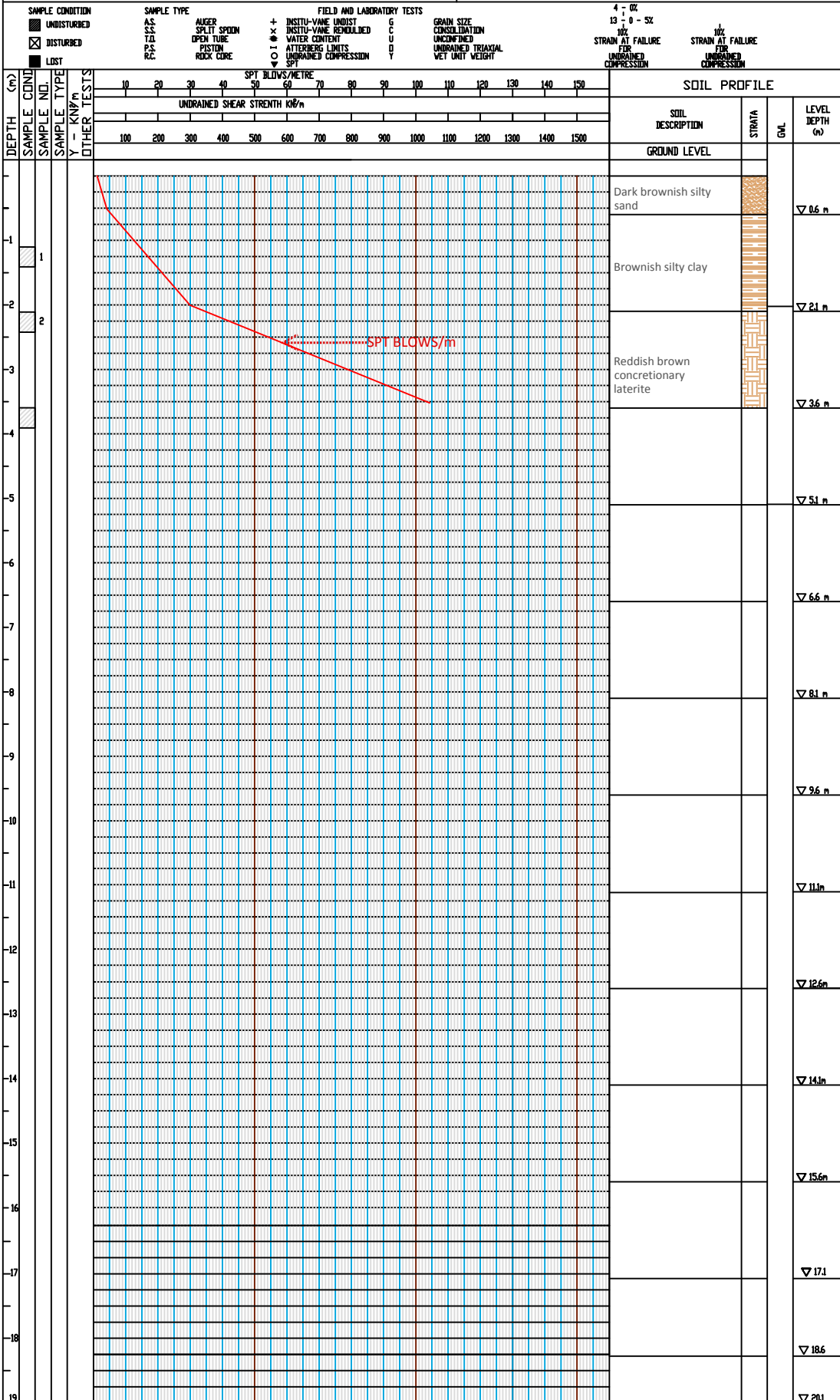
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: NA13

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018



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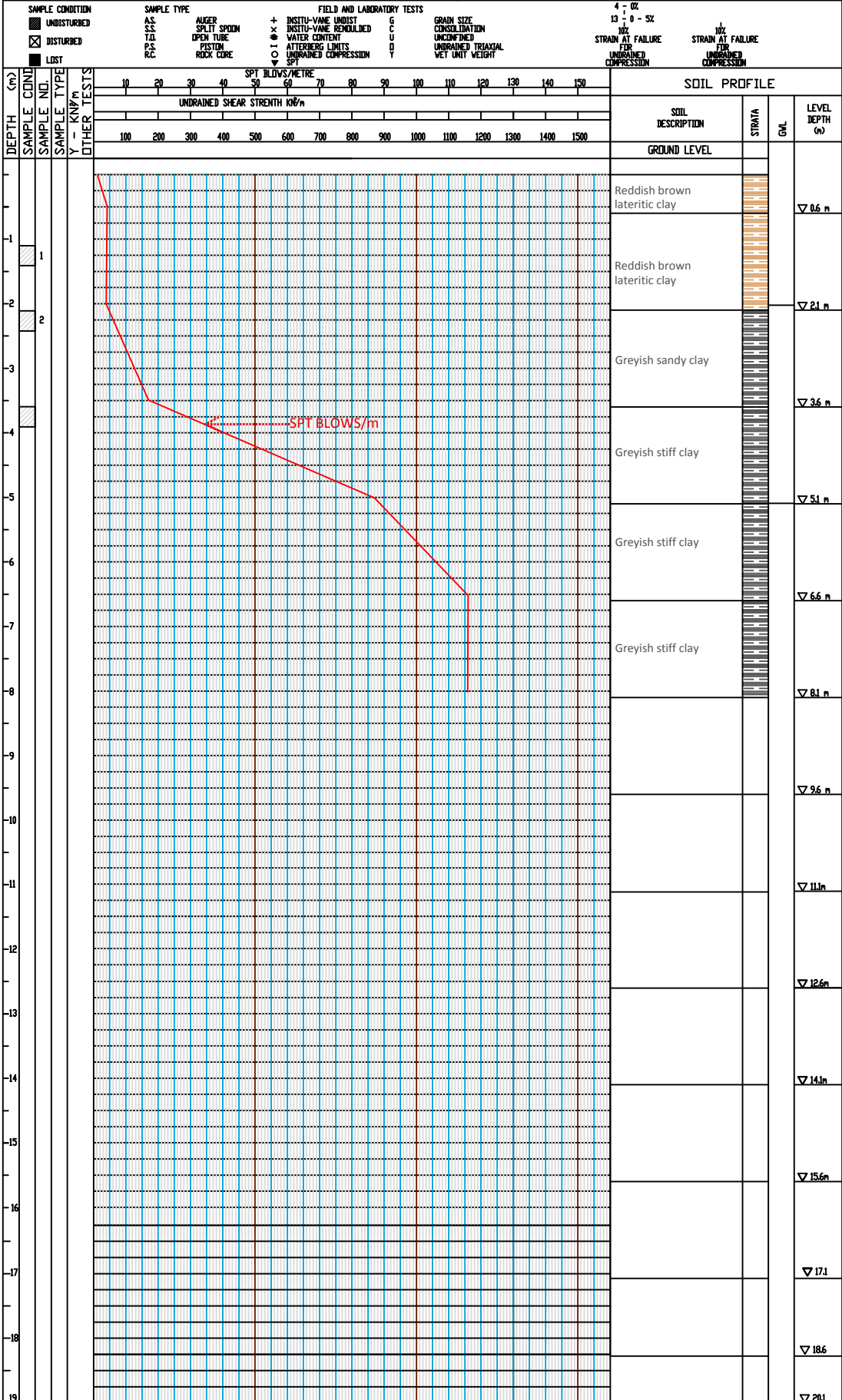
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: NA14

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018









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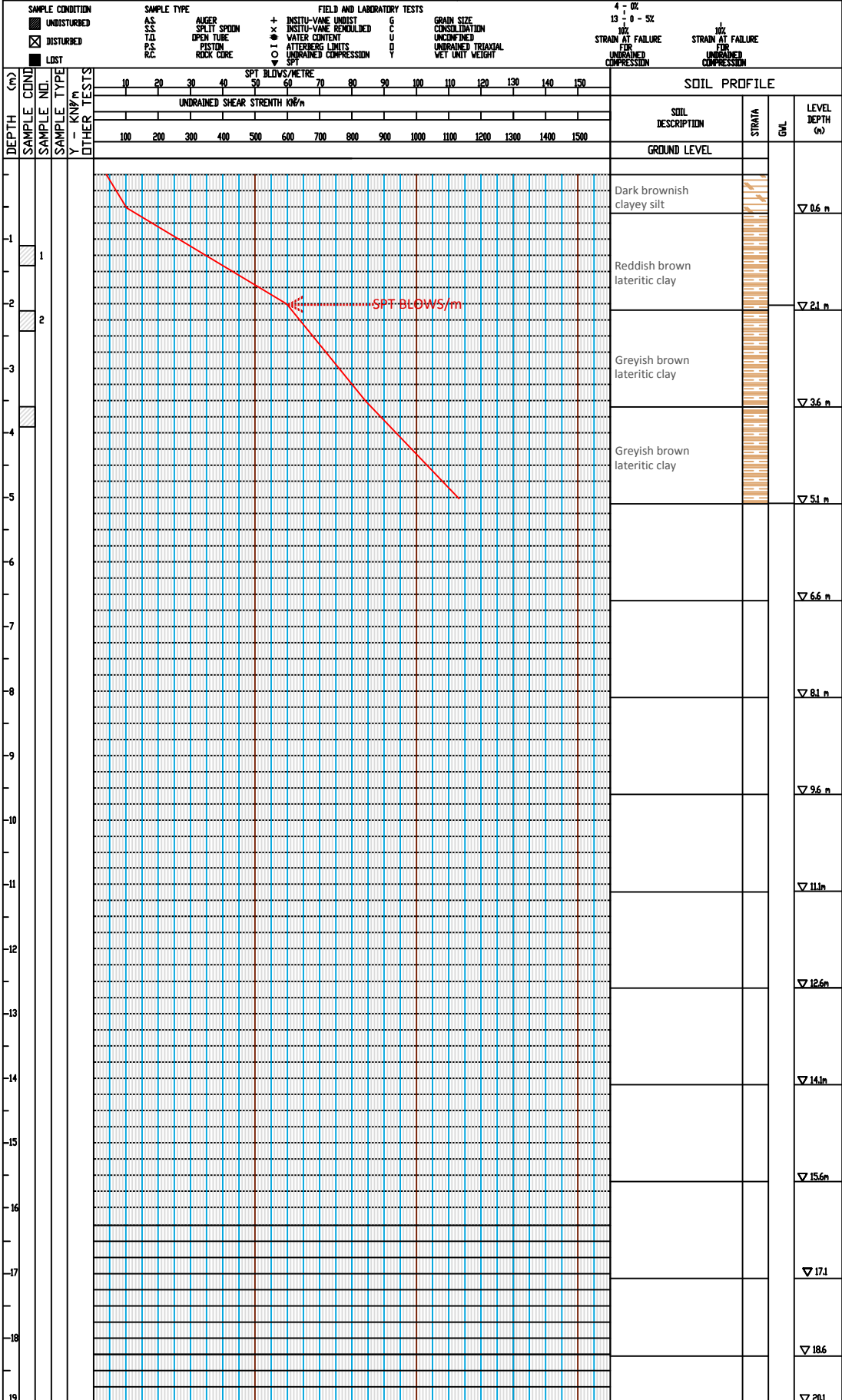
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: SA3

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018



IN-DEPTH ENGINEERING LIMITED.

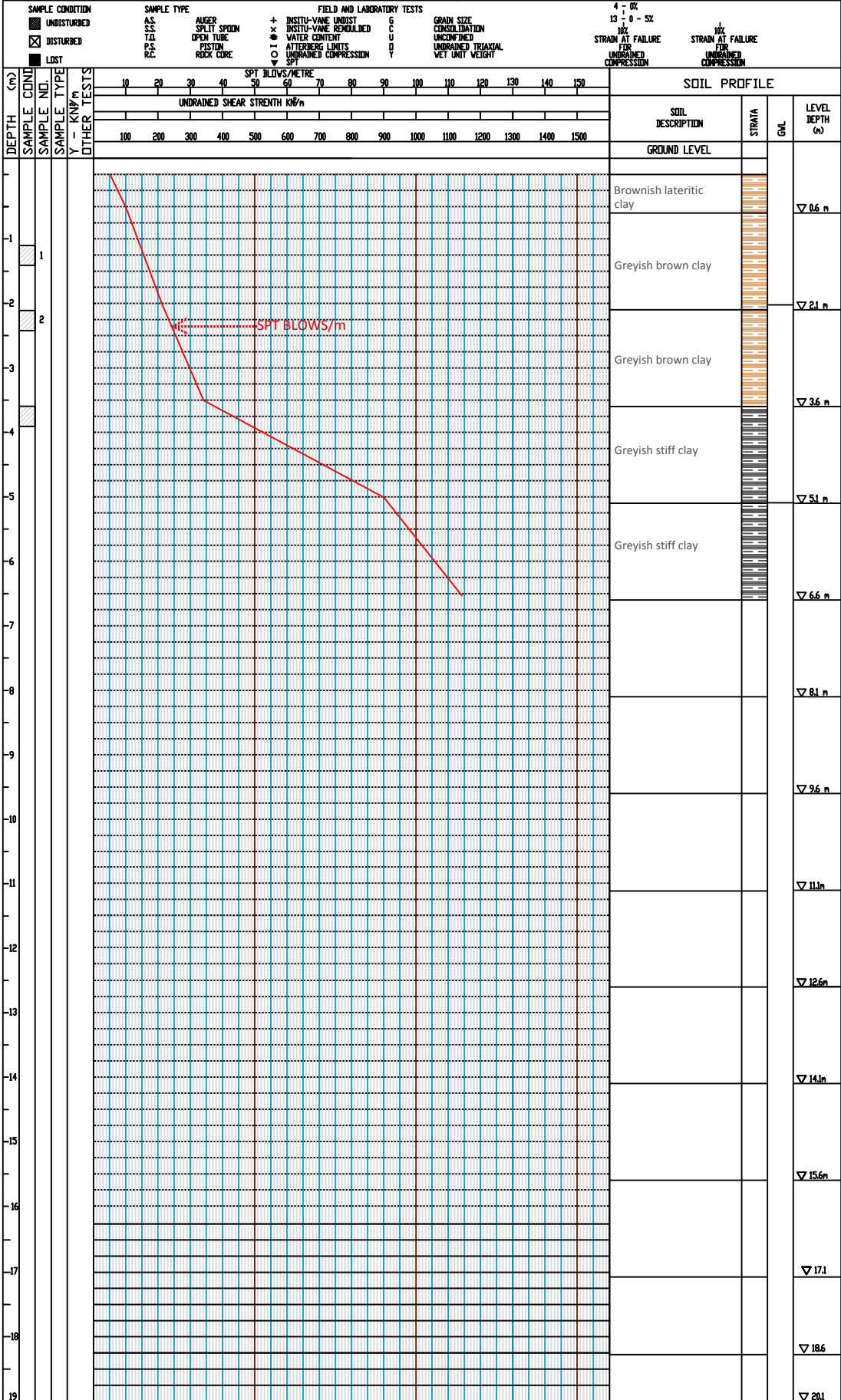
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: SA4  
STATION: SA4

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018



IN-DEPTH ENGINEERING LIMITED.

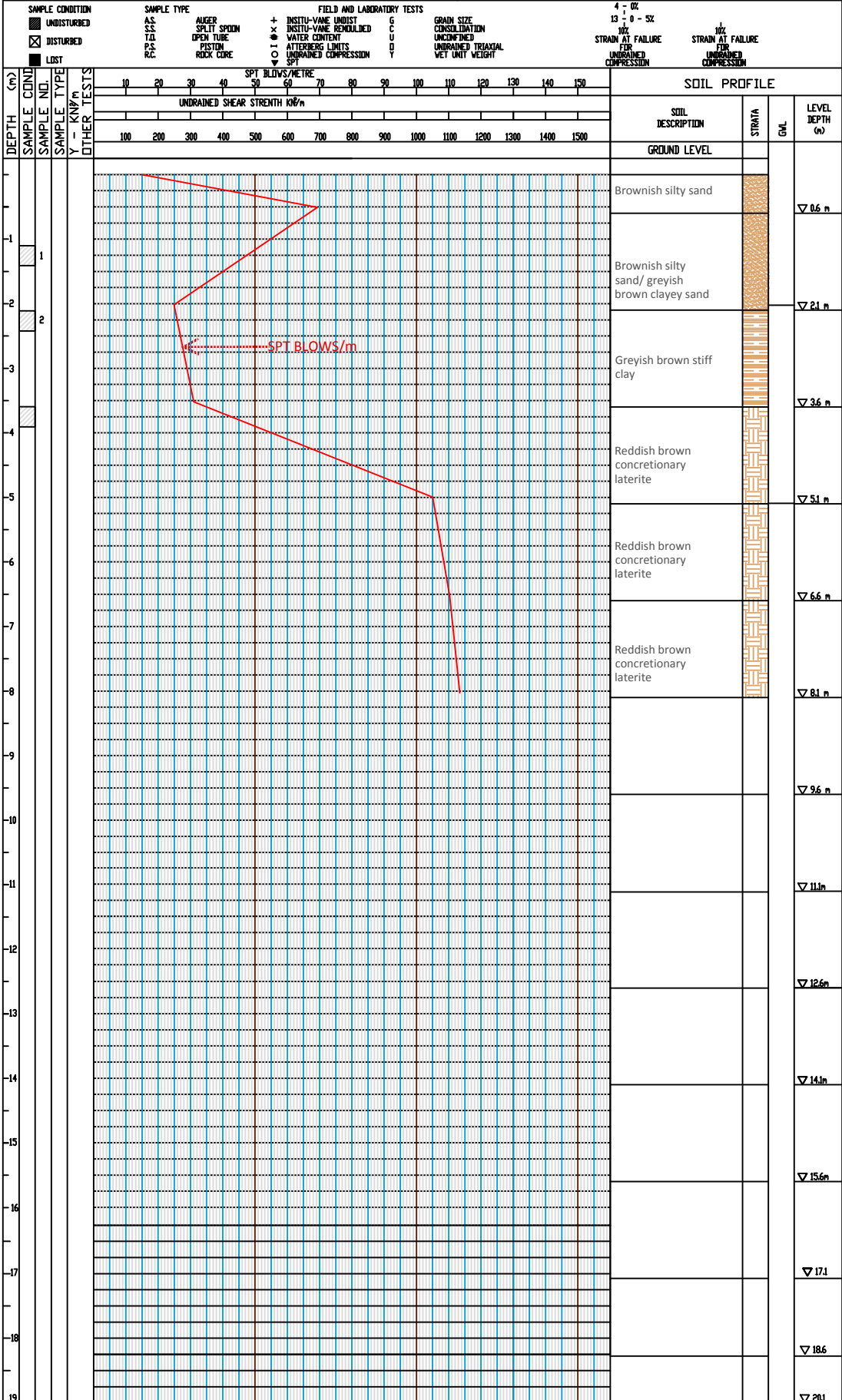
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: SA6

DRILLER: JACOB SPOON OD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018





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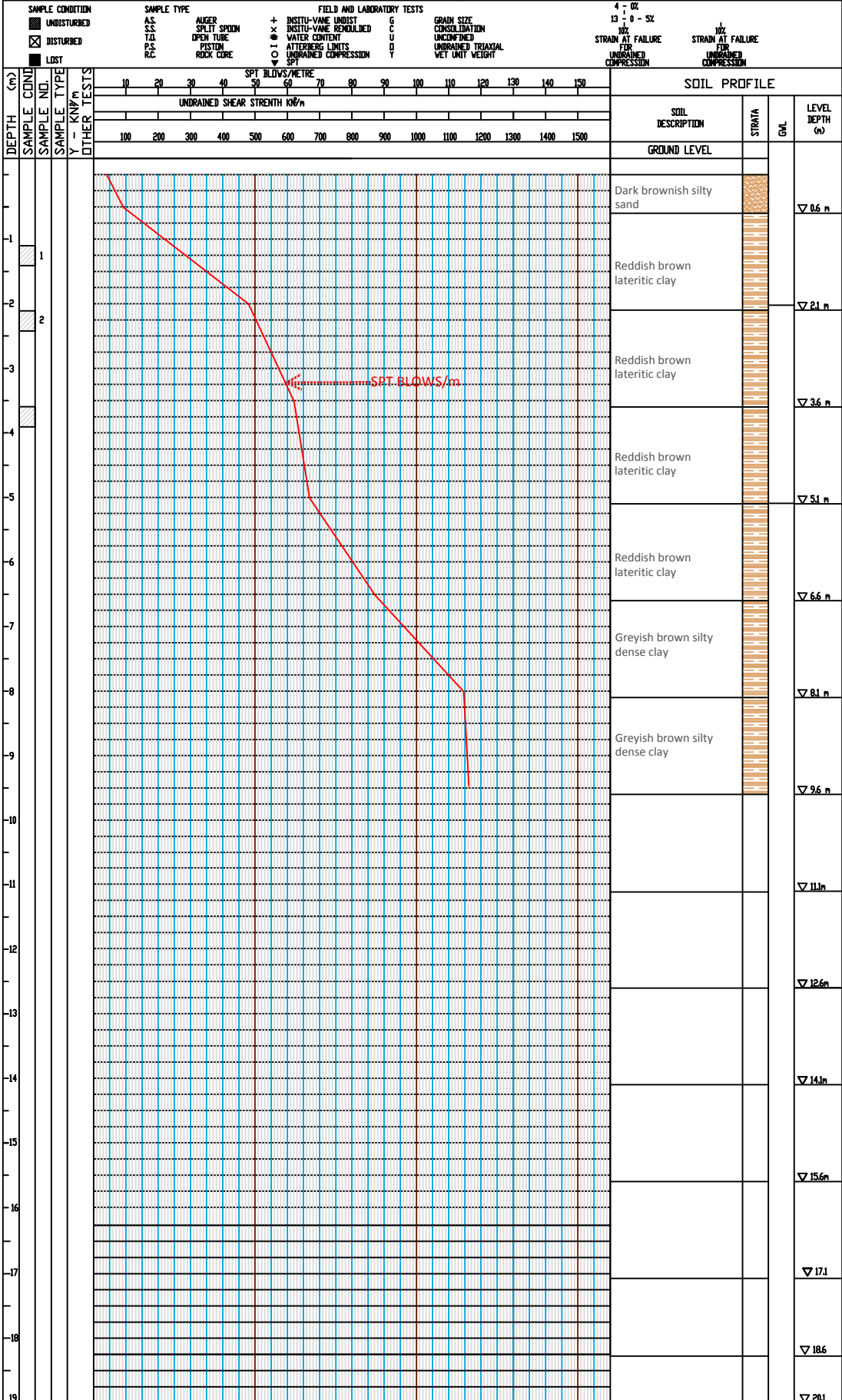
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: SA10

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018







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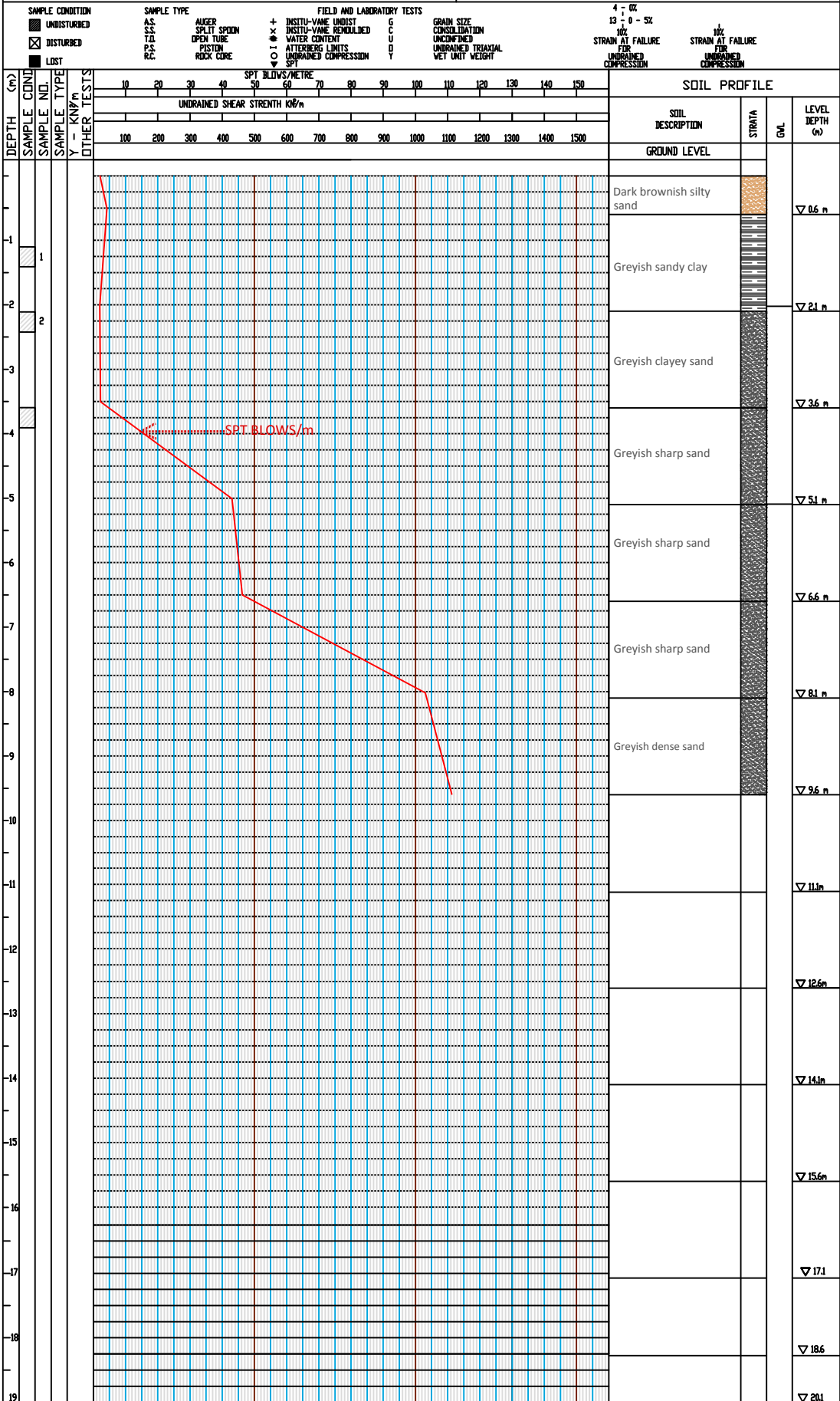
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: SA12

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018





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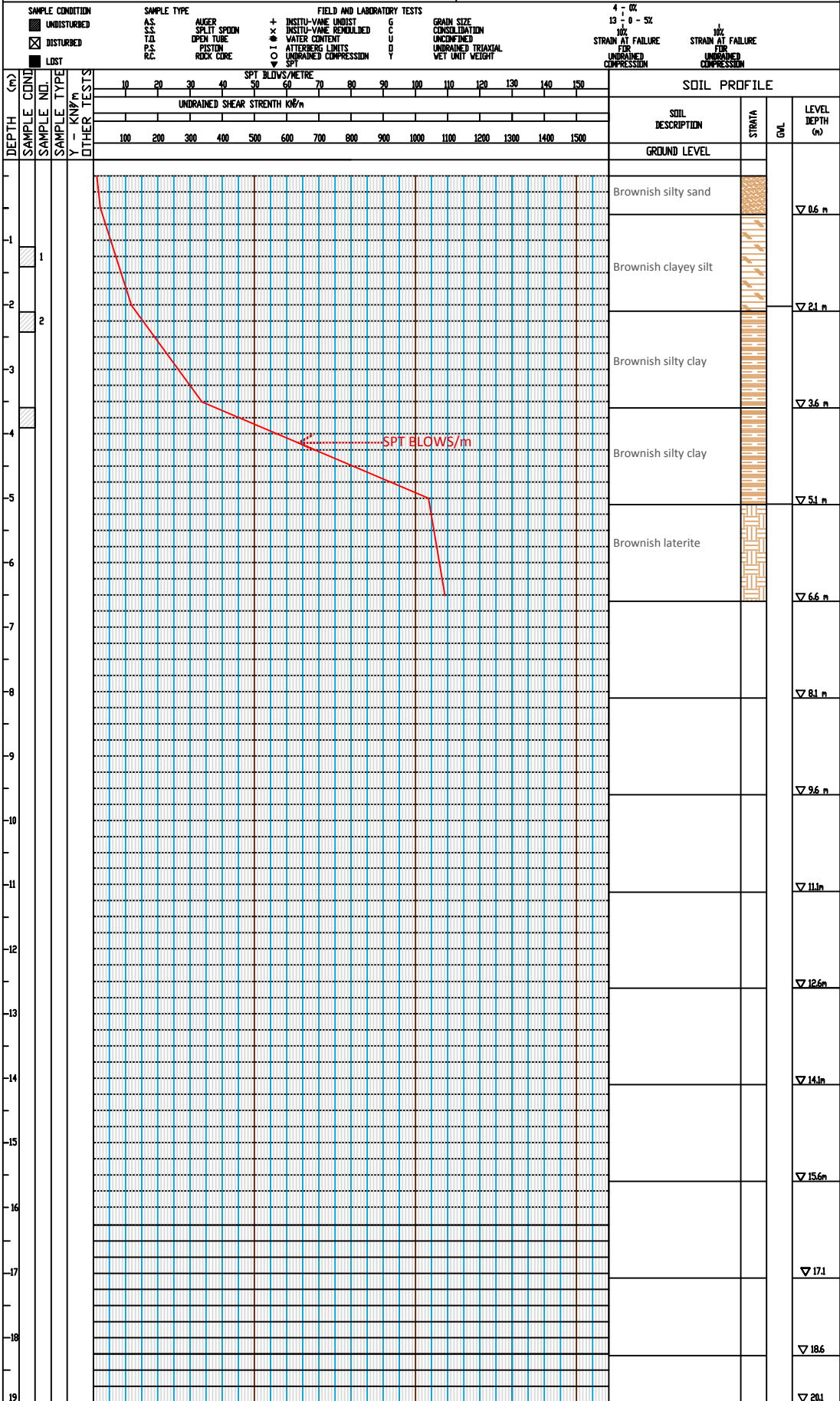
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: SA16

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018



IN-DEPTH ENGINEERING LIMITED.

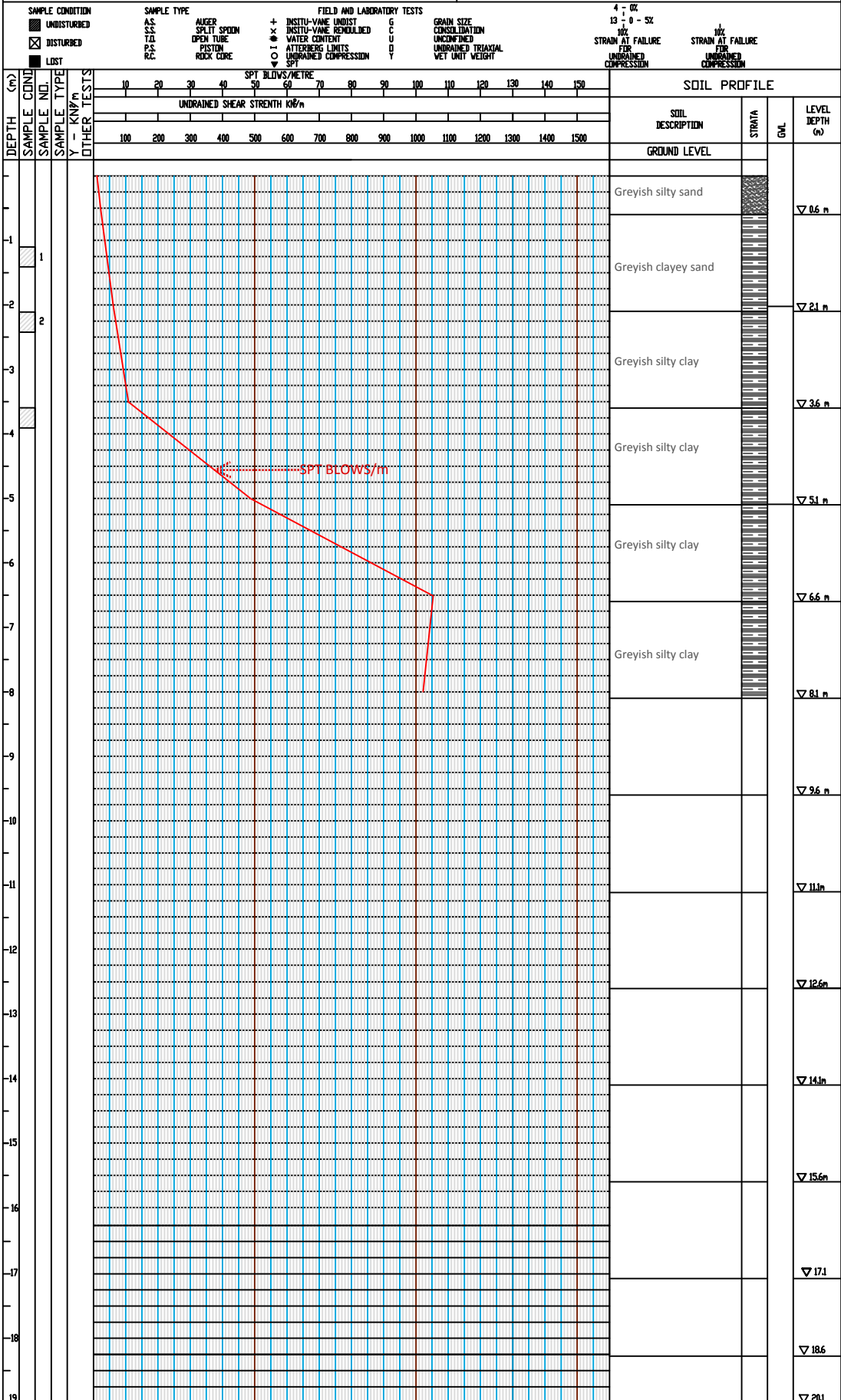
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: SA17

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018



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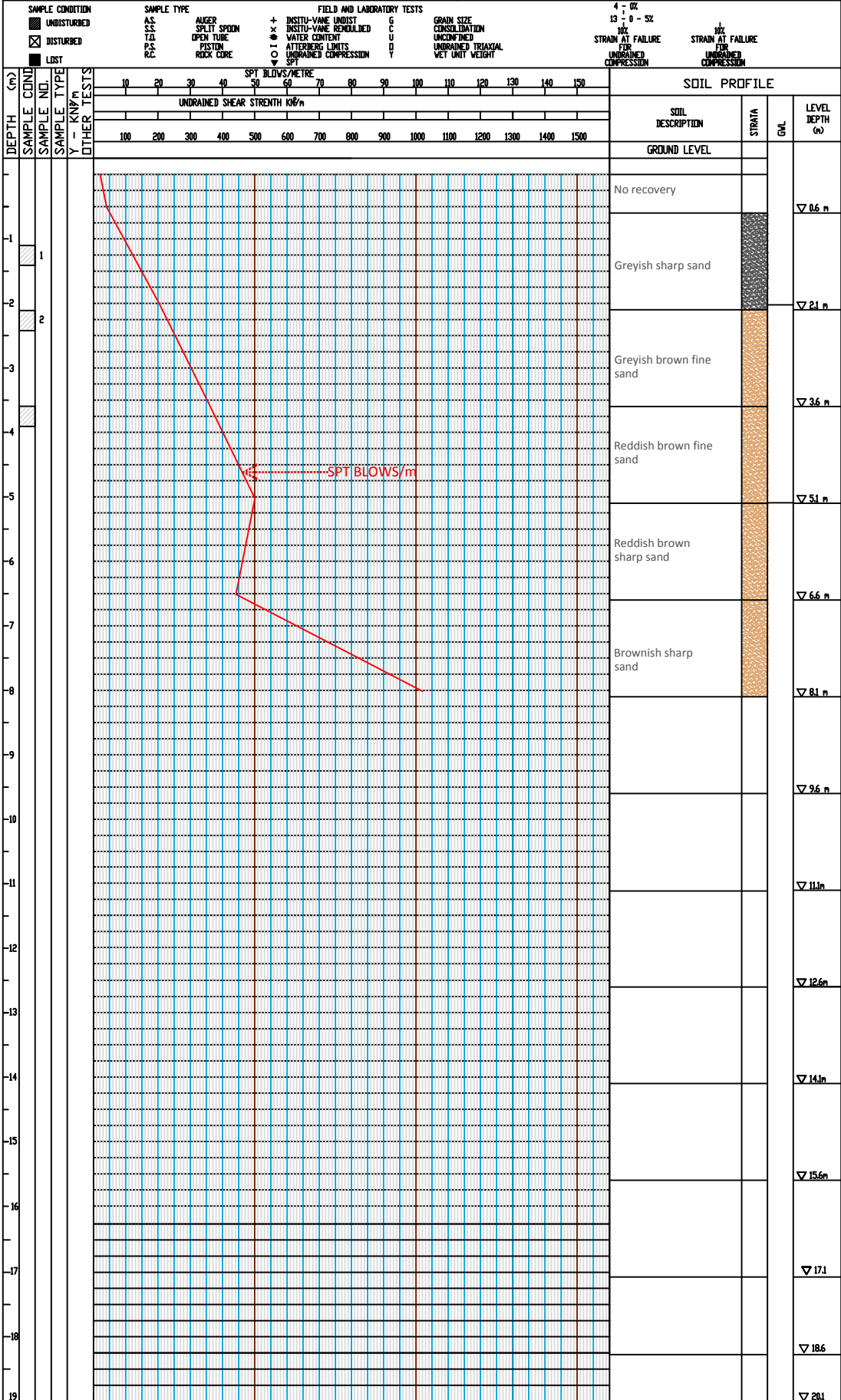
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: SA18

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018



IN-DEPTH ENGINEERING LIMITED.

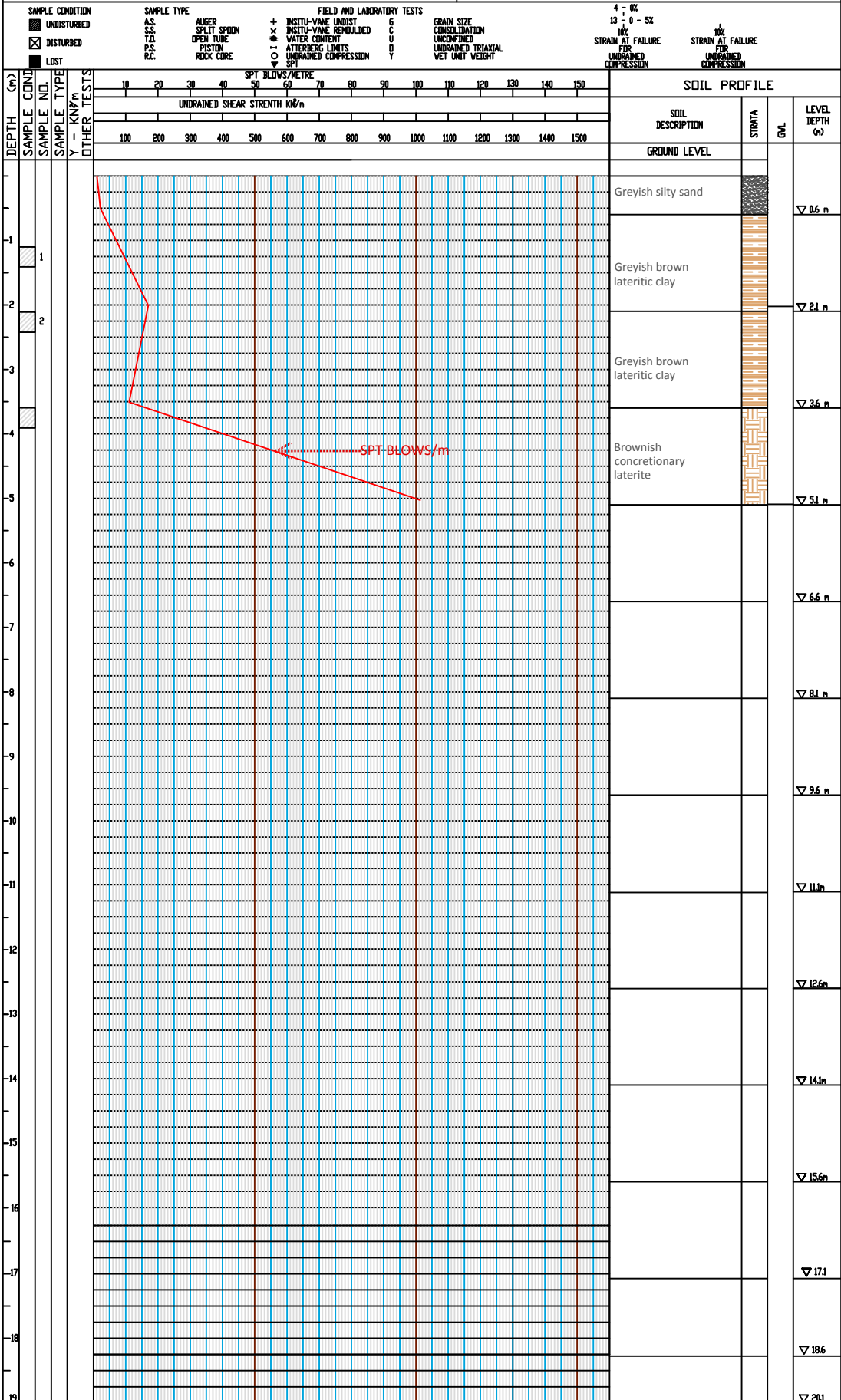
FIGURE: APPENDIX B

PROJECT: PROP.TRANS. LINE AND SUBST. IN OGUN & LAGOS

BORING: SA19

DRILLER: JACOB SPOON DD: 1 1/2" CASING SIZE: 4" CORE SIZE: 2"

DATE: SEPTEMBER, 2018





**APPENDIX A**  
**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: SA1</b>        | <b>September 2018</b> |
|---|--------------------|--------------------------------------|---------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      |                           |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                           |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                           | <b>SHEET 1 OF 26</b>  |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b> |                       |
| 0.0 – 0.6   | SS/UT              | 2, 2, 2                              | Dark silty sand           |                       |
| 1.5 – 2.1   | SS/UT              | 8, 8, 13                             | Brownish clayey sand      |                       |
| 3.0 – 3.6   | SS/UT              | 12, 12, 14                           | Brownish clayey sand      |                       |
| 4.5 – 5.1   | SS/UT              | 12, 15, 17                           | Brownish clayey sand      |                       |
| 6.0 – 6.6   | SS/UT              | 16, 18, 19                           | Brownish clayey sand      |                       |
| 7.5 – 8.1   | SS/UT              | 21, 29, 31                           | Greyish sandy clay        |                       |
| 9.0 – 9.6   | SS/UT              | 37, 60, 82                           | Greyish stiff sandy clay  |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                           |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                           |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                           |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                           |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                           |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                           |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                           |                       |



**APPENDIX A**  
**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: SA2</b>        | <b>September 2018</b> |
|---|--------------------|--------------------------------------|---------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      |                           |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                           |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                           | <b>SHEET 2 OF 26</b>  |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b> |                       |
| 0.0 – 0.6   | SS/UT              | 3, 3, 3                              | Brownish clayey silt      |                       |
| 1.5 – 2.1   | SS/UT              | 27, 28, 28                           | Brownish lateritic clay   |                       |
| 3.0 – 3.6   | SS/UT              | 36, 40, 42                           | Brownish lateritic clay   |                       |
| 4.5 – 5.1   | SS/UT              | 49, 54, 79                           | Brownish laterite         |                       |
| 6.0 – 6.6   | SS/UT              | 56, 77, 83                           | Brownish laterite         |                       |
| 7.5 – 8.1   | SS/UT              | 100                                  | Brownish laterite         |                       |
| 9.0 – 9.6   | SS/UT              |                                      |                           |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                           |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                           |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                           |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                           |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                           |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                           |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                           |                       |

**APPENDIX A**  
**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: SA3</b>           | <b>September 2018</b> |
|---|--------------------|--------------------------------------|------------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      |                              |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                              |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                              | <b>SHEET 3 OF 26</b>  |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b>    |                       |
| 0.0 – 0.6   | SS/UT              | 4, 5, 5                              | Dark brownish clayey silt    |                       |
| 1.5 – 2.1   | SS/UT              | 30, 30, 30                           | Reddish brown lateritic clay |                       |
| 3.0 – 3.6   | SS/UT              | 39, 41, 43                           | Greyish brown lateritic clay |                       |
| 4.5 – 5.1   | SS/UT              | 50, 56, 82                           | Greyish brown lateritic clay |                       |
| 6.0 – 6.6   | SS/UT              |                                      |                              |                       |
| 7.5 – 8.1   | SS/UT              |                                      |                              |                       |
| 9.0 – 9.6   | SS/UT              |                                      |                              |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                              |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                              |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                              |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                              |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                              |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                              |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                              |                       |

**APPENDIX A**  
**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: SA4</b>        | <b>September 2018</b> |
|---|--------------------|--------------------------------------|---------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      |                           |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                           |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                           | <b>SHEET 4 OF 26</b>  |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b> |                       |
| 0.0 – 0.6   | SS/UT              | 5, 5, 5                              | Brownish lateritic clay   |                       |
| 1.5 – 2.1   | SS/UT              | 7, 10, 11                            | Greyish brown clay        |                       |
| 3.0 – 3.6   | SS/UT              | 16, 16, 18                           | Greyish brown clay        |                       |
| 4.5 – 5.1   | SS/UT              | 27, 37, 53                           | Greyish stiff clay        |                       |
| 6.0 – 6.6   | SS/UT              | 60, 81, 100                          | Greyish stiff clay        |                       |
| 7.5 – 8.1   | SS/UT              |                                      |                           |                       |
| 9.0 – 9.6   | SS/UT              |                                      |                           |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                           |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                           |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                           |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                           |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                           |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                           |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                           |                       |

**APPENDIX A**  
**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |  | <b>BORING: NA5</b>              | <b>September 2018</b> |
|---|--------------------|--|---------------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |  |                                 |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |  |                                 |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>                |                                 | <b>SHEET 5 OF 26</b>  |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS<br/>(0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b>       |                       |
| 0.0 – 0.6   | SS/UT              | 6, 12, 7                                 | Dark greyish brown clayey silt  |                       |
| 1.5 – 2.1   | SS/UT              | 25, 26, 27                               | Reddish brown laterite          |                       |
| 3.0 – 3.6   | SS/UT              | 20, 25, 27                               | Greyish brown lateritic clay    |                       |
| 4.5 – 5.1   | SS/UT              | 28, 35, 55                               | Greyish brown lateritic clay    |                       |
| 6.0 – 6.6   | SS/UT              | 77, 87, 100                              | Brownish concretionary laterite |                       |
| 7.5 – 8.1   | SS/UT              |  |                                 |                       |
| 9.0 – 9.6   | SS/UT              |  |                                 |                       |
| 10.5 – 11.1   | SS/UT              |  |                                 |                       |
| 12.0 – 12.6   | SS/UT              |  |                                 |                       |
| 13.5 – 14.1   | SS/UT              |  |                                 |                       |
| 15.0 – 15.6   | SS/UT              |  |                                 |                       |
| 16.5 – 17.1   | SS/UT              |  |                                 |                       |
| 18.0 – 18.6   | SS/UT              |  |                                 |                       |
| 19.5 – 20.1   | SS/UT              |  |                                 |                       |

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**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: SA6</b>                             | <b>September 2018</b> |
|---|--------------------|--------------------------------------|--|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      |  |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |  |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |  | <b>SHEET 6 OF 26</b>  |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b>                      |                       |
| 0.0 – 0.6   | SS/UT              | 15, 32, 37                           | Brownish silty sand                            |                       |
| 1.5 – 2.1   | SS/UT              | 26, 13, 12                           | Brownish silty sand/ greyish brown clayey sand |                       |
| 3.0 – 3.6   | SS/UT              | 12, 13, 18                           | Greyish brown stiff clay                       |                       |
| 4.5 – 5.1   | SS/UT              | 54, 55, 65                           | Reddish brown concretionary laterite           |                       |
| 6.0 – 6.6   | SS/UT              | 76, 79, 88                           | Reddish brown concretionary laterite           |                       |
| 7.5 – 8.1   | SS/UT              | 88, 100                              | Reddish brown concretionary laterite           |                       |
| 9.0 – 9.6   | SS/UT              |                                      |  |                       |
| 10.5 – 11.1   | SS/UT              |                                      |  |                       |
| 12.0 – 12.6   | SS/UT              |                                      |  |                       |
| 13.5 – 14.1   | SS/UT              |                                      |  |                       |
| 15.0 – 15.6   | SS/UT              |                                      |  |                       |
| 16.5 – 17.1   | SS/UT              |                                      |  |                       |
| 18.0 – 18.6   | SS/UT              |                                      |  |                       |
| 19.5 – 20.1   | SS/UT              |                                      |  |                       |

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**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: NA7</b>                   | <b>September 2018</b> |
|---|--------------------|--------------------------------------|--------------------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      |                                      |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                                      |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                                      | <b>SHEET 7 OF 26</b>  |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b>            |                       |
| 0.0 – 0.6   | SS/UT              | 2, 4, 15                             | Reddish brown laterite               |                       |
| 1.5 – 2.1   | SS/UT              | 30, 81, 92                           | Reddish brown concretionary laterite |                       |
| 3.0 – 3.6   | SS/UT              | 100                                  | Reddish brown concretionary laterite |                       |
| 4.5 – 5.1   | SS/UT              |                                      |                                      |                       |
| 6.0 – 6.6   | SS/UT              |                                      |                                      |                       |
| 7.5 – 8.1   | SS/UT              |                                      |                                      |                       |
| 9.0 – 9.6   | SS/UT              |                                      |                                      |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                                      |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                                      |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                                      |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                                      |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                                      |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                                      |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                                      |                       |

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**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: SA8</b>        | <b>September 2018</b> |
|---|--------------------|--------------------------------------|---------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      |                           |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                           |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                           | <b>SHEET 8 OF 26</b>  |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b> |                       |
| 0.0 – 0.6   | SS/UT              | 1, 1, 1                              | Brownish clayey silt      |                       |
| 1.5 – 2.1   | SS/UT              | 5, 5, 5                              | Reddish lateritic clay    |                       |
| 3.0 – 3.6   | SS/UT              | 8, 9, 10                             | Reddish lateritic clay    |                       |
| 4.5 – 5.1   | SS/UT              | 14, 14, 18                           | Reddish lateritic clay    |                       |
| 6.0 – 6.6   | SS/UT              | 18, 18, 22                           | Reddish lateritic clay    |                       |
| 7.5 – 8.1   | SS/UT              | 23, 24, 26                           | Reddish brown laterite    |                       |
| 9.0 – 9.6   | SS/UT              | 68, 100                              | Reddish brown laterite    |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                           |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                           |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                           |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                           |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                           |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                           |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                           |                       |

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**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: NA9</b>           | <b>September 2018</b> |
|---|--------------------|--------------------------------------|------------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      |                              |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                              |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                              | <b>SHEET 9 OF 26</b>  |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b>    |                       |
| 0.0 – 0.6   | SS/UT              | 12, 12, 14                           | Greyish brown silty clay     |                       |
| 1.5 – 2.1   | SS/UT              | 12, 13, 16                           | Greyish brown lateritic clay |                       |
| 3.0 – 3.6   | SS/UT              | 44, 46, 47                           | Greyish stiff clay           |                       |
| 4.5 – 5.1   | SS/UT              | 51, 58, 67                           | Greyish stiff clay           |                       |
| 6.0 – 6.6   | SS/UT              | 100                                  | Greyish stiff clay           |                       |
| 7.5 – 8.1   | SS/UT              |                                      |                              |                       |
| 9.0 – 9.6   | SS/UT              |                                      |                              |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                              |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                              |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                              |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                              |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                              |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                              |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                              |                       |



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**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: SA10</b>            | <b>September 2018</b> |
|---|--------------------|--------------------------------------|--------------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      |                                |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                                |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                                | <b>SHEET 10 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b>      |                       |
| 0.0 – 0.6   | SS/UT              | 4, 4, 5                              | Dark brownish silty sand       |                       |
| 1.5 – 2.1   | SS/UT              | 20, 24, 24                           | Reddish brown lateritic clay   |                       |
| 3.0 – 3.6   | SS/UT              | 20, 30, 32                           | Reddish brown lateritic clay   |                       |
| 4.5 – 5.1   | SS/UT              | 24, 32, 35                           | Reddish brown lateritic clay   |                       |
| 6.0 – 6.6   | SS/UT              | 34, 39, 48                           | Reddish brown lateritic clay   |                       |
| 7.5 – 8.1   | SS/UT              | 52, 76, 85                           | Greyish brown silty dense clay |                       |
| 9.0 – 9.6   | SS/UT              | 88, 100                              | Greyish brown silty dense clay |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                                |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                                |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                                |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                                |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                                |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                                |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                                |                       |

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**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: SA11</b>       | <b>September 2018</b> |
|---|--------------------|--------------------------------------|---------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      |                           |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                           |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                           | <b>SHEET 11 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b> |                       |
| 0.0 – 0.6   | SS/UT              | 1, 1, 2                              | Brownish clayey sand      |                       |
| 1.5 – 2.1   | SS/UT              | 9, 9, 11                             | Brownish clayey sand      |                       |
| 3.0 – 3.6   | SS/UT              | 9, 39, 100                           | Greyish dense sand        |                       |
| 4.5 – 5.1   | SS/UT              | 100                                  | Greyish dense sand        |                       |
| 6.0 – 6.6   | SS/UT              | 100                                  | Greyish dense sand        |                       |
| 7.5 – 8.1   | SS/UT              |                                      |                           |                       |
| 9.0 – 9.6   | SS/UT              |                                      |                           |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                           |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                           |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                           |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                           |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                           |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                           |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                           |                       |

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**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |  | <b>BORING: SA12</b>       | <b>September 2018</b> |
|---|--------------------|--|---------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |  |                           |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |  |                           |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>                |                           | <b>SHEET 12 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS<br/>(0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b> |                       |
| 0.0 – 0.6   | SS/UT              | 2, 2, 2                                  | Dark brownish silty sand  |                       |
| 1.5 – 2.1   | SS/UT              | 1, 1, 1                                  | Greyish sandy clay        |                       |
| 3.0 – 3.6   | SS/UT              | 1, 1, 1                                  | Greyish clayey sand       |                       |
| 4.5 – 5.1   | SS/UT              | 15, 17, 25                               | Greyish sharp sand        |                       |
| 6.0 – 6.6   | SS/UT              | 17, 22, 24                               | Greyish sharp sand        |                       |
| 7.5 – 8.1   | SS/UT              | 26, 49, 69                               | Greyish sharp sand        |                       |
| 9.0 – 9.6   | SS/UT              | 75, 85, 100                              | Greyish dense sand        |                       |
| 10.5 – 11.1   | SS/UT              |  |                           |                       |
| 12.0 – 12.6   | SS/UT              |  |                           |                       |
| 13.5 – 14.1   | SS/UT              |  |                           |                       |
| 15.0 – 15.6   | SS/UT              |  |                           |                       |
| 16.5 – 17.1   | SS/UT              |  |                           |                       |
| 18.0 – 18.6   | SS/UT              |  |                           |                       |
| 19.5 – 20.1   | SS/UT              |  |                           |                       |

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| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: NA13</b>                  | <b>September 2018</b> |
|---|--------------------|--------------------------------------|--------------------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      |                                      |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                                      |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                                      | <b>SHEET 13 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b>            |                       |
| 0.0 – 0.6   | SS/UT              | 1, 2, 2                              | Dark brownish silty sand             |                       |
| 1.5 – 2.1   | SS/UT              | 12, 13, 17                           | Brownish silty clay                  |                       |
| 3.0 – 3.6   | SS/UT              | 58, 100                              | Reddish brown concretionary laterite |                       |
| 4.5 – 5.1   | SS/UT              |                                      |                                      |                       |
| 6.0 – 6.6   | SS/UT              |                                      |                                      |                       |
| 7.5 – 8.1   | SS/UT              |                                      |                                      |                       |
| 9.0 – 9.6   | SS/UT              |                                      |                                      |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                                      |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                                      |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                                      |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                                      |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                                      |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                                      |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                                      |                       |

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**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: NA14</b>          | <b>September 2018</b> |
|---|--------------------|--------------------------------------|------------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      |                              |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                              |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                              | <b>SHEET 14 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b>    |                       |
| 0.0 – 0.6   | SS/UT              | 1, 2, 2                              | Reddish brown lateritic clay |                       |
| 1.5 – 2.1   | SS/UT              | 2, 2, 2                              | Reddish brown lateritic clay |                       |
| 3.0 – 3.6   | SS/UT              | 5, 7, 10                             | Greyish sandy clay           |                       |
| 4.5 – 5.1   | SS/UT              | 35, 42, 45                           | Greyish stiff clay           |                       |
| 6.0 – 6.6   | SS/UT              | 69, 70, 75                           | Greyish stiff clay           |                       |
| 7.5 – 8.1   | SS/UT              | 81, 100                              | Greyish stiff clay           |                       |
| 9.0 – 9.6   | SS/UT              |                                      |                              |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                              |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                              |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                              |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                              |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                              |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                              |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                              |                       |

**APPENDIX A**  
**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: SA15</b>             | <b>September 2018</b> |
|---|--------------------|--------------------------------------|---------------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      |                                 |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                                 |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                                 | <b>SHEET 15 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b>       |                       |
| 0.0 – 0.6   | SS/UT              | 1, 1, 1                              | Reddish brown silty clay        |                       |
| 1.5 – 2.1   | SS/UT              | 17, 18, 19                           | Reddish brown lateritic clay    |                       |
| 3.0 – 3.6   | SS/UT              | 47, 45, 35                           | Reddish brown lateritic clay    |                       |
| 4.5 – 5.1   | SS/UT              | 17, 18, 27                           | Reddish brown lateritic clay    |                       |
| 6.0 – 6.6   | SS/UT              | 20, 20, 20                           | Reddish brown lateritic clay    |                       |
| 7.5 – 8.1   | SS/UT              | 28, 28, 52                           | Brownish concretionary laterite |                       |
| 9.0 – 9.6   | SS/UT              | 69, 77, 89                           | Brownish concretionary laterite |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                                 |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                                 |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                                 |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                                 |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                                 |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                                 |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                                 |                       |

**APPENDIX A**  
**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |  | <b>BORING: SA16</b>       | <b>September 2018</b> |
|---|--------------------|--|---------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |  |                           |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |  |                           |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>                |                           | <b>SHEET 16 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS<br/>(0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b> |                       |
| 0.0 – 0.6   | SS/UT              | 1, 1, 1                                  | Brownish silty sand       |                       |
| 1.5 – 2.1   | SS/UT              | 10, 7, 5                                 | Brownish clayey silt      |                       |
| 3.0 – 3.6   | SS/UT              | 17, 17, 17                               | Brownish silty clay       |                       |
| 4.5 – 5.1   | SS/UT              | 50, 55, 85                               | Brownish silty clay       |                       |
| 6.0 – 6.6   | SS/UT              | 92, 100                                  | Brownish laterite         |                       |
| 7.5 – 8.1   | SS/UT              |  |                           |                       |
| 9.0 – 9.6   | SS/UT              |  |                           |                       |
| 10.5 – 11.1   | SS/UT              |  |                           |                       |
| 12.0 – 12.6   | SS/UT              |  |                           |                       |
| 13.5 – 14.1   | SS/UT              |  |                           |                       |
| 15.0 – 15.6   | SS/UT              |  |                           |                       |
| 16.5 – 17.1   | SS/UT              |  |                           |                       |
| 18.0 – 18.6   | SS/UT              |  |                           |                       |
| 19.5 – 20.1   | SS/UT              |  |                           |                       |

**APPENDIX A**  
**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |  | <b>BORING: SA17</b>       | <b>September 2018</b> |
|---|--------------------|--|---------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |  |                           |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |  |                           |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>                |                           | <b>SHEET 17 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS<br/>(0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b> |                       |
| 0.0 – 0.6   | SS/UT              | 1, 1, 1                                  | Greyish silty sand        |                       |
| 1.5 – 2.1   | SS/UT              | 3, 3, 3                                  | Greyish clayey sand       |                       |
| 3.0 – 3.6   | SS/UT              | 4, 5, 6                                  | Greyish silty clay        |                       |
| 4.5 – 5.1   | SS/UT              | 23, 24, 25                               | Greyish silty clay        |                       |
| 6.0 – 6.6   | SS/UT              | 31, 49, 61                               | Greyish silty clay        |                       |
| 7.5 – 8.1   | SS/UT              | 79, 100                                  | Greyish silty clay        |                       |
| 9.0 – 9.6   | SS/UT              |  |                           |                       |
| 10.5 – 11.1   | SS/UT              |  |                           |                       |
| 12.0 – 12.6   | SS/UT              |  |                           |                       |
| 13.5 – 14.1   | SS/UT              |  |                           |                       |
| 15.0 – 15.6   | SS/UT              |  |                           |                       |
| 16.5 – 17.1   | SS/UT              |  |                           |                       |
| 18.0 – 18.6   | SS/UT              |  |                           |                       |
| 19.5 – 20.1   | SS/UT              |  |                           |                       |



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**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |  | <b>BORING: SA18</b>       | <b>September 2018</b> |
|---|--------------------|--|---------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |  |                           |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |  |                           |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>                |                           | <b>SHEET 18 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS<br/>(0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b> |                       |
| 0.0 – 0.6   | SS/UT              | 2, 2, 2                                  | No recovery               |                       |
| 1.5 – 2.1   | SS/UT              | 11, 10, 10                               | Greyish sharp sand        |                       |
| 3.0 – 3.6   | SS/UT              | 15, 17, 18                               | Greyish brown fine sand   |                       |
| 4.5 – 5.1   | SS/UT              | 20, 24, 26                               | Reddish brown fine sand   |                       |
| 6.0 – 6.6   | SS/UT              | 18, 20, 24                               | Reddish brown sharp sand  |                       |
| 7.5 – 8.1   | SS/UT              | 28, 30, 71                               | Brownish sharp sand       |                       |
| 9.0 – 9.6   | SS/UT              |  |                           |                       |
| 10.5 – 11.1   | SS/UT              |  |                           |                       |
| 12.0 – 12.6   | SS/UT              |  |                           |                       |
| 13.5 – 14.1   | SS/UT              |  |                           |                       |
| 15.0 – 15.6   | SS/UT              |  |                           |                       |
| 16.5 – 17.1   | SS/UT              |  |                           |                       |
| 18.0 – 18.6   | SS/UT              |  |                           |                       |
| 19.5 – 20.1   | SS/UT              |  |                           |                       |

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**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: SA19</b>             | <b>September 2018</b> |
|---|--------------------|--------------------------------------|---------------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      |                                 |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                                 |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                                 | <b>SHEET 19 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b>       |                       |
| 0.0 – 0.6   | SS/UT              | 1, 1, 1                              | Greyish silty sand              |                       |
| 1.5 – 2.1   | SS/UT              | 8, 8, 9                              | Greyish brown lateritic clay    |                       |
| 3.0 – 3.6   | SS/UT              | 4, 5, 6                              | Greyish brown lateritic clay    |                       |
| 4.5 – 5.1   | SS/UT              | 55, 67, 100                          | Brownish concretionary laterite |                       |
| 6.0 – 6.6   | SS/UT              |                                      |                                 |                       |
| 7.5 – 8.1   | SS/UT              |                                      |                                 |                       |
| 9.0 – 9.6   | SS/UT              |                                      |                                 |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                                 |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                                 |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                                 |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                                 |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                                 |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                                 |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                                 |                       |

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| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: SA20</b>       | <b>September 2018</b> |
|---|--------------------|--------------------------------------|---------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      |                           |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                           |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                           | <b>SHEET 20 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b> |                       |
| 0.0 – 0.6   | SS/UT              | 1, 1, 2                              | Greyish silty sand        |                       |
| 1.5 – 2.1   | SS/UT              | 2, 2, 2                              | Greyish silty sand        |                       |
| 3.0 – 3.6   | SS/UT              | 8, 8, 9                              | Greyish silty sand        |                       |
| 4.5 – 5.1   | SS/UT              | 18, 18, 23                           | Greyish silty sand        |                       |
| 6.0 – 6.6   | SS/UT              | 24, 30, 35                           | Greyish silty sand        |                       |
| 7.5 – 8.1   | SS/UT              | 53, 55, 86                           | Greyish silty sand        |                       |
| 9.0 – 9.6   | SS/UT              |                                      |                           |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                           |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                           |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                           |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                           |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                           |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                           |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                           |                       |

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**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: BH1</b>                               | <b>September 2018</b> |
|---|--------------------|--------------------------------------|--|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      | <b>EJIO SUBSTATION</b>                           |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |  |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |  | <b>SHEET 21 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b>                        |                       |
| 0.0 – 0.6   | SS/UT              | 1, 3, 3                              | Dark brownish silty sand/ reddish brown laterite |                       |
| 1.5 – 2.1   | SS/UT              | 52, 63, 80                           | Reddish brown concretionary laterite             |                       |
| 3.0 – 3.6   | SS/UT              | 84, 100                              | Reddish brown concretionary laterite             |                       |
| 4.5 – 5.1   | SS/UT              |                                      |  |                       |
| 6.0 – 6.6   | SS/UT              |                                      |  |                       |
| 7.5 – 8.1   | SS/UT              |                                      |  |                       |
| 9.0 – 9.6   | SS/UT              |                                      |  |                       |
| 10.5 – 11.1   | SS/UT              |                                      |  |                       |
| 12.0 – 12.6   | SS/UT              |                                      |  |                       |
| 13.5 – 14.1   | SS/UT              |                                      |  |                       |
| 15.0 – 15.6   | SS/UT              |                                      |  |                       |
| 16.5 – 17.1   | SS/UT              |                                      |  |                       |
| 18.0 – 18.6   | SS/UT              |                                      |  |                       |
| 19.5 – 20.1   | SS/UT              |                                      |  |                       |

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**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: BH2</b>              | <b>September 2018</b> |
|---|--------------------|--------------------------------------|---------------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      | <b>EJIO SUBSTATION</b>          |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                                 |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                                 | <b>SHEET 22 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b>       |                       |
| 0.0 – 0.6   | SS/UT              | 2, 4, 5                              | Brownish silty sand             |                       |
| 1.5 – 2.1   | SS/UT              | 100                                  | Brownish concretionary laterite |                       |
| 3.0 – 3.6   | SS/UT              |                                      |                                 |                       |
| 4.5 – 5.1   | SS/UT              |                                      |                                 |                       |
| 6.0 – 6.6   | SS/UT              |                                      |                                 |                       |
| 7.5 – 8.1   | SS/UT              |                                      |                                 |                       |
| 9.0 – 9.6   | SS/UT              |                                      |                                 |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                                 |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                                 |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                                 |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                                 |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                                 |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                                 |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                                 |                       |

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**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: BH3</b>                           | <b>September 2018</b> |
|---|--------------------|--------------------------------------|--|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      | <b>EJIO SUBSTATION</b>                       |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |  |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |  | <b>SHEET 23 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b>                    |                       |
| 0.0 – 0.6   | SS/UT              | 5, 5, 5                              | Brownish clayey silt/ reddish brown laterite |                       |
| 1.5 – 2.1   | SS/UT              | 25, 100                              | Reddish brown concretionary laterite         |                       |
| 3.0 – 3.6   | SS/UT              |                                      |  |                       |
| 4.5 – 5.1   | SS/UT              |                                      |  |                       |
| 6.0 – 6.6   | SS/UT              |                                      |  |                       |
| 7.5 – 8.1   | SS/UT              |                                      |  |                       |
| 9.0 – 9.6   | SS/UT              |                                      |  |                       |
| 10.5 – 11.1   | SS/UT              |                                      |  |                       |
| 12.0 – 12.6   | SS/UT              |                                      |  |                       |
| 13.5 – 14.1   | SS/UT              |                                      |  |                       |
| 15.0 – 15.6   | SS/UT              |                                      |  |                       |
| 16.5 – 17.1   | SS/UT              |                                      |  |                       |
| 18.0 – 18.6   | SS/UT              |                                      |  |                       |
| 19.5 – 20.1   | SS/UT              |                                      |  |                       |

**APPENDIX A**  
**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: BH1</b>           | <b>September 2018</b> |
|---|--------------------|--------------------------------------|------------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      | <b>RCCG SUBSTATION</b>       |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |                              |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |                              | <b>SHEET 24 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b>    |                       |
| 0.0 – 0.6   | SS/UT              | 3, 3, 10                             | Reddish brown lateritic clay |                       |
| 1.5 – 2.1   | SS/UT              | 72, 100                              | Reddish brown laterite       |                       |
| 3.0 – 3.6   | SS/UT              |                                      |                              |                       |
| 4.5 – 5.1   | SS/UT              |                                      |                              |                       |
| 6.0 – 6.6   | SS/UT              |                                      |                              |                       |
| 7.5 – 8.1   | SS/UT              |                                      |                              |                       |
| 9.0 – 9.6   | SS/UT              |                                      |                              |                       |
| 10.5 – 11.1   | SS/UT              |                                      |                              |                       |
| 12.0 – 12.6   | SS/UT              |                                      |                              |                       |
| 13.5 – 14.1   | SS/UT              |                                      |                              |                       |
| 15.0 – 15.6   | SS/UT              |                                      |                              |                       |
| 16.5 – 17.1   | SS/UT              |                                      |                              |                       |
| 18.0 – 18.6   | SS/UT              |                                      |                              |                       |
| 19.5 – 20.1   | SS/UT              |                                      |                              |                       |

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**STANDARD PENETRATION TEST: FIELD RESULTS**

| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |  | <b>BORING: BH2</b>        | <b>September 2018</b> |
|---|--------------------|--|---------------------------|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |  | <b>RCCG SUBSTATION</b>    |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |  |                           |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>                |                           | <b>SHEET 25 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS<br/>(0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b> |                       |
| 0.0 – 0.6   | SS/UT              | 2, 2, 2                                  | Dark brownish silty sand  |                       |
| 1.5 – 2.1   | SS/UT              | 6, 6, 8                                  | Reddish brown laterite    |                       |
| 3.0 – 3.6   | SS/UT              | 9, 9, 11                                 | Reddish brown laterite    |                       |
| 4.5 – 5.1   | SS/UT              | 24, 66, 82                               | Reddish brown laterite    |                       |
| 6.0 – 6.6   | SS/UT              | 100                                      | Reddish brown laterite    |                       |
| 7.5 – 8.1   | SS/UT              |  |                           |                       |
| 9.0 – 9.6   | SS/UT              |  |                           |                       |
| 10.5 – 11.1   | SS/UT              |  |                           |                       |
| 12.0 – 12.6   | SS/UT              |  |                           |                       |
| 13.5 – 14.1   | SS/UT              |  |                           |                       |
| 15.0 – 15.6   | SS/UT              |  |                           |                       |
| 16.5 – 17.1   | SS/UT              |  |                           |                       |
| 18.0 – 18.6   | SS/UT              |  |                           |                       |
| 19.5 – 20.1   | SS/UT              |  |                           |                       |



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**STANDARD PENETRATION TEST: FIELD RESULTS**

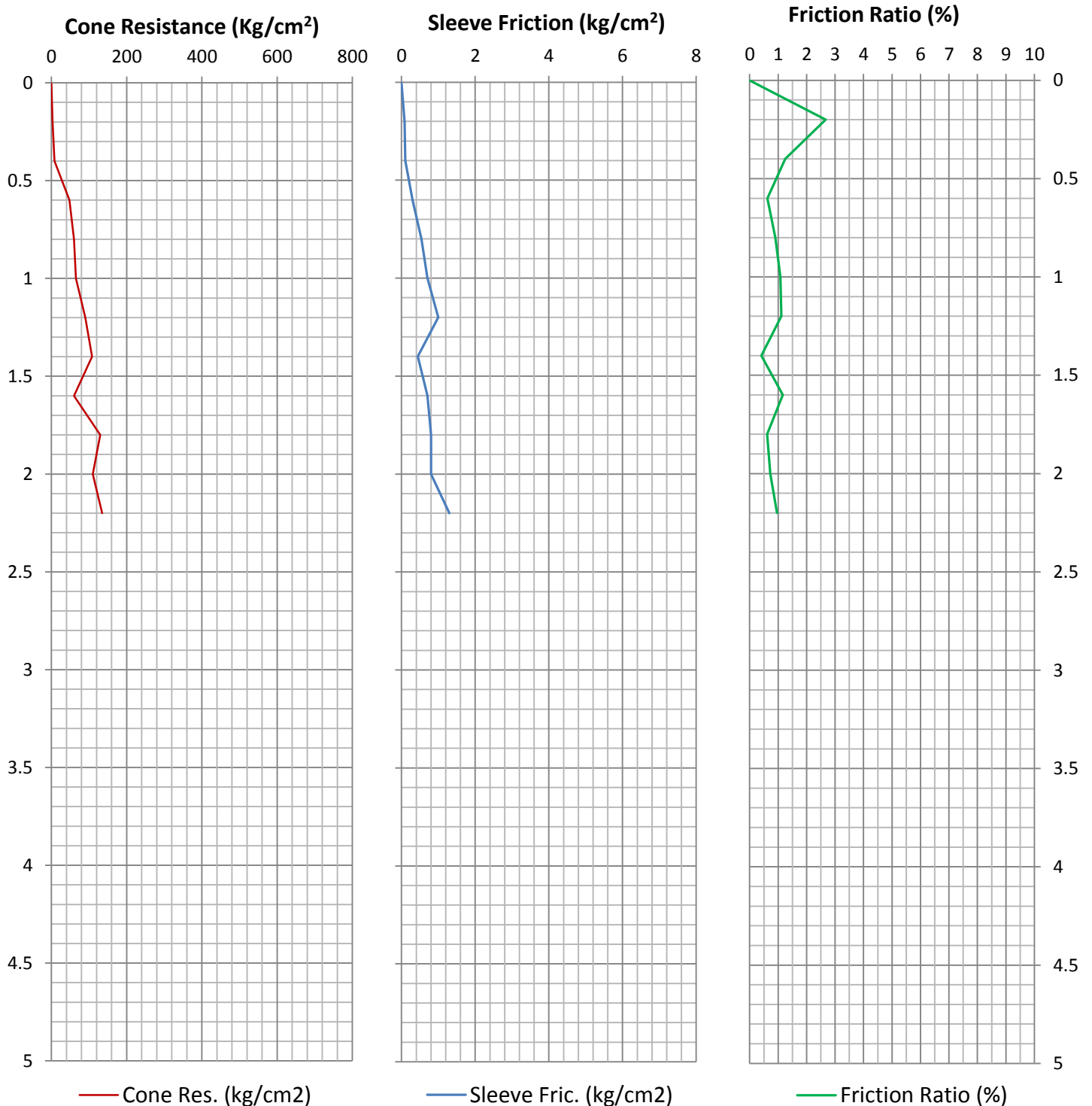
| <b>PROJECT NAME: PROPOSED TRANSMISSION LINE AND SUBSTATION IN OGUN &amp; LAGOS STATES</b> |                    |                                      | <b>BORING: BH3</b>                         | <b>September 2018</b> |
|---|--------------------|--------------------------------------|--|-----------------------|
| <b>RIG: MECHANISED CAT HEAD</b>   |                    |                                      | <b>RCCG SUBSTATION</b>                     |                       |
| <b>METHOD OF BORING: WASH BORE</b>  |                    |                                      |  |                       |
| <b>DRILLER: JACOB</b>   |                    | <b>TECHNICIAN: ISHAKU</b>            |  | <b>SHEET 26 OF 26</b> |
| <b>DEPTH</b>  | <b>SAMPLE TYPE</b> | <b>S.P.T. BLOWS (0.15m INTERVAL)</b> | <b>SAMPLE DESCRIPTION</b>                  |                       |
| 0.0 – 0.6   | SS/UT              | 2, 2, 2                              | Brownish clayey sand                       |                       |
| 1.5 – 2.1   | SS/UT              | 2, 4, 5                              | Brownish clayey sand                       |                       |
| 3.0 – 3.6   | SS/UT              | 7, 7, 8                              | Brownish clayey sand                       |                       |
| 4.5 – 5.1   | SS/UT              | 21, 27, 32                           | Reddish brown clayey highly weathered rock |                       |
| 6.0 – 6.6   | SS/UT              | 47, 62, 100                          | Greyish weathered rock                     |                       |
| 7.5 – 8.1   | SS/UT              |                                      |  |                       |
| 9.0 – 9.6   | SS/UT              |                                      |  |                       |
| 10.5 – 11.1   | SS/UT              |                                      |  |                       |
| 12.0 – 12.6   | SS/UT              |                                      |  |                       |
| 13.5 – 14.1   | SS/UT              |                                      |  |                       |
| 15.0 – 15.6   | SS/UT              |                                      |  |                       |
| 16.5 – 17.1   | SS/UT              |                                      |  |                       |
| 18.0 – 18.6   | SS/UT              |                                      |  |                       |
| 19.5 – 20.1   | SS/UT              |                                      |  |                       |

**INDEPTH ENGINEERING LIMITED****APPENDIX F: CONE PENETROMETER TEST DATA SHEET**

| Machine Capacity: 10 Ton                      |  |   | Type: Mechanical                     | GWL = Deep                            | Page 1 of 1                        |
|---|--|---|--------------------------------------|---------------------------------------|------------------------------------|
| Test Location: <i>CPT 1 Redeem Substation</i> |  |   | Cone Angle: 60°                      | Tip Area: 10cm <sup>2</sup>           | Date: 11/09/18                     |
| Depth (m)                                     | Tip Resistance, q <sub>c</sub> (Kg/cm <sup>2</sup> ) | Sleeve Friction, f <sub>s</sub> (Kg/cm <sup>2</sup> ) | Tip Resistance, q <sub>c</sub> (MPa) | Sleeve Friction, f <sub>s</sub> (KPa) | Friction Ratio, F <sub>R</sub> (%) |
| 0.2   | 3  | 0.08  | 0.3                                  | 8                                     | 2.7                                |
| 0.4   | 8  | 0.1   | 0.8                                  | 10                                    | 1.3                                |
| 0.6   | 48   | 0.3   | 4.8                                  | 30                                    | 0.6                                |
| 0.8   | 60   | 0.54  | 6.0                                  | 54                                    | 0.9                                |
| 1.0   | 65   | 0.7   | 6.5                                  | 70                                    | 1.1                                |
| 1.2   | 90   | 1   | 9.0                                  | 100                                   | 1.1                                |
| 1.4   | 108  | 0.44  | 10.8                                 | 44                                    | 0.4                                |
| 1.6   | 60   | 0.7   | 6.0                                  | 70                                    | 1.2                                |
| 1.8   | 130  | 0.8   | 13.0                                 | 80                                    | 0.6                                |
| 2.0   | 110  | 0.8   | 11.0                                 | 80                                    | 0.7                                |
| 2.2   | 135  | 1.3   | 13.5                                 | 130                                   | 1.0                                |

|                                    |  |
|------------------------------------|--|
| <b>CONE PENETROMETER TEST PLOT</b> | <b>Project:</b> <i>REDEEM SUBSTATION</i>             |
|                                    | <b>Location:</b> <i>REDEMPTION CAMP, OGUN STATE.</i> |
| <b>INDEPTH ENGINEERING LIMITED</b> | <b>Machine Capacity:</b> <i>10 Ton</i>               |
|                                    | <b>Cone Angle:</b> <i>60°</i>                        |
|                                    | <b>Tip Area:</b> <i>10cm<sup>2</sup></i>             |
| <b>Client:</b>                     | <b>Type:</b> <i>Mechanical</i>                       |

**CPT No: CPT 1 (REDEEM SUBSTATION)**



# INDEPTH ENGINEERING LIMITED

## APPENDIX F: CONE PENETROMETER TEST DATA SHEET

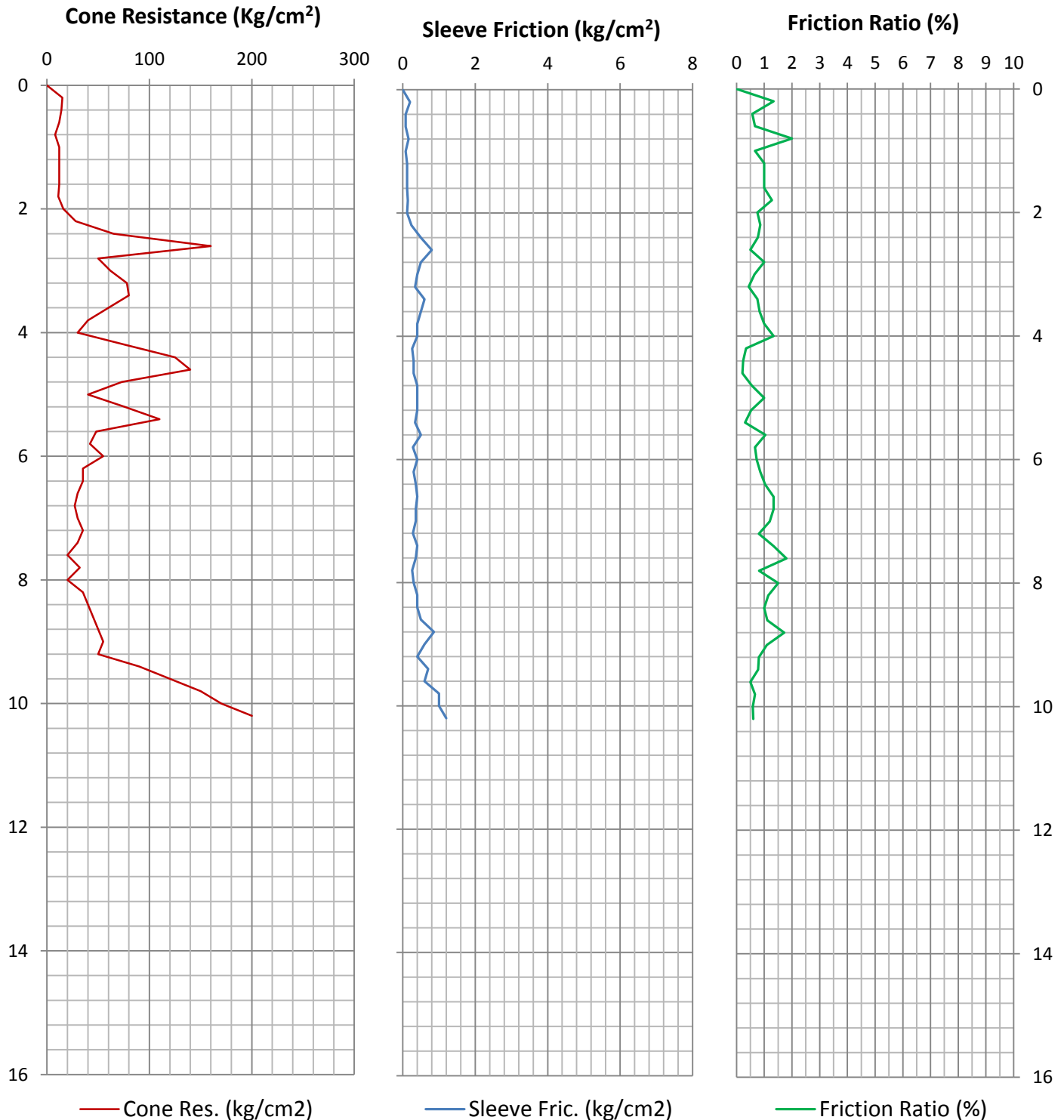
| Machine Capacity: 10 Ton               |  |   | Type: Mechanical                     | GWL = Deep                            | Page 1 of 2                        |
|--|--|---|--------------------------------------|---------------------------------------|------------------------------------|
| Test Location: CPT 2 Redeem Substation |  |   | Cone Angle: 60°                      | Tip Area: 10cm <sup>2</sup>           | Date: 11/09/18                     |
| Depth (m)                              | Tip Resistance, q <sub>c</sub> (Kg/cm <sup>2</sup> ) | Sleeve Friction, f <sub>s</sub> (Kg/cm <sup>2</sup> ) | Tip Resistance, q <sub>c</sub> (MPa) | Sleeve Friction, f <sub>s</sub> (KPa) | Friction Ratio, F <sub>R</sub> (%) |
| 0.2                                    | 15   | 0.2   | 1.5                                  | 20                                    | 1.3                                |
| 0.4                                    | 14   | 0.08  | 1.4                                  | 8                                     | 0.6                                |
| 0.6                                    | 12   | 0.08  | 1.2                                  | 8                                     | 0.7                                |
| 0.8                                    | 8  | 0.16  | 0.8                                  | 16                                    | 2.0                                |
| 1.0                                    | 12   | 0.08  | 1.2                                  | 8                                     | 0.7                                |
| 1.2                                    | 12   | 0.12  | 1.2                                  | 12                                    | 1.0                                |
| 1.4                                    | 12   | 0.12  | 1.2                                  | 12                                    | 1.0                                |
| 1.6                                    | 12   | 0.12  | 1.2                                  | 12                                    | 1.0                                |
| 1.8                                    | 11   | 0.14  | 1.1                                  | 14                                    | 1.3                                |
| 2.0                                    | 16   | 0.12  | 1.6                                  | 12                                    | 0.8                                |
| 2.2                                    | 28   | 0.24  | 2.8                                  | 24                                    | 0.9                                |
| 2.4                                    | 65   | 0.5   | 6.5                                  | 50                                    | 0.8                                |
| 2.6                                    | 160  | 0.8   | 16.0                                 | 80                                    | 0.5                                |
| 2.8                                    | 50   | 0.5   | 5.0                                  | 50                                    | 1.0                                |
| 3.0                                    | 62   | 0.4   | 6.2                                  | 40                                    | 0.6                                |
| 3.2                                    | 78   | 0.34  | 7.8                                  | 34                                    | 0.4                                |
| 3.4                                    | 80   | 0.6   | 8.0                                  | 60                                    | 0.8                                |
| 3.6                                    | 60   | 0.5   | 6.0                                  | 50                                    | 0.8                                |
| 3.8                                    | 40   | 0.4   | 4.0                                  | 40                                    | 1.0                                |
| 4.0                                    | 30   | 0.4   | 3.0                                  | 40                                    | 1.3                                |
| 4.2                                    | 77   | 0.26  | 7.7                                  | 26                                    | 0.3                                |
| 4.4                                    | 125  | 0.3   | 12.5                                 | 30                                    | 0.2                                |
| 4.6                                    | 140  | 0.3   | 14.0                                 | 30                                    | 0.2                                |
| 4.8                                    | 73   | 0.4   | 7.3                                  | 40                                    | 0.5                                |
| 5.0                                    | 40   | 0.4   | 4.0                                  | 40                                    | 1.0                                |
| 5.2                                    | 76   | 0.4   | 7.6                                  | 40                                    | 0.5                                |
| 5.4                                    | 110  | 0.34  | 11.0                                 | 34                                    | 0.3                                |
| 5.6                                    | 48   | 0.5   | 4.8                                  | 50                                    | 1.0                                |
| 5.8                                    | 42   | 0.28  | 4.2                                  | 28                                    | 0.7                                |
| 6.0                                    | 55   | 0.4   | 5.5                                  | 40                                    | 0.7                                |
| 6.2                                    | 35   | 0.3   | 3.5                                  | 30                                    | 0.9                                |
| 6.4                                    | 35   | 0.36  | 3.5                                  | 36                                    | 1.0                                |
| 6.6                                    | 30   | 0.4   | 3.0                                  | 40                                    | 1.3                                |
| 6.8                                    | 27   | 0.36  | 2.7                                  | 36                                    | 1.3                                |
| 7.0                                    | 30   | 0.36  | 3.0                                  | 36                                    | 1.2                                |
| 7.2                                    | 35   | 0.28  | 3.5                                  | 28                                    | 0.8                                |
| 7.4                                    | 30   | 0.4   | 3.0                                  | 40                                    | 1.3                                |
| 7.6                                    | 20   | 0.36  | 2.0                                  | 36                                    | 1.8                                |
| 7.8                                    | 32   | 0.26  | 3.2                                  | 26                                    | 0.8                                |
| 8.0                                    | 20   | 0.3   | 2.0                                  | 30                                    | 1.5                                |

**INDEPTH ENGINEERING LIMITED****APPENDIX F: CONE PENETROMETER TEST DATA SHEET**

| Machine Capacity: 10 Ton               |  |   | Type: Mechanical                     | GWL = 3.70m                           | Page 2 of 2                        |
|--|--|---|--------------------------------------|---------------------------------------|------------------------------------|
| Test Location: CPT 2 Redeem Substation |  |   | Cone Angle: 60°                      | Tip Area: 10cm <sup>2</sup>           | Date: 11/09/18                     |
| Depth (m)                              | Tip Resistance, q <sub>c</sub> (Kg/cm <sup>2</sup> ) | Sleeve Friction, f <sub>s</sub> (Kg/cm <sup>2</sup> ) | Tip Resistance, q <sub>c</sub> (MPa) | Sleeve Friction, f <sub>s</sub> (KPa) | Friction Ratio, F <sub>R</sub> (%) |
| 8.2                                    | 35   | 0.4   | 3.5                                  | 40                                    | 1.1                                |
| 8.4                                    | 40   | 0.4   | 4.0                                  | 40                                    | 1.0                                |
| 8.6                                    | 45   | 0.5   | 4.5                                  | 50                                    | 1.1                                |
| 8.8                                    | 50   | 0.86  | 5.0                                  | 86                                    | 1.7                                |
| 9.0                                    | 55   | 0.6   | 5.5                                  | 60                                    | 1.1                                |
| 9.2                                    | 50   | 0.4   | 5.0                                  | 40                                    | 0.8                                |
| 9.4                                    | 90   | 0.7   | 9.0                                  | 70                                    | 0.8                                |
| 9.6                                    | 120  | 0.6   | 12.0                                 | 60                                    | 0.5                                |
| 9.8                                    | 150  | 1   | 15.0                                 | 100                                   | 0.7                                |
| 10.0                                   | 170  | 1   | 17.0                                 | 100                                   | 0.6                                |
| 10.2                                   | 200  | 1.2   | 20.0                                 | 120                                   | 0.6                                |

|                                    |  |
|------------------------------------|--|
| <b>CONE PENETROMETER TEST PLOT</b> | <b>Project:</b> <i>REDEEM SUBSTATION</i>             |
|                                    | <b>Location:</b> <i>REDEMPTION CAMP, OGUN STATE.</i> |
| <b>INDEPTH ENGINEERING LIMITED</b> | <b>Machine Capacity:</b> <i>10 Ton</i>               |
|                                    | <b>Cone Angle:</b> <i>60°</i>                        |
|                                    | <b>Tip Area:</b> <i>10cm<sup>2</sup></i>             |
| <b>Client:</b>                     | <b>Type:</b> <i>Mechanical</i>                       |

**CPT No: CPT 2 (REDEEM SUBSTATION)**

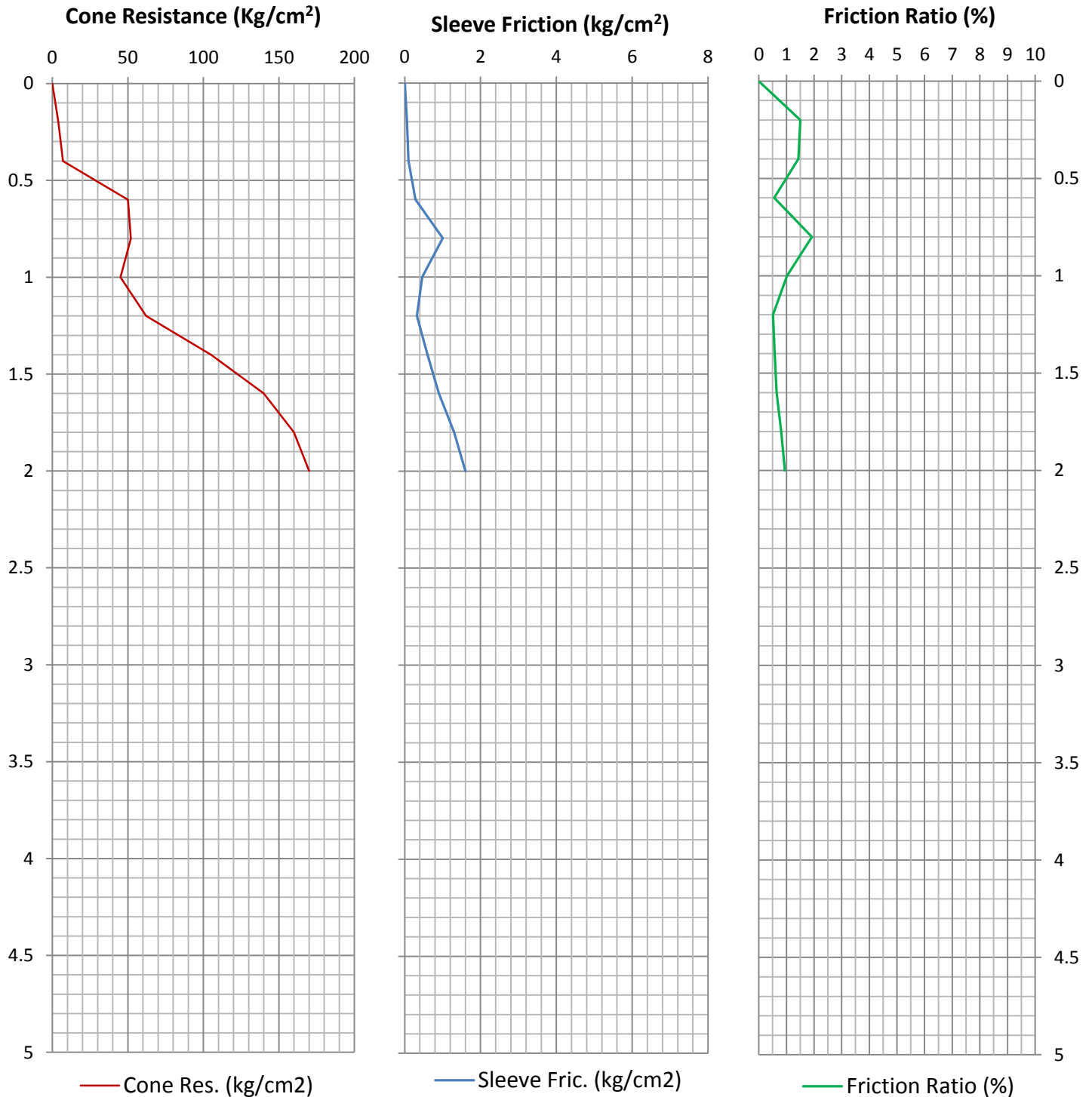


**INDEPTH ENGINEERING LIMITED****APPENDIX F: CONE PENETROMETER TEST DATA SHEET**

| Machine Capacity: 10 Ton             |  |   | Type: Mechanical                     | GWL = Deep                            | Page 1 of 1                        |
|--------------------------------------|--|---|--------------------------------------|---------------------------------------|------------------------------------|
| Test Location: CPT 1 Ejio Substation |  |   | Cone Angle: 60°                      | Tip Area: 10cm <sup>2</sup>           | Date: 12/09/18                     |
| Depth (m)                            | Tip Resistance, q <sub>c</sub> (Kg/cm <sup>2</sup> ) | Sleeve Friction, f <sub>s</sub> (Kg/cm <sup>2</sup> ) | Tip Resistance, q <sub>c</sub> (MPa) | Sleeve Friction, f <sub>s</sub> (KPa) | Friction Ratio, F <sub>R</sub> (%) |
| 0.2                                  | 4  | 0.06  | 0.4                                  | 6                                     | 1.5                                |
| 0.4                                  | 7  | 0.1   | 0.7                                  | 10                                    | 1.4                                |
| 0.6                                  | 50   | 0.28  | 5.0                                  | 28                                    | 0.6                                |
| 0.8                                  | 52   | 1   | 5.2                                  | 100                                   | 1.9                                |
| 1.0                                  | 45   | 0.46  | 4.5                                  | 46                                    | 1.0                                |
| 1.2                                  | 62   | 0.32  | 6.2                                  | 32                                    | 0.5                                |
| 1.4                                  | 105  | 0.6   | 10.5                                 | 60                                    | 0.6                                |
| 1.6                                  | 140  | 0.9   | 14.0                                 | 90                                    | 0.6                                |
| 1.8                                  | 160  | 1.3   | 16.0                                 | 130                                   | 0.8                                |
| 2.0                                  | 170  | 1.6   | 17.0                                 | 160                                   | 0.9                                |

|                                    |  |
|------------------------------------|--|
| <b>CONE PENETROMETER TEST PLOT</b> | <b>Project:</b> <i>EJIO SUBSTATION</i>   |
|                                    | <b>Location:</b> <i>IFO, OGUN STATE.</i> |
| <b>INDEPTH ENGINEERING LIMITED</b> | <b>Machine Capacity:</b> <i>10 Ton</i>   |
|                                    | <b>Cone Angle:</b> <i>60°</i>            |
|                                    | <b>Tip Area:</b> <i>10cm<sup>2</sup></i> |
| <b>Client:</b>                     | <b>Type:</b> <i>Mechanical</i>           |

**CPT No: CPT 1 (EJIO SUBSTATION)**



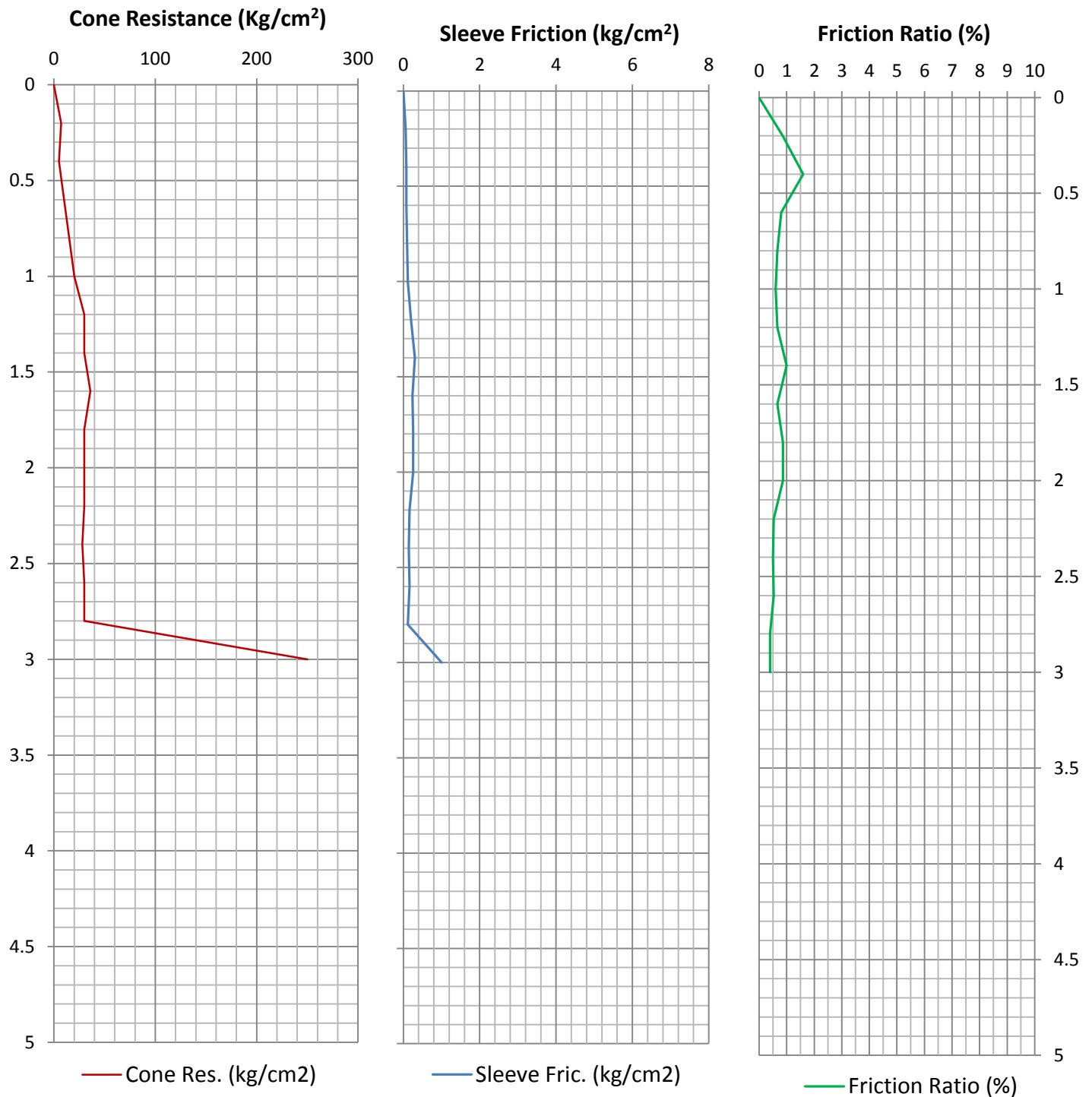


**INDEPTH ENGINEERING LIMITED****APPENDIX F: CONE PENETROMETER TEST DATA SHEET**

| Machine Capacity: 10 Ton             |  |   | Type: Mechanical                     | GWL = Deep                            | Page 1 of 1                        |
|--------------------------------------|--|---|--------------------------------------|---------------------------------------|------------------------------------|
| Test Location: CPT 2 Ejio Substation |  |   | Cone Angle: 60°                      | Tip Area: 10cm <sup>2</sup>           | Date: 12/09/18                     |
| Depth (m)                            | Tip Resistance, q <sub>c</sub> (Kg/cm <sup>2</sup> ) | Sleeve Friction, f <sub>s</sub> (Kg/cm <sup>2</sup> ) | Tip Resistance, q <sub>c</sub> (MPa) | Sleeve Friction, f <sub>s</sub> (KPa) | Friction Ratio, F <sub>R</sub> (%) |
| 0.2                                  | 7  | 0.06  | 0.7                                  | 6                                     | 0.9                                |
| 0.4                                  | 5  | 0.08  | 0.5                                  | 8                                     | 1.6                                |
| 0.6                                  | 10   | 0.08  | 1.0                                  | 8                                     | 0.8                                |
| 0.8                                  | 15   | 0.1   | 1.5                                  | 10                                    | 0.7                                |
| 1.0                                  | 20   | 0.12  | 2.0                                  | 12                                    | 0.6                                |
| 1.2                                  | 30   | 0.2   | 3.0                                  | 20                                    | 0.7                                |
| 1.4                                  | 30   | 0.3   | 3.0                                  | 30                                    | 1.0                                |
| 1.6                                  | 36   | 0.24  | 3.0                                  | 24                                    | 0.7                                |
| 1.8                                  | 30   | 0.26  | 3.6                                  | 26                                    | 0.9                                |
| 2.0                                  | 30   | 0.26  | 3.0                                  | 26                                    | 0.9                                |
| 2.2                                  | 30   | 0.16  | 3.0                                  | 16                                    | 0.5                                |
| 2.4                                  | 28   | 0.14  | 2.8                                  | 14                                    | 0.5                                |
| 2.6                                  | 30   | 0.16  | 3.0                                  | 16                                    | 0.5                                |
| 2.8                                  | 30   | 0.12  | 3.0                                  | 12                                    | 0.4                                |
| 3.0                                  | 250  | 1   | 25.0                                 | 100                                   | 0.4                                |

|                                    |  |
|------------------------------------|--|
| <b>CONE PENETROMETER TEST PLOT</b> | <b>Project:</b> <i>EJIO SUBSTATION</i>   |
|                                    | <b>Location:</b> <i>IFO, OGUN STATE.</i> |
| <b>INDEPTH ENGINEERING LIMITED</b> | <b>Machine Capacity:</b> <i>10 Ton</i>   |
|                                    | <b>Cone Angle:</b> <i>60°</i>            |
|                                    | <b>Tip Area:</b> <i>10cm<sup>2</sup></i> |
| <b>Client:</b>                     | <b>Type:</b> <i>Mechanical</i>           |

**CPT No: CPT 2 (EJIO SUBSTATION)**





**DETAILS-OF-LABORATORY-TEST-RESULTS.XIS**

| Sample No. | Sample Depth (m) | Description of Sample        | EMC (%) | LL (%) | PL (%) | PI (%) | PARTICLES SIZE ANALYSIS |              |            |               |              |              |              |               |               |   | Clay % | C <sub>v</sub> (m <sup>2</sup> /yr) | M <sub>v</sub> (m <sup>2</sup> /kn) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |
|------------|------------------|------------------------------|---------|--------|--------|--------|-------------------------|--------------|------------|---------------|--------------|--------------|--------------|---------------|---------------|---|--------|-------------------------------------|-------------------------------------|------------------|--------------------------------|
|            |                  |                              |         |        |        |        | #.5 (5mm)               | #.7 (3.35mm) | #.10 (2mm) | #.14 (1.18mm) | #.25 (600mm) | #.38 (425mm) | #.72 (212mm) | #.100 (150mm) | #.200 (850mm) |   |        |                                     |                                     |                  |                                |
| SA 3       | 0.6              | Dark Brown Clayey Silt       | 21.57   |        |        |        | 96.45                   | 80.60        | 63.38      | 35.3          | 26.99        | 8.45         | 4.7          | 4.34          | 3.18          | - | -      | 2.77                                | 22.21                               |                  |                                |
| "          | 2.1              | Reddish Brown Lateritic Clay | 15.71   |        |        |        | -                       | -            | 93.33      | 77.05         | 68.85        | 20.12        | 16.25        | 12.67         | 7.67          | - | -      | 2.33                                | 17.27                               |                  |                                |
| "          | 3.6              | Greyish Brown Lateritic Clay | 16.95   |        |        |        | 98.31                   | 94.92        | 89.83      | 71.79         | 42.37        | 16.95        | 11.86        | 11.44         | 6.36          | - | -      | 2.6                                 | 19.17                               |                  |                                |
| "          | 5.1              | Greyish Brown Lateritic Clay | 21.5    |        |        |        | 94.47                   | 79.83        | 67.6       | 43.77         | 24.84        | 6.23         | 3.5          | 3.12          | 1.95          | 6 | 20     | 2.5                                 | 21.71                               |                  |                                |
| SA 4       | 0.6              | Brown Lateritic Clay         | 32.1    |        |        |        | 76.20                   | 58.26        | 49.58      | 49.58         | 29.84        | 19.55        | 15.77        | 15.3          | 13.41         | - | -      | 2.4                                 | 25.16                               |                  |                                |
| "          | 2.1              | Greyish Brown Clay           | 38.6    |        |        |        | 56.18                   | 40.34        | 31.58      | 21.05         | 14.04        | 7.02         | 5.26         | 4.52          | 1.32          | - | -      | 2.6                                 | 18.17                               |                  |                                |
| "          | 3.1              | Greyish Brown Clay           |         |        |        |        |                         |              |            |               |              |              |              |               |               | - | -      | 2.81                                | 19.42                               |                  |                                |
| "          | 5.1              | Gravish Silty Clay           | 39.5    |        |        |        | 80.33                   | 68.85        | 60.66      | 49.18         | 36.07        | 9.82         | 4.92         | 4.92          | 3.28          | - | -      | 2.35                                | 18.63                               |                  |                                |
| "          | 6.6              | Greyish Silty Clay           | 49.9    |        |        |        | 62.89                   | 51.84        | 44.33      | 33.57         | 24.64        | 14.87        | 12.61        | 11.9          | 10.48         | - | -      | 2.68                                | 18.42                               |                  |                                |
| Sample No. | Sample Depth (m) | Description of Sample        | EMC (%) | LL (%) | PL (%) | PI (%) | PARTICLES SIZE ANALYSIS |              |            |               |              |              |              |               |               |   | Clay % | C <sub>v</sub> (m <sup>2</sup> /yr) | M <sub>v</sub> (m <sup>2</sup> /kn) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |
| NA 5       | 0.6              | Dark Grey Brown Clay         | 13.85   |        |        |        | -                       | 98.94        | 95.74      | 88.3          | 79.79        | 70.21        | 36.17        | 35.11         | 15.96         | - | -      | 2.6                                 | 17.2                                |                  |                                |
| "          | 2.1              | Reddish Brown Laterite       | 18.16   |        |        |        | 99.12                   | 96.36        | 83.62      | 66.42         | 37.66        | 11.24        | 8.73         | 8.41          | 7.53          | - | -      | 2.62                                | 18.41                               |                  |                                |
| "          | 3.6              | Greish Brown Lateritic Clay  | 20.41   |        |        |        | 96.96                   | 95.92        | 69.39      | 51.02         | 44.9         | 22.45        | 14.29        | 13.78         | 5.61          | - | -      | 2.6                                 | 25.17                               |                  |                                |
| "          | 5.1              | Greish Brown Lateritic Clay  | 35.56   |        |        |        | 86.67                   | 80.00        | 60.00      | 46.6          | 33.33        | 17.78        | 13.33        | 12.78         | 8.33          | - | -      | 2.6                                 | 16.14                               |                  |                                |
| "          | 6.6              | Brownish conc Laterite       | 18.61   |        |        |        | -                       | 99.12        | 97.62      | 95.74         | 85.26        | 8.85         | 4.01         | 3.8           | 1.5           | - | -      | 2.61                                | 19.21                               |                  |                                |
| SA 6       | 0.6              | Brownish Silty Sand          | 13.7    |        |        |        | 98.62                   | 93.23        | 84.5       | 69.4          | 34.43        | 6.83         | 3.83         | 3.76          | 2.38          | - | -      | 2.16                                | 20.41                               |                  |                                |

Prepared By: In-Depth Engineering Limited, Kaduna.



**DETAILS-OF-LABORATORY-TEST-RESULTS.XIS**

| Sample No. | Sample Depth (m) | Description of Sample   | EMC (%) | LL (%) | PL (%) | PI (%) | PARTICLES SIZE ANALYSIS |              |            |               |              |              |              |               |              |        | DIRECT SHEAR        |    |                                     | Bulk Density kn/m <sup>3</sup> |                                     |                  |  |
|------------|------------------|-------------------------|---------|--------|--------|--------|-------------------------|--------------|------------|---------------|--------------|--------------|--------------|---------------|--------------|--------|---------------------|----|-------------------------------------|--------------------------------|-------------------------------------|------------------|--|
|            |                  |                         |         |        |        |        | #.5 (5mm)               | #.7 (3.35mm) | #.10 (2mm) | #.14 (1.18mm) | #.25 (600mm) | #.38 (625mm) | #.72 (212mm) | #.100 (150mm) | #.200 (83mm) | Clay % | C kn/m <sup>2</sup> | Φ. | C <sub>v</sub> (m <sup>2</sup> /yr) |                                | M <sub>v</sub> (m <sup>2</sup> /kn) | Specific Gravity |  |
| NA 7       | 0.6              | Reddish Brown Laterite  | 23.74   |        |        |        | 98.62                   | 97.43        | 92.66      | 84.80         | 61.94        | 34.43        | 6.33         | 3.99          | 3.76         | 2.38   | 8                   | 16 |                                     |                                | 2.64                                | 21.24            |  |
| "          | 2.1              | Brownish Lateritic Clay |         |        |        |        |                         |              |            |               |              |              |              |               |              |        |                     |    |                                     |                                |                                     |                  |  |
| "          | 3.6              | Brownish Lateritic Clay |         |        |        |        |                         |              |            |               |              |              |              |               |              |        |                     |    |                                     |                                |                                     |                  |  |
| SA 8       | 0.6              |                         | 26.63   |        |        |        | -                       | -            | -          | 87.89         | 66.1         | 22.52        | 12.83        | 12.23         | 4.96         | 14     | 14                  |    |                                     |                                | 2.6                                 | 14.96            |  |
| "          | 2.1              |                         | 19.19   |        |        |        | -                       | -            | -          | 92.62         | 71.96        | 24.72        | 15.87        | 15.5          | 6.64         | 9      | 17                  |    |                                     |                                | 2.6                                 | 15.51            |  |
| "          | 3.6              |                         | 24.48   |        |        |        | -                       | 98.98        | 97.97      | 92.86         | 80.61        | 57.14        | 11.22        | 6.12          | 5.37         | 3.83   | 6                   | 24 |                                     |                                | 2.33                                | 19.71            |  |
| "          | 5.1              |                         | 25.4    |        |        |        | 99.12                   | 96.36        | 89.90      | 83.62         | 66.42        | 37.66        | 11.24        | 8.73          | 8.51         | 7.53   | 2                   | 18 |                                     |                                | 2.57                                | 18.65            |  |
| "          | 6.6              |                         |         |        |        |        |                         |              |            |               |              |              |              |               |              |        |                     |    |                                     |                                |                                     |                  |  |
| "          | 8.1              |                         | 18.18   |        |        |        | -                       | -            | -          | 98.18         | 85.15        | 60           | 14.55        | 9.09          | 8.64         | 5      | 13                  | 20 |                                     |                                | 2.69                                | 21.41            |  |

**DETAILS-OF-LABORATORY-TEST-RESULTS.XIS**

| Sample No. | Sample Depth (m) | Description of Sample          | EMC (%) | LL(%) | PL(%) | PI (%) | PARTICLES SIZE ANALYSIS |              |            |               |              |              |              |               |              |  | Clay % | C <sub>v</sub> (m <sup>2</sup> /yr) | M <sub>v</sub> (m <sup>2</sup> /kn) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |
|------------|------------------|--------------------------------|---------|-------|-------|--------|-------------------------|--------------|------------|---------------|--------------|--------------|--------------|---------------|--------------|--|--------|-------------------------------------|-------------------------------------|------------------|--------------------------------|
|            |                  |                                |         |       |       |        | #.5 (5mm)               | #.7 (3.35mm) | #.10 (2mm) | #.14 (1.18mm) | #.25 (600mm) | #.38 (625mm) | #.72 (212mm) | #.100 (150mm) | #.200 (83mm) |  |        |                                     |                                     |                  |                                |
| NA 9       | 0.6              | Greyish Brown Silty Clay       | 25.1    |       |       |        | 97.96                   | 93.93        | 81.35      | 68.10         | 50.44        | 32.66        | 5.68         | 2.65          | 2.57         |  |        |                                     | 2.34                                | 18.44            |                                |
| "          | 2.1              | Greyish Brown Lateritic Clay   | 23.1    |       |       |        | -                       | -            | 91.07      | 82.14         | 71.43        | 62.5         | 32.14        | 17.86         | 16.07        |  |        |                                     | 2.33                                | 17.82            |                                |
| "          | 3.6              | Greyish Stiff Clay             | 31.99   |       |       |        | -                       | 97.87        | 82.98      | 70.21         | 53.19        | 40.43        | 23.4         | 14.89         | 14.36        |  |        |                                     | 2.33                                | 20.11            |                                |
| "          | 5.1              | Greyish Stiff Clay             | 29.1    |       |       |        | 96.36                   | 92.73        | 87.64      | 74.55         | 60           | 49.09        | 23.64        | 12.73         | 18.27        |  |        |                                     | 2.33                                | 19.71            |                                |
| "          | 6.6              | Greyish Stiff Clay             |         |       |       |        |                         |              |            |               |              |              |              |               |              |  |        |                                     |                                     |                  |                                |
| SA 10      | 0.6              | Dark bBrownish Silty Sand      | 22.22   |       |       |        | -                       | -            | 96.49      | 93.72         | 84.46        | 49.91        | 17.85        | 15.2          | 14.91        |  |        |                                     | 2.5                                 | 26.14            |                                |
| "          | 2.1              | Reddish Brown Lateritic Clay   | 19.9    | 40.40 | 30.40 | 10.00  | -                       | -            | 94.36      | 88.72         | 77.43        | 42.52        | 7.97         | 1.9           | 1.55         |  |        |                                     | 2.34                                | 20.81            |                                |
| "          | 3.6              | Reddish Brown Lateritic Clay   | 22.16   |       |       |        | -                       | -            | 87.16      | 74.77         | 48.19        | 22.11        | 18.2         | 14.17         | 8.81         |  |        |                                     | 2.65                                | 18.2             |                                |
| "          | 5.1              | Reddish Brown Lateritic Clay   | 19.4    |       |       |        | -                       | -            | -          | 94.49         | 77.96        | 54.09        | 11.85        | 6.34          | 5.88         |  |        |                                     | 2.47                                | 19.66            |                                |
| "          | 6.6              | Reddish Brown Lateritic Clay   | 14      | 27.40 | 26.70 | 0.70   | -                       | -            | -          | 97.64         | 82.46        | 42.88        | 8.43         | 5.84          | 5.21         |  |        |                                     | 2.71                                | 21.79            |                                |
| "          | 8.1              | Greyish Brown Silty Dense Clay | 15.61   |       |       |        | -                       | 96.17        | 91.79      | 89.17         | 62.72        | 53.14        | 34.56        | 18.23         | 8.17         |  |        |                                     | 2.65                                | 22.85            |                                |
| "          | 9.6              | Greyish Brown Silty Dense Clay | 14.28   |       |       |        | -                       | -            | -          | 78.16         | 72.16        | 51.17        | 20.17        | 17.19         | 12.61        |  |        |                                     | 2.71                                | 17.19            |                                |









**DETAILS-OF-LABORATORY-TEST-RESULTS.xis**

| Sample No. | Sample Depth (m) | Description of Sample    | EMC (%) | LL (%) | PL (%) | PI (%) | PARTICLES SIZE ANALYSIS |              |            |               |              |              |              |               |              |        | DIRECT SHEAR |   | M <sub>v</sub> (m <sup>2</sup> /kN) | C <sub>v</sub> (m <sup>2</sup> /yr) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |
|------------|------------------|--------------------------|---------|--------|--------|--------|-------------------------|--------------|------------|---------------|--------------|--------------|--------------|---------------|--------------|--------|--------------|---|-------------------------------------|-------------------------------------|------------------|--------------------------------|
|            |                  |                          |         |        |        |        | #.5 (5mm)               | #.7 (3.35mm) | #.10 (2mm) | #.14 (1.18mm) | #.25 (600mm) | #.38 (625mm) | #.72 (212mm) | #.100 (150mm) | #.200 (83mm) | Clay % | C            | Φ |                                     |                                     |                  |                                |
| SA 17      | 0.6              | Grayish Silty Sand       | 28.12   |        |        |        |                         | 91.41        | 82.17      | 72.81         | 56.16        | 20.21        | 17.62        | 8.14          | 7.81         |        |              |   |                                     | 2.76                                | 21.17            |                                |
| "          | 2.1              | Grayish clayey sand      | 17.9    |        |        |        |                         |              | 97.92      | 66.96         | 33.58        | 6.27         | 5.1          | 4.85          | 3.67         |        |              |   |                                     | 2.41                                | 18.11            |                                |
| "          | 3.6              | Grayish silty clay       | 18.7    |        |        |        |                         |              | 98.42      | 80.54         | 49.66        | 17.53        | 9.84         | 9.28          | 4.3          | 16     | 18           |   |                                     | 2.19                                | 21.882           |                                |
| "          | 5.1              | Grayish Silty Clay       | 15      |        |        |        |                         | 98.17        | 87.16      | 64.28         | 36.24        | 9.69         | 6.38         | 5.94          | 2.62         | 22     | 24           |   |                                     | 2.52                                | 21.02            |                                |
| "          | 6.6              | Gray stiff clay          | 18.22   |        |        |        |                         | 82.71        | 76.24      | 64.52         | 46.64        | 10.91        | 8.22         | 4.27          | 3.74         |        |              |   |                                     | 2.77                                | 19.42            |                                |
| "          | 8.1              | Gray stiff clay          | 20.18   |        |        |        |                         |              |            | 92.62         | 71.96        | 24.72        | 15.87        | 15.5          | 6.64         |        |              |   |                                     | 2.81                                | 18.41            |                                |
| SA 18      | 0.6              | Grayish clayey sand      | 19      |        |        |        |                         | 87.62        | 81.34      | 68.74         | 45.34        | 7.31         | 2.78         | 2.35          | 0.27         |        |              |   |                                     | 2.63                                | 19.22            |                                |
| "          | 2.1              | Grayish sharp sand       | 18      |        |        |        |                         | 92.02        | 86.61      | 64.76         | 33.1         | 8.52         | 6.59         | 6.32          | 5.3          |        |              |   |                                     | 2.37                                | 20.17            |                                |
| "          | 3.6              | Greyish Brown fine sand  | 17.8    |        |        |        |                         | 98.73        | 95.24      | 88.07         | 74.66        | 14.01        | 7.37         | 7.04          | 3.75         |        |              |   |                                     | 2.47                                | 20.41            |                                |
| "          | 5.1              | reddish Brown Fine Sand  | 19.4    |        |        |        |                         | 99.35        | 97.85      | 88.87         | 82.96        | 14.57        | 6.08         | 5.81          | 3.12         |        |              |   |                                     | 2.7                                 | 20.77            |                                |
| "          | 6.6              | Reddish Brown Sharp sand | 17.5    |        |        |        |                         |              | 99.23      | 89.23         | 51.76        | 6.18         | 3.42         | 3.17          | 2.3          |        |              |   |                                     | 2.68                                | 18.18            |                                |
| "          | 8.1              | BROWNISH Sharp Sand      | 17.4    |        |        |        |                         | 97.69        | 96.67      | 89.81         | 46.25        | 6.89         | 4.51         | 4.32          | 3.33         |        |              |   |                                     | 2.54                                | 19.24            |                                |

**DETAILS-OF-LABORATORY-TEST-RESULTS.XIS**

| Sample No. | Sample Depth (m) | Description of Sample        | EMC (%) | LL (%) | PL (%) | PI (%) | PARTICLES SIZE ANALYSIS |              |            |               |              |              |              |               |              |        | DIRECT SHEAR |      | M <sub>v</sub> (m <sup>2</sup> /kn) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |
|------------|------------------|------------------------------|---------|--------|--------|--------|-------------------------|--------------|------------|---------------|--------------|--------------|--------------|---------------|--------------|--------|--------------|------|-------------------------------------|------------------|--------------------------------|
|            |                  |                              |         |        |        |        | #.5 (5mm)               | #.7 (3.35mm) | #.10 (2mm) | #.14 (1.18mm) | #.25 (600mm) | #.38 (625mm) | #.72 (212mm) | #.100 (150mm) | #.200 (83mm) | Clay % | C            | Φ    |                                     |                  |                                |
| SA 19      | 0.6              | Greyish Silty sand           | 26.5    |        |        |        | 99.07                   | 98.56        | 97.52      | 96.96         | 90.46        | 41.88        | 7.43         | 4.44          | 4.18         | 2.42   |              |      |                                     | 2.36             | 19.25                          |
| "          | 2.1              | Greyish Brown Lateritic Clay | 18.17   |        |        |        |                         |              |            | 99.03         | 92.88        | 66.17        | 18.19        | 10.14         | 9.65         | 5.36   |              |      |                                     | 2.71             | 20.11                          |
| "          | 3.6              | Greyish Brown Lateritic Clay | 24.17   |        |        |        |                         |              |            | 95.57         | 80.6         | 50.76        | 12.28        | 8.35          | 7.72         | 6.33   |              |      |                                     | 2.56             | 26.51                          |
| "          | 5.1              | Brownish conc Laterite       | 20.24   |        |        |        |                         |              |            | 99.40         | 97.90        | 35.94        | 8.71         | 6.43          | 6.13         | 5.29   |              |      |                                     | 2.66             | 19.11                          |
| SA 20      | 0.6              | Greyish Silty Sand           | 29.32   |        |        |        | 87.04                   | 85.39        | 79.69      | 75.28         | 62.57        | 58.43        | 35.45        | 14.61         | 13.48        | 4.49   |              |      |                                     | 2.31             | 26.12                          |
| "          | 2.1              | Greyish Silty Sand           | 20.61   |        |        |        |                         |              |            | 96.50         | 88.63        | 63.38        | 36.31        | 26.99         | 8.45         | 4.36   | 3.06         |      |                                     | 2.72             | 18.16                          |
| "          | 3.6              | Greyish Silty Sand           | 17.9    |        |        |        | 96.48                   | 87.61        | 814.62     | 64.17         | 42.61        | 31.61        | 26.41        | 10.21         | 8.17         | 4.69   |              |      |                                     | 2.45             | 20.21                          |
| "          | 5.1              | Greyish Silty Sand           | 24.5    |        |        |        |                         |              |            | 99.57         | 98.79        | 97.44        | 88.38        | 50.11         | 9.62         | 5.16   | 4.96         | 2.73 |                                     | 2.29             | 22.18                          |
| "          | 6.6              | Greyish Silty Sand           | 18.12   |        |        |        |                         |              |            | 88.72         | 86.77        | 79.62        | 46.18        | 11.16         | 10.76        | 6.88   | 4.68         |      |                                     | 2.67             | 19.77                          |
| "          | 8.1              | Greyish Silty Sand           | 28.1    |        |        |        |                         |              |            |               | 84.21        | 61.26        | 51.66        | 30.21         | 18.29        | 9.22   | 5.64         |      |                                     | 2.76             | 17.61                          |

**DETAILS-OF-LABORATORY-TEST-RESULTS.xis**

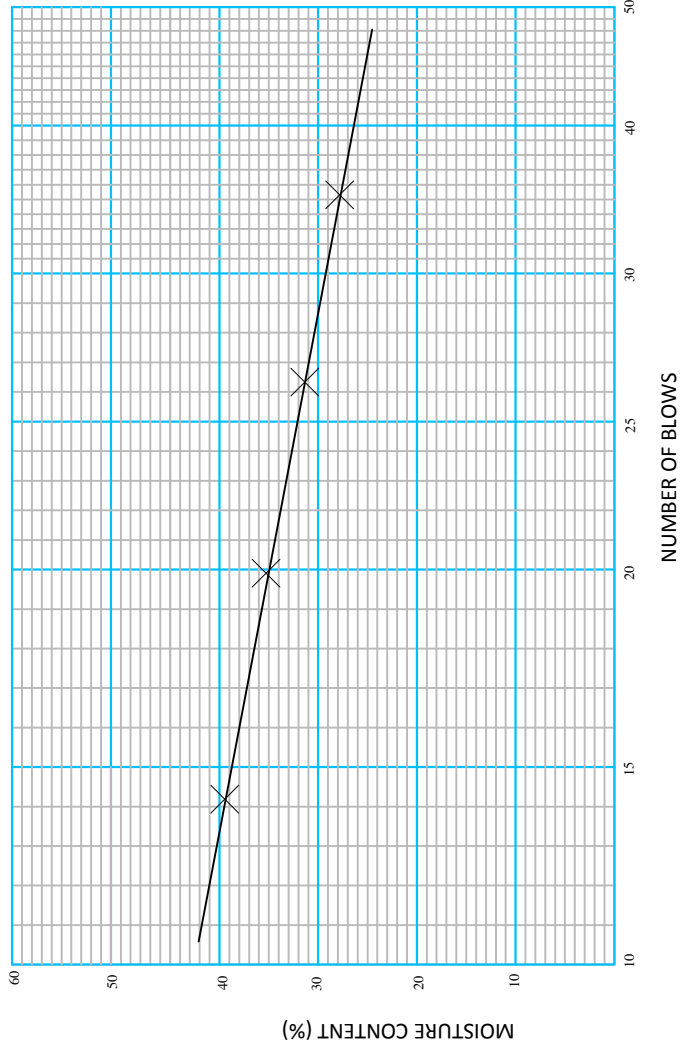
| EJO SUBSTATION |                  |                                    |         |       |       |        |                         |              |            |               |              |              |              |               |               |        |              |    |                                     |                                     |                  |                                |
|----------------|------------------|------------------------------------|---------|-------|-------|--------|-------------------------|--------------|------------|---------------|--------------|--------------|--------------|---------------|---------------|--------|--------------|----|-------------------------------------|-------------------------------------|------------------|--------------------------------|
| Sample No.     | Sample Depth (m) | Description of Sample              | EMC (%) | LL(%) | PL(%) | PI (%) | PARTICLES SIZE ANALYSIS |              |            |               |              |              |              |               |               |        | DIRECT SHEAR |    | C <sub>v</sub> (m <sup>2</sup> /yr) | M <sub>v</sub> (m <sup>2</sup> /kN) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |
|                |                  |                                    |         |       |       |        | #.5 (0.075mm)           | #.7 (3.35mm) | #.10 (2mm) | #.14 (1.18mm) | #.25 (600mm) | #.38 (625mm) | #.72 (212mm) | #.100 (100mm) | #.200 (850mm) | Clay % | C            | Φ  |                                     |                                     |                  |                                |
| BH.1           | 0.6              | Dark Brown Silty Sand              | 23.6    |       |       |        | 94.74                   | 92.12        | 96.86      | 81.60         | 68.46        | 51.38        | 46.12        | 40.87         | 40.54         | 35.28  |              |    |                                     |                                     | 2.6              | 18.41                          |
| "              | 2.1              | Reddish Brown conc Laterite        | 21.82   |       |       |        |                         |              | 96.03      | 90.08         | 72.22        | 50.4         | 18.65        | 14.68         | 14.19         | 10.22  | 24           | 14 |                                     |                                     | 2.33             | 20.96                          |
| "              | 3.6              | Reddish Brown conc Laterite        | 18.33   |       |       |        |                         |              |            | 95.00         | 80           | 60           | 16.67        | 10            | 9.58          | 6.28   | 24           | 13 |                                     |                                     | 2.6              | 20.15                          |
| BH.2           | 0.6              | Brownish Silty Sand                | 14.7    |       |       |        | 89.71                   | 88.24        | 83.82      | 80.88         | 72.06        | 55.88        | 17.65        | 10.29         | 9.93          | 4.04   | 13           | 18 |                                     |                                     | 2.6              | 17.41                          |
| "              | 2.1              | Brownish conc Laterite             | 26      |       |       |        |                         |              | 91.12      | 85.21         | 73.37        | 64.5         | 28.99        | 14.2          | 13.46         | 4.59   | 9            | 27 |                                     |                                     | 2.6              | 16.96                          |
| BH.3           | 0.6              | Brown Clay Silt Red Brown laterite | 25      |       |       |        | 95.95                   | 78.13        | 63.63      | 57.81         | 46.88        | 32.81        | 10.94        | 6.25          | 5.86          | 1.17   | 5            | 17 |                                     |                                     | 2.6              | 21.22                          |
| "              | 2.1              | Reddish Brown conc Laterite        | 20.58   |       |       |        | 89.71                   | 85.67        | 77.37      | 71.19         | 58.85        | 40.33        | 15.64        | 9.47          | 8.95          | 4.84   | 12           | 28 |                                     |                                     | 2.6              | 17.16                          |



APPENDIX E

LIQUID LIMIT TEST GRAPH

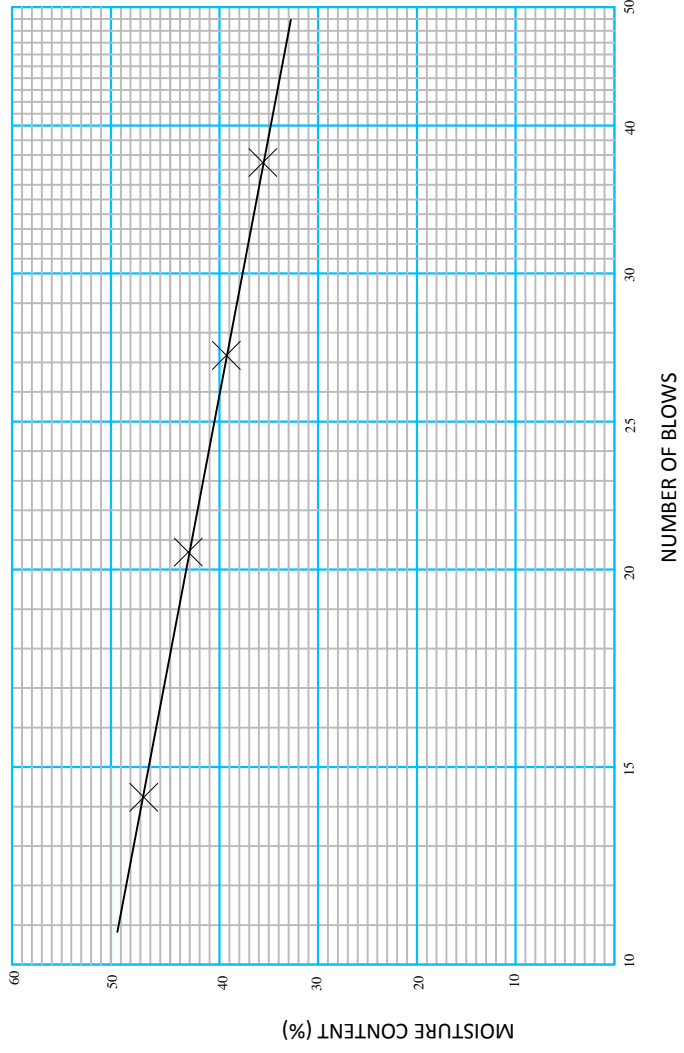
|   |                         |                      |
|---|-------------------------|----------------------|
| Sample No.: SA1                               | Liquid Limit: 32%       | Plastic Limit: 13.3% |
| Boring No.: SA1                               | Plasticity Index: 18.7% |                      |
| Description of Soils: Grayish Silty Sand Clay |                         | Depth: 9.6m          |



APPENDIX E

LIQUID LIMIT TEST GRAPH

|  |                       |                      |
|--|-----------------------|----------------------|
| Sample No.: SA10                                   | Liquid Limit: 40.4%   | Plastic Limit: 30.4% |
| Boring No.: SA10                                   | Plasticity Index: 10% |                      |
| Description of Soils: Reddish Brown Lateritic Clay |                       | Depth: 2.1m          |

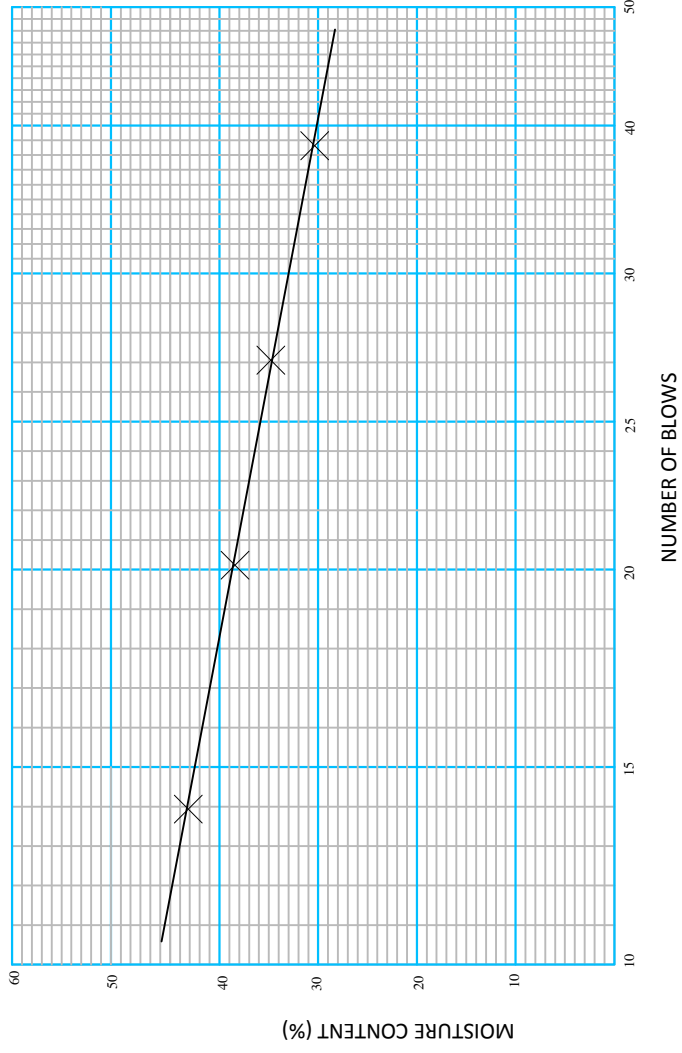


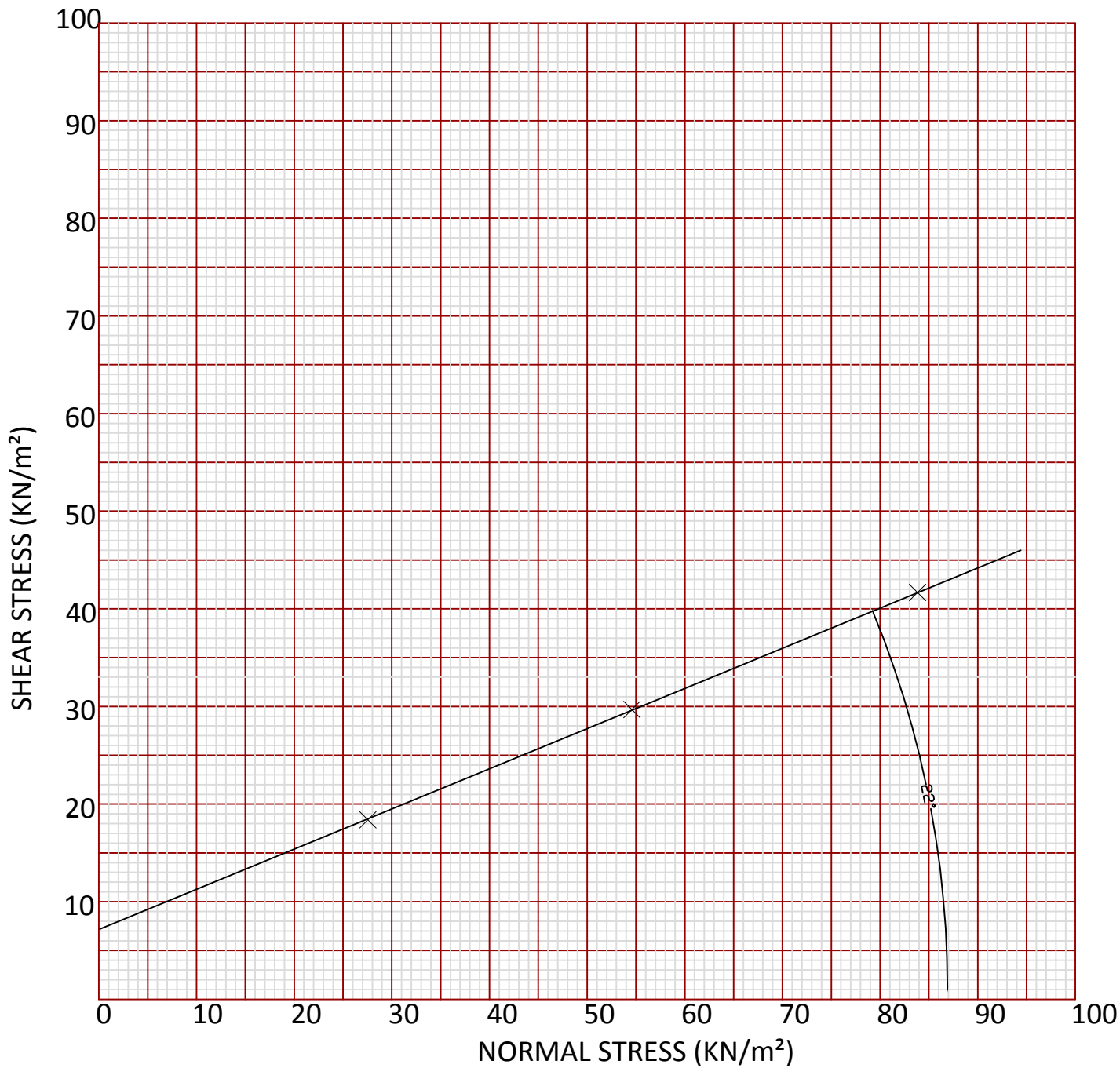


APPENDIX E

LIQUID LIMIT TEST GRAPH

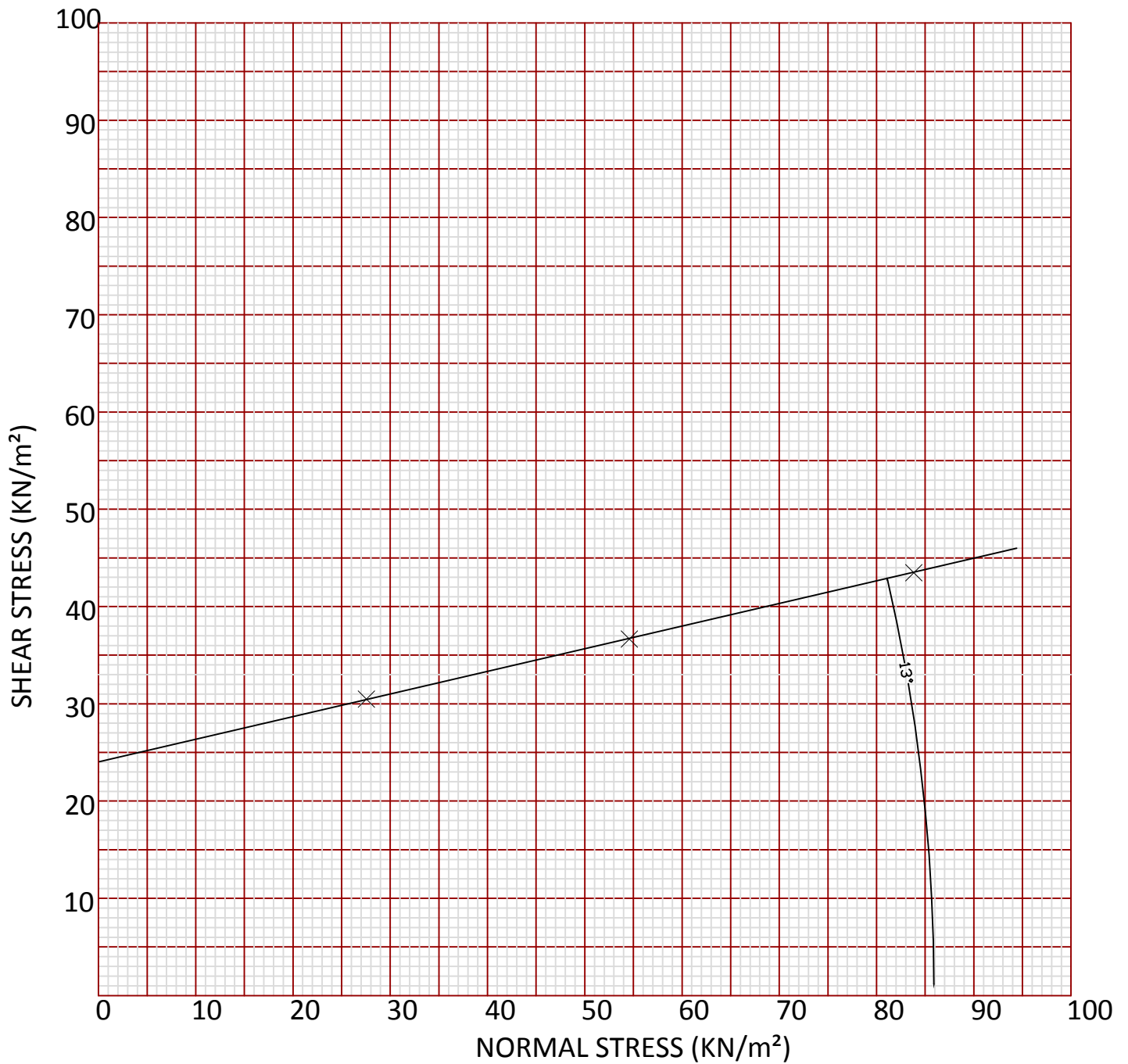
|  |                         |                    |
|--|-------------------------|--------------------|
| Sample No.: NA14                         | Liquid Limit: 36.9%     | Plastic Limit: 26% |
| Boring No.: NA14                         | Plasticity Index: 10.9% |                    |
| Description of Soils: Greyish Stiff Clay |                         | Depth: 8.1m        |





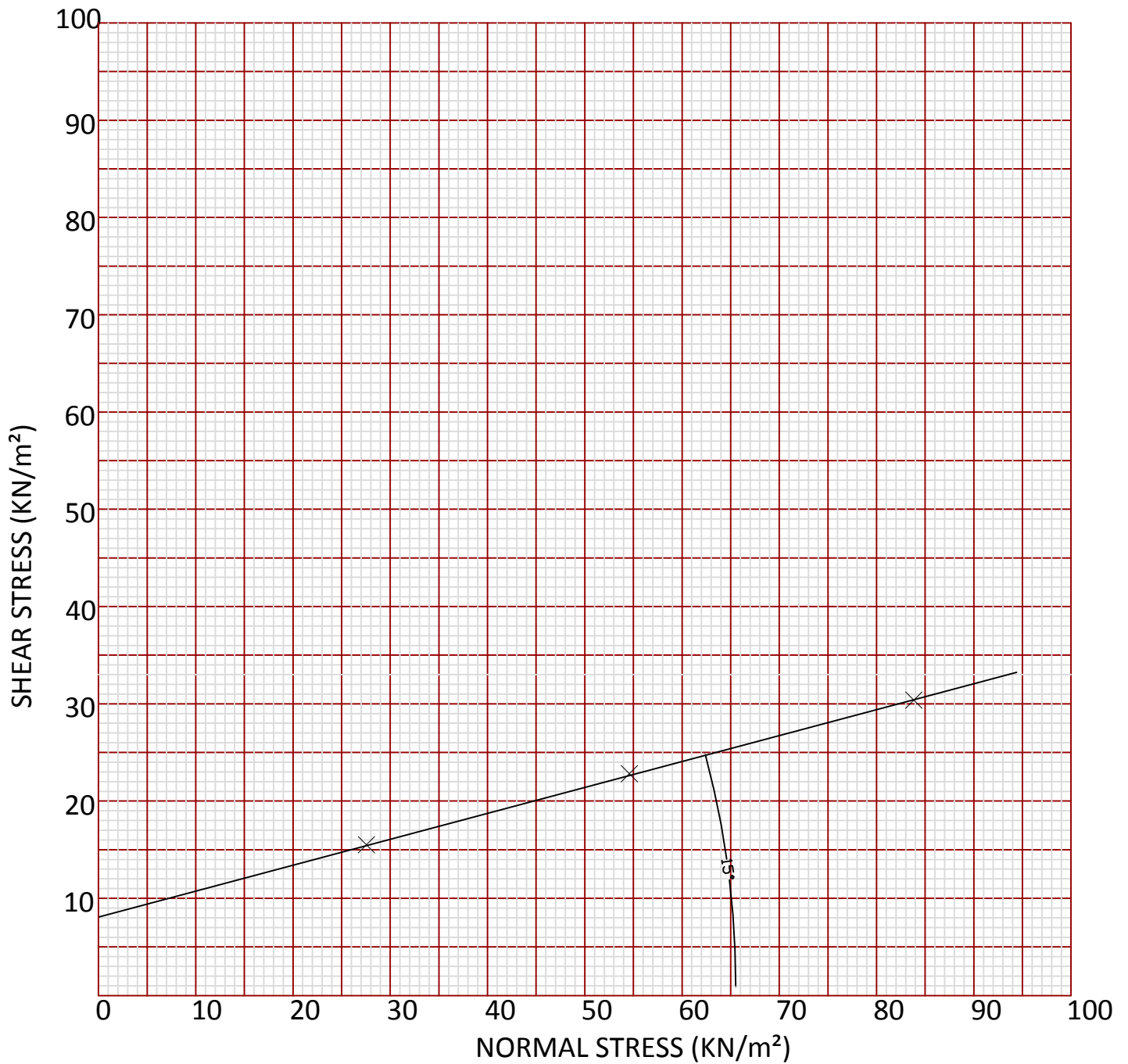
| Field Description of Sample | Specimen Identification | NORMAL STRESS (KN/m <sup>2</sup> ) | SHEAR STRESS (KN/m <sup>2</sup> ) | BULK DENSITY (KN/m <sup>3</sup> ) | Sample Depth (m) | C (KN/m <sup>2</sup> ) | Ø° |
|-----------------------------|-------------------------|------------------------------------|-----------------------------------|-----------------------------------|------------------|------------------------|----|
| Reddish Brown Laterite      | BH1 RCCG                | 27.25                              | 18.23                             | 17.22                             | 3.6              | 7                      | 22 |
|                             |                         | 54.50                              | 29.32                             |                                   |                  |                        |    |
|                             |                         | 81.75                              | 42.54                             |                                   |                  |                        |    |

APPENDIX D: SHEAR BOX TEST GRAPH



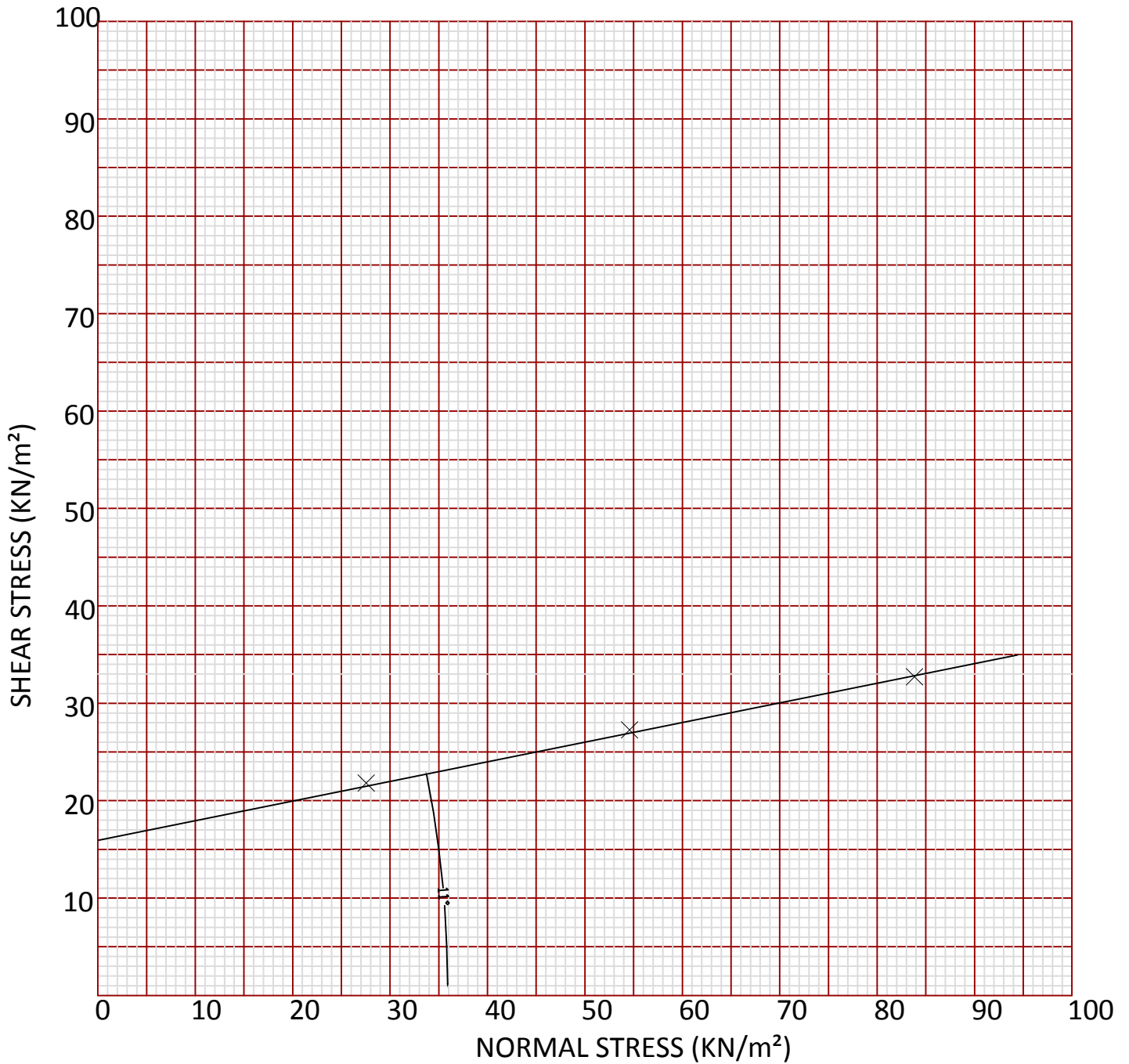
| Field Description of Sample | Specimen Identification | NORMAL STRESS (KN/m <sup>2</sup> ) | SHEAR STRESS (KN/m <sup>2</sup> ) | BULK DENSITY (KN/m <sup>3</sup> ) | Sample Depth (m) | C KN/m <sup>2</sup> | φ° |
|-----------------------------|-------------------------|------------------------------------|-----------------------------------|-----------------------------------|------------------|---------------------|----|
| Reddish Brown conc Laterite | BH1 EJIO                | 27.25                              | 30.21                             | 20.15                             | 3.6              | 24                  | 13 |
|                             |                         | 54.50                              | 36.98                             |                                   |                  |                     |    |
|                             |                         | 81.75                              | 43.65                             |                                   |                  |                     |    |

APPENDIX D: SHEAR BOX TEST GRAPH



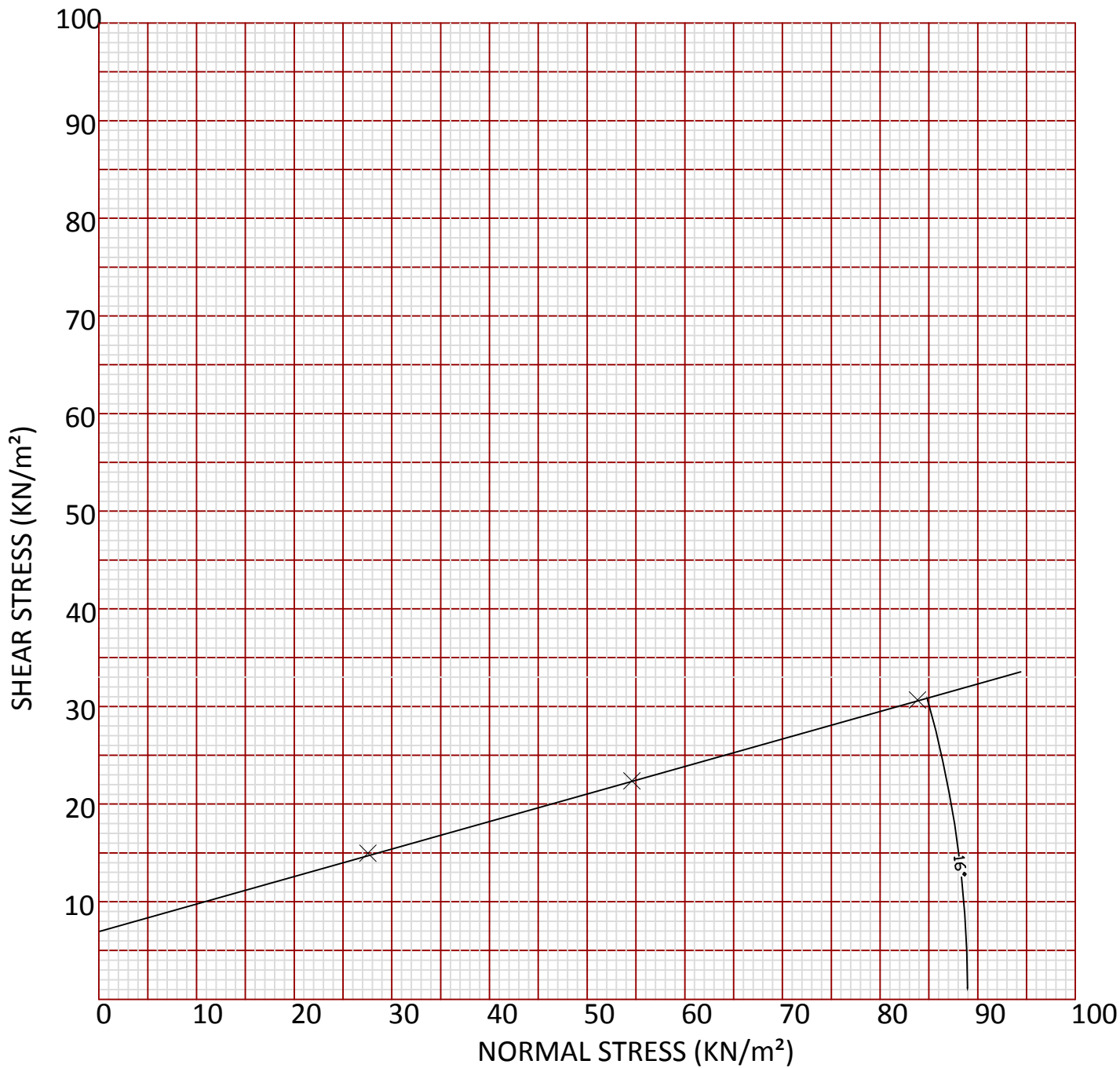
| Field Description of Sample | Specimen Identification | NORMAL STRESS (KN/m <sup>2</sup> ) | SHEAR STRESS (KN/m <sup>2</sup> ) | BULK DENSITY (KN/m <sup>3</sup> ) | Sample Depth (m) | C (KN/m <sup>2</sup> ) | Ø° |
|-----------------------------|-------------------------|------------------------------------|-----------------------------------|-----------------------------------|------------------|------------------------|----|
| Brownish Clayed Sand        | SA1                     | 27.25                              | 15.23                             | 21.11                             | 2.1              | 8                      | 15 |
|                             |                         | 54.50                              | 22.32                             |                                   |                  |                        |    |
|                             |                         | 81.75                              | 30.56                             |                                   |                  |                        |    |

APPENDIX D: SHEAR BOX TEST GRAPH



| Field Description of Sample | Specimen Identification | NORMAL STRESS (KN/m <sup>2</sup> ) | SHEAR STRESS (KN/m <sup>2</sup> ) | BULK DENSITY (KN/m <sup>3</sup> ) | Sample Depth (m) | C KN/m <sup>2</sup> | Ø° |
|-----------------------------|-------------------------|------------------------------------|-----------------------------------|-----------------------------------|------------------|---------------------|----|
| Grayish Dark Silty Clay     | SA6                     | 27.25                              | 21.54                             | 20.61                             | 3.6              | 16                  | 11 |
|                             |                         | 54.50                              | 27.98                             |                                   |                  |                     |    |
|                             |                         | 81.75                              | 33.0                              |                                   |                  |                     |    |

APPENDIX D: SHEAR BOX TEST GRAPH



| Field Description of Sample | Specimen Identification | NORMAL STRESS (KN/m <sup>2</sup> ) | SHEAR STRESS (KN/m <sup>2</sup> ) | BULK DENSITY (KN/m <sup>3</sup> ) | Sample Depth (m) | C (KN/m <sup>2</sup> ) | φ° |
|-----------------------------|-------------------------|------------------------------------|-----------------------------------|-----------------------------------|------------------|------------------------|----|
| Greyish Clay Sand           | SA11                    | 27.25                              | 15.76                             | 21.98                             | 3.6              | 7                      | 16 |
|                             |                         | 54.50                              | 22.21                             |                                   |                  |                        |    |
|                             |                         | 81.75                              | 30.32                             |                                   |                  |                        |    |

APPENDIX D: SHEAR BOX TEST GRAPH

**DETAILS-OF-LABORATORY-TEST-RESULTS.XIS**

**TABLE 4.1: DETAILS OF LABORATORY RESULTS FOR GEOTECHNICAL INVESTIGATIONS AT PROPOSED TRANSMISSION LINE AND SUBSTATIONS IN OGUN AND LAGOS STATES**

| Sample No. | Sample Depth (m) | Description of Sample   | PARTICLES SIZE ANALYSIS |        |        |        |                        |             |           |              |             |             | EMC (%)     | LL (%)       | PL (%)      | PI (%) | #5 (5mm)     | #7 (3.35mm) | #10 (2mm)                           | #14 (1.18mm)                        | #25 (600mm)      | #38 (425mm)                    | #72 (212mm) | #100 (150mm) | #200 (63mm) | Clay % | DIRECT SHEAR |   | C <sub>v</sub> (m <sup>2</sup> /yr) | M <sub>v</sub> (m <sup>2</sup> /kn) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |   |     |       |       |
|------------|------------------|-------------------------|-------------------------|--------|--------|--------|------------------------|-------------|-----------|--------------|-------------|-------------|-------------|--------------|-------------|--------|--------------|-------------|-------------------------------------|-------------------------------------|------------------|--------------------------------|-------------|--------------|-------------|--------|--------------|---|-------------------------------------|-------------------------------------|------------------|--------------------------------|---|-----|-------|-------|
|            |                  |                         | EMC (%)                 | LL (%) | PL (%) | PI (%) | C (kN/m <sup>2</sup> ) | Φ.          |           |              |             |             |             |              |             |        |              |             |                                     |                                     |                  |                                |             |              |             |        |              |   |                                     |                                     |                  |                                |   |     |       |       |
| SA 1       | 0.6              | Dark Silty Soil         | 34                      | -      | -      | -      | -                      | -           | -         | -            | -           | -           | -           | -            | -           | -      | -            | -           | -                                   | -                                   | -                | -                              | -           | -            | -           | -      | -            | - | -                                   | -                                   | -                | -                              | - | 2.6 | 15.29 |       |
| "          | 2.1              | Brownish Clayed Sand    | 22.7                    | -      | -      | -      | -                      | -           | -         | -            | -           | -           | -           | -            | -           | -      | -            | -           | -                                   | -                                   | -                | -                              | -           | -            | -           | -      | -            | - | -                                   | -                                   | -                | -                              | - | -   | 2.69  | 21.11 |
| "          | 3.6              | Brownish Clayed Sand    | 18.14                   | -      | -      | -      | -                      | -           | -         | -            | -           | -           | -           | -            | -           | -      | -            | -           | -                                   | -                                   | -                | -                              | -           | -            | -           | -      | -            | - | -                                   | -                                   | -                | -                              | - | -   | 2.72  | 20.21 |
| "          | 5.1              | Brownish Clayed Sand    | 20.7                    | -      | -      | -      | -                      | -           | -         | -            | -           | -           | -           | -            | -           | -      | -            | -           | -                                   | -                                   | -                | -                              | -           | -            | -           | -      | -            | - | -                                   | -                                   | -                | -                              | - | -   | 2.81  | 20.47 |
| "          | 6.6              | Brownish Clayed Sand    | 22.14                   | -      | -      | -      | -                      | -           | -         | -            | -           | -           | -           | -            | -           | -      | -            | -           | -                                   | -                                   | -                | -                              | -           | -            | -           | -      | -            | - | -                                   | -                                   | -                | -                              | - | -   | 2.68  | 18.22 |
| "          | 8.1              | Grayish Sandy Clayed    | 18.76                   | -      | -      | -      | -                      | -           | -         | -            | -           | -           | -           | -            | -           | -      | -            | -           | -                                   | -                                   | -                | -                              | -           | -            | -           | -      | -            | - | -                                   | -                                   | -                | -                              | - | -   | 2.72  | 20.18 |
| "          | 9.6              | Grayish Silty Sand Clay | 23.1                    | 32.00  | 13.30  | 18.70  | -                      | -           | -         | -            | -           | -           | -           | -            | -           | -      | -            | -           | -                                   | -                                   | -                | -                              | -           | -            | -           | -      | -            | - | -                                   | -                                   | -                | -                              | - | -   | 2.38  | 21.79 |
| Sample No. | Sample Depth (m) | Description of Sample   | EMC (%)                 | LL (%) | PL (%) | PI (%) | #5 (5mm)               | #7 (3.35mm) | #10 (2mm) | #14 (1.18mm) | #25 (600mm) | #38 (425mm) | #72 (212mm) | #100 (150mm) | #200 (63mm) | Clay % | DIRECT SHEAR |             | C <sub>v</sub> (m <sup>2</sup> /yr) | M <sub>v</sub> (m <sup>2</sup> /kn) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |             |              |             |        |              |   |                                     |                                     |                  |                                |   |     |       |       |
| SA 2       | 0.6              | Brownish Clayed Silt    | 18.03                   | -      | -      | -      | -                      | -           | -         | -            | -           | -           | -           | -            | -           | -      | -            | -           | -                                   | -                                   | -                | -                              | -           | -            | -           | -      | -            | - | -                                   | -                                   | -                | -                              | - | -   | 2.69  | 19.62 |
| "          | 2.1              | Brownish Laterite Clay  | 18.3                    | -      | -      | -      | -                      | -           | -         | -            | -           | -           | -           | -            | -           | -      | -            | -           | -                                   | -                                   | -                | -                              | -           | -            | -           | -      | -            | - | -                                   | -                                   | -                | -                              | - | -   | 2.76  | 18.41 |
| "          | 3.6              | Brownish Laterite Clay  | 20                      | -      | -      | -      | -                      | -           | -         | -            | -           | -           | -           | -            | -           | -      | -            | -           | -                                   | -                                   | -                | -                              | -           | -            | -           | -      | -            | - | -                                   | -                                   | -                | -                              | - | -   | 2.64  | 20.72 |
| "          | 5.1              | Brownish Laterite       | 17.8                    | -      | -      | -      | -                      | -           | -         | -            | -           | -           | -           | -            | -           | -      | -            | -           | -                                   | -                                   | -                | -                              | -           | -            | -           | -      | -            | - | -                                   | -                                   | -                | -                              | - | -   | 2.62  | 18.64 |
| "          | 6.6              | Brownish Laterite       | 20.6                    | -      | -      | -      | -                      | -           | -         | -            | -           | -           | -           | -            | -           | -      | -            | -           | -                                   | -                                   | -                | -                              | -           | -            | -           | -      | -            | - | -                                   | -                                   | -                | -                              | - | -   | 2.76  | 19.81 |
| "          | 8.1              | Brownish Laterite       | 15.2                    | -      | -      | -      | -                      | -           | -         | -            | -           | -           | -           | -            | -           | -      | -            | -           | -                                   | -                                   | -                | -                              | -           | -            | -           | -      | -            | - | -                                   | -                                   | -                | -                              | - | -   | 2.66  | 25.61 |

**DETAILS-OF-LABORATORY-TEST-RESULTS.XIS**

| Sample No. | Sample Depth (m) | Description of Sample        | EMC (%) | LL (%) | PL (%) | PI (%) | PARTICLES SIZE ANALYSIS |              |            |               |              |              |              |               |               |   | Clay % | C <sub>v</sub> (m <sup>2</sup> /yr) | M <sub>v</sub> (m <sup>2</sup> /kn) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |
|------------|------------------|------------------------------|---------|--------|--------|--------|-------------------------|--------------|------------|---------------|--------------|--------------|--------------|---------------|---------------|---|--------|-------------------------------------|-------------------------------------|------------------|--------------------------------|
|            |                  |                              |         |        |        |        | #.5 (5mm)               | #.7 (3.35mm) | #.10 (2mm) | #.14 (1.18mm) | #.25 (600mm) | #.38 (425mm) | #.72 (212mm) | #.100 (150mm) | #.200 (850mm) |   |        |                                     |                                     |                  |                                |
| SA 3       | 0.6              | Dark Brown Clayey Silt       | 21.57   |        |        |        | 96.45                   | 80.60        | 63.38      | 35.3          | 26.99        | 8.45         | 4.7          | 4.34          |               |   |        | 2.77                                | 22.21                               |                  |                                |
| "          | 2.1              | Reddish Brown Lateritic Clay | 15.71   |        |        |        |                         |              | 93.33      | 77.05         | 68.85        | 20.12        | 16.25        | 12.67         |               |   |        | 2.33                                | 17.27                               |                  |                                |
| "          | 3.6              | Greyish Brown Lateritic Clay | 16.95   |        |        |        | 98.31                   | 94.92        | 89.83      | 71.79         | 42.37        | 16.95        | 11.86        | 11.44         |               |   |        | 2.6                                 | 19.17                               |                  |                                |
| "          | 5.1              | Greyish Brown Lateritic Clay | 21.5    |        |        |        | 94.47                   | 79.83        | 67.6       | 43.77         | 24.84        | 6.23         | 3.5          | 3.12          |               | 6 | 20     | 2.5                                 | 21.71                               |                  |                                |
| SA 4       | 0.6              | Brown Lateritic Clay         | 32.1    |        |        |        | 76.20                   | 58.26        | 49.58      | 49.58         | 29.84        | 19.55        | 15.77        | 15.3          |               |   |        | 2.4                                 | 25.16                               |                  |                                |
| "          | 2.1              | Greyish Brown Clay           | 38.6    |        |        |        | 56.18                   | 40.34        | 31.58      | 21.05         | 14.04        | 7.02         | 5.26         | 4.52          |               |   |        | 2.6                                 | 18.17                               |                  |                                |
| "          | 3.1              | Greyish Brown Clay           |         |        |        |        |                         |              |            |               |              |              |              |               |               |   |        | 2.81                                | 19.42                               |                  |                                |
| "          | 5.1              | Gravish Silty Clay           | 39.5    |        |        |        | 80.33                   | 68.85        | 60.66      | 49.18         | 36.07        | 9.82         | 4.92         | 4.92          |               |   |        | 2.35                                | 18.63                               |                  |                                |
| "          | 6.6              | Greyish Silty Clay           | 49.9    |        |        |        | 62.89                   | 51.84        | 44.33      | 33.57         | 24.64        | 14.87        | 12.61        | 11.9          |               |   |        | 2.68                                | 18.42                               |                  |                                |
| Sample No. | Sample Depth (m) | Description of Sample        | EMC (%) | LL (%) | PL (%) | PI (%) | PARTICLES SIZE ANALYSIS |              |            |               |              |              |              |               |               |   | Clay % | C <sub>v</sub> (m <sup>2</sup> /yr) | M <sub>v</sub> (m <sup>2</sup> /kn) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |
| NA 5       | 0.6              | Dark Grey Brown Clay         | 13.85   |        |        |        |                         | 98.94        | 95.74      | 88.3          | 79.79        | 70.21        | 36.17        | 35.11         |               |   |        | 2.6                                 | 17.2                                |                  |                                |
| "          | 2.1              | Reddish Brown Laterite       | 18.16   |        |        |        | 99.12                   | 89.14        | 83.62      | 66.42         | 37.66        | 11.24        | 8.73         | 8.41          |               |   |        | 2.62                                | 18.41                               |                  |                                |
| "          | 3.6              | Greish Brown Lateritic Clay  | 20.41   |        |        |        | 96.96                   | 89.39        | 67.35      | 51.02         | 44.9         | 22.45        | 14.29        | 13.78         |               |   |        | 2.6                                 | 25.17                               |                  |                                |
| "          | 5.1              | Greish Brown Lateritic Clay  | 35.56   |        |        |        | 86.67                   | 66.67        | 60.00      | 46.6          | 33.33        | 17.78        | 13.33        | 12.78         |               |   |        | 2.6                                 | 16.14                               |                  |                                |
| "          | 6.6              | Brownish conc Laterite       | 18.61   |        |        |        |                         | 99.12        | 97.62      | 95.74         | 85.26        | 8.85         | 4.01         | 3.8           |               |   |        | 2.61                                | 19.21                               |                  |                                |
| SA 6       | 0.6              | Brownish Silty Sand          | 13.7    |        |        |        | 98.62                   | 93.23        | 84.5       | 69.4          | 34.43        | 6.83         | 3.83         | 3.76          |               |   |        | 2.16                                | 20.41                               |                  |                                |

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**DETAILS-OF-LABORATORY-TEST-RESULTS.xis**

| Sample No. | Sample Depth (m) | Description of Sample   | EMC (%) | LL (%) | PL (%) | PI (%) | PARTICLES SIZE ANALYSIS |              |            |               |              |              |              |               |              |        | DIRECT SHEAR        |      |                                     | Bulk Density kn/m <sup>3</sup> |                                     |                  |
|------------|------------------|-------------------------|---------|--------|--------|--------|-------------------------|--------------|------------|---------------|--------------|--------------|--------------|---------------|--------------|--------|---------------------|------|-------------------------------------|--------------------------------|-------------------------------------|------------------|
|            |                  |                         |         |        |        |        | #.5 (5mm)               | #.7 (3.35mm) | #.10 (2mm) | #.14 (1.18mm) | #.25 (600mm) | #.38 (625mm) | #.72 (212mm) | #.100 (150mm) | #.200 (83mm) | Clay % | C kn/m <sup>2</sup> | Φ.   | C <sub>v</sub> (m <sup>2</sup> /yr) |                                | M <sub>v</sub> (m <sup>2</sup> /kn) | Specific Gravity |
| NA 7       | 0.6              | Reddish Brown Laterite  | 23.74   |        |        |        | 98.62                   | 97.43        | 92.66      | 84.80         | 61.94        | 34.43        | 6.33         | 3.99          | 3.76         | 2.38   | 8                   | 16   |                                     | 2.64                           | 21.24                               |                  |
| "          | 2.1              | Brownish Lateritic Clay |         |        |        |        |                         |              |            |               |              |              |              |               |              |        |                     |      |                                     |                                |                                     |                  |
| "          | 3.6              | Brownish Lateritic Clay |         |        |        |        |                         |              |            |               |              |              |              |               |              |        |                     |      |                                     |                                |                                     |                  |
| SA 8       | 0.6              |                         | 26.63   |        |        |        |                         |              |            | 87.89         | 66.1         | 22.52        | 12.83        | 12.23         | 4.96         | 14     | 14                  |      | 2.6                                 | 14.96                          |                                     |                  |
| "          | 2.1              |                         | 19.19   |        |        |        |                         |              |            | 92.62         | 71.96        | 24.72        | 15.87        | 15.5          | 6.64         | 9      | 17                  |      | 2.6                                 | 15.51                          |                                     |                  |
| "          | 3.6              |                         | 24.48   |        |        |        |                         |              |            | 98.98         | 97.97        | 92.86        | 80.61        | 57.14         | 11.22        | 6.12   | 5.37                | 3.83 | 6                                   | 24                             | 2.33                                | 19.71            |
| "          | 5.1              |                         | 25.4    |        |        |        | 99.12                   | 96.36        | 89.90      | 83.62         | 66.42        | 37.66        | 11.24        | 8.73          | 8.51         | 7.53   | 2                   | 18   |                                     | 2.57                           | 18.65                               |                  |
| "          | 6.6              |                         |         |        |        |        |                         |              |            |               |              |              |              |               |              |        |                     |      |                                     |                                |                                     |                  |
| "          | 8.1              |                         | 18.18   |        |        |        |                         |              |            | 98.18         | 85.15        | 60           | 14.55        | 9.09          | 8.64         | 5      | 13                  | 20   |                                     | 2.69                           | 21.41                               |                  |

**DETAILS-OF-LABORATORY-TEST-RESULTS.XIS**

| Sample No. | Sample Depth (m) | Description of Sample          | EMC (%) | LL(%) | PL(%) | PI (%) | PARTICLES SIZE ANALYSIS |              |            |               |              |              |              |               |              |  | Clay % | C <sub>v</sub> (m <sup>2</sup> /yr) | M <sub>v</sub> (m <sup>2</sup> /kn) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |
|------------|------------------|--------------------------------|---------|-------|-------|--------|-------------------------|--------------|------------|---------------|--------------|--------------|--------------|---------------|--------------|--|--------|-------------------------------------|-------------------------------------|------------------|--------------------------------|
|            |                  |                                |         |       |       |        | #.5 (5mm)               | #.7 (3.35mm) | #.10 (2mm) | #.14 (1.18mm) | #.25 (600mm) | #.38 (625mm) | #.72 (212mm) | #.100 (150mm) | #.200 (83mm) |  |        |                                     |                                     |                  |                                |
| NA 9       | 0.6              | Greyish Brown Silty Clay       | 25.1    |       |       |        | 97.96                   | 93.93        | 81.35      | 68.10         | 50.44        | 32.66        | 5.68         | 2.65          | 2.57         |  |        |                                     | 2.34                                | 18.44            |                                |
| "          | 2.1              | Greyish Brown Lateritic Clay   | 23.1    |       |       |        | -                       | -            | 91.07      | 82.14         | 71.43        | 62.5         | 32.14        | 17.86         | 16.07        |  |        |                                     | 2.33                                | 17.82            |                                |
| "          | 3.6              | Greyish Stiff Clay             | 31.99   |       |       |        | -                       | 97.87        | 82.98      | 70.21         | 53.19        | 40.43        | 23.4         | 14.89         | 14.36        |  |        |                                     | 2.33                                | 20.11            |                                |
| "          | 5.1              | Greyish Stiff Clay             | 29.1    |       |       |        | 96.36                   | 92.73        | 87.64      | 74.55         | 60           | 49.09        | 23.64        | 12.73         | 18.27        |  |        |                                     | 2.33                                | 19.71            |                                |
| "          | 6.6              | Greyish Stiff Clay             |         |       |       |        |                         |              |            |               |              |              |              |               |              |  |        |                                     |                                     |                  |                                |
| SA 10      | 0.6              | Dark bBrownish Silty Sand      | 22.22   |       |       |        | -                       | -            | 96.49      | 93.72         | 84.46        | 49.91        | 17.85        | 15.2          | 14.91        |  |        |                                     | 2.5                                 | 26.14            |                                |
| "          | 2.1              | Reddish Brown Lateritic Clay   | 19.9    | 40.40 | 30.40 | 10.00  | -                       | -            | 94.36      | 88.72         | 77.43        | 42.52        | 7.97         | 1.9           | 1.55         |  |        |                                     | 2.34                                | 20.81            |                                |
| "          | 3.6              | Reddish Brown Lateritic Clay   | 22.16   |       |       |        | -                       | -            | 87.16      | 74.77         | 48.19        | 22.11        | 18.2         | 14.17         | 8.81         |  |        |                                     | 2.65                                | 18.2             |                                |
| "          | 5.1              | Reddish Brown Lateritic Clay   | 19.4    |       |       |        | -                       | -            | -          | 94.49         | 77.96        | 54.09        | 11.85        | 6.34          | 5.88         |  |        |                                     | 2.47                                | 19.66            |                                |
| "          | 6.6              | Reddish Brown Lateritic Clay   | 14      | 27.40 | 26.70 | 0.70   | -                       | -            | -          | 97.64         | 82.46        | 42.88        | 8.43         | 5.84          | 5.21         |  |        |                                     | 2.71                                | 21.79            |                                |
| "          | 8.1              | Greyish Brown Silty Dense Clay | 15.61   |       |       |        | -                       | 96.17        | 91.79      | 89.17         | 62.72        | 53.14        | 34.56        | 18.23         | 8.17         |  |        |                                     | 2.65                                | 22.85            |                                |
| "          | 9.6              | Greyish Brown Silty Dense Clay | 14.28   |       |       |        | -                       | -            | -          | 78.16         | 72.16        | 51.17        | 20.17        | 17.19         | 12.61        |  |        |                                     | 2.71                                | 17.19            |                                |

**DETAILS-OF-LABORATORY-TEST-RESULTS.XIS**

| Sample No. | Sample Depth (m) | Description of Sample | EMC (%) | LL (%) | PL (%) | PI (%) | PARTICLES SIZE ANALYSIS |           |              |            |               |              |              |              |               |              | DIRECT SHEAR |                     | M <sub>v</sub> (m <sup>2</sup> /kN) | C <sub>v</sub> (m <sup>2</sup> /yr) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |
|------------|------------------|-----------------------|---------|--------|--------|--------|-------------------------|-----------|--------------|------------|---------------|--------------|--------------|--------------|---------------|--------------|--------------|---------------------|-------------------------------------|-------------------------------------|------------------|--------------------------------|
|            |                  |                       |         |        |        |        | #.75 (3.35mm)           | #.5 (5mm) | #.7 (3.35mm) | #.10 (2mm) | #.14 (1.18mm) | #.25 (600mm) | #.38 (625mm) | #.72 (212mm) | #.100 (150mm) | #.200 (83mm) | Clay %       | C kN/m <sup>2</sup> |                                     |                                     |                  |                                |
| SA 11      | 0.6              | Brown Clayey Sand     | 13      |        |        |        |                         |           |              | 97.91      | 89.47         | 44           | 9.41         | 6.07         | 5.72          | 4.74         |              |                     |                                     |                                     | 2.86             | 18.42                          |
| "          | 2.1              | No Recovery           |         |        |        |        |                         |           |              |            |               |              |              |              |               |              |              |                     |                                     |                                     |                  |                                |
| "          | 3.6              | Greyish Clay Sand     | 16.4    |        |        |        |                         |           |              | 99.22      | 90.39         | 57.75        | 10.14        | 6.47         | 6.15          | 4.05         | 7            | 16                  |                                     |                                     | 2.58             | 21.98                          |
| "          | 5.1              | Greyish Clay Sand     | 29.77   |        |        |        |                         | 84.61     |              | 76.21      | 52.17         | 48.11        | 20.17        | 12.17        | 8.44          | 3.47         |              |                     |                                     |                                     | 2.69             | 18.71                          |
| "          | 6.6              | Greyish Clay Sand     | 31.67   |        |        |        |                         |           |              | 97.04      | 82.41         | 46.19        | 8.43         | 5.54         | 5.17          | 3.84         |              |                     |                                     |                                     | 2.76             | 18.42                          |
| SA 12      | 0.6              | Dark Brown Silty Sand | 24      |        |        |        |                         |           |              | 98.09      | 90.78         | 56.76        | 12.16        | 7.31         | 6.92          | 5.33         |              |                     |                                     |                                     | 2.37             | 19.69                          |
| "          | 2.1              | Grey Sand Clay        | 24.1    |        |        |        |                         |           |              | 96.28      | 74.38         | 33.6         | 8.6          | 6.2          | 5.59          | 5.09         |              |                     |                                     |                                     | 2.42             | 21.89                          |
| "          | 3.6              | Grey Clayey Sand      | 18.2    |        |        |        |                         |           |              | 99.01      | 88.27         | 43.41        | 6.21         | 6.13         | 6             | 4.83         |              |                     |                                     |                                     | 2.57             | 20.71                          |
| "          | 5.1              | Grey Sharp Sand       | 13.9    |        |        |        |                         |           | 97.66        | 95.59      | 82.91         | 44.89        | 6.49         | 3.59         | 3.28          | 2.14         |              |                     |                                     |                                     | 2.77             | 17.26                          |
| "          | 6.6              | Grey Sharp Sand       | 20.18   |        |        |        |                         |           | 97.18        | 80.17      | 62.11         | 50.78        | 18.17        | 16.78        | 12.12         | 7.68         |              |                     |                                     |                                     | 2.76             | 19.24                          |
| "          | 8.1              | Grey Sharp Sand       | 15.6    |        |        |        |                         |           | 99.20        | 96.10      | 73.51         | 36.16        | 8.03         | 5.99         | 5.77          | 5.01         |              |                     |                                     |                                     | 2.62             | 21.18                          |
| "          | 9.6              | Greyish Densey Sand   | 18.22   |        |        |        |                         |           |              | 98.18      | 85.45         | 60           | 14.55        | 9.09         | 8.64          | 5            |              |                     |                                     |                                     | 2.81             | 18.41                          |





**DETAILS-OF-LABORATORY-TEST-RESULTS.xis**

| Sample No. | Sample Depth (m) | Description of Sample    | EMC (%) | LL (%) | PL (%) | PI (%) | PARTICLES SIZE ANALYSIS |              |            |               |              |              |              |               |               |        | DIRECT SHEAR |   | M <sub>v</sub> (m <sup>2</sup> /kN) | C <sub>v</sub> (m <sup>2</sup> /yr) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |
|------------|------------------|--------------------------|---------|--------|--------|--------|-------------------------|--------------|------------|---------------|--------------|--------------|--------------|---------------|---------------|--------|--------------|---|-------------------------------------|-------------------------------------|------------------|--------------------------------|
|            |                  |                          |         |        |        |        | #.5 (5mm)               | #.7 (3.35mm) | #.10 (2mm) | #.14 (1.18mm) | #.25 (600mm) | #.38 (425mm) | #.72 (212mm) | #.100 (150mm) | #.200 (850mm) | Clay % | C            | Φ |                                     |                                     |                  |                                |
| SA 17      | 0.6              | Grayish Silty Sand       | 28.12   |        |        |        |                         | 91.41        | 82.17      | 72.81         | 56.16        | 20.21        | 17.62        | 8.14          | 7.81          |        |              |   |                                     | 2.76                                | 21.17            |                                |
| "          | 2.1              | Grayish clayey sand      | 17.9    |        |        |        |                         |              | 97.92      | 66.96         | 33.58        | 6.27         | 5.1          | 4.85          | 3.67          |        |              |   |                                     | 2.41                                | 18.11            |                                |
| "          | 3.6              | Grayish silty clay       | 18.7    |        |        |        |                         |              | 98.42      | 80.54         | 49.66        | 17.53        | 9.84         | 9.28          | 4.3           | 16     | 18           |   |                                     | 2.19                                | 21.882           |                                |
| "          | 5.1              | Grayish Silty Clay       | 15      |        |        |        |                         | 98.17        | 87.16      | 64.28         | 36.24        | 9.69         | 6.38         | 5.94          | 2.62          | 22     | 24           |   |                                     | 2.52                                | 21.02            |                                |
| "          | 6.6              | Gray stiff clay          | 18.22   |        |        |        |                         | 82.71        | 76.24      | 64.52         | 46.64        | 10.91        | 8.22         | 4.27          | 3.74          |        |              |   |                                     | 2.77                                | 19.42            |                                |
| "          | 8.1              | Gray stiff clay          | 20.18   |        |        |        |                         |              |            | 92.62         | 71.96        | 24.72        | 15.87        | 15.5          | 6.64          |        |              |   |                                     | 2.81                                | 18.41            |                                |
| SA 18      | 0.6              | Grayish clayey sand      | 19      |        |        |        |                         | 87.62        | 81.34      | 68.74         | 45.34        | 7.31         | 2.78         | 2.35          | 0.27          |        |              |   |                                     | 2.63                                | 19.22            |                                |
| "          | 2.1              | Grayish sharp sand       | 18      |        |        |        |                         | 92.02        | 86.61      | 64.76         | 33.1         | 8.52         | 6.59         | 6.32          | 5.3           |        |              |   |                                     | 2.37                                | 20.17            |                                |
| "          | 3.6              | Greyish Brown fine sand  | 17.8    |        |        |        |                         | 98.73        | 95.24      | 88.07         | 74.66        | 14.01        | 7.37         | 7.04          | 3.75          |        |              |   |                                     | 2.47                                | 20.41            |                                |
| "          | 5.1              | reddish Brown Fine Sand  | 19.4    |        |        |        |                         | 99.35        | 97.85      | 88.87         | 82.96        | 14.57        | 6.08         | 5.81          | 3.12          |        |              |   |                                     | 2.7                                 | 20.77            |                                |
| "          | 6.6              | Reddish Brown Sharp sand | 17.5    |        |        |        |                         |              | 99.23      | 89.23         | 51.76        | 6.18         | 3.42         | 3.17          | 2.3           |        |              |   |                                     | 2.68                                | 18.18            |                                |
| "          | 8.1              | BROWNISH Sharp Sand      | 17.4    |        |        |        |                         | 97.69        | 96.67      | 89.81         | 46.25        | 6.89         | 4.51         | 4.32          | 3.33          |        |              |   |                                     | 2.54                                | 19.24            |                                |

**DETAILS-OF-LABORATORY-TEST-RESULTS.xis**

| Sample No. | Sample Depth (m) | Description of Sample        | EMC (%) | LL (%) | PL (%) | PI (%) | PARTICLES SIZE ANALYSIS |              |            |               |              |              |              |               |              |        | DIRECT SHEAR |   | M <sub>v</sub> (m <sup>2</sup> /kn) | C <sub>v</sub> (m <sup>2</sup> /yr) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |
|------------|------------------|------------------------------|---------|--------|--------|--------|-------------------------|--------------|------------|---------------|--------------|--------------|--------------|---------------|--------------|--------|--------------|---|-------------------------------------|-------------------------------------|------------------|--------------------------------|
|            |                  |                              |         |        |        |        | #.5 (5mm)               | #.7 (3.35mm) | #.10 (2mm) | #.14 (1.18mm) | #.25 (600mm) | #.38 (625mm) | #.72 (212mm) | #.100 (150mm) | #.200 (83mm) | Clay % | C            | Φ |                                     |                                     |                  |                                |
| SA 19      | 0.6              | Greyish Silty sand           | 26.5    |        |        |        | 99.07                   | 98.56        | 97.52      | 96.96         | 90.46        | 41.88        | 7.43         | 4.44          | 4.18         | 2.42   |              |   |                                     | 2.36                                | 19.25            |                                |
| "          | 2.1              | Greyish Brown Lateritic Clay | 18.17   |        |        |        |                         |              | 99.03      | 92.88         | 66.17        | 18.19        | 10.14        | 9.65          | 5.36         |        |              |   |                                     | 2.71                                | 20.11            |                                |
| "          | 3.6              | Greyish Brown Lateritic Clay | 24.17   |        |        |        |                         |              | 95.57      | 80.6          | 50.76        | 12.28        | 8.35         | 7.72          | 6.33         |        |              |   |                                     | 2.56                                | 26.51            |                                |
| "          | 5.1              | Brownish conc Laterite       | 20.24   |        |        |        |                         | 99.40        | 97.90      | 79.15         | 35.94        | 8.71         | 6.43         | 6.13          | 5.29         |        |              |   |                                     | 2.66                                | 19.11            |                                |
| SA 20      | 0.6              | Greyish Silty Sand           | 29.32   |        |        |        | 87.04                   | 85.39        | 79.69      | 75.28         | 62.57        | 58.43        | 35.45        | 14.61         | 13.48        | 4.49   |              |   |                                     | 2.31                                | 26.12            |                                |
| "          | 2.1              | Greyish Silty Sand           | 20.61   |        |        |        |                         | 96.50        | 88.63      | 63.38         | 36.31        | 26.99        | 8.45         | 4.74          | 4.36         | 3.06   |              |   |                                     | 2.72                                | 18.16            |                                |
| "          | 3.6              | Greyish Silty Sand           | 17.9    |        |        |        | 96.48                   | 87.61        | 814.62     | 64.17         | 42.61        | 31.61        | 26.41        | 10.21         | 8.17         | 4.69   |              |   |                                     | 2.45                                | 20.21            |                                |
| "          | 5.1              | Greyish Silty Sand           | 24.5    |        |        |        |                         | 99.57        | 98.79      | 97.44         | 88.38        | 50.11        | 9.62         | 5.16          | 4.96         | 2.73   |              |   |                                     | 2.29                                | 22.18            |                                |
| "          | 6.6              | Greyish Silty Sand           | 18.12   |        |        |        |                         | 88.72        | 86.77      | 79.62         | 56.11        | 46.18        | 11.16        | 10.76         | 6.88         | 4.68   |              |   |                                     | 2.67                                | 19.77            |                                |
| "          | 8.1              | Greyish Silty Sand           | 28.1    |        |        |        |                         |              | 84.21      | 61.26         | 51.66        | 30.21        | 18.29        | 9.22          | 5.64         |        |              |   |                                     | 2.76                                | 17.61            |                                |



**DETAILS-OF-LABORATORY-TEST-RESULTS.xis**

| EJO SUBSTATION |                  |                                    |         |       |       |        |                         |              |            |               |              |              |              |               |              |        |              |    |                                     |                                     |                  |                                |
|----------------|------------------|------------------------------------|---------|-------|-------|--------|-------------------------|--------------|------------|---------------|--------------|--------------|--------------|---------------|--------------|--------|--------------|----|-------------------------------------|-------------------------------------|------------------|--------------------------------|
| Sample No.     | Sample Depth (m) | Description of Sample              | EMC (%) | LL(%) | PL(%) | PI (%) | PARTICLES SIZE ANALYSIS |              |            |               |              |              |              |               |              |        | DIRECT SHEAR |    | C <sub>v</sub> (m <sup>2</sup> /yr) | M <sub>v</sub> (m <sup>2</sup> /kN) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |
|                |                  |                                    |         |       |       |        | #.5 (0.075mm)           | #.7 (3.35mm) | #.10 (2mm) | #.14 (1.18mm) | #.25 (600mm) | #.38 (625mm) | #.72 (212mm) | #.100 (100mm) | #.200 (53mm) | Clay % | C            | Φ  |                                     |                                     |                  |                                |
| BH.1           | 0.6              | Dark Brown Silty Sand              | 23.6    |       |       |        | 94.74                   | 92.12        | 96.86      | 81.60         | 68.46        | 51.38        | 46.12        | 40.87         | 40.54        | 35.28  |              |    |                                     |                                     | 2.6              | 18.41                          |
| "              | 2.1              | Reddish Brown conc Laterite        | 21.82   |       |       |        |                         |              | 96.03      | 90.08         | 72.22        | 50.4         | 18.65        | 14.68         | 14.19        | 10.22  | 24           | 14 |                                     |                                     | 2.33             | 20.96                          |
| "              | 3.6              | Reddish Brown conc Laterite        | 18.33   |       |       |        |                         |              |            | 95.00         | 80           | 60           | 16.67        | 10            | 9.58         | 6.28   | 24           | 13 |                                     |                                     | 2.6              | 20.15                          |
| BH.2           | 0.6              | Brownish Silty Sand                | 14.7    |       |       |        | 89.71                   | 88.24        | 83.82      | 80.88         | 72.06        | 55.88        | 17.65        | 10.29         | 9.93         | 4.04   | 13           | 18 |                                     |                                     | 2.6              | 17.41                          |
| "              | 2.1              | Brownish conc Laterite             | 26      |       |       |        |                         |              | 91.12      | 85.21         | 73.37        | 64.5         | 28.99        | 14.2          | 13.46        | 4.59   | 9            | 27 |                                     |                                     | 2.6              | 16.96                          |
| BH.3           | 0.6              | Brown Clay Silt Red Brown laterite | 25      |       |       |        | 95.95                   | 78.13        | 63.63      | 57.81         | 46.88        | 32.81        | 10.94        | 6.25          | 5.86         | 1.17   | 5            | 17 |                                     |                                     | 2.6              | 21.22                          |
| "              | 2.1              | Reddish Brown conc Laterite        | 20.58   |       |       |        | 89.71                   | 85.67        | 77.37      | 71.19         | 58.85        | 40.33        | 15.64        | 9.47          | 8.95         | 4.84   | 12           | 28 |                                     |                                     | 2.6              | 17.16                          |

**DETAILS-OF-LABORATORY-TEST-RESULTS.XIS**

| Sample No.  | Sample Depth (m) | Description of Sample    | EMC (%) | LL(%) | PL(%) | PI (%) | PARTICLES SIZE ANALYSIS |              |            |               |              |              |              |               |               |       | Clay % | C <sub>v</sub> (m <sup>2</sup> /yr) | M <sub>v</sub> (m <sup>2</sup> /kn) | Specific Gravity | Bulk Density kn/m <sup>3</sup> |
|-------------|------------------|--------------------------|---------|-------|-------|--------|-------------------------|--------------|------------|---------------|--------------|--------------|--------------|---------------|---------------|-------|--------|-------------------------------------|-------------------------------------|------------------|--------------------------------|
|             |                  |                          |         |       |       |        | #.5 (5mm)               | #.7 (3.35mm) | #.10 (2mm) | #.14 (1.18mm) | #.25 (600mm) | #.38 (425mm) | #.72 (212mm) | #.100 (150mm) | #.200 (850mm) |       |        |                                     |                                     |                  |                                |
| <b>RCCG</b> |                  | <b>RCCG</b>              |         |       |       |        |                         |              |            |               |              |              |              |               |               |       |        |                                     |                                     |                  |                                |
| BH 1        | 0.6              | Reddish Brown Laterite   | 23.61   |       |       |        | 97.22                   | 90.28        | 83.33      | 66.67         | 50           | 19.44        | 13.54        |               |               | 7.99  | 6      | 18                                  |                                     | 2.33             | 20.72                          |
| "           | 2.1              | Reddish Brown Laterite   | 18.92   |       |       |        |                         | 94.59        | 89.59      | 78.38         | 62.16        | 27.03        | 15.54        |               |               | 12.84 | 7      | 22                                  |                                     | 2.6              | 17.22                          |
| BH 2        | 0.6              | Dark Brown Silty Sand    | 16.67   |       |       |        |                         |              |            | 92.31         | 64.1         | 17.95        | 12.82        |               |               | 7.05  | 10     | 15                                  |                                     | 2.6              | 17.35                          |
| "           | 2.1              | Reddish Brown Laterite   | 16.13   |       |       |        |                         | 98.61        | 94.44      | 83.83         | 61.11        | 19.44        | 11.11        |               |               | 2.43  | 15     | 24                                  |                                     | 2.6              | 21.17                          |
| "           | 3.6              | Reddish Brown Laterite   | 14.94   |       |       |        | 97.62                   | 92.86        | 88.10      | 76.19         | 59.52        | 16.57        | 9.52         |               |               | 4.17  | 6      | 27                                  |                                     | 2.33             | 17.35                          |
| "           | 5.1              | Reddish Brown Laterite   | 23.52   |       |       |        | 97.32                   | 92.80        | 89.10      | 69.19         | 58.51        | 10.57        | 9.82         |               |               | 3.05  | 16     | 15                                  |                                     | 2.6              | 17.54                          |
| "           | 6.6              | Reddish Brown Laterite   | 19.95   |       |       |        |                         | 90.41        | 78.32      | 60.82         | 49.61        | 16.66        | 10.57        |               |               | 4.7   | 3      | 22                                  |                                     | 2.33             | 18.14                          |
| BH 3        | 0.6              | Brownish Clayed Sand     | 15.58   |       |       |        |                         |              | 98.63      | 87.67         | 65.75        | 16.44        | 9.59         |               |               | 3.77  | 7      | 18                                  |                                     | 2.6              | 17.74                          |
| "           | 2.1              | Brownish Clayed Sand     | 18.06   |       |       |        |                         |              | 98.44      | 89.06         | 70.31        | 20.31        | 10.94        |               |               | 2.73  | 7      | 17                                  |                                     | 2.33             | 18.11                          |
| "           | 3.6              | Brownish Clayed Sand     | 10.96   |       |       |        |                         | 98.89        | 94.25      | 83.91         | 67.82        | 21.84        | 10.34        |               |               | 3.16  | 10     | 30                                  |                                     | 2.6              | 20.41                          |
| "           | 5.1              | Reddish Brown Clayey HWR | 11      |       |       |        |                         | 98.90        | 95.60      | 84.61         | 65.93        | 18.64        | 8.74         |               |               | 4.07  | 12     | 25                                  |                                     | 2.6              | 19.22                          |
| "           | 6.6              | Greivish                 | 10.96   |       |       |        |                         |              | 94.12      | 84.31         | 66.67        | 19.61        | 13.73        |               |               | 7.35  | 3      | 18                                  |                                     | 2.76             | 22.66                          |

### 3. パネルレビューからのコメント



# FEDERAL MINISTRY OF ENVIRONMENT

## Environment House

Independence Way South, Central Business District, Abuja - FCT.

Tel: 09-2911 337 www.environment.gov.ng, ea-environment.org

## ENVIRONMENTAL ASSESSMENT DEPARTMENT

Ref: FMEnv/EA/EIA/4272/1/220

Date: 28<sup>th</sup> November, 2018.

The Managing Director/CEO,  
Transmission Company of Nigeria (TCN)  
Corporate Headquarters,  
Plot 14 Zambezi Crescent,  
Maitama,  
Abuja. FCT

### ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED LAGOS AND OGUN STATES TRANSMISSION LINES FOR LOT 1 PROJECT.

Please refer to the EIA Panel Review meeting conducted for the above stated project on 19<sup>th</sup> October, 2018.

2. Following the conclusion of the review exercise, I am directed to inform you that the Draft EIA Report was adjudged satisfactory despite some omissions and inadequacies.
3. I am further directed to convey the following information on matters to be handled by your Organization: -
  - a) Submission of five (5) hard copies and two (2) e-copies (in PDF) of the Final EIA Report addressing the harmonized comments from the review meeting (attached); and
  - b) Payment of the Final Assessed Charge (FAC) to the Ministry for the EIA Approval as per the attached invoice.
4. Kindly note that this is not an approval letter and that the EIA Approval Letter shall only be issued on the confirmation that items 3(a) and (b) above have been satisfactorily complied with.
5. Thank you for your co-operation.

J. A. Alonge

Director, Environmental Assessment Dept.

For: Honourable Minister



# FEDERAL MINISTRY OF ENVIRONMENT

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## ENVIRONMENTAL ASSESSMENT DEPARTMENT

Ref: FMEnv/EA/EIA/4272/1/221

Date: 28<sup>th</sup> November, 2018

The Managing Director/CEO,  
Transmission Company of Nigeria (TCN)  
Corporate Headquarters,  
Plot 14 Zambezi Crescent,  
Maitama,  
Abuja, FCT.

### INVOICE

#### ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED LAGOS AND OGUN STATES TRANSMISSION LINES FOR LOT 1 PROJECT.

| S/N  | ITEM DESCRIPTION  | AMOUNT (₦)          |
|------|---|---------------------|
| i    | Registration fees   | 50,000.00 Paid      |
| ii.  | Impact Mitigation Monitoring (IMM) for the first exercise   | 500,000.00          |
| iii. | Assessed Charge for the proposed construction and installation of 54.6Km Transmission Lines for LOT 1 is 1,365,000.00.<br>(a) Revenue – 1,023,750.00<br>(b) Operational- 341,250.00 | 1,365,000.00        |
| iv   | <b>Final Assessed Charge</b>  | <b>1,865,000.00</b> |

The total amount to be paid to the Federal Ministry of Environment for issuance of Environmental Impact Statement (EIS) and Environmental Impact Assessment (EIA) Certificate for the proposed project is One Million, Eight Hundred and Sixty-Five Thousand Naira (₦1,865,000.00) only, as follows:-

- a) **EIA Operational Charge:** Eight Hundred and Forty-One Thousand, Two Hundred and Fifty Naira (₦841,250.00) only
  - b) **EIA Government Revenue:** One Million and Twenty-Three Thousand, Seven Hundred and Fifty Naira (₦1,023,750.00) only
2. The payments are to be made separately into the Federal Government Treasury Single Account (TSA) Platform ([www.remita.net](http://www.remita.net))
  3. The evidence of both payments shall be forwarded to the Ministry's Headquarters at Mabushi. Abuja.

J. A. Atonge

Director, Environmental Assessment Dept.

For: Honourable Minister.

**FEDERAL MINISTRY OF ENVIRONMENT'S HARMONIZED COMMENTS ON  
THE DRAFT ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF THE  
PROPOSED LAGOS -OGUN TRANSMISSION LINES AND OTHER  
ASSOCIATED FACILITIES LOT 1**

**Preliminary Pages**

Cover/title pages

- The cover page should be rephrased to indicate 'substations' instead of 'substation' since there are number's of associated substations.
- The title page has an extension of the cover page to include "line study, ESIA and RAP". The extensions should be expunged to maintain uniformity which reflects the content of the report.
- Please include submitted to the Federal Ministry of Environment in the revised title.

Table of contents

- There are so many items in the executive summary which are also repeated as subsections of other chapters. The Executive Summary should be revised to have only the key topics and not detail's of all the key topics and subsections.
- There are inconsistencies in the writing of chapters and their titles, chapters and their titles should be properly written e.g. Chapter One: Introduction, Chapter Two: Project Justification, Chapter Three: Project Description, Chapter Four: Environmental Baseline Data Acquisition, Chapter Five: Potential and Associated Impacts, Chapter Six: Mitigation Measures, Chapter Seven: Environmental and Social Management Plan (ESMP), etc.

Page x: List of Tables 'Ground Water' in Table 4.21 should be corrected to 'Groundwater' this should be applied to all other relevant sections of the report.

Pages xvii-xx: List of Abbreviations and Acronyms

- The list of Abbreviation and Acronyms should be arranged in an alphabetical order not randomly as presented.
- ISO means International Organization for Standardization
- The list should also be updated with all other abbreviations and acronyms used in the body of the report.

Page xxi: List of EIA Preparers

- The column on the qualification of the members is vague because it fails to provide their specific disciplines e.g. B. Sc, M. Sc. Ph. D. This column should be updated with specific disciplines of all the members..

## **EXECUTIVE SUMMARY**

Page xxiv refer. **Project Location**

Para 1, line 6, Olorunsogo Power Station is in Ewekoro LGA and not Ifo LGA.

Page xxxiv refers :

### **Wastes Generation and Management**

Item (b)

AEPB's sewage treatment facility does not exist in Lagos state or Ogun state. This should be expunged in the updated report.

Page xxxvi, the Table E1 the entire table should be expunged from the executive summary since it's a non technical.

### **Project Schedule**

The projects construction commencement date of 2019 is contrary to late 2019 on page xxxi under Project Phases and Activities, which declare it "will" commence in late 2019. Reconciled this statement in the updated report.

### **Chapter One: Introduction**

Para.1, Line 1, ESMP should read Environmental and Social Management Plan not 'Environmental Management Plan' as stated.

Page 3: Subsection 1.1.3 Project Location,

Para 1, line 6, it stated that the lines in lot 1 have a total length of 54.55km contrary to the breakdown provided in lines 7-13 of same paragraph as well as page 2 and the executive summary. These inconsistencies should be reconciled.

Pages 4-5:

- Figures 1.1 and 1.2 are not legible; they should be replaced with enlarged and legible ones.
- Figure 1.2 should be rephrased as 'plate' not figure in the up dated report.

- The title of figure 1.3 should be rephrased to read 'Map of Ogun State showing the proposed project (Lot-1) route'

Page 9: Section A- National Environmental Policy, para.3 stated 'Some specific laws include' however, all the information presented in 7 bullet points are for regulations and not laws. The statement should be rephrased to reflect the contents.

Page 19: Item xiv National Environmental Regulations

- This section should be harmonized with information presented in section 'A' where some 7no. regulations were presented. It is wrong to state that the Minister issues the listed regulations as a result of NESREA Act, the regulations listed predates the NESREA Act of 2007. This should be corrected.
- Bullet points 1-2, the date of production for S.I. 8 and S.I. 15 regulations is 1991 contrary to 1999 as presented. This should be corrected in the updated report.
- Bullet point 3; the regulation should be properly cited as 'S.I. 9 National Environmental Protection (Pollution Abatement in Industries and Facilities Generating Wastes) Regulations, 1991'

Page 19 refers. **Ogun State Laws**

Environmental Management (Miscellaneous) Provisions Law, 2004 should be cited.

Page 26, Power Holding Company of Nigeria (PHCN) is no longer existing as such cannot be an agency under the Federal Ministry of Power, Works and Housing (FMPW&H).

- ✓ The following are not part of the responsibilities of Federal Ministry of Power, Works and Housing (FMPW&H):
  - Licensing of electrical contractors and electric generating sets of 1MW capacity and below
  - Conducting investigation on electrical accidents and to ensure safety in the electricity industry in Nigeria
  - Conducting statutory tests and certification of electric poles (concrete, wooden, steel etc.) and other major electrical materials before they are used on the grid and networks in Nigeria



Page 28, section 1.4.2.16 Ibadan Electricity Distribution Company;

The Ibadan Electricity Distribution Company is one of the 11 and NOT 13 distribution companies unbundled from defunct PHCN during electricity reform in 2005.

The revised section on legal and administrative framework should include other relevant ones such as National Inland Waterways Authority Act, African Development Bank and Convention on Conservation of Migratory Species of Animals and RAMSER Convention on Wetlands of International Importance amongst others.

### **Chapter Two: Project Justification**

Page 3, Figure 2.1: the presented figure is not clear, it should be presented on A3 paper in the updated report.

Page 4: Subsection 2.3.1 Technical Sustainability; the availability of adequate and qualified manpower for the project execution and operation should form part of its technical sustainability. This should be incorporated in the revised subsection.

Pages 37-38: Substations, the alternative sites considered for the location of the proposed substations should be highlighted and justification for chosen the preferred locations.

Pages 5-6, Section 2.4.2.1 refers. **Design /Technology Alternatives**

Substations: Air-insulated Substation is preferred to Gas-insulated and hybrid sub-station on account of availability of land. The silence on comparative cost, efficiency and environmental friendliness should be reversed in the final report.

Page 6, Underground versus Surface Transmission Alternatives: Surface transmission in Nigeria has its climatic and security challenges. Do these still place it environmentally better than underground transmission?

How reliable are the data obtained from **Lagos State Electricity Board** as compared to those available with Eko Electricity Distribution Company (EKEDC) and Ikeja Electricity Distribution Company (IKEDC)?

What study/test was carried out and nature of result(s) obtained that justified the conclusion on **the technical viability of the proposed project as asserted?**

Page 22, Table 3.1 **Disposal Company Column**

Rows 1- 3, and 4 should read OGEPA allotted but OGSMEvn. registered Waste Contractor.

Same column, it reads "OGEPA sewage treatment facility, Abuja" How? this is evidence of copy and paste. Please edit properly in the updated report

Page 49, Figure 3.15 is a plate not a figure.

Chapter three should be revised and a lot of generic information that is not relevant to the proposed project should be expunged.

- ✓ Design standards references was not in line with **Nigerian Electricity Supply and Installation Standards (NESIS), 2015** but TCN standards.
- ✓ There is no information about types and sizes of Conductors and cables.
- ✓ Type of substation fence construction is not clearly stated.
- ✓ There are no Single line diagrams (SLD) or schematic drawings for some of the proposed substations (Eg **Ejio**). Layout plan drawings are provided instead and the SLD that are available for some other substations are not legible (Eg New Abeokuta and Olorunsogo substations).
- ✓ The Google earth route maps does not show proposed positions for towers. The maps are pictures that cannot be work-on to verify details of information submitted.

**Chapter Four: Description of Existing Environment**

Page 3, **Table 4.1 Inventory of Biophysical and Socio Samples**

Groundwater column, there is no way the FMEnv will not asked to collect Groundwater samples except otherwise. This should be printed in the updated report.

Page 5 Figure 4.1 Generalized Sampling Map for all the Environmental Components;

The presented figure is not legible therefore should be replaced with an enlarged and legible one.

**Page 12, Figure 4.7: Ambient Air Quality**

Figures are titled at the bottom not on top as presented. These should be addressed and corrected.

### **Chapter Three: Project Description**

Page 6, Section 3.4.2 refers. **Access Track Repair/ Upgrade/ Construction**

“.....final route of access road will be determined in consultation with the landowner, giving consideration to environmental impacts” how realistic is this statement.

Pages 7-8 Fig. 3.3 and 3.4, the figures should be presented on A3 paper for legibility in the updated report.

Page 17, Section 3.4.8.2 Hours of Operation,  
lines 3-4 stated ‘All construction activities that are likely to generate noise shall not be undertaken during night time’ please specify the activities that will be conducted at night.

Page 17 Item (i) Clean-Up and Final Inspection

- Bullet points 5-6 are on irrigation ditches and facilities. Please state the relevance of these points and the specific location at which irrigation facilities will be affected by the proposed power transmission line projects.
- Bullet point ‘Any fences, gates, etc., which have been damaged during construction shall be restored’ is confusing, the re-construction of structures along the line routes and substation sites are very unlikely. The bullet point should be expunged.

Page 18, Section 3.5.2, **Easement Maintenance**

Last paragraph, NSCDC stands for Nigeria Security and Civil Defence Corps and not National Security and Civil Defence Corps as presented. This should be corrected throughout the report.

Page 21, Section 3.6.2 **Waste Disposal**

Para 1, line 1, "Sewage from site .....will be vacuum-sucked into septic tanks trucks and taken to facilities approved by OGEPA". Any approval so received for this exercise within the State is illegal as Ogun State has no such facility.

Page 22 Table 3.1 **Proposed Transmission Project Waste Estimates and Disposal Plan**

The liquid wastes such as spent oil from heavy duty vehicles and sanitary from camp during pre-construction and construction phases should be identified, characterized, quantified and the management strategies should be provided.

The presented figure is not legible therefore should be replaced with an enlarged and legible one.

Pages 19-20: Section 4.5.1 Noise Quality Measurement;

It was stated that the IFC, WHO and FMEnv limits shall be used to benchmark the ambient noise levels; only WHO limits was used as presented on table 4.10. The IFC standards and FMEnv limits should also be provided in the revised section.

Page 39 Table 4.13 Groundwater Physico-Chemical Characteristics

- There is need to add a column for FMEnv Limits to the table in the updated report

Page 40, **Figure 4.21: Groundwater sampling location map**

The presented map is not clear and the title at the bottom not on top as presented, it should be represented with a clearer map in the updated report.

Same applied to figure 4.22 Surface water sampling map on page 51 of the report.

Page 77-93 4.10 Biodiversity;

The section highlights the richness & diversity of flora within the study area but fails to highlight the possible areas where vegetation will be cleared. This should include the measurement estimate since the vegetation are carbon sinks that would be lost.

Pages 81-82, the presented plates 4.14-4.17, the exact community were those pictures taken should be stated in the updated report.

Page 123: Figure 4.28b Map showing communities; the map should be represented on A3 paper and be more legible and enlarged manner.

**Page 124, Section 4.12.3 Household Characteristics**

The report stated that 500 questionnaires were used! This should be corrected to read 500 copies of the questionnaire were administered. Even though the report stated that 36% of the adult population was covered. In a population of about seven (7) household members, the household heads would not have been 36% of the population.

It is expected that the number of questionnaires administered and retrieved per each community should be stated.

It said 488 questionnaires were retrieved from the respondents what happened to the remaining number?

### ***Marital status of head of household***

It was stated that 'The total adults sampled consisted of 280 males and 208 females'. The sum of the household head contradicts the total number of 500 copies of questionnaires deployed for the studies. please reconciled.

Page 131, there is the need to tabulate the figures under income (4.12.4.3) and educational level (4.12.4.4) and not in prose as presented currently. Also the number of the responded per community should be stated.

Page 139 Table 4.56; suggests that everything is normal for the 50 children chosen for investigation and yet malnutrition and others were reported to be common in the area. Please examine your data again. Plate 4.46 read processing of garri, it should be processing of cassava!

Also, Table 4.55 the Body Mass Index of the respondents should be presented based on age and gender of the study area.

### Page 145-146 Item (a) Government Authorities

- Federal Ministry of Power, Abuja should be corrected to Federal Ministry of Power, Works and Housing.
- There is a mixed-up in the listed bullet points. While bullet points 1-3 referred to the institutions, bullet points 4-5 referred to teams from some institutions. Please reconcile.
- Other relevant government institutions such as National Energy Commission should also be captured in the revised section.
- Same text was repeated, One should be expunged in the updated report.

Note;

It would be more appropriate to indicate the number of respondents interviewed per community or at least per LGA specifying the various villages or communities covered in each LGA, in the state.

Under the Focus Group Discussion, the felt needs of the communities were not presented. This is key for each community or village.

The percentage land area allocated by each LGA should be presented in the updated report.

“Household” not “Houshold” should be corrected in the entire chapter.

## **Chapter Five: Associated and Potential Impacts**

Page 1, Section 5.1 Introduction

- Para.5 on project activities is completely silent on the activities related to pre-construction phase of the project activities. The section should be updated with all the key project activities for all the project components.
- Some items listed are impacts and not project activities as stated e.g. spills, traffic, accidents and tower collapse amongst others. This should be addressed.
- The section should be revised to include other phases of the project as well as their corresponding activities e.g. pre-construction and decommissioning phases as outlined in other sections of the report.

### **Page 2, Section 5.3.4 Construction phase**

Emissions from vehicles and equipment (SO<sub>2</sub>, CO, NO<sub>x</sub>, CO<sub>2</sub>, PM) should be corrected to ‘...(SO<sub>2</sub>,CO<sub>2</sub>)’ were applicable in the entire report.

Page 8 Section 5.3.3 Process from Material Production

The GHG production embodied from the material that will be used for construction is not part of the contributions to climate change from the project due to the fact that the proponent is not the manufacturer of these products. This section should be removed.

Page 9 Section 5.3.3 Energy used in the Construction Activity

The proponent failed to highlight what contributions of GHG the energy used in the construction activity for the project could generate. It is understood that diesel fueled transportation, equipment and generators would be used during construction activities, these will lead to gas emissions.

Emission rate per hour for the engines with consideration for the engine efficiency which would lower emissions significantly should be highlighted. This can be obtained from secondary data.

Pages 9-10, Section 5.3.3; Land Clearing

The references with regards to GHG emissions due to material production are not contributions from this project thus should be removed from the draft. Only direct contributions should be highlighted.

Page 13, Section 5.4.2 **Operation Phase**

Item 2, The baseline data of corona discharge from the existing transmission lines in the area of influence of the project should have been documented for benchmarking the project in future.

Page 15, Section 5.6.2 operation phase, the information provided that no impact was anticipated on surface water during operational phase is not correct. Please revise the section to clearly identify impacts associated with project activities e.g. maintenance of the lines and substations could result in some impacts.

Page 16, Section 5.7.1 *Impact on Terrestrial flora and Fauna*

It was stated that 'However, the identified species that fall within the IUCN Red list classification are as follows; *Albizia ferruginea*, *Albizia zygia*, *Sterculia oblonbata*, *Terminalia ivorensis*, and *Diospyros barteri*' therefore the impact cant not be rated as minor since these species will be displaced.

Page 23, 5.13 refers. **Resettlement**

The Resettlement Action Plan (RAP) report as referred to in this section and some other section's of the report is missing. The RAP report should be integrated into the ESIA report or it should be submitted differently.

Section of 5.18.2 refers.

### **Identification of Relevant Development(s)**

Has Abeokuta Independent Power Project (Energy Culture) taken off? The Power Plant in that vicinity is Lisabi Power Plant and it should be included in the list of the existing project within 10km radius.

Chapter five on impacts should be revised in line with revised chapter three on project description. The revised chapter should take cognizance of all the key project activities as well as their associated and potential impacts including cumulative impacts.

## **Chapter Six: Mitigation Measures**

### *Page 29 Potential soil contamination*

With regards to soil contamination impacts, the following measures will be implemented:

- Some of the points listed are not applicable to this project eg, Regular checking and maintenance of all plant and equipment to minimize the risk of fuel or lubricant leakages; Install oil/water separators and silt traps before effluent leaves the site; etc, specific potential related contamination to the project should be stated.

Page 6, para 2, does this project involve handling of any hazardous chemicals during the construction of the towers? If so, please state those hazardous chemicals.

Operational Phase,

The impacts will not be considered negligible since considering the fact that some leakages of hazardous chemicals, spill during fuelling of machineries were identified as impact therefore the impact should not be negligible.

Pages 15-285: Tables 6.1a & 6.2b: Summary of Mitigation Measures; the Tables should be revised to include the key project activities, the phases as well as their corresponding mitigation measures.

Chapter six on mitigation measures should be revised in line with revised chapters three on project description and five on associated and potential impacts. The revised chapter should take cognizance of all the key project activities in the revised chapter three and identified impacts in revised chapter five.

## **Chapter Seven: Environmental Management Plan**

Page 1, Section 7.1 Introduction, line 1 stated 'This chapter provides the ESMP for the Lagos and Ogun Transmission Line Project' the sentence should be revised to include the associated substation facilities.

Page 2, Table 7.1 **Major roles and Responsibilities**

Ogun State Environmental Protection Agency should be replaced with Ogun State Ministry of Environment as the mother Ministry in the updated report.

Page 4, Section 7.3.3 refers. **Regulatory Agencies**

Ogun State Ministry of Environment should be listed as one of the Regulatory agencies of the proposed project.



Page 11, Table 7.2a is in conflict with Table 1 as Table. 7.2a does not assign any responsibility to the identified regulatory bodies i.e FMEnv, OGMEnv etc on the Environmental and Social Monitoring Plan. It should be revised to capture the relevant regulatory bodies on the Responsibility column. Also, Table 7.2a is silent on RAP. It is part of the project to be monitored and should be captured on the table.

Pages 31 Table 7.2b ESMP during construction; there is need to re-examine the monitoring frequencies as proposed e.g. Annual monitoring of air quality, nothing was mentioned on noise levels and vibration during construction phase in the Table. The air quality, noise levels and vibration should be monitored more frequently (e.g. daily & weekly) during the construction phase to ensure all associated issues are adequately addressed.

Chapter seven on EMP should be revised in line with revised chapters three on project description, five on associated and potential impacts and six on mitigation measures.

### **General Comments**

- i) The Report should be carefully edited to correct/expunge all typo, spelling and grammatical errors.
- ii) The Corporate Social Responsibility (CRS) specific for the proposed project should be clearly and concisely presented in the revise report.
- iii) All illegible tables, figures and maps should be made legible in the revised report.
- iv) All sources of information used in the report should be properly cited and included in the reference list and those not relevant should be expunged.
- v) The executive summary should be revised to reflect the comments on all the chapters of the report.



# FEDERAL MINISTRY OF ENVIRONMENT

## Environment House

Independence Way South, Central Business District, Abuja - FCT.  
Tel: 09-2911 337 www.environment.gov.ng, ea-environment.org

## ENVIRONMENTAL ASSESSMENT DEPARTMENT

Ref: FMEnv/EA/EIA/4318/180

Date: 28<sup>th</sup> November, 2018.

The Managing Director/CEO,  
Transmission Company of Nigeria (TCN)  
Corporate Headquarters,  
Plot 14 Zambezi Crescent,  
Maitama,  
Abuja, FCT

### ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED LAGOS AND OGUN STATES TRANSMISSION LINES AND ASSOCIATED SUBSTATIONS FOR LOT 2 PROJECT

Please refer to the EIA Panel Review meeting conducted for the above stated project on 19<sup>th</sup> October, 2018.

2. Following the conclusion of the review exercise, I am directed to inform you that the Draft EIA Report was adjudged satisfactory despite some omissions and inadequacies.
3. I am further directed to convey the following information on matters to be handled by your Organization: -
  - a) Submission of five (5) hard copies and two (2) e-copies (in PDF) of the Final EIA Report addressing the harmonized comments from the review meeting (attached); and
  - b) Payment of the Final Assessed Charge (FAC) to the Ministry for the EIA Approval as per the attached invoice.
4. Kindly note that this is not an approval letter and that the EIA Approval Letter shall only be issued on the confirmation that items 3(a) and (b) above have been satisfactorily complied with.
5. Thank you for your co-operation.

J. A. Alonge

Director, Environmental Assessment Dept.

For: Honourable Minister



# FEDERAL MINISTRY OF ENVIRONMENT

## Environment House

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## ENVIRONMENTAL ASSESSMENT DEPARTMENT

Ref: FMEnv/EA/EIA/4318/1/181

Date: 28<sup>th</sup> November, 2018

The Managing Director/CEO,  
Transmission Company of Nigeria (TCN)  
Corporate Headquarters,  
Plot 14 Zambezi Crescent,  
Maitama,  
Abuja, FCT.

### INVOICE

#### ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED LAGOS AND OGUN STATES TRANSMISSION LINES AND ASSOCIATED SUBSTATIONS FOR LOT 2 PROJECT.

| S/N  | ITEM DESCRIPTION  | AMOUNT (₦)          |
|------|---|---------------------|
| i    | Registration fees   | 50,000.00 Paid      |
| ii.  | Impact Mitigation Monitoring (IMM) for the first exercise   | 500,000.00          |
| iii. | Assessed Charge for the proposed construction and installation of 69.98km Transmission Lines and 3 nos high voltage substations for LOT 2 project in Lagos and Ogun States, is 2,199,500.00.<br>(a) Revenue – 1,649,625.00<br>(b) Operational- 549,875.00 | 2,199,500.00        |
| Iv   | <b>Final Assessed Charge</b>  | <b>2,699,500.00</b> |

The total amount to be paid to the Federal Ministry of Environment for issuance of Environmental Impact Statement (EIS) and Environmental Impact Assessment (EIA) Certificate for the proposed project is Two Million, Six Hundred and Ninety-Nine Thousand Five Hundred Naira (₦2,699,500.00) only, as follows:-

- a) **EIA Operational Charge:** One Million and Forty Nine Thousand, Eight Hundred and Seventy-Five Naira (₦1,049,875.00) only
  - b) **EIA Government Revenue:** One Million, Six Hundred and Forty-Nine Thousand, Six Hundred and Twenty- Five Naira (₦1,649,625.00) only
2. The payments are to be made separately into the Federal Government Treasury Single Account (TSA) Platform ([www.remita.net](http://www.remita.net))
  3. The evidence of both payments shall be forwarded to the Ministry's Headquarters at Mabushi, Abuja.

J. A. Alonge

Director, Environmental Assessment Dept.  
For: Honourable Minister.

**FEDERAL MINISTRY OF ENVIRONMENT'S HAMORNIZED COMMENTS ON  
THE DRAFT ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF THE  
PROPOSED LAGOS -OGUN TRANSMISSION LINES AND OTHER  
ASSOCIATED FACILITIES LOT 2**

**Preliminary Pages**

Cover/title pages

- The cover page should be rephrased to indicate 'substations' instead of 'substation' since there are number's of associated substations.
- The title page has an extension of the cover page to include "line study, ESIA and RAP". The extensions should be expunged to maintain uniformity which reflects the content of the report.
- Please include submitted to the Federal Ministry of Environment in the revised title.

Pages iii-x: Table of contents

- There are so many items in the Executive Summary which are also repeated as subsections of other chapters. The executive summary should be revised to have only the key topics and not details of all the key topics and subsections.
- There are inconsistencies in the writing of chapters and their titles and should be properly written e.g. Chapter One: Introduction, Chapter Two: Project Justification, Chapter Three: Project Description, Chapter Four: Environmental Baseline Data Acquisition, Chapter Five: Potential and Associated Impacts, Chapter Six: Mitigation Measures etc.

Page vii, Table of Content, chapter nine should be captured as Conclusion and Recommendations

Page xiii: List of Tables 'Ground Water' in Table 4.13 should be corrected to 'Groundwater' this should be applied to all other relevant sections of the report.

Pages L i-iii: List of Abbreviations and Acronyms

Units of Measurement: All quantities that has 'meter' in their measurement should be edited to "metre".

m<sup>3</sup> is 'metre cubed' and not 'meter cube'.

Chemical elements and Compound: PO<sub>4</sub><sup>3-</sup> is 'Phosphate ion' and not 'Phosphate'.

### **Organizations**

- ISO mean 'International Organization for Standardization' and not 'International Standard Organization'.
- The list should also be updated with all other abbreviations and acronyms used in the body of the report.

Page iv: List of ESIA Preparers Not "List of Prepares"

Page A-i: Acknowledgement; the acknowledgement should come after the executive summary and not before as presented in the report.

### **EXECUTIVE SUMMARY**

Page i, para 1, last sentence, Environmental and Social Management Plan not Environmental Management Plan

Page ii, The Need and Benefits of the Project;

Bullet 5, "use" not "Used" should be corrected.

Project Sustainability

The sustainability should be captured and the social and Economic aspect of the project.

Same page under Project description;

'Transmit' should be corrected to read 'transmission',

Page iv, **Description of Existing Environment**

"Secondary data from previous studies was obtained to cover rainy season", the Source of the secondary data in reference needs disclosure should be stated.

Page vi, para1, first sentence under Soil and Land Use Studies:

"...were collected in bulked mixed and sub-sampled for laboratory analysis" should be edited to convey the name.

Page xiv, row 2 refers. **The potential impact.**

"the high resistivity subsoil at the upper 2m beneath the proposed substation at Likosi/Dejuwogbo and Redeem are poor earthing media" and the corresponding mitigation and enhancement measures are not in tune because the latter was probabilistic and non-commutant, through the statement "may be need to be artificially enhanced". This was also repeated in section 6.5.

Page xv, last row, column 5 refers. It is OGMEnv. that registers environmental contractors not OGEPA, it only allots. This should be corrected in the updated report.

Page xxv, row 2 **Terrestrial and Aquatic Ecology.**

"Maximum of 7.5m wide within centre line of RoW shall be maintained for TL maintenance". This leaves about 22.5m to 42.5m of the RoW unattended to. How will this be secured against encroachers' intrusion?

Page xxviii **Conclusions**

TCN is recommending ESMP. Who is to implement the recommendation? This should be edited.

Note,

Nothing was mentioned on waste generation, categorization and management of the project.

Value of the proposed project should also be included in monetary terms.

## **Chapter One: Introduction**

Page 1, Para.4, Line 5, ESMP should read Environmental and Social Management Plan not 'Environmental Management Plan' as stated.

Page 3: Subsection 1.1.3 Project Location,

Para 1, line 1, "the entire project consists of about 203km high transmission lines and **6 high voltage substations.**" not '**5 high voltage substations**'

Also, last sentence on the same page it stated that ' Table 1.1 shows the description of the proposed Transmission line with a total length of about 60.5km and substations' this is contrary to the breakdown provided in the table which sum up 63.97km on page 1 and the executive summary. These inconsistencies should be reconciled.

Pages 4-5:

- Figures 1.1.1-1.1.5 are not legible; they should be replaced with legible ones on A3 papers in the updated report.
- The title of figure 1.3 should be rephrased to read 'Map of Ogun State showing the proposed project (Lot-2) route'

Page 9 Section 1.3 Scope of the Project Component

The Resettlement Action Plan (RAP) report should have been attached to the report since references were made to it in the ESIA report.

Page 9, item 1.4.1.14 Section A- National Environmental Policy, para.3 stated 'Some specific laws include' however, all the information presented in 6<sup>th</sup>

bullet points are for regulations and not laws. The statement should be rephrased to reflect the contents.

#### Page 20 Item xiv National Environmental Regulations

- This section should be harmonized with information presented in section '1.4.1.14 on page 9' where some 6 numbers of regulations were presented. It is wrong to state that the Minister issues the listed regulations as a result of NESREA Act, the regulations listed predates the NESREA Act of 2007. This should be corrected.
- Bullet points 1-2, the date of production for S.I. 8 and S.I. 15 regulations is 1991 contrary to 1999 as presented. This should be corrected in the updated report.
- Bullet point 3; the regulations should be properly cited as 'S.I. 9 National Environmental Protection (Pollution Abatement in Industries and Facilities Generating Wastes) Regulations, 1991'

Pages 20-21: there are a lot of information that is bolded unnecessarily e.g. bullet points 6-16 of section 1.4.3 and bullet points 1-8 of section 1.4.6 IFC PS amongst others. These should be addressed throughout the report.

#### Page 20 **Ogun State Laws**

Environmental Management (Miscellaneous) Provisions Law, 2004 should be cited. This is omnibus environmental law in Ogun State.

Page 26, Power Holding Company of Nigeria (PHCN) is no longer existing as such cannot be an agency under the Federal Ministry of Power, Works and Housing (FMPW&H).

- ✓ The following are not part of the responsibilities of Federal Ministry of Power, Works and Housing (FMPW&H):



- Licensing of electrical contractors and electric generating sets of 1MW capacity and below
- Conducting investigation on electrical accidents and to ensure safety in the electricity industry in Nigeria
- Conducting statutory tests and certification of electric poles (concrete, wooden, steel etc.) and other major electrical materials before they are used on the grid and networks in Nigeria

Page 27 Section 1.4.9.6 **Ministry of Physical Planning.**

This Ministry does not exist in Ogun state but “Ministry of Urban and Physical Planning” this should be corrected in the updated report.

**Page 28, section 1.4.2.16 Ibadan Electricity Distribution Company;**

**The Ibadan Electricity Distribution Company** is one of the **11** and NOT **13** distribution companies unbundled from defunct PHCN during electricity reform in 2005.

- The revised section on legal and administrative framework should include other relevant ones such as National Inland Waterways Authority Act, African Development Bank and Convention on Conservation of Migratory Species of Animals and RAMSER Convention on Wetlands of International Importance amongst others. Electric Power Sector Reform Act 2005 should also be reviewed.

## **Chapter Two: Project Justification**

Page 3, ***Figure 2.1.1 the presented figure is not clear, it should be presented on A3 paper in the updated report.***

Page 2: Subsection 2.3.1 Technical Sustainability; the availability of adequate and qualified manpower for the project execution and operation should form part of its technical sustainability. This should be incorporated in the revised subsection.

Pages 5-6, Section 2.4.2.1 refers. **Design /Technology Alternatives**

Substations: Air-insulated Substation is preferred to Gas-insulated and hybrid sub-station on account of availability of land. The silence on comparative cost, efficiency and environmental friendliness should be reversed in the final report.

Page 6, Underground versus Surface Transmission Alternatives: Surface transmission in Nigeria has its climatic and security challenges. Do these still place it environmentally better than underground transmission?

How reliable are the data obtained from **Lagos State Electricity Board** as compared to those available with Eko Electricity Distribution Company (EKEDC) and Ikeja Electricity Distribution Company (IKEDC)?

What study/test was carried out and nature of result(s) obtained that justified the conclusion on **the technical viability of the proposed project as asserted?**

Page 8, second to the last paragraph, the location of Redeemed substation is still uncertain. When it is resolved, what is the assurance that LRS will still be relevant?

Chapter two should be revised to capture the value of the project,.

Chapter Three: Project Description

Page 1, section 3.1 Nature of the project;

Para 1, line 1, it should read 'the proposed project (LOT 1) by transmission Company of Nigeria (TCN)...' in the updated report.

Page 2, '... the existing Transmission line between Ikeja West S/S and Omotosho S/S is double circuit and TCN is planning to change it to four circuit system tower near the branching point...' is this plan part of this project? If yes, it should be clearly spelt out in the updated report.

Pages 3-4, Project Phase and Activities

The listed points should be numbered using Roman Numerals instead of Alphabet which is confusing to an abbreviation e.g AA, BB etc.

Page 6, Section 3.4.2 refers. **Access Track Repair/ Upgrade/ Construction**  
“.....final route of access road will be determined in consultation with the landowner, giving consideration to environmental impacts” how realistic is this statement.

Pages 7-8 Fig. 3.3 and 3.4, the figures should be presented on A3 paper for legibility in the updated report.

Page 12, Section 3.4.8.2 Hours of Operation,  
lines 3-4 stated ‘All construction activities that are likely to generate noise shall not be undertaken during night time’ please specify the activities that will be conducted at night.

Page 12 Item (i) Clean-Up and Final Inspection

- Bullet points 5-6 are on irrigation ditches and facilities. Please state the relevance of these points and the specific location at which irrigation facilities will be affected by the proposed power transmission line projects.
- Bullet point ‘Any fences, gates, etc., which have been damaged during construction shall be restored’ is confusing, the re-construction of structures along the line routes and substation sites are very unlikely.

The bullet point should be expunged.

Page 13, Section 3.5.2, **Easement Maintenance**

Last paragraph, NSCDC stands for Nigeria Security and Civil Defence Corps and not National Security and Civil Defence Corps as presented. This should be corrected throughout the report.

Page 15, Section 3.6.2 **Waste Disposal**

Para 1, line 1, "Sewage from site .....will be vacuum-sucked into septic tanked trucks and taken to facilities approved by OGEPA". Any approval so received for this exercise within the State is illegal as Ogun State has no such facility.

Page 22 Table 3.6.1 **Proposed Transmission Project Waste Estimates and Disposal Plan**

The liquid wastes such as spent oil from heavy duty vehicles and sanitary from camp during pre-construction and construction phases should be identified, characterized, quantified and the management strategies should be provided.

Page 33, Tower erection/Accessories

Towers shall be erected at approved distance' what is the approve distance and by who was approval given? Please state it in the updated report.

Page 3.8.5 Line insulators type Analysis;

Based on the three listed type which one is selected to be used and state the reason for the selection, please.

Page 22, Table 3.1 **Disposal Company Column**

Rows 1- 3, and 4 should read OGEPA allotted but OGMEvn. Registers Waste Contractor.

Same column, it reads "OGEPA sewage treatment facility, Abuja" How? this is evidence of copy and paste. Please edit properly in the updated report

Pages 37-38: Substations, the alternative sites considered for the location of the proposed substations should be highlighted and justification for chosing the preferred locations.

Page 43, Figure 3.10 is a plate not a figure as captured.

Page 44, Table 3.10.1 Location and configuration of substation

It was stated during the presentation at the review meeting and the Site visit that all the substations will be constructed on a 25Ha of land. However the

land sizes varies on the presented table. Please reconcile in the updated report.

Pages 45-47 figures 3.10.1-3.10.3, the presented figures should be represented on A3 paper for clarity in the updated report.

Page 48, section 3.11 Land Take requirement for Transmission lines;

It was stated on the second paragraph that 'the land of the RoW under transmission lines will need to be acquired by TCN'. What is the current status of the RoW?

Chapter three should be revised and a lot of generic information that is not relevant to the proposed project should be expunged. The following should be captured in the chapter;

- ✓ Design standards references was not in line with **Nigerian Electricity Supply and Installation Standards (NESIS), 2015** but TCN standards.
- ✓ There is no information about types and sizes of Conductors and cables.
- ✓ Type of substation fence to be constructed is not clearly stated.
- ✓ The Google earth route maps does not show proposed positions for towers. The maps are pictures that cannot be work-on to verify details of information submitted.

#### **Chapter Four: Description of Existing Environment**

Page 35, Table 4.7.2 Physico-chemical characteristic of Groundwater source from the area;

It is expected that a column for regulatory limits should be included into the table in the updated report.

Page 26, the presented subsurface sequence and geo-electric characteristic of the study should be presented in a tabular form in the updated report.

Page 32, Section 4.7.1 Groundwater sources

The "Source of the water" is different from the "chemical properties of the water" the text should be rephrased to tally with the heading. Also para1, line 1, what is the relationship between the ambient air temperature and that of the groundwater, please explain in the updated report.

Pages 35-36, Table 4.7.2 Physico-Chemical Characteristics of “Groundwater” not “Underground water”.

Also, a column for regulatory limits should be added to the table in the updated report.

Pages 39-40 Table 4.7.3 Physico-Chemical Characteristics of Surface water from the study area; A column for regulatory limits should be added to the table in the updated report.

Page 41, Section 4.8.1 Methodology;

Para1, lines 4-5, ‘...which were then used to pin point the exact locations as we moved along the route (Table 4.8.1)’. The statement should be captured as “**...which were then used to pin point the exact locations along the routes (Table 4.8.1)**’. in the updated report

Page 48, section 4.10.2.1 Methodology;

The total length of the route given and individual routes length given contradict with the figures given in other part of the report, this should be reconciled in the updated report.

Page 101, section 4.11.1.2 Country Location and Administrative structure;

Para 1, line 1, Nigeria lies between Latitude 4o and 14o north of the equator and longitudes 3o and 15o east ...’ this should be captured as **4<sup>o</sup>** and **14<sup>o</sup>** North Longitudes **3<sup>o</sup>** and **15<sup>o</sup>** in the updated report.

Page 104, Table 4.11.1 Relevant livelihood indices in the project states;

This project is solely domiciled in Ogun State therefore the Lagos State data presented should be expunged in the updated report.

Page 105 section 4.11.2.4 Host Communities;

Para 1, line 1, it should read ‘**it was expected that more than 50 communities would be...**’ Not “it was expected that more 50 communities would be...”.

Same paragraph, line 2, '...Out of more than almost 80 communities...' this sentence need to be recast correctly if it's 'More than' or 'Almost' one of the adjective should be used to convey the meaning.

Also, the number of the affected communities is confusing it was stated more than 50 communities, In the ESIA out of more than almost 80 communities are potentially affected by the project, what is the actual number of the affected communities by the project?

The entire paragraph needs to be rephrased to convey the intended information.

Page 105, Table 4.11.3 **Communities Potentially Affected by the Project**

This table needs to be reviewed in order to appropriately place communities/LCDA in their respective LGAs e.g. Ofada/Mokoloki LCDA is not in Ifo LGA. Also Ifo is not in Sagamu LGA. This should be corrected in the updated report.

Page 121, figure 4.11.2 should be presented on A3 paper for legibility in the updated report.

Page 123: Item (a) Government Authorities

- Federal Ministry of Power, Abuja should be corrected to Federal Ministry of Power, Works and Housing.
- Other relevant government institutions such as Energy Commission of Nigeria should also be captured in the revised section.

## **Chapter Five: Associated and Potential Impacts**

Page 9, Table 5.3.2 refers. **Estimated land deforested for the proposed project component;**

The area column should be reviewed in row 1 to give the actual land take.

Page 1, Section 5.1 Introduction

- Para.2 on project activities is completely silent on the activities related to construction/installation and operation of associated substations. The section should be updated with all the key project activities for all the project components.
- Some items listed are impacts and not project activities as stated e.g. spills, traffic accidents and tower collapse amongst others. These should be addressed.
- The section should be revised to include other phases of the project as well as their corresponding activities e.g. pre-construction and decommissioning phases as outlined in other sections of the report.

Page 2 Section Para.1 line 1 ‘...the associated with the potential impacts...’ should be corrected to read ‘...the associated and potential impacts...’

Page 8, Climate Change impact due to construction activity;

The Greenhouse Gases (GHG) production embodied from the material that will be used for construction is not contributions from the project due to the fact that the proponent is not the manufacture of these products. This section should be expunged in the updated report.

Page 235:



- Subsection 5.3.1.3 Climate Change Impact, 2<sup>nd</sup> sentence ‘...following activity is considered for climate change impact...’ should be corrected to read ‘...following activities are considered for climate change impact...’

Page 15 Subsection 5.7.12 operation phase;

The information provided that no impact was anticipated on surface water during operational phase is not correct. Please revise the section to clearly identify impacts associated with project activities e.g. maintenance of the lines and substations could result in some impacts.

Page 23 Section 5.13 Resettlement;

Section 5.13 refers. **Resettlement**

It stated that “A Separate Resettlement Action Plan has been provided for the Proposed Transmission Line and Substation Projects.... (see RAP report)”. RAP report is not in this draft report, hence, expunge the quoted sentence. Please provide some succinct highlight of resettlement issues instead of making reference to Resettlement Action Plan (RAP) report which many could not have access to.

Page 23 Subsection 5.14.1 para.2 lines 3-4, ‘The construction areas are close enough to Lagos and Abeokuta that a worker’s accommodation camp...’ this statement is not realistic and contradicts information provided in other sections of the report. Please reconcile.

Page 24 Subsection 5.15.1 Operation Phase,

- Para.1 line 1 stated 'The most important benefit generated by the project will certainly is the improved availability...' this statement should be rephrased to communicate its intending meaning.
- Para2, the entire para. does not make much meaning. The project is expected to serve as catalyst for the growth of small, medium and large scale activities therefore, it should not be limited to storage of agricultural produce in a refrigerator for one day. The para. should be revised as appropriate or to be expunged.

Page 27 Subsection 5.18.3 Cumulative Impact; this section should be revised to include corona effect and EMF of the existing and proposed power lines.

Chapter five on impacts should be revised in line with revised chapter three on project description. The revised chapter should take cognizance of all the key project activities as well as their associated and potential impacts including cumulative impacts from other Oil and Gas activities. Is this an Oil & Gas Project? This is a clear indication that there are several cut and paste information in the report.

## **Chapter Six: Mitigation Measures**

Page 2 refers. **Assessing Residual Impact**

Assessing residual impacts;

Para 1, last sentence, it reads "The residual impacts are described in terms of their significance with categories identified in Box 5-2 above". There is no Box 5-2 on this page. Please insert the stated box in the updated report.

Page 2, Section 6.3 Air Quality;

Under Air Pollutant Emission, bullets 2 & 5; how realistic is it or it should be expunged in the updated report.

Pages 15-20 Tables 6.18, 1a & 6.18.1b Summary of Mitigation Measures, the tables should be revised to include the key project activities as well as their corresponding mitigation measures.

Chapter six on mitigation measures should be revised in line with revised chapters three on project description and three (3) substations and potential impacts. The revised chapter should take cognizance of all the key project activities in the revised chapter three and identified impacts in revised chapter five.

Also, this chapter contains references to many plans e.g. RAP, Local Content Plan (Used), Traffic Safety Plan, Security Plan, Waste Management Plan, Occupational and HSE Plan, Stakeholders Engagement Plan and Emergency Response Plan which are not included in the report. They should be included in the updated report.

### **Chapter Seven: Environmental Management Plan**

Page 1 Section 7.1 Introduction;

Para 1, line 1, it stated that 'This chapter provides the ESMP for the Lagos and Ogun Transmission Line Project' the sentence should be revised to include the associated substations facilities.

Page 2, Table 7.3.1 **Roles and Responsibilities;**

The first column, last row, the Ogun State Environmental Agency should be changed to Ogun State Ministry of Environment in the updated report.

Pages 23-29 Table 7.4 ESMP during construction; there is need to re-examine the monitoring frequencies as proposed e.g. quarterly monitoring of air quality, noise levels and vibration during construction phase is too wide. The air quality, noise levels and vibration should be monitored more frequently (e.g. daily & weekly) during the construction phase to ensure all associated issues are adequately addressed.

Chapter seven on EMP should be revised in line with revised chapters three on project description, three substations, other associated and potential impacts and six on mitigation measures.

### **General Comments**

- i) The Report should be carefully edited to correct/expunge all typo, spelling and grammatical errors.
- ii) The Corporate Social Responsibility (CRS) specific for the proposed project should be clearly and concisely presented in the revised report.
- iii) All illegible tables, figures and maps should be made legible in the revised report.
- iv) All sources of information used in the report should be properly cited and included in the reference list and those not relevant should be expunged.



# FEDERAL MINISTRY OF ENVIRONMENT

## Environment House

Independence Way South, Central Business District, Abuja - FCT.

Tel: 09-2911 337 [www.environment.gov.ng](http://www.environment.gov.ng), [ea-environment.org](http://ea-environment.org)

## ENVIRONMENTAL ASSESSMENT DEPARTMENT

Ref: FMEnv/EA/EIA/4267/1/173

Date: 28<sup>th</sup> November, 2018.

The Managing Director/CEO,  
Transmission Company of Nigeria (TCN)  
Corporate Headquarters,  
Plot 14 Zambezi Crescent,  
Maitama,  
Abuja, FCT

**ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED LAGOS AND OGUN STATES TRANSMISSION LINES AND ASSOCIATED SUBSTATIONS FOR LOT 3 PROJECT.**

Please refer to the EIA Panel Review meeting conducted for the above stated project on 19<sup>th</sup> October, 2018.

2. Following the conclusion of the review exercise, I am directed to inform you that the Draft EIA Report was adjudged satisfactory despite some omissions and inadequacies.
3. I am further directed to convey the following information on matters to be handled by your Organization: -
  - a) Submission of five (5) hard copies and two (2) e-copies (in PDF) of the Final EIA Report addressing the harmonized comments from the review meeting (attached); and
  - b) Payment of the Final Assessed Charge (FAC) to the Ministry for the EIA Approval as per the attached invoice.
4. Kindly note that this is not an approval letter and that the EIA Approval Letter shall only be issued on the confirmation that items 3(a) and (b) above have been satisfactorily complied with.
5. Thank you for your co-operation.

J. A. Alonge

Director, Environmental Assessment Dept.  
For: Honourable Minister



# FEDERAL MINISTRY OF ENVIRONMENT

## Environment House

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Tel: 09-2911 337 [www.environment.gov.ng](http://www.environment.gov.ng), [ea-environment.org](mailto:ea-environment.org)

## ENVIRONMENTAL ASSESSMENT DEPARTMENT

Ref: FMEnv/EA/EIA/4267/1/174

Date: 28<sup>th</sup> November, 2018

The Managing Director/CEO,  
Transmission Company of Nigeria (TCN)  
Corporate Headquarters,  
Plot 14 Zambezi Crescent,  
Maitama,  
Abuja FCT.

### INVOICE

#### ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED LAGOS AND OGUN STATES TRANSMISSION LINES AND ASSOCIATED SUBSTATIONS FOR LOT 3 PROJECT.

| S/N  | ITEM DESCRIPTION  | AMOUNT (₦)          |
|------|---|---------------------|
| I    | Registration fees   | 50,000.00 Paid      |
| ii.  | Impact Mitigation Monitoring (IMM) for the first exercise   | 500,000.00          |
| iii. | Assessed Charge for the proposed construction and installation of 86.2km Transmission Lines and 3 nos high voltage substations for LOT 3 project in Lagos and Ogun States is 2,755,000.00.<br>(a) Revenue – 2,066,250.00<br>(b) Operational- 688,750.00 | 2,755,000.00        |
| Iv   | <b>Final Assessed Charge</b>  | <b>3,255,000.00</b> |

The total amount to be paid to the Federal Ministry of Environment for issuance of Environmental Impact Statement (EIS) and Environmental Impact Assessment (ESIA) Certificate for the proposed project is Three Million, Two Hundred and Fifty-Five Thousand Five Hundred Naira (₦3,255,000.00) only, as follows:-

- a) **EIA Operational Charge:** One Million , One Hundred and Eighty-Eight Thousand, Seven Hundred and Fifty Naira (₦1,188,750.00) only
  - b) **EIA Government Revenue:** Two Million and Sixty-Six Thousand, Two Hundred and Fifty Naira (₦2,066,250.00) only
2. The payments are to be made separately into the Federal Government Treasury Single Account (TSA) Platform ([www.remita.net](http://www.remita.net))
  3. The evidence of both payments shall be forwarded to the Ministry's Headquarters at Mabushi, Abuja.

J. A. Alonge

Director, Environmental Assessment Dept.

For: Honourable Minister.

**FEDERAL MINISTRY OF ENVIRONMENT'S HARMONIZED COMMENTS ON  
THE DRAFT ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF THE  
PROPOSED LAGOS -OGUN TRANSMISSION LINES AND OTHER  
ASSOCIATED FACILITIES LOT 3**

**PRELIMINARY PAGES**

Cover/title pages

- The cover page should be rephrased to indicate 'substations' instead of 'substation' since there are number's of associated substations in more than one.
- The title page has an extension of the cover page to include "line study, ESIA and RAP". The extensions should be expunged to maintain uniformity which reflects the content of the report.
- Please include submitted to the Federal Ministry of Environment in the revised title.
- The inclusion of the term "Resettlement Action Plan" in the cover page of the report is confusing and should be removed to give the report the desired meaning and so as not to confuse the reader;
- The information pertaining to EEMS Limited as consultants for the project's EIA indicated in the cover page of the document is not necessary and should be expunged while the report should be clearly marked as " Draft ESIA" and indicate TCN as owner of the project;

Pages iii-x: Table of contents

- There are so many items in the executive summary which are also repeated as subsections of other chapters. The executive summary should be revised

to have only the key topics and not detail of all the key topics and subsections.

- There are inconsistencies in the writing of chapters and their titles, chapters and their titles should be properly written e.g. Chapter One: Introduction, Chapter Two: Project Justification, Chapter Three: Project Description, Chapter Four: Environmental Baseline Data Acquisition, Chapter Five: Potential and Associated Impacts, Chapter Six: Mitigation Measures etc.

Page xiii: List of Tables 'Ground Water' in Table 4.13 should be corrected to 'Groundwater' this should be applied to all other relevant sections of the report.

Pages xvi-xxii: List of Abbreviations and Acronyms

- AIDS should be written as Acquired Immuno-Deficiency Syndrome, ESIA was written twice, one should be expunged, ILO should be written as International Labour Organization instead of just 'International'
- Please ensure Nigerian Minerals and Mining Act (NMMA) 2007 and United Cement (UNICEM) etc are relevant to the proposed project otherwise they should be expunged.
- The following should be edited; D to d, DB to dB, K<sup>+</sup> to K, MOU to MoU, Na<sup>+</sup> to Na, PO<sub>4</sub><sup>2-</sup> to PO<sub>4</sub>, SO<sub>4</sub><sup>2-</sup> to SO<sub>4</sub>, Sqm<sup>2</sup> to m<sup>2</sup>, TOR to ToR, etc.
- The list should also be updated with all other abbreviations and acronyms used in the body of the report.

Page xxiii: List of EIA Preparers Please be consistent on the use of either ESIA or EIA except when making references to the existing legislations.



- The column on the qualification of the members is vague because it fails to provide their specific disciplines e.g. B. Sc, M. Sc. Ph. D. This column should be updated with specific disciplines of all the members while the 3<sup>rd</sup> column should provide information on the specific task/ role they played in the ESIA studies.

Page xxiv: Acknowledgement; the acknowledgement should be revised to indicate the project proponent instead of 'We wish to thank all stakeholders...' other parties may also be acknowledged.

## **EXECUTIVE SUMMARY**

### **Page xxx Ogun State Laws**

Environmental Management (Miscellaneous) Provisions Law, 2004, should be listed. This should be replicated on page xxxviii of the report.

### **Page xxxviii Waste Generation and Management**

Bullet b. '...AEPB's sewage treatment facility'. This is an evidence of direct copy and paste. AEPB is located in Abuja while the proposed project is domiciled in Ogun/Lagos State. What is the relationship of AEPB with the proposed project? This should be corrected in the updated report.

### **Page xliii Performance Monitoring and Surveillance**

Last paragraph, the Regulatory monitoring and oversight is not only conducted by FMEnv but in conjunction with other relevant Regulators to the proposed project and other tiers of Government.

## **CHAPTER ONE: INTRODUCTION**

### **Page 2: Subsection 1.1.1 The Project**

- Para.1 – ESMP should read Environmental and Social Management Plan.

- Bullet points 1-3, the length of the proposed lines presented slightly contradicts the information provided on pg. xxv of the executive summary. These should be reconciled.

Page 3: Subsection 1.1.3 Project Location, line stated that the lines in lot 3 have a total length of 79.5km contrary to the breakdown provided in lines 5-7 as well as executive summary. These inconsistencies should be reconciled.

Pages 4-5:

- Figures 1.1 and 1.2 are not legible; they should be replaced with enlarged and legible ones.
- The title of figure 1.2 should be rephrased to read 'Map of Lagos and Ogun States showing the proposed project (Lot-3) route'

Pages 7-8: Section A- National Environmental Policy, para.3 stated 'Some specific laws include' however, all the information presented in 7 bullet points are for regulations and not laws. The statement should be rephrased to reflect the contents.

Pages 17-18: Item xiv National Environmental Regulations

- This section should be harmonized with information presented in section 'A' where some 7no. regulations were presented. It is wrong to state that the Minister issues the listed regulations as a result of NESREA Act, the regulations listed predates the NESREA Act of 2007. This should be corrected.
- Bullet points 1-2, the date of production for S.I. 8 and S.I. 15 regulations is 1991 contrary to 1999 as presented. This should be corrected in the updated report.

- Bullet point 3; the regulation should be properly cited as 'S.I. 9 National Environmental Protection (Pollution Abatement in Industries and Facilities Generating Wastes) Regulations, 1991'

Pages 18-21: there are a lot of information that is bolded unnecessarily e.g. all the bullet points under Lagos State laws, bullet points 6-16 of section 1.4.3 and bullet points 1-8 of section 1.4.6 IFC PS amongst others. These should be addressed throughout the report.

Page 29, sub-section 1.4.9.13 There is no Ministry in Lagos State called "Lagos State Ministry of Physical Planning" its "**Lagos State Ministry of Physical Planning and Urban Development**" this should be corrected in the updated report.

**Page 26, section 1.4.9.4 Electricity Distribution Companies (Ibadan, Ikeja and Eko)**

**The Ibadan Electricity Distribution Company** is one of the **11** and NOT **13** distribution companies unbundled from defunct PHCN during electricity reform in 2005.

Page 26, Power Holding Company of Nigeria (PHCN) is no longer existing as such cannot be an agency under the Federal Ministry of Power, Works and Housing (FMPW&H).

- ✓ The following are not part of the responsibilities of Federal Ministry of Power, Works and Housing (FMPW&H):
  - Licensing of electrical contractors and electric generating sets of 1MW capacity and below
  - Conducting investigation on electrical accidents and to ensure safety in the electricity industry in Nigeria
  - Conducting statutory tests and certification of electric poles (concrete, wooden, steel etc.) and other major electrical materials before they are used on the grid and networks in Nigeria

Page 27 Section 1.4.9.6 **Ogun State Ministry of Physical Planning.**

This Ministry does not exist in Ogun state but “Ministry of Urban and Physical Planning” this should be corrected in the updated report.

The revised section on legal and administrative framework should include other relevant ones such as National Inland Waterways Authority Act, Water Resources Act CAP W2 LFN 2004, Lagos State Properties Protection Law, 2016, African Development Bank and Convention on Conservation of Migratory Species of Animals and RAMSER Convention on Wetlands of International Importance amongst others. The electric Power Sector Reform Act of 2005 should also be included and reviewed.

- The arrangement of the laws and regulations should be reviewed such that it shall start with National regulations followed by State and Local regulations, and then International conventions;

## **CHAPTER TWO: PROJECT JUSTIFICATION**

Page 36: Subsection 2.3.1 Technical Sustainability; the availability of adequate and qualified manpower for the project execution and operation should form part of its technical sustainability. This should be incorporated in the revised subsection.

Pages 37-38: Substations, the alternative sites considered for the location of the proposed substations should be highlighted and justification for choosing the preferred locations.

Page 39 item b, Tower Types (Tubular/Lattice) Alternatives;

The report made reference to two type of towers (Tubular and lattice) and justified the use of lattice tower type for 330 KV DC line but failed to state the type that shall be used for the remaining two (2) 132KV DC lines which runs from

Ajgunle to Agbara and from Ajgunle to Yafin in Badagry LGA of Lagos State. This should be stated in the updated report.

Page 43, figure 2.5 to 2.6 **Alternative Analysis for Routes**

The line routes are clear but the traversing settlements are not legible. The magnification of the figures should be enhanced to make the settlements legible, it could have been better if presented on A3 paper.

- ✓ How reliable are the data obtained from **Lagos State Electricity Board** as compared to those available with Eko Electricity Distribution Company (EKEDC) and Ikeja Electricity Distribution Company (IKEDC)?
- ✓ What study/test was carried out and nature of result(s) obtained that justified the conclusion on **the technical viability of the proposed project as asserted?**

### **CHAPTER THREE: PROJECT DESCRIPTION**

Page 47: Section 3.1 Introduction, the total length of lines for lot 3 is given as 88km contrary to 86.2km, 87km, 79.5km etc in other sections of the report. These should be reconciled.

Page 52, item b, Access Track Repair/upgrade /construction ;

Para 6, that EPC contractor shall prepare Erosion and sediment control Plan (ESCP) in accordance with regulatory standard and submit same to the Federal Ministry of Environment for approval is not acceptable. The ESCP along the project route ought to have been carried out and the statement would be better rephrased to imply that ESCP when completed shall be submitted to Federal Ministry of Environment by TCN who is the owner of the report and project;

Similarly, the statement in paragraph 7 of the same page 52 that the main and secondary roads **may** not require repair or upgrade and that the minor roads **may** need to be upgraded, needs to further explain what it meant by main, secondary and minor roads. It should be more specific on the intent and purpose of the project with regard to use of the word "may" in the statement;

Page 57, item f, Substation Construction;

Last bullet point, last sentence, it was indicate that 75% of materials for substation construction will come from offshore location while the remaining 25% will be sourced locally is not clear. There is need to specify what it meant by offshore location in the updated report.

Page 59, item g, construction equipment and transportation of materials to the sites;

Some listed articulated trucks that shall be used for this purpose but noted that some of the heavy cargos e.g steel stanchion and transformers shall be moved from Lagos Tin Can Port, in Apapa to the various sites. However, it was expected that information on the route to be used in Lagos should be provided taken cognizance of attendant traffic and possibly indicate if the selected route is free from any restrictions on the transport of heavy and large cargo in Lagos state.

Page 60: Para.2 on hours of operation, lines 3-4 stated 'All construction activities that are likely to generate noise shall not be undertaken during night time' please specify the activities that will be conducted at night.

Pages 60-61: Item (i) Clean-Up and Final Inspection

- Bullet points 5-6 are on irrigation ditches and facilities. Please state the relevance of these points and the specific location at which irrigation facilities will be affected by the proposed power transmission line projects.
- Bullet point 'Any fences, gates, etc., which have been damaged during construction shall be restored' is confusing, the re-construction of structures along the line routes and substation sites are very unlikely. The bullet point should be expunged.

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presented would mean that the construction work had already commenced with completion date set in 2018/2019 contrary to the report that the construction phase of the project shall commence in 1<sup>st</sup> Quarter of 2019.

Also, the schedule should be positioned at the later part of the chapter;

Pages 69-72: Subsection 3.5.1-3.5.3, please be consistent with the length of the proposed lines. There is need to reconcile the length of the lines provided with other sections of the report including table 3.7

Page 88: Underground Transmission Cables, please state the relevance of the information provided in this section. The information provided is not clear whether there is any section of the lines that requires installation of underground transmission cables. This should be clarified.

Chapter three should be revised and a lot of generic information that is not relevant to the proposed project should be expunged.

#### **CHAPTER FOUR: DESCRIPTION OF EXISTING ENVIRONMENT**

##### **Page 97, Section 4.3.2 Field Sampling/Measurement**

Para 1, line 3 it reads "...field data gathering exercise was performed between 27th through 4th December 2017" should be edited as 27th cannot stand alone without month. Please indicate the Month in the updated report.

Pages 99-100: Table 4.2 Sampling Stations and Sampling Requirements; columns 6-11 on soil, air/noise, meteorology, surface water/ sediments, groundwater and biodiversity are completely blank. They should be provided with appropriate information otherwise be expunged.

Page 101: Figure 4.1 Sampling map for all Environmental/ Social Components; the figure is not legible therefore should be replaced with an enlarged and legible one in A3 paper.



Pages 108-119: Section 4.5.2 Ambient Air Quality Result

- Para.1 lines 2-3 stated that 'Particular attention was paid to the Greenhouse gases (GHG) like CO<sub>2</sub>, N<sub>2</sub>O and CH<sub>4</sub>.' However; only CO<sub>2</sub> amongst these three (3) was presented on table 4.5 on ambient air quality results. This should be reconciled.
- The numbering of the subsections started from j-q while a-i are missing. This should be corrected in the updated report.

Page 110 refers. **Sulphur Dioxide**

SO<sub>2</sub> concentration was found to be high at some sampling stations in the afternoon and evening. Yet the report says "the SO<sub>2</sub> level is not projected to exceed regulatory limits during all phases of the project life cycle". How possible was this assertion?

Pages 112-115: Section 4.6 Noise Quality and Electromagnetic Fields, while it was stated the IFC, WHO and FMEnv limits shall be used to benchmark the ambient noise levels; only WHO and FMEnv limits were used. The IFC standards should also be provided in the revised section.

Page 122: Table 4.13 Groundwater Physico-Chemical Parameters

- There is need to re-examine the values for Total Suspended Solids (TSS) and Turbidity which are relatively high (though below the limits) contrary to results for water colour which indicates that all the water samples were found to be clear and colourless.
- There is also need to provide results of the Total Dissolved Solids (TDS) for all the samples. This is conspicuously missing in the table.

Page 190: Figure 4.15 Map showing communities; the map should be represented in A3 paper which will make it more legible and enlarge manner.

Page 203:

- Plate 4.31, the 3<sup>rd</sup> picture is wrongly titled as 'Asbestos in Igbele' where as the roofing material presented is rusted corrugated Iron sheets. This should be corrected.
- Table 4.69 Walling Material of Houses; column 1 last row 'Others' the other building materials identified during the studies apart from those listed in the column 1 should be specified for better understanding of stakeholders.

Page 211: Subsection 4.16.3; the title 'Stake Holder Identification...' should be corrected to 'Stakeholders Identification...'

Page 212: Item (a) Government Authorities

- Federal Ministry of Power, Abuja should be corrected to Federal Ministry of Power, Works and Housing.
- There is mixed-up in the listed bullet points. While bullet points 1-3 referred to the institutions, bullet points 4-5 referred to teams from some institutions. Please reconcile.
- Other relevant government institutions such as National Energy Commission should also be captured in the revised section.

Page 213: Table 4.74 List of Identified Stakeholders; column 1 row 2 referred to for the list of communities. However, table 4 does not exist in the entire report. This should be addressed.

Page 228: Table 4.83 NCF Comments and response, row 3 is blank and row 4 made reference to appendix xx which does not exist in the report. These should be corrected.

## CHAPTER FIVE: ASSOCIATED AND POTENTIAL IMPACTS

Page 229: Section 5.1 Introduction

- Para.2 on project activities is completely silent on the activities related to construction/installation and operation of associated substations. The section should be updated with all the key project activities for all the project components.
- Some items listed on impacts are not project specific activities as stated e.g. spills, traffic accidents and tower collapse amongst others. This should be addressed.
- The section should be revised to include other phases of the project as well as their corresponding activities e.g. pre-construction, Operation and decommissioning phases as outlined in other sections of the report.

Page 230: Section 5.1, Para.1 line 1 '...the associated with the potential impacts...' should be corrected to read '...the associated and potential impacts...'

Page 235:

- Subsection 5.3.1.2, emissions from movement of vehicle was captured in both subsections 5.3.1.1 and 5.3.1.2. This should be addressed to avoid duplication of information.
- Subsection 5.3.1.3 Climate Change Impact, 2<sup>nd</sup> sentence '...following activity is considered for climate change impact...' should be corrected to read '...following activities are considered for climate change impact...'

Page 243: Subsection 5.6.2 operation phase, the information provided that no impact was anticipated on surface water during operational phase is not correct. Please revise the section to clearly identify impacts associated with project

activities e.g. maintenance of the lines and substations could result in some impacts.

Page 245: Subsection 5.7.1.1 Impact on Terrestrial Fauna and Flora, the total length of the proposed lines was given as 81km (30km+51km) contrary to other sections of the report. This should be reconciled.

Page 251: Section 5.13 Resettlement, please provide some succinct highlight of resettlement issues instead of making reference to Resettlement Action Plan (RAP) report which many could not have access to.

Page 252: Subsection 5.14.1.1 para.2 'The construction areas are close enough to Lagos and Abeokuta that a worker's accommodation camp...' this statement is not realistic and contradicts information provided in other sections of the report. Please reconcile.

Page 253: Subsection 5.15.2 Operation Phase,

- Para.1 line 1 stated 'The most important benefit generated by the project will certainly is the improved availability...' this statement should be rephrased to communicate its intending meaning.
- Para2, the entire para. does not make much meaning. The project is expected to serve as catalyst for the growth of small, medium and large scale activities therefore should not be limited to storage of agricultural produce in a refrigerator for one day. The para. should be revised as appropriate.

Page 255: Subsection 5.17.2 last line 'This is a negligible impact' this is meaningless therefore should be rephrased.

Page 257: Subsection 5.18.3 Cumulative Impact; this section should be revised to include corona effect and EMF of the existing and proposed power lines.

Chapter five on impacts should be revised in line with revised chapter three on project description. The revised chapter should take cognizance of all the key project activities as well as their associated and potential impacts including cumulative impacts from other Oil and Gas activities.

## **CHAPTER SIX: MITIGATION MEASURES**

Page 271 Section 6.12 **Resettlement**

“A separate resettlement framework has been prepared....” But the RAP report was not attached/included to this report. How will the decision of the panel be justified as regards this report?

Pages 275-285: Tables 6.1 & 62 Summary of Mitigation Measures, the tables should be revised to include the key project activities as well as their corresponding mitigation measures.

Chapter six on mitigation measures should be revised in line with revised chapters three on project description and five on associated and potential impacts. The revised chapter should take cognizance of all the key project activities in the revised chapter three and identified impacts in revised chapter five.

## **CHAPTER SEVEN: ENVIRONMENTAL MANAGEMENT PLAN**

Page 286: Section 7.1 Introduction, line 1 stated ‘This chapter provides the ESMP for the Lagos and Ogun Transmission Line Project’ the sentence should be revised to include the associated substation facilities.

Pages 315-317: Table 7.3 ESMP during construction; there is need to re-examined the monitoring frequencies as proposed e.g. quarterly monitoring of air quality, noise levels and vibration during construction phase is too wide. The air quality, noise levels and vibration should be monitored more frequently (e.g. daily & weekly) during the construction phase to ensure all associated issues are adequately addressed.

Chapter seven on EMP should be revised in line with revised chapters three on project description, five on associated and potential impacts and six on mitigation measures.

## **CHAPTER EIGHT: DECOMMISSIONING AND CLOSURE**

The report should discuss in details how the various decommissioning activities listed in bullet 1-4 of section 8.4 shall be carried out and how the materials either as recovery or wastes shall be disposed

### **General Comments**

- i) The Report should be carefully edited to correct/expunge all typo, spelling and grammatical errors.
- ii) The Corporate Social Responsibility (CRS) specific for the proposed project should be clearly and concisely presented in the revise report.
- iii) All illegible tables, figures and maps should be made legible in the revised report.
- iv) All sources of information used in the report should be properly cited and included in the reference list and those not relevant should be expunged.
- v) The executive summary should be revised to reflect the comments on all the chapters of the report.

## 4. ベースライン調査結果

## LOT 1 Baseline Study

### 1.1 Ambient Air Quality

#### 1.1.1 Sampling Location

Ambient air and noise quality measurements were carried out between December 18 and 23, 2017 at sampling locations along the project sites as shown in Table 1-1 and Figure 1-1.

Table 1-1: Sampling Locations for Air Quality and Noise

| S/No | Station on Map | Coordinates |           | Nearest town/Designation                 |
|------|----------------|-------------|-----------|--|
| 1    | AQ1            | 6.8491      | 3.2023466 | Ejio                                     |
| 2    | AQ2            | 6.8514411   | 3.1823444 | Ayepe                                    |
| 3    | AQ3            | 6.8384879   | 3.1535053 | Sojuolu                                  |
| 4    | AQ4            | 6.84887     | 3.21305   | Soderu                                   |
| 5    | AQ5            | 6.88643     | 3.23764   | Adubi-Aro                                |
| 6    | AQ6            | 6.93145     | 3.24742   | Oluke -Orile                             |
| 7    | AQ7            | 6.96769     | 3.27383   | Fallow Land                              |
| 8    | AQ8            | 7.00249     | 3.30202   | Ijumo-Ologboni                           |
| 9    | AQ9            | 7.04896     | 3.34141   | Opanigangan (Ogun River Bank)            |
| 10   | AQ10           | 7.10539     | 3.38824   | Ototo (Close to New Abeokuta substation) |
| 11   | AQ11           | 6.84681     | 3.21501   | Habited Area (Ejio)                      |
| 12   | AQ12           | 6.86741     | 3.24728   | Sowunmi                                  |
| 13   | AQ13           | 6.87506     | 3.28868   | Akilagun                                 |
| 14   | AQ14           | 6.88468     | 3.31266   | Olorunsogo Thermal Plant Fenceline       |

#### 1.1.2 Result of Ambient air quality survey

The result of ambient air quality is presented below. The result shows that the PM<sub>10</sub> exceeded the IFC standard at AQ 13 and AQ 14 as well as that TSP exceeded FMEEn limit at AQ 13. Other parameters are below applicable limit at all locations.

a) Particular mater : 24 hours

Table 1-2: 24 hour measured Particular matter

| Sampling Location | Concentrations ( $\mu\text{g}/\text{m}^3$ ) |                  |        |
|-------------------|---|------------------|--------|
|                   | PM <sub>2.5</sub>                           | PM <sub>10</sub> | TSP    |
| AQ1               | 16.22                                       | 84.65            | 126.54 |
| AQ2               | 13.80                                       | 99.96            | 149.21 |
| AQ3               | 16.02                                       | 56.14            | 66.86  |
| AQ4               | 20.66                                       | 75.82            | 92.33  |



|                                  |              |               |            |
|----------------------------------|--------------|---------------|------------|
| AQ5                              | 16.51        | 59.18         | 76.51      |
| AQ6                              | 20.29        | 102.92        | 143.70     |
| AQ7                              | 18.28        | 98.94         | 143.95     |
| AQ8                              | 18.65        | 87.73         | 160.62     |
| AQ9                              | 16.02        | 51.79         | 75.28      |
| AQ10                             | 17.58        | 52.20         | 59.06      |
| AQ11                             | 19.92        | 72.57         | 87.60      |
| AQ12                             | 21.19        | 118.61        | 196.23     |
| AQ13                             | 31.17        | 155.37        | 200.26     |
| AQ14                             | 28.38        | 176.19        | 346.18     |
| <b>FME<sub>n</sub>V Limit</b>    | -            | -             | <b>250</b> |
| <b>IFC standatrd<sup>1</sup></b> | <b>25-75</b> | <b>50-150</b> | -          |

<sup>1</sup> IFC EHS Guideline, AIR EMISSIONS AND AMBIENT AIR QUALITY, table 1.1.1

b) NO, NO<sub>2</sub>, CO, SO<sub>2</sub>, NH<sub>3</sub>, VOCs : 24 hours

**Table 1-3: 24 hour measured Particular matter**

| Sampling Location               | Mean Concentration (ppm) |                 |           |   |                 |      |
|---------------------------------|--------------------------|-----------------|-----------|---|-----------------|------|
|                                 | NO                       | NO <sub>2</sub> | CO        | SO <sub>2</sub>                                       | NH <sub>3</sub> | VOCs |
| AQ1                             | 0.00                     | 0.12            | 0.82      | 0.00  | 0.41            | 0.00 |
| AQ2                             | 0.00                     | 0.00            | 0.00      | 0.00  | 0.00            | 0.00 |
| AQ3                             | 0.00                     | 0.33            | 0.82      | 0.00  | 0.41            | 0.00 |
| AQ4                             | 0.00                     | 0.00            | 0.00      | 0.00  | 0.41            | 0.00 |
| AQ5                             | 0.00                     | 0.00            | 0.41      | 0.00  | 0.82            | 0.00 |
| AQ6                             | 0.00                     | 0.00            | 1.00      | 0.00  | 0.41            | 0.41 |
| AQ7                             | 0.00                     | 0.00            | 0.00      | 0.00  | 0.00            | 0.00 |
| AQ8                             | 0.00                     | 0.00            | 0.00      | 0.00  | 0.41            | 0.00 |
| AQ9                             | 0.00                     | 0.00            | 0.00      | 0.00  | 0.41            | 0.00 |
| AQ10                            | 0.00                     | 0.00            | 0.00      | 0.00  | 0.00            | 0.00 |
| AQ11                            | 0.00                     | 0.00            | 0.00      | 0.00  | 0.82            | 0.41 |
| AQ12                            | 0.00                     | 0.00            | 0.00      | 0.00  | 0.41            | 0.00 |
| AQ13                            | 0.00                     | 0.00            | 0.00      | 0.00  | 1.23            | 0.00 |
| AQ14                            | 0.00                     | 0.45            | 2.05      | 0.00  | 0.00            | 0.82 |
| <b>FMENV Limit</b>              | <b>0.04 - 0.06</b>       |                 | <b>10</b> | <b>0.1</b>  | <b>0.28</b>     | -    |
| <b>IFC Standard<sup>1</sup></b> | -                        |                 | -         | <b>0.007-0.045</b><br><b>(20-125ug/m<sup>3</sup>)</b> | -               | -    |

<sup>1</sup> IFC EHS Guideline, AIR EMISSIONS AND AMBIENT AIR QUALITY, table 1.1.1

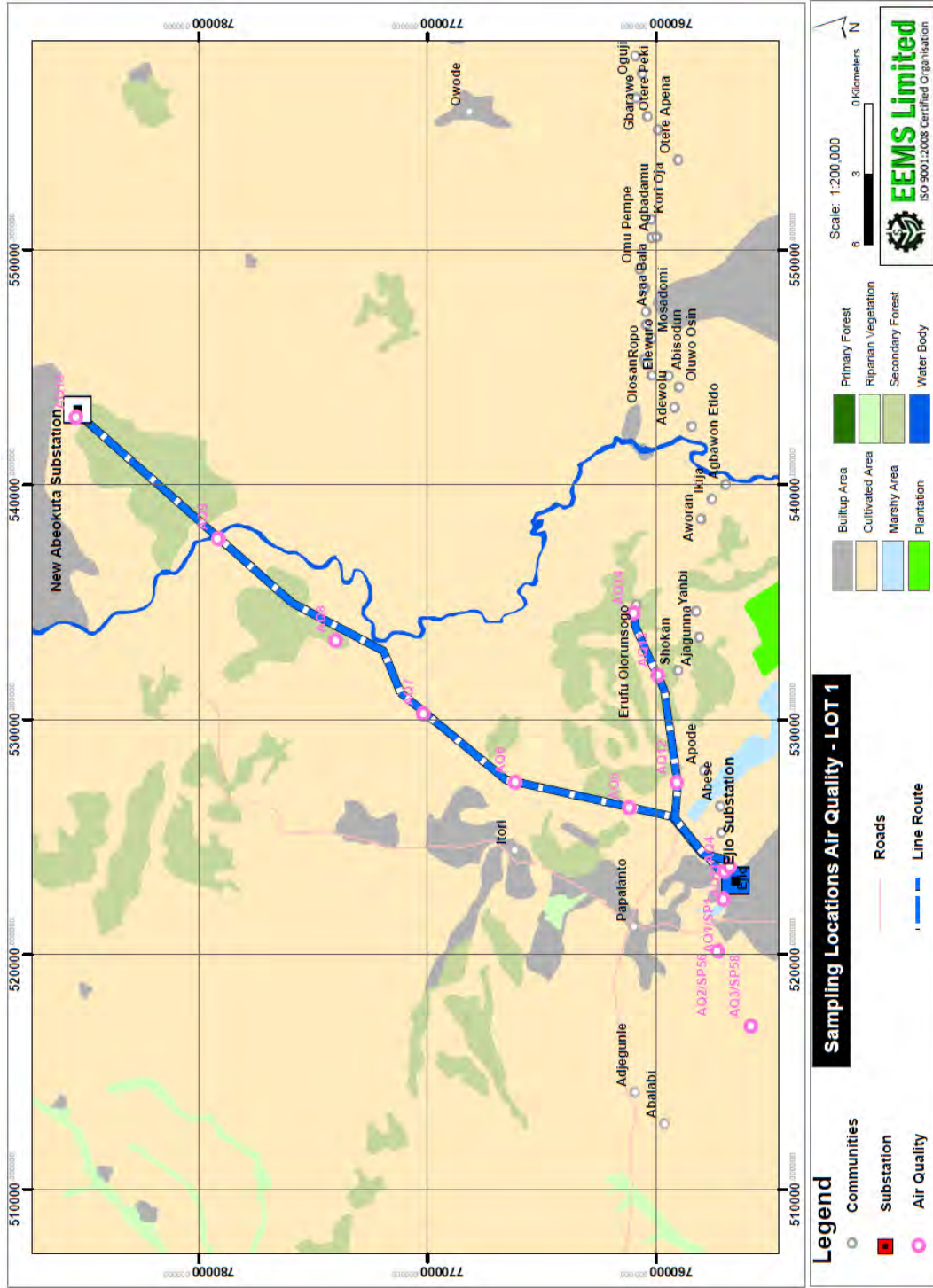


Figure 1-1: Air and Noise Quality sampling point for Lot1

## 1.2 Noise Quality

### 1.2.1 Sampling Location

Sampling location is same as Air Quality.

### 1.2.2 Result of Noise quality survey

The summary results of the 10-minute measurements are shown in below.

The locations AQ1 – A14 are with the minimum noise levels being 21.6 – 48.2 dB(A) and the maximum levels were of the range 46.6 – 81.2 dB(A). The measured noise level in the location are attributable to heavy cement haulage trailers movement and the presence of Olorunsogo Power Plants Phase I and II. Maximum noise level at some locations (AQ1, 4, 6, 9, 11) exceeded WHO limit. Elevated levels were as a result of heavy sand and cement trucks movement in some locations of the study area.

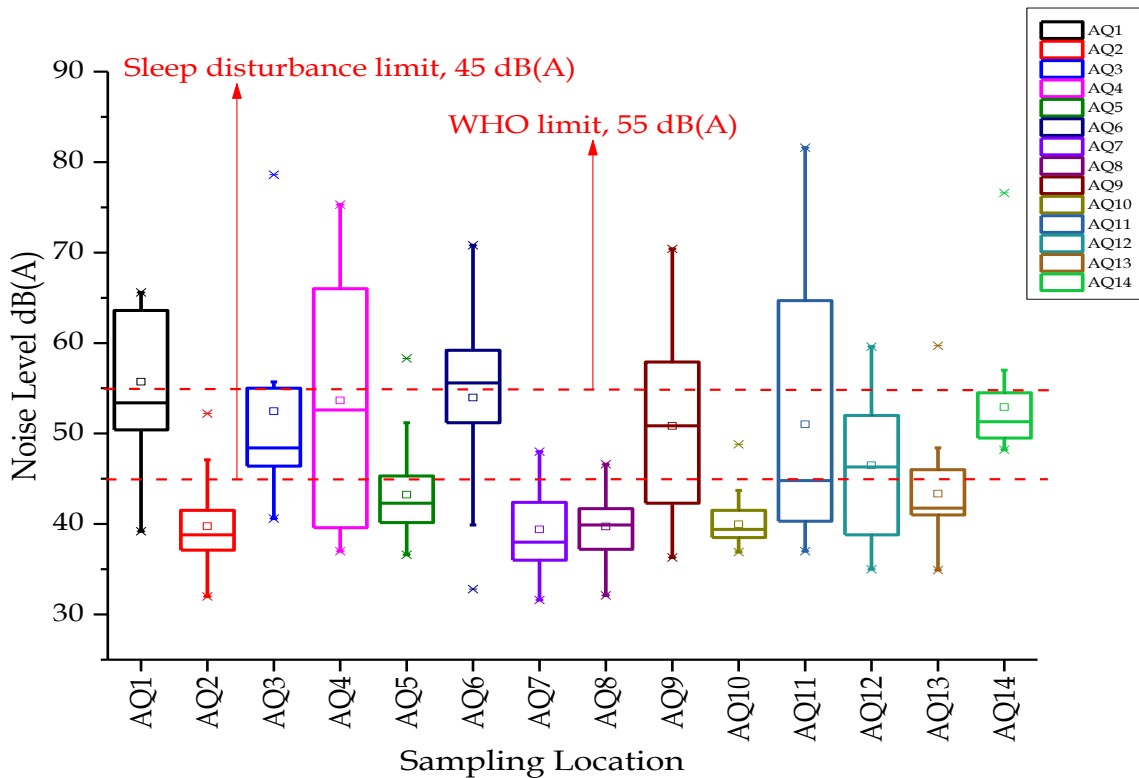


Figure 1-2: Result of Noise Quality Survey (10 min average)

## 1.3 Groundwater Quality

### 1.3.1 Sampling Location

Groundwater quality measurements were carried out at sampling locations along the project site as shown in Table 1-4 and **Error! Reference source not found.**

**Table 1-4:** Sampling Locations for Meteorology, Air Quality and Noise

| S/N | Water Sample Points | Name of Location | Latitude |
|-----|---------------------|------------------|----------|
| 1   | GW1                 | Ejio             | 6.85106  |
| 2   | GW2                 | Ejio             | 6.84857  |
| 3   | GW3                 | Soderu           | 6.868056 |
| 4   | GW4                 | Mose             | 6.872    |
| 5   | GW5                 | Olorunsogo       | 6.877111 |
| 6   | GW6                 | Ajade            | 6.991225 |
| 7   | GW7                 | Ijumo            | 7.013636 |
| 8   | GW8                 | Oba-Eerin        | 7.041194 |

### 1.3.2 Result of Groundwater quality survey

Groundwater quality measurements were carried out at sampling locations along the project site as shown in Table 1-5. The result shows the exceedance of Magnesium, Iron, Nickel, Chromium and Cadmium against NSDW limit and/or WHO drinking limit at some points.

**Table 1-5: The result of Groundwater Quality analysis for Lot 1**

| Line Route section<br>Parameters | Ejio to Sojuulu |       | Olorungso to Ejio |       |             |       | Ejio to New Abeokuta |       |           |           | NSDW<br>2007 <sup>1</sup><br>Limit, | WHO Limit |
|----------------------------------|-----------------|-------|-------------------|-------|-------------|-------|----------------------|-------|-----------|-----------|-------------------------------------|-----------|
|                                  | GW1             | GW2   | GW3               | GW4   | GW5         | GW6   | GW7                  | GW8   |           |           |                                     |           |
| Well Depth                       | 3.27            | 4.01  | NA                | NA    | <b>2.95</b> | NA    | NA                   | NA    | NA        | NA        | NA                                  | NA        |
| pH                               | 6.96            | 6.52  | 7.04              | 7.25  | 7.12        | 6.96  | 7.54                 | 6.93  | 6.5 – 8.5 | 6.5 – 8.5 | 6.5 – 9.2                           |           |
| Temperature (°C)                 | 27.2            | 26.0  | 30.1              | 29.0  | 29.0        | 28.2  | 27.4                 | 29.1  | NS        | NS        | 40°C                                |           |
| Colour                           | Clear           | Clear | Clear             | Clear | Clear       | Clear | Clear                | Clear | Clear     | Clear     | Clear                               | Clear     |
| Conductivity                     | 55.3            | 54.3  | 474               | 420   | 1094        | 498   | 350                  | 374   | 1000      | 1000      | 250                                 | 250       |
| TDS                              | 27.0            | 27.0  | 235               | 208   | 547         | 249   | 175                  | 184   | 500       | 500       | NS                                  | NS        |
| TSS                              | 33.1            | 28.2  | 0.02              | 0.20  | 0.29        | 0.68  | 0.20                 | 0.54  | NS        | NS        | 50                                  | 50        |
| Chloride                         | ND*             | ND*   | 96.09             | 79.25 | 59.30       | 50.28 | 63.20                | 40.25 | 250       | 250       | 250                                 | 250       |
| Total Hardness                   | 14.2            | 13.6  | 14.86             | 15.32 | 10.10       | 19.38 | 15.20                | 12.39 | 150       | 150       | -                                   | -         |
| TSS                              | 33.1            | 28.2  | 0.02              | 1.22  | 0.40        | 0.20  | 0.65                 | 0.50  | NS        | NS        | 50                                  | 50        |
| Turbidity                        | 6.95            | 1.35  | 1.74              | 4.06  | 5.00        | 4.06  | 4.06                 | 4.06  | 5         | 5         | 5                                   | 5         |
| DO                               | 10.90           | 9.62  | 5.80              | 5.40  | 3.44        | 4.50  | 3.40                 | 5.52  | NS        | NS        | <5                                  | <5        |
| COD                              | 10.2            | 9.8   | 6.40              | 7.70  | 9.20        | 6.45  | 5.70                 | 6.73  | NS        | NS        | 10                                  | 10        |
| BOD                              | 1.48            | 1.23  | 1.50              | 0.60  | 0.95        | 0.62  | 1.60                 | 0.30  | NS        | NS        | 10                                  | 10        |
| Nitrate                          | 0.21            | 0.10  | 0.57              | 0.44  | 0.58        | 1.05  | 0.84                 | 1.49  | 50        | 50        | 10                                  | 10        |
| Phosphate                        | 0.55            | 0.68  | 3.98              | 4.33  | 3.36        | 4.98  | 2.31                 | 4.53  | NS        | NS        | 5                                   | 5         |
| Sulphate                         | <1.0            | <0.1  | 0.51              | 0.52  | 0.59        | 0.42  | 0.25                 | 0.34  | 100       | 100       | 500                                 | 500       |
| PAH                              | ND*             | ND*   | ND                | ND    | ND          | ND    | ND                   | ND    | NS        | NS        | 0.0007                              | 0.0007    |
| BTEX                             | ND*             | ND*   | ND                | ND    | ND          | ND    | ND                   | ND    | NS        | NS        | -                                   | -         |

| Line section   | Route | Ejio to Sojuolu |      |        | Olorunsogo to Ejio |        |        | Ejio to New Abeokuta |        |       | NSDW 2007 Limit, | WHO Limit |
|----------------|-------|-----------------|------|--------|--------------------|--------|--------|----------------------|--------|-------|------------------|-----------|
|                |       | GW1             | GW2  | GW3    | GW4                | GW5    | GW6    | GW7                  | GW8    |       |                  |           |
| Parameter      |       | GW1             | GW2  | GW3    | GW4                | GW5    | GW6    | GW7                  | GW8    |       |                  |           |
| Phenols        |       | ND*             | ND*  | ND     | ND                 | ND     | ND     | ND                   | ND     | NS    |                  |           |
| THC            |       | ND*             | ND*  | <0.001 | <0.001             | <0.001 | <0.001 | <0.001               | <0.001 | NS    | 0.05             |           |
| TPH            |       | ND*             | ND*  | ND     | ND                 | ND     | ND     | ND                   | ND     | NS    |                  |           |
| PCB            |       | ND*             | ND*  | ND     | ND                 | ND     | ND     | ND                   | ND     | NS    | 0.003            |           |
| Oil and Grease |       | ND*             | ND*  | <0.001 | <0.001             | <0.001 | <0.001 | <0.001               | <0.001 | NS    |                  |           |
| Potassium      |       | 0.39            | 0.30 | 2.64   | 2.92               | 1.95   | 2.02   | 1.12                 | 0.42   | NS    | 10               |           |
| Sodium         |       | ND*             | ND*  | 5.00   | 4.30               | 2.30   | 3.30   | 3.10                 | 3.80   | 200   | -                |           |
| Calcium        |       | ND*             | ND*  | 3.96   | 3.76               | 3.55   | 2.79   | 3.16                 | 7.75   | NS    | -                |           |
| Magnesium      |       | ND*             | ND*  | 1.19   | 1.42               | 1.57   | 1.02   | 2.45                 | 3.62   | 0.20  | -                |           |
| Copper         |       | 0.12            | 0.01 | <0.001 | 0.02               | 0.01   | 0.01   | 0.02                 | 0.01   | 1.0   | 2.0              |           |
| Iron           |       | 0.15            | 0.22 | 2.58   | 3.11               | 2.21   | 1.91   | 0.25                 | 1.10   | 0.3   | 0.3              |           |
| Nickel         |       | ND*             | ND*  | 0.03   | 0.01               | 0.01   | 0.01   | 0.01                 | 0.01   | 0.02  | -                |           |
| Chromium       |       | ND*             | ND*  | 0.79   | 1.27               | 0.50   | 0.20   | 0.14                 | 0.22   | 0.05  | -                |           |
| Cadmium        |       | ND*             | ND*  | 0.02   | 0.04               | 0.01   | 0.02   | 0.01                 | 0.01   | 0.003 | -                |           |
| Zinc           |       | ND*             | ND*  | <0.001 | 0.01               | 0.02   | 0.01   | 0.01                 | 0.01   | 3.0   | -                |           |
| Barium         |       | ND*             | ND*  | <0.001 | <0.001             | <0.001 | <0.001 | <0.001               | <0.001 | 0.7   | 1.3              |           |
| Lead           |       | ND*             | ND*  | <0.001 | 0.01               | <0.001 | <0.001 | <0.001               | <0.001 | 0.01  | 0.02             |           |
| Mercury        |       | ND*             | ND*  | <0.001 | <0.001             | <0.001 | <0.001 | <0.001               | <0.001 | 0.001 | -                |           |

<sup>1</sup> Nigerian Standard for Drinking Water Quality

<sup>2</sup>WHO Drinking Water Quality Guideline

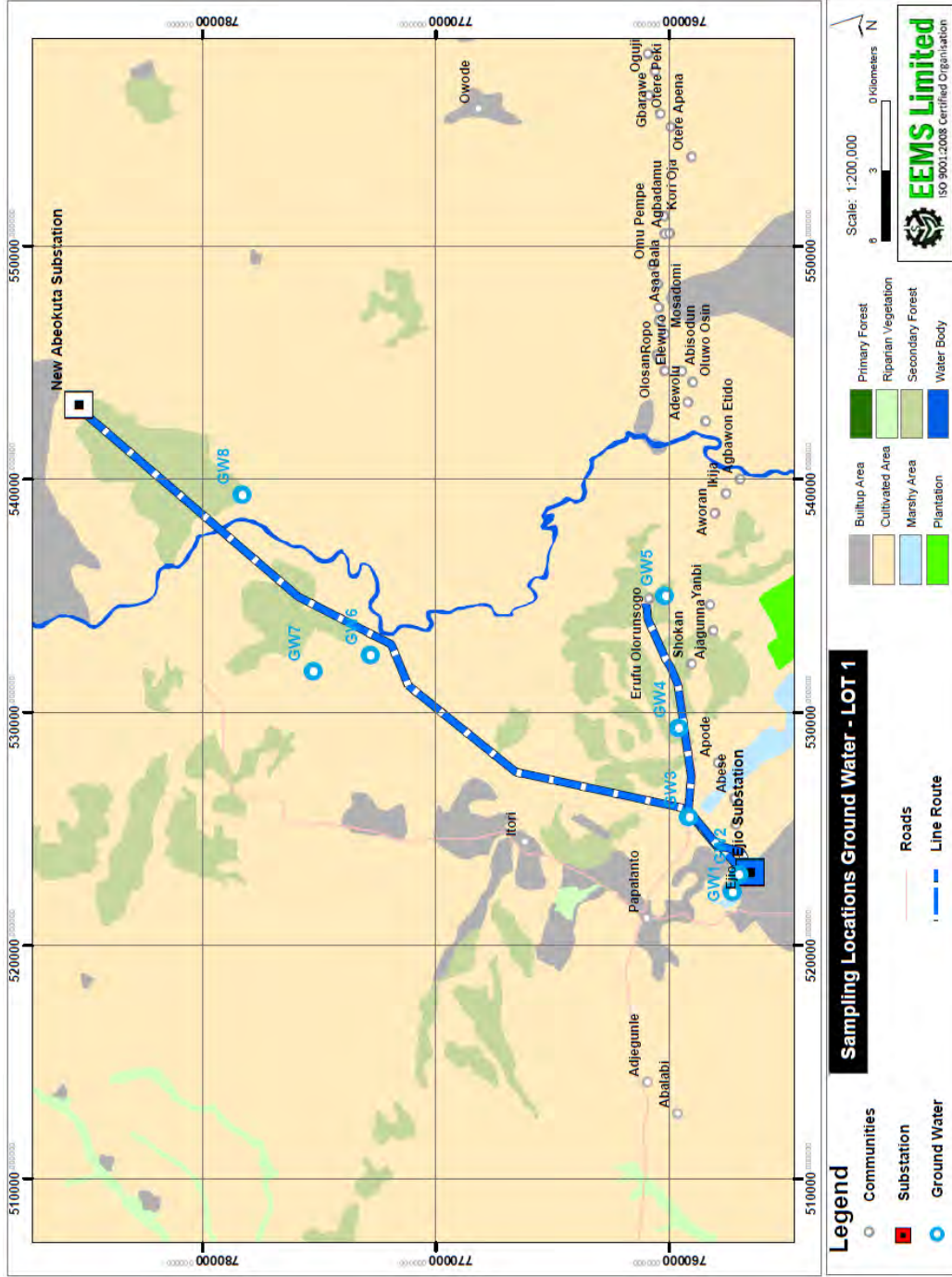


Figure 1-3: Groundwater Quality sampling point for Lot1

## 1.1 Surface water Quality

### 1.1.1 Sampling Location

Surface water quality measurements were carried out at sampling locations along the project site as shown in Table 1-6 and Figure 1-4.

**Table 1-6: Sampling Locations for Surface water**

| S/N | Water Sample Points | Name of River/stream       | Latitude | Longitude |
|-----|---------------------|----------------------------|----------|-----------|
| 1   | SW1A                | Osun stream @ Iludun- Ejio | 6.856214 | 3.218069  |
| 2   | SW1B                | Osun stream @Iludun-Ejio   | 6.853344 | 3.218633  |
| 3   | SW2B                | Osun stream @ Abese        | 6.865411 | 3.229073  |
| 4   | SW2C                | Osun stream @ Abese        | 6.865097 | 3.230619  |
| 5   | SW3A                | Wagunnu River@ Soderu      | 6.871644 | 3.233017  |
| 6   | WS3B                | Wagunnu River@ Soderu      | 6.870361 | 3.234411  |
| 7   | SW3C                | Wagunnu River@ Soderu      | 6.869039 | 3.235658  |
| 8   | SW4B                | Sowunmi stream             | 6.867981 | 3.237125  |
| 9   | SW4C                | Sowunmi stream             | 6.86665  | 3.236636  |
| 10  | SW5A                | Wagunnu River @ Adubi aro  | 6.876358 | 3.234697  |
| 11  | SW5B                | Wagunnu River @ Adubi aro  | 6.874389 | 3.235236  |
| 12  | SW5C                | Wagunnu River @ Adubi aro  | 6.872969 | 3.236006  |
| 13  | SW6B                | Odoipa stream              | 7.001128 | 3.300558  |
| 14  | SW6C                | Odoipa stream              | 6.999833 | 3.301781  |
| 15  | SW7A                | Ogun River @ Opanigangan   | 7.052586 | 3.341354  |
| 16  | SW7B                | Ogun River @ Opanigangan   | 7.050886 | 3.342122  |
| 17  | SW7C                | Ogun River @ Opanigangan   | 7.048251 | 3.343675  |
| 18  | SW8A                | Ototo stream               | 7.106083 | 3.387217  |
| 19  | SW8B                | Ototo stream               | 7.104347 | 3.387406  |
| 20  | SW8C                | Ototo stream               | 7.102872 | 3.386906  |

### 1.1.2 Result of Surface quality survey

Result of surface water quality is shown in Table 1-7.



Table 1-7: Result of Surface water quality survey

| PARAMETER      | EJIO - OLORUNSOGO AXIS       |       |        |       |        |                   |        |        |        |       |                     |        |       |       |       | Secondary Data (ICCL 2015) | Secondary Data (EMP Baseline 2017) |                      |  |  |
|----------------|------------------------------|-------|--------|-------|--------|-------------------|--------|--------|--------|-------|---------------------|--------|-------|-------|-------|----------------------------|------------------------------------|----------------------|--|--|
|                | ODO-OSUN @ ILUDUN-EJIO (SW1) |       |        |       |        | OSUN STREAM (SW2) |        |        |        |       | WAGUNNU RIVER (SW3) |        |       |       |       |                            |                                    | SOWUNMI STREAM (SW4) |  |  |
|                | min                          | max   | mean   | min   | max    | mean              | min    | max    | mean   | min   | max                 | mean   | min   | max   | mean  |                            |                                    |                      |  |  |
|                | 4.39                         | 14.24 | 9.315  | 96.09 | 120.17 | 108.13            | 144.26 | 168.34 | 156.30 | 96.09 | 120.17              | 108.12 | 15.23 | 17.6  | 16.42 |                            |                                    |                      |  |  |
| Chloride       | 8.39                         | 8.54  | 8.465  | 11.87 | 12.26  | 12.065            | 24.70  | 37.71  | 30.28  | 0.02  | 0.02                | 0.02   | 0.02  | 0.02  | 0.02  | NA                         | 7.54 – 41.07                       |                      |  |  |
| Total Hardness | 0                            | 0     | 0      | 0.01  | 0.01   | 0.01              | 0.01   | 0.03   | 0.02   | 0.03  | 0.02                | 0.03   | 0.02  | 0.02  | 0.02  | NA                         | 79.35 – 93.61                      |                      |  |  |
| TSS            | 0.01                         | 0.21  | 0.11   | 2.43  | 2.55   | 2.49              | 1.10   | 2.68   | 1.79   | 2.68  | 1.79                | 2.05   | 2.30  | 2.18  | 2.18  | 1 - 45                     | 1.53 – 7.59                        |                      |  |  |
| Turbidity      | 4.8                          | 5.1   | 4.95   | 5.6   | 5.8    | 5.7               | 6.00   | 6.20   | 6.13   | 6.20  | 6.13                | 4.70   | 5.60  | 5.15  | 5.15  | 2.66 – 45                  | 7.2 -10.6                          |                      |  |  |
| DO             | 27.7                         | 28.9  | 28.1   | 26.7  | 27.0   | 26.9              | 28.30  | 28.70  | 28.50  | 28.30 | 28.70               | 26.9   | 26.9  | 26.9  | 26.9  | 24.4 – 28.1                | 29.7 – 33.3                        |                      |  |  |
| Temperature    | 7.02                         | 7.1   | 7.06   | 7.06  | 7.2    | 7.11              | 6.99   | 7.15   | 7.08   | 7.15  | 7.08                | 6.85   | 6.80  | 6.83  | 6.83  | 7.20 – 7.56                | 8.49 – 9.61                        |                      |  |  |
| pH             | 45                           | 45    | 42.7   | 85    | 86     | 85.3              | 371    | 371    | 371.0  | 371   | 371.0               | 68     | 67    | 67.5  | 67.5  | 45.1 – 287                 | 314 – 418                          |                      |  |  |
| EC             | 19                           | 20    | 45.7   | 43    | 43     | 43                | 184    | 186    | 185.0  | 186   | 185.0               | 33     | 34    | 33.5  | 33.5  | 29.- 43.2                  | 213 – 276                          |                      |  |  |
| TDS            | 0.5                          | 0.15  | 0.33   | 0.3   | 0.4    | 0.35              | 0.95   | 0.97   | 0.96   | 0.97  | 0.96                | 0.15   | 0.19  | 0.17  | 0.17  | NA                         | NA                                 |                      |  |  |
| Depth          | 1.9                          | 3     | 2.3    | 2.1   | 2.9    | 2.33              | 2.50   | 3.10   | 2.71   | 3.10  | 2.71                | 1.50   | 1.58  | 1.54  | 1.54  | NA                         | NA                                 |                      |  |  |
| Width          | clear                        | clear | clear  | 0.3   | 0.3    | 0.3               | 0.13   | 0.15   | 0.14   | 0.15  | 0.14                | 0.20   | 0.20  | 0.20  | 0.20  | NA                         | 0.15 – 0.9                         |                      |  |  |
| Transparency   | 0.21                         | 0.25  | 0.23   | 0.12  | 0.21   | 0.2               | 0.22   | 0.21   | 0.22   | 0.21  | 0.22                | 0.10   | 0.10  | 0.10  | 0.10  | NA                         | NA                                 |                      |  |  |
| Flow Rate      | 16.79                        | 31.5  | 24.145 | 26.6  | 31.5   | 29.05             | 21.70  | 26.60  | 23.33  | 26.60 | 23.33               | 36.40  | 41.30 | 77.7  | 77.7  | 20.6 – 51.3                | 11.54 – 23.08                      |                      |  |  |
| COD            | 0.6                          | 1.3   | 0.95   | 1.3   | 1.7    | 1.5               | 0.80   | 0.90   | 0.83   | 0.90  | 0.83                | 1.00   | 2.00  | 1.50  | 1.50  | 8 – 15.6                   | 2.6 – 6.0                          |                      |  |  |
| BOD            | 0.46                         | 0.59  | 0.525  | 0.46  | 0.54   | 0.5               | 0.44   | 0.49   | 0.46   | 0.49  | 0.46                | 0.47   | 0.48  | 0.475 | 0.475 | NA                         | 0 – 0.9                            |                      |  |  |
| Nitrate        | 2.43                         | 3.22  | 2.825  | 3.11  | 4.08   | 3.595             | 3.98   | 4.71   | 4.27   | 4.71  | 4.27                | 3.81   | 4.15  | 3.98  | 3.98  | NA                         | 0.002 – 0.01                       |                      |  |  |
| Phosphate      | 0.53                         | 0.54  | 0.535  | 0.64  | 0.67   | 0.655             | 0.66   | 0.67   | 0.67   | 0.67  | 0.67                | 0.52   | 0.74  | 0.63  | 0.63  | NA                         | 19.14 – 41.99                      |                      |  |  |
| Sulphate       |                              |       |        |       |        |                   |        |        |        |       |                     |        |       |       |       |                            |                                    |                      |  |  |

|         |        |      |      |      |      |       |       |       |       |      |      |       |    |
|---------|--------|------|------|------|------|-------|-------|-------|-------|------|------|-------|----|
| PAH     | 0.00   | 0.02 | 0.01 | 0    | 0.01 | 0.005 | 0.000 | 0.010 | 0.003 | 0.02 | 0.03 | 0.015 | NA |
| BTEX    | 0.00   | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 0.00  | NA |
| Phenols | 0.00   | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 0.00  | NA |
| THC     | <0.001 | 0.12 | 0.12 | 0.11 | 0.21 | 0.16  | 0.02  | 0.12  | 0.06  | 0.03 | 0.14 | 0.085 | NA |
| TPH     | 0.00   | 0.12 | 0.06 | 0.1  | 0.21 | 0.155 | 0.10  | 0.02  | 0.05  | 0.03 | 0.13 | 0.08  | NA |

| PARAMETER    | OLORUNSOGO AXIS |        |        |        |        |        |                   |        |        |        |        |        | EJJO               |               |       | Secondary Data (ICCL 2015) | Secondary Data (EMP Baseline 2017) |               |     |      |        |  |  |
|--------------|-----------------|--------|--------|--------|--------|--------|-------------------|--------|--------|--------|--------|--------|--------------------|---------------|-------|----------------------------|------------------------------------|---------------|-----|------|--------|--|--|
|              | ILUDUN (SW1)    |        |        |        |        |        | OSUN STREAM (SW2) |        |        |        |        |        | WAGUNU RIVER (SW3) |               |       |                            |                                    | SOWUNMI (SW4) |     |      | STREAM |  |  |
|              | min             | max    | mean   | min    | max    | mean   | min               | max    | mean   | min    | max    | mean   | min                | max           | mean  |                            |                                    | min           | max | mean |        |  |  |
| Sodium       | 2.60            | 6.50   | 4.55   | 6.10   | 6.90   | 6.50   | 10.00             | 11.00  | 10.50  | 7.30   | 13.00  | 10.15  | NA                 | 4.21 – 9.85   |       |                            |                                    |               |     |      |        |  |  |
| Oil & grease | <0.001          | <0.001 | <0.001 | <0.001 | 0.01   | <0.01  | <0.001            | 0.02   | <0.01  | <0.001 | <0.001 | <0.01  | 0.01               | <0.01         | 1 - 4 |                            |                                    |               |     |      |        |  |  |
| Calcium      | 1.14            | 1.4    | 1.27   | 2.28   | 2.37   | 2.325  | 7.48              | 12.40  | 9.81   | 3.89   | 4.54   | 4.23   | NA                 | 21.59-31.87   |       |                            |                                    |               |     |      |        |  |  |
| Magnesium    | 1.21            | 1.33   | 1.27   | 1.48   | 1.52   | 1.5    | 1.09              | 1.61   | 1.38   | 1.32   | 1.51   | 1.42   | NA                 | 3.39 – 6.42   |       |                            |                                    |               |     |      |        |  |  |
| Copper       | 0.01            | 0.02   | 0.015  | <0.001 | <0.001 | <0.001 | <0.001            | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.01 – 1.3         | 0.233 – 0.296 |       |                            |                                    |               |     |      |        |  |  |
| Iron         | 0.64            | 1.24   | 0.94   | 1.58   | 2.4    | 1.99   | 1.23              | 2.6    | 1.94   | 1.11   | 2.71   | 1.91   | 2 - 6              | 18.9 – 24.5   |       |                            |                                    |               |     |      |        |  |  |
| Nickel       | 0.03            | 0.28   | 0.155  | 0.1    | 0.04   | 0.07   | <0.001            | <0.001 | <0.001 | 0.01   | 0.01   | 0.01   | 0.00 – 0.12        | 0.019 – 0.288 |       |                            |                                    |               |     |      |        |  |  |
| Chromium     | 0.1             | 0.3    | 0.2    | 0.2    | 0.5    | 0.35   | 0.4               | 0.07   | 0.36   | 0.40   | 1.20   | 0.8    | NA                 | 0.031 – 0.08  |       |                            |                                    |               |     |      |        |  |  |
| Cadmium      | <0.001          | 0.01   | 0.01   | <0.001 | <0.001 | <0.001 | <0.001            | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.01               | 0.01 – 0.03   |       |                            |                                    |               |     |      |        |  |  |
| Zinc         | <0.001          | 0.01   | 0.01   | <0.001 | <0.001 | <0.001 | 0.02              | <0.001 | 0.015  | <0.001 | <0.001 | <0.001 | 3 - 11             |               |       |                            |                                    |               |     |      |        |  |  |
| Barium       | <0.001          | 0.02   | 0.02   | <0.001 | 0.01   | 0.01   | <0.001            | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | NA                 |               |       |                            |                                    |               |     |      |        |  |  |
| Lead         | <0.001          | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001            | <0.001 | <0.001 | <0.001 | 0.01   | <0.01  | 2 - 16             | 0.033 – 0.348 |       |                            |                                    |               |     |      |        |  |  |
| Mercury      | <0.001          | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001            | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | NA                 | ND            |       |                            |                                    |               |     |      |        |  |  |

| PARAMETER | EJJO          |  |  |  |  |  |     |  |  |  |  |  | Secondary Data | Secondary Data (EMP) |
|-----------|---------------|--|--|--|--|--|-----|--|--|--|--|--|----------------|----------------------|
|           | ABEOKUTA AXIS |  |  |  |  |  | NEW |  |  |  |  |  |                |                      |

|                | RIVER WAGUNU (SW5) |        |       | ODOIPA (SW6) |        |       | OGUN RIVER (SW7) |        |       | OTOTO STREAM (SW8) |        |       | ICCL 2015)  | Baseline 2017) |
|----------------|--------------------|--------|-------|--------------|--------|-------|------------------|--------|-------|--------------------|--------|-------|-------------|----------------|
|                | min                | max    | mean  | min          | max    | mean  | min              | max    | mean  | min                | max    | mean  |             |                |
| Chloride       | 72.01              | 100.91 | 86.46 | 93.68        | 132.21 | 112.9 | 127.40           | 153.89 | 140.6 | 129.81             | 158.70 | 144.3 | NA          | 7.54 – 41.07   |
| Total Hardness | 10.08              | 16.74  | 13.41 | 11.05        | 16.13  | 13.59 | 10.68            | 15.57  | 13.12 | 11.80              | 17.77  | 14.78 | NA          | 79.35 – 93.61  |
| TSS            | 0.01               | 0.08   | 0.045 | 0.00         | 0.07   | 0.07  | 0.03             | 0.08   | 0.05  | 0.01               | 0.07   | 0.04  | 9-74        |                |
| Turbidity      | 0.28               | 1.50   | 0.89  | 0.31         | 1.23   | 0.77  | 1.32             | 2.50   | 1.91  | 0.30               | 0.60   | 0.45  | 1-45        | 1.53 – 7.59    |
| DO             | 5.10               | 5.50   | 5.30  | 4.90         | 5.60   | 5.25  | 4.80             | 5.00   | 4.90  | 4.90               | 5.90   | 5.40  | 2.66-45     | 7.2-10.6       |
| Temperature    | 28.8               | 29.0   | 28.9  | 27.0         | 27.2   | 27.1  | 30.6             | 31.5   | 31.05 | 29.2               | 29.8   | 29.5  | 24.4 – 28.1 | 29.7 – 33.3    |
| pH             | 6.35               | 6.38   | 6.37  | 7.15         | 7.18   | 7.16  | 7.10             | 7.40   | 7.25  | 8.70               | 8.72   | 8.71  | 7.20-7.56   | 8.49 – 9.61    |
| EC             | 375                | 378    | 376.5 | 75.0         | 75.0   | 75.0  | 165              | 165    | 165   | 92.0               | 92.0   | 92.0  | 45.1 - 287  | 314 - 418      |
| TDS            | 186                | 189    | 187.5 | 36.0         | 36.0   | 36.0  | 82               | 82     | 82    | 46.0               | 46.0   | 46.0  | 29-43.2     | 213 - 276      |
| Depth          | 0.55               | 0.67   | 0.61  | 1.50         | 1.56   | 1.53  | 6.51             | 6.70   | 13.21 | 0.32               | 0.35   | 0.34  | NA          |                |
| Width          | 4.2                | 4.7    | 4.45  | 14.3         | 15.0   | 14.65 | 62.5             | 70.0   | 66.3  | 2.92               | 2.93   | 2.93  | NA          |                |
| Transparency   | 2.14               | 2.16   | 2.15  | 1.10         | 1.14   | 1.12  | 2.60             | 2.65   | 2.63  | 0.24               | 0.28   | 0.26  | NA          | 0.15 – 0.9     |
| Flow Rate      | 0.20               | 0.22   | 0.21  | 0.80         | 0.83   | 0.82  | 1.22             | 1.24   | 1.23  | 2.80               | 2.88   | 2.84  | NA          |                |
| COD            | 16.79              | 21.70  | 19.25 | 16.79        | 31.50  | 24.14 | 31.50            | 36.40  | 33.95 | 11.50              | 16.60  | 14.05 | 20.6 – 51.3 | 11.54 – 23.08  |
| BOD            | 0.30               | 1.10   | 0.70  | 0.40         | 1.90   | 0.93  | 0.50             | 1.50   | 1.00  | 0.70               | 1.40   | 1.05  | 8 – 15.6    | 2.6 – 6.0      |
| Nitrate        | 0.76               | 0.94   | 0.85  | 0.77         | 1.10   | 0.93  | 0.51             | 0.90   | 0.71  | 0.50               | 0.71   | 0.61  | NA          | 0 – 0.9        |
| Posphate       | 4.23               | 5.10   | 4.66  | 4.50         | 4.86   | 4.68  | 3.45             | 4.76   | 4.11  | 2.36               | 3.11   | 2.74  | NA          | 0.002 – 0.01   |
| Sulphate       | 0.53               | 1.11   |       | 0.45         | 1.20   | 0.82  | 0.48             | 0.67   | 0.57  | 0.69               | 0.81   | 0.75  | NA          | 19.14 – 41.99  |
| PAH            | 0.00               | 0.20   | 0.20  | 0.03         | 0.03   | 0.03  | 0.01             | 0.03   | 0.02  | 0.00               | 0.01   | 0.01  | NA          |                |
| BTEX           | 0.00               | 0.00   | 0.00  | 0.00         | 0.01   | 0.01  | 0.00             | 0.01   | 0.01  | 0.00               | 0.00   | 0.00  | NA          |                |
| Phenols        | 0.00               | 0.01   | 0.01  | 0.00         | 0.02   | 0.02  | 0.00             | 0.01   | 0.01  | 0.00               | 0.00   | 0.00  | NA          |                |
| THC            | 0.05               | 0.23   | 0.14  | 0.14         | 0.15   | 0.145 | 0.03             | 0.14   | 0.08  | 0.02               | 0.04   | 0.03  | NA          |                |
| TPH            | 0.04               | 0.21   | 0.125 | 0.13         | 0.14   | 0.135 | 0.02             | 0.13   | 0.07  | 0.01               | 0.01   | 0.01  | NA          |                |

|  | EJIO | Secondary | Secondary Data |
|--|------|-----------|----------------|
|  | –    |           |                |

| PARAMETER    | NEW ABEOKUTA AXIS  |        |        |                    |        |        |                  |        |        |             |        |        |        |        |               | Data (ICCL 2015) | (EMP Baseline 2017) |
|--------------|--------------------|--------|--------|--------------------|--------|--------|------------------|--------|--------|-------------|--------|--------|--------|--------|---------------|------------------|---------------------|
|              | WAGUNU RIVER (SW5) |        |        | ODOIPA RIVER (SW6) |        |        | OGUN RIVER (SW7) |        |        | OTOTO (SW8) |        |        | STREAM |        |               |                  |                     |
|              | min                | max    | mean   | min                | max    | mean   | min              | max    | mean   | min         | max    | mean   | min    | max    | mean          |                  |                     |
|              |                    |        |        |                    |        |        |                  |        |        |             |        |        |        |        |               |                  |                     |
| Sodium       | 6.23               | 8.00   | 7.12   | 4.56               | 6.12   | 5.34   | 4.30             | 8.70   | 6.50   | 6.20        | 7.99   | 7.09   | 7.99   | 7.09   | 4.21 – 9.85   | NA               |                     |
| Oil & Grease | <0.001             | 0.01   | <0.01  | 0.01               | 0.02   | 0.015  | <0.001           | 0.01   | <0.01  | <0.001      | 0.02   | <0.02  | 0.02   | <0.02  | 1 - 4         | 1 - 4            |                     |
| Calcium      | 2.20               | 3.93   | 3.06   | 2.42               | 3.45   | 2.93   | 1.67             | 3.56   | 2.61   | 1.87        | 3.11   | 2.49   | 3.11   | 2.49   | 21.59-31.87   | NA               |                     |
| Magnesium    | 1.09               | 1.66   | 1.37   | 1.20               | 1.80   | 1.50   | 1.43             | 1.60   | 1.51   | 1.71        | 2.41   | 2.06   | 2.41   | 2.06   | 3.39 – 6.42   | NA               |                     |
| Copper       | <0.001             | 0.03   | <0.01  | <0.001             | 0.02   | <0.02  | <0.001           | <0.001 | <0.001 | <0.001      | 0.01   | 0.105  | 0.105  | 0.20   | 0.233 – 0.296 | 0.01 – 1.3       |                     |
| Iron         | 1.20               | 2.99   | 2.09   | 1.44               | 2.10   | 1.77   | 0.20             | 2.01   | 1.10   | 0.30        | 2.56   | 1.43   | 2.56   | 1.43   | 18.9 – 24.5   | 2 - 6            |                     |
| Nickel       | 0.01               | 0.02   | 0.015  | <0.001             | 0.02   | <0.02  | <0.001           | 0.02   | <0.02  | <0.001      | 0.02   | <0.02  | 0.02   | <0.02  | 0.019 – 0.288 | 0.00 – 0.12      |                     |
| Chromium     | 0.01               | 0.45   | 0.23   | 0.01               | 0.20   | 0.11   | 0.02             | 0.10   | 0.06   | 0.003       | 0.40   | 0.201  | 0.40   | 0.201  | 0.031 – 0.08  | NA               |                     |
| Cadmium      | <0.001             | 0.10   | <0.10  | <0.001             | <0.001 | <0.001 | <0.001           | <0.001 | <0.001 | <0.001      | 0.01   | <0.01  | 0.01   | <0.01  | 0.01 – 0.03   | 0.01             |                     |
| Zinc         | <0.001             | 0.01   | <0.01  | <0.001             | 0.02   | <0.02  | <0.001           | 0.01   | <0.01  | <0.001      | 0.10   | <0.05  | 0.10   | <0.05  |               | 3 - 11           |                     |
| Barium       | <0.001             | <0.001 | <0.001 | <0.001             | <0.001 | <0.001 | <0.001           | <0.001 | <0.001 | <0.001      | <0.001 | <0.001 | <0.001 | <0.001 |               | NA               |                     |
| Lead         | <0.001             | 0.01   | <0.01  | <0.001             | <0.001 | <0.001 | <0.001           | <0.001 | <0.001 | <0.001      | <0.001 | <0.001 | <0.001 | <0.001 | 0.033 – 0.348 | 2 - 16           |                     |
| Mercury      | <0.001             | <0.001 | <0.001 | <0.001             | <0.001 | <0.001 | <0.001           | <0.001 | <0.001 | <0.001      | <0.001 | <0.001 | <0.001 | <0.001 |               | NA               |                     |
|              |                    |        |        |                    |        |        |                  |        |        |             |        |        |        |        |               | ND               |                     |

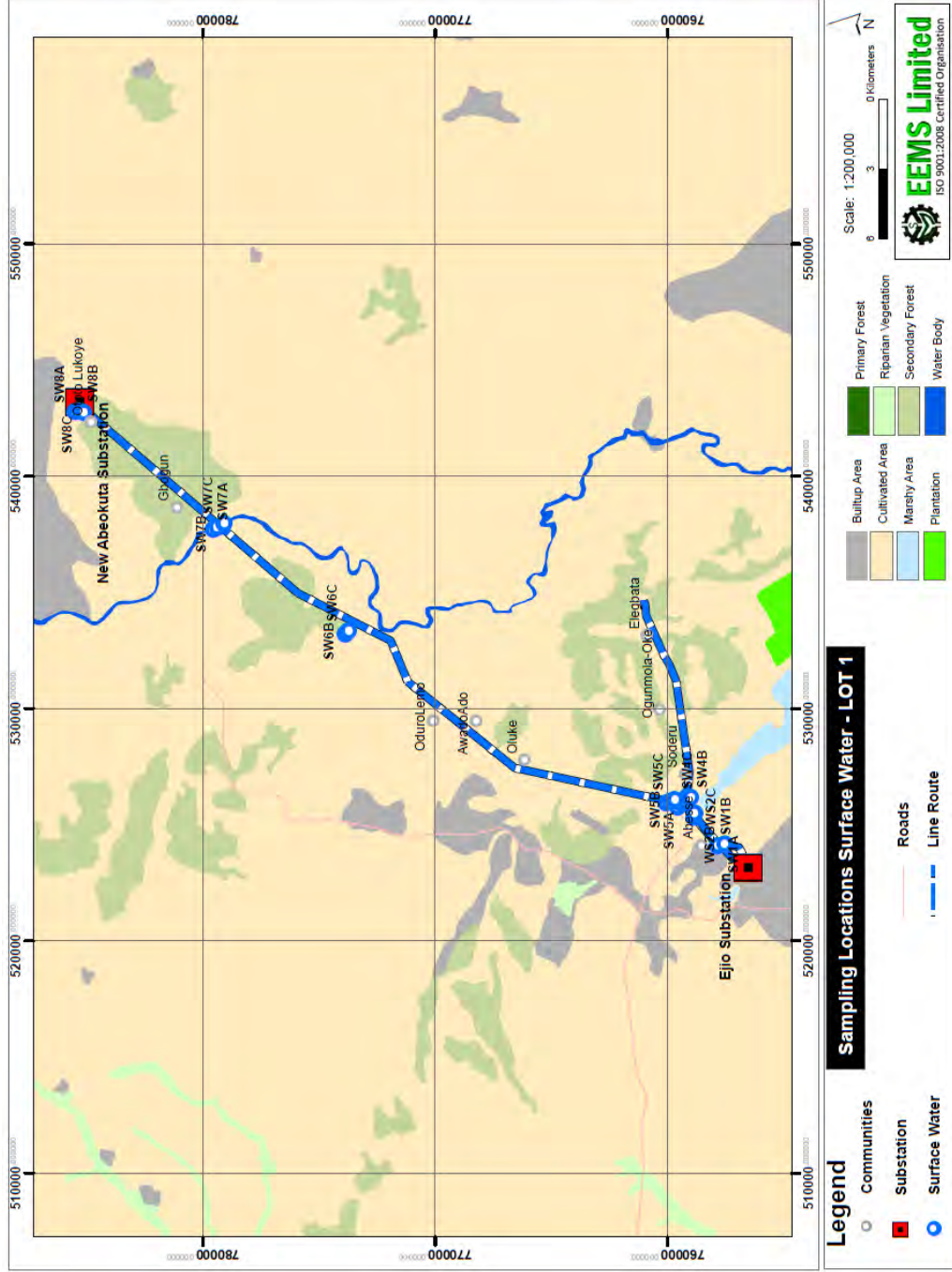


Figure 1-4: Surface water Quality sampling point for Lot1

## **1.2 Soil Quality**

### **1.2.1 Sampling Location**

Soil samples were collected at 14 stations. At each station, soil samples were collected at two depths (0-15cm for top soil and 15-30cm for sub soil). The soil sampling location is shown in Figure 1-5.

### **1.2.2 Soil Analysis Results**

The result of soil analysis is shown in Table 1-8.**Error! Reference source not found.**

**Table 1-8: Result of Soil analysis**

| Parameters                        | Ejio – Sojuolu            |        |        |        |        | Ejio - Olorunsogo         |        |        |        |        | Ejio - Abeokuta           |        |        |       |        | FMENV Limits (USDA 2017)  |       |        |  |  |
|-----------------------------------|---------------------------|--------|--------|--------|--------|---------------------------|--------|--------|--------|--------|---------------------------|--------|--------|-------|--------|---------------------------|-------|--------|--|--|
|                                   | Mean                      | Min    | Max    | Mean   | Min    | Max                       | Mean   | Min    | Max    | Mean   | Min                       | Max    | Mean   | Min   | Max    |                           |       |        |  |  |
|                                   | Sub soil                  |        |        |        |        | Top soil                  |        |        |        |        | Sub soil                  |        |        |       |        |                           |       |        |  |  |
| Colour                            | Gray and Brown            |        |        |        |        | Gray                      |        |        |        |        | Gray, Brown and Black     |        |        |       |        |                           |       |        |  |  |
| MC (%)                            | 19.78                     | 10.50  | 26.30  | 26.09  | 25.12  | 28.30                     | 19.28  | 18.24  | 19.80  | 19.08  | 16.65                     | 23.95  | 18.41  | 13.80 | 26.10  | 21.39                     | 19.59 | 22.76  |  |  |
| pH                                | 7.74                      | 6.65   | 8.20   | 7.56   | 6.42   | 7.95                      | 7.29   | 7.08   | 7.72   | 7.21   | 7.01                      | 7.60   | 7.94   | 8.01  | 8.24   | 7.78                      | 7.20  | 8.10   |  |  |
| Sand (%)                          | 73.82                     | 58.30  | 79.10  | 73.98  | 58.50  | 79.40                     | 70.50  | 68.10  | 71.70  | 71.07  | 68.60                     | 72.30  | 76.85  | 68.20 | 88.90  | 77.23                     | 68.70 | 89.00  |  |  |
| Silt (%)                          | 14.18                     | 11.10  | 21.70  | 14.02  | 11.00  | 21.50                     | 17.83  | 13.30  | 26.90  | 15.60  | 12.70                     | 21.40  | 14.40  | 6.10  | 26.80  | 14.03                     | 6.00  | 26.30  |  |  |
| Clay (%)                          | 12.00                     | 10.00  | 20.00  | 12.00  | 5.00   | 20.00                     | 11.67  | 5.00   | 15.00  | 13.33  | 10.00                     | 15.00  | 8.75   | 5.00  | 15.00  | 8.75                      | 5.00  | 15.00  |  |  |
| Texture                           | Loamy sand and Sandy loam |        |        |        |        | Loamy sand and Sandy loam |        |        |        |        | Sandy loam and Loamy sand |        |        |       |        | Sandy loam and Loamy sand |       |        |  |  |
| Bulk density (g/cm <sup>3</sup> ) | 2.09                      | 1.97   | 2.33   | 1.98   | 1.87   | 2.08                      | 2.05   | 2.00   | 2.07   | 2.00   | 1.94                      | 2.12   | 2.02   | 1.75  | 2.27   | 1.95                      | 1.74  | 2.14   |  |  |
| Porosity (%)                      | 21.74                     | 12.04  | 25.63  | 24.93  | 21.36  | 29.38                     | 22.79  | 21.85  | 24.67  | 24.62  | 20.12                     | 26.87  | 23.81  | 14.35 | 33.97  | 26.52                     | 19.35 | 34.41  |  |  |
| WHC (%)                           | 22.04                     | 18.66  | 25.34  | 22.10  | 20.05  | 24.76                     | 23.98  | 23.45  | 25.05  | 23.40  | 22.71                     | 23.74  | 20.84  | 17.90 | 23.56  | 21.16                     | 18.02 | 24.43  |  |  |
| Ext. Sulphate (mg/kg)             | 6.88                      | 4.60   | 14.96  | 6.14   | 3.90   | 13.56                     | 4.80   | 4.51   | 5.38   | 4.18   | 3.88                      | 4.79   | 9.23   | 4.74  | 15.19  | 8.34                      | 4.30  | 14.05  |  |  |
| Bicarbonate (mg/kg)               | 32.40                     | 8.00   | 72.00  | 30.80  | 12.00  | 60.00                     | 61.33  | 56.00  | 72.00  | 53.33  | 48.00                     | 64.00  | 31.50  | 16.00 | 68.00  | 33.00                     | 20.00 | 60.00  |  |  |
| CEC (meq/100g)                    | 2.6                       | 2.08   | 3.61   | 2.50   | 1.97   | 3.50                      | 2.26   | 3.21   | 3.56   | 3.24   | 3.08                      | 3.32   | 2.28   | 1.26  | 3.77   | 2.23                      | 1.18  | 3.70   |  |  |
| Nitrate (mg/kg)                   | 161.32                    | 141.50 | 210.10 | 148.88 | 128.90 | 196.80                    | 107.33 | 105.40 | 111.20 | 100.33 | 98.30                     | 101.35 | 121.45 | 97.80 | 162.50 | 108.34                    | 80.10 | 143.30 |  |  |

|                  |           |       |           |       |         |       |       |           |       |           |       |       |           |       |       |           |       |           |        |
|------------------|-----------|-------|-----------|-------|---------|-------|-------|-----------|-------|-----------|-------|-------|-----------|-------|-------|-----------|-------|-----------|--------|
| Chloride (mg/kg) | 88.6<br>8 | 79.62 | 94.2<br>0 | 92.31 | 84.35   | 97.35 | 85.40 | 83.1<br>7 | 89.86 | 89.3<br>4 | 87.89 | 92.23 | 89.8<br>6 | 87.89 | 91.83 | 88.8<br>8 | 86.71 | 91.8<br>3 |        |
| TOC (%)          | 3.46      | 2.98  | 3.96      | 3.01  | 2.73    | 3.32  | 3.96  | 3.95      | 3.97  | 2.65      | 2.63  | 2.69  | 3.18      | 2.93  | 3.39  | 2.96      | 2.75  | 3.22      |        |
| K (mg/kg)        | 0.38      | 0.23  | 0.73      | 0.51  | 0.29    | 0.98  | 1.17  | 1.08      | 1.21  | 1.29      | 1.22  | 1.32  | 1.18      | 0.5   | 2.04  | 1.56      | 0.89  | 2.68      |        |
| Na (mg/kg)       | 1.97      | 1.61  | 2.23      | 2.11  | 1.82    | 2.44  | 1.94  | 1.86      | 2.10  | 2.07      | 1.98  | 2.24  | 1.94      | 1.68  | 2.24  | 2.06      | 1.89  | 2.41      |        |
| Cu (mg/kg)       | 0.01      | BDL   | 0.02      | 0.03  | BDL     | 0.04  | BDL   | BD<br>L   | BDL   | BD<br>L   | BDL   | BDL   | 0.02      | BDL   | 0.02  | 0.02      | BDL   | 0.03      | 36     |
| Fe (mg/kg)       | 33.8<br>7 | 6.93  | 44.7<br>0 | 30.36 | 6.10    | 39.66 | 32.23 | 31.0<br>0 | 34.70 | 28.5<br>9 | 27.44 | 30.88 | 46.4<br>5 | 27.90 | 59.50 | 42.7<br>3 | 25.70 | 53.7<br>0 | 30,000 |
| Zn (mg/kg)       | 0.10      | 0.07  | 0.15      | 0.05  | 0.02    | 0.10  | 0.09  | 0.09      | 0.09  | 0.03      | 0.02  | 0.03  | 0.10      | 0.07  | 0.11  | 0.03      | 0.01  | 0.04      | 140    |
| Ba (mg/kg)       | 0.02      | BDL   | 0.02      | 0.03  | BD<br>L | 0.04  | 0.13  | 0.10      | 0.20  | 0.05      | 0.03  | 0.09  | 0.02      | BDL   | 0.03  | 0.01      | BDL   | 0.01      |        |
| Ni (mg/kg)       | 0.36      | 0.02  | 0.61      | 0.26  | 0.01    | 0.52  | 0.18  | 0.17      | 0.21  | 0.04      | 0.01  | 0.06  | 0.28      | 0.03  | 0.60  | 0.24      | BDL   | 0.42      | 35     |
| Cr (mg/kg)       | 0.05      | 0.04  | 0.06      | 0.03  | 0.02    | 0.06  | 0.06  | 0.05      | 0.07  | 0.04      | 0.04  | 0.05  | 0.07      | 0.06  | 0.08  | 0.06      | 0.05  | 0.07      |        |
| Cd (mg/kg)       | 0.04      | 0.01  | 0.06      | 0.05  | BD<br>L | 0.11  | 0.04  | 0.01      | 0.06  | 0.13      | 0.06  | 0.16  | 0.07      | 0.01  | 0.13  | 0.02      | BDL   | 0.02      |        |
| Pb (mg/kg)       | 0.01      | BDL   | 0.01      | BDL   | BD<br>L | BDL   | BDL   | BD<br>L   | BDL   | BD<br>L   | BDL   | BDL   | 0.02      | BDL   | 0.02  | 0.01      | BDL   | 0.01      | 85     |
| Hg (mg/kg)       | BD<br>L   | BDL   | BD<br>L   | BDL   | BD<br>L | BDL   | BDL   | BD<br>L   | BDL   | BD<br>L   | BDL   | BDL   | BD<br>L   | BDL   | BDL   | BD<br>L   | BDL   | BD<br>L   |        |
| PAH (mg/kg)      | 4.24      | 0.55  | 13.1<br>4 | 3.21  | 0.06    | 11.51 | 0.38  | 0.02      | 1.09  | 0.30      | 0.04  | 0.82  | 0.00      | 0.00  | 0.01  | 0.00      | 0.00  | 0.00      |        |
| BTEX (mg/kg)     | 0.00      | 0.00  | 0.01      | 0.00  | 0.00    | 0.00  | 0.00  | 0.00      | 0.02  | 0.00      | 0.00  | 0.01  | 0.01      | 0.00  | 0.04  | 0.00      | 0.00  | 0.01      |        |
| Phenols (mg/kg)  | 1.22      | 0.00  | 1.32      | 0.08  | 0.00    | 0.30  | 0.07  | 0.00      | 0.11  | 0.01      | 0.01  | 0.02  | 0.39      | 0.00  | 1.53  | 0.06      | 0.00  | 0.22      |        |
| TPH (mg/kg)      | 9.74      | 2.31  | 27.2<br>1 | 7.30  | 1.15    | 21.74 | 0.98  | 0.32      | 2.29  | 0.63      | 0.06  | 1.76  | 1.12      | 0.00  | 3.78  | 0.52      | 0.00  | 1.67      |        |
| THC (mg/kg)      | 13.2<br>0 | 5.93  | 30.1<br>9 | 10.32 | 4.47    | 24.47 | 4.94  | 4.27      | 6.28  | 3.28      | 2.69  | 4.46  | 4.31      | 2.97  | 7.17  | 3.48      | 2.76  | 4.89      |        |



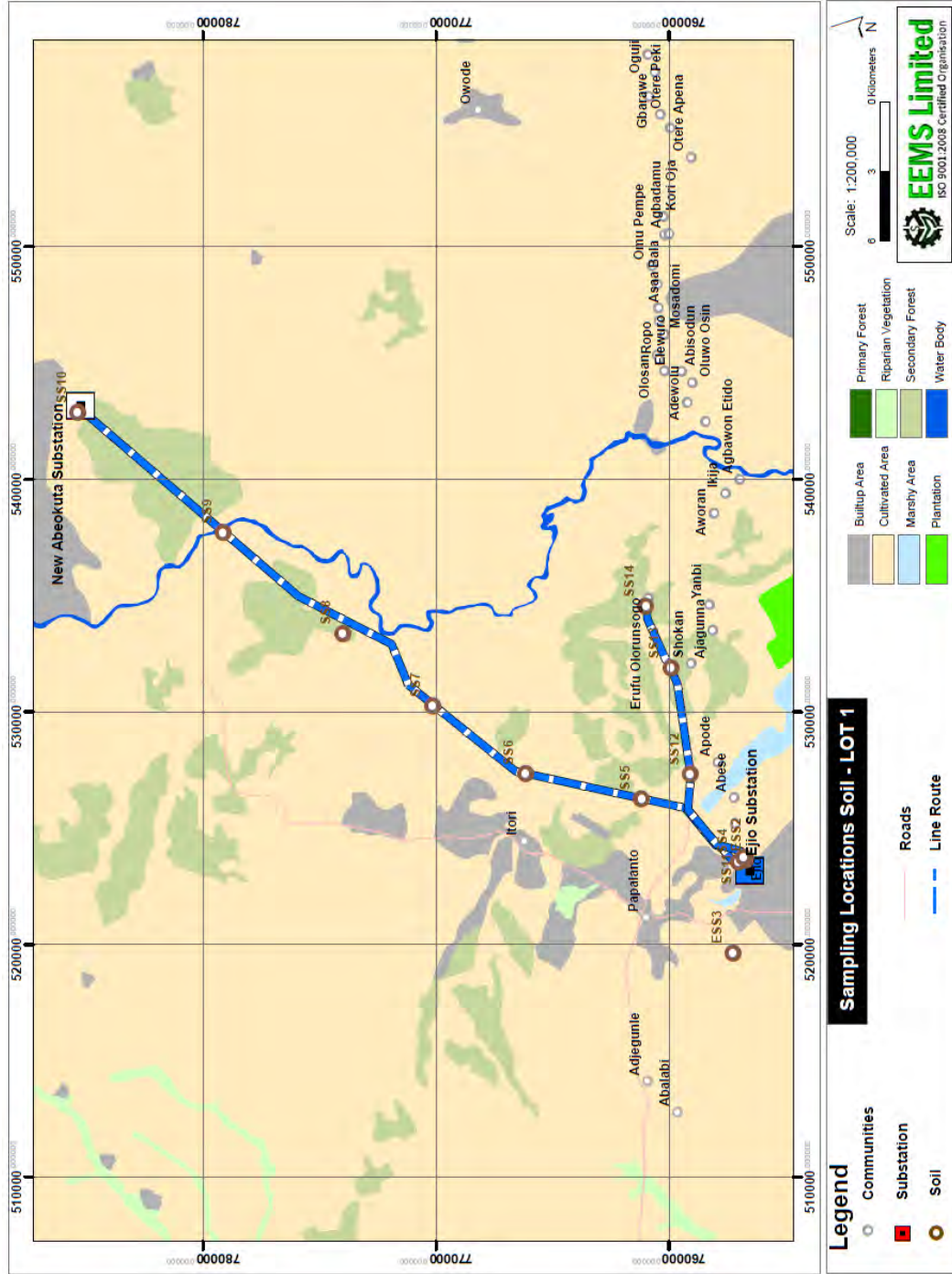


Figure 1-5: Soil sampling locations

## LOT 2 Baseline Study

### 2.1 Ambient Air Quality

#### 2.1.1 Sampling Location

Ambient air and noise quality measurements were carried out at sampling locations along the project site s as shown in Table 2-1 and **Error! Reference source not found..**

**Table 2-1: Sampling Locations for Air Quality and Noise**

| S/N | Location                      | Coordinate, UTM (WGS 84) Zone 31N |             |
|-----|-------------------------------|-----------------------------------|-------------|
|     |                               | Northing (m)                      | Easting (m) |
| 1   | Likosi Sub 1                  | 748706                            | 558515      |
| 2   | Likosi Sub 2                  | 748677                            | 559029      |
| 3   | Likos1 Sub 3                  | 749169                            | 559025      |
| 4   | Likosi Sub 4                  | 749196                            | 558558      |
| 5.  | Lik-Sag TL 1                  | 749340                            | 561532      |
| 6.  | Lik-Sag TL 2                  | 748827                            | 560164      |
| 7.  | Lik-Redeem TL 1               | 748210                            | 556856      |
| 8.  | Redeem Sub                    | 749120                            | 554111      |
| 9.  | Lik-Ejio TL 1 (Control Point) | 749695                            | 559345      |
| 10. | Lik-Redeem TL 2- Ologbun      | 748221                            | 556826      |
| 11. | Lik-Redeem TL 3- Sosho Ogbara | 746593                            | 553379      |
| 12. | Lik- Ejio TL 4-Oriola         | 757327                            | 533450      |
| 13. | MFM Sub 1                     | 746637                            | 540975      |
| 14  | MFM Sub 2                     | 746487                            | 542656      |
| 15. | MFM Sub 3                     | 746086                            | 541410      |
| 16. | Ikj – MFM TL Pipeline         | 742646                            | 541718      |
| 17. | Ikj-MFM TL Iganun             | 741020                            | 542120      |
| 18. | Lik- Ejio TL 2-Wichtech       | 758599                            | 560262      |
| 19. | Lik- Ejio TL 3- Ori           | 760273                            | 550492      |
| 20. | Lik- Ejio TL 5-Ifesowapo      | 758522                            | 541694      |
| 21. | Lik- Ejio TL 6 Adewolu        | 759804                            | 543758      |
| 22. | Lik- Ejio TL 7 Jaguna         | 757313                            | 533504      |
| 23. | Lik- Ejio TL 8 Ibokuru        | 757161                            | 525258      |
| 24. | Lik- Ejio TL 9 Ejio           | 756753                            | 523781      |

#### 2.1.2 Result of Ambient air quality survey

The result of ambient air quality is presented below.

**Table 2-2: The result of ambient air quality survey**

| ID   | Sampling Station              | TSP                | SO <sub>2</sub>    | NO <sub>2</sub>    | CO         | H <sub>2</sub> S | NMHC            |
|--|-------------------------------|--------------------|--------------------|--------------------|------------|------------------|-----------------|
|  |                               | µg.m <sup>-3</sup> | ppm                |                    |            |                  |                 |
| AN1  | Likosi Sub 1                  | 90.00              | <0.01              | <0.01              | 1.00       | <0.10            | <0.01           |
| AN2  | Likosi Sub 2                  | 91.00              | <0.01              | <0.01              | 1.00       | 0.10             | <0.01           |
| AN3  | Likos1 Sub 3                  | 89.10              | <0.01              | <0.01              | 1.00       | <0.10            | <0.01           |
| AN4  | Likosi Sub 4                  | 90.00              | <0.01              | <0.01              | 2.00       | <0.10            | <0.01           |
| AN5  | Lik-Sag TL 1                  | 248.0              | <0.01              | <0.01              | 1.00       | <0.10            | <0.01           |
| AN6  | Lik-Sag TL 2                  | 48.0               | <0.01              | <0.01              | 4.00       | <0.10            | <0.01           |
| AN7  | Lik-Redeem TL 1               | 248.0              | <0.01              | <0.01              | 2.00       | <0.10            | <0.01           |
| AN8  | Redeem Sub                    | 111.20             | <0.01              | <0.01              | 1.00       | <0.10            | <0.01           |
| AN9  | Lik-Ejio TL 1                 | 100.0              | <0.01              | <0.01              | <1.00      | <0.10            | <0.01           |
| AN10   | Lik-Redeem TL 2- Ologbun      | 65.00              | <0.01              | <0.01              | 1.00       | <0.10            | <0.01           |
| AN11   | Lik-Redeem TL 3- Sosho Ogbara | 72.00              | <0.01              | <0.01              | 1.00       | 0.010            | <0.01           |
| AN12   | Lik- Ejio TL 4-Dagunja        | 98.00              | <0.01              | <0.01              | <1.00      | <0.10            | <0.01           |
| AN13   | MFM Sub 1                     | 84.00              | <0.01              | <0.01              | 2.00       | 0.10             | <0.01           |
| AN14   | MFM Sub 2                     | 84.00              | <0.01              | <0.01              | 1.00       | 0.10             | <0.01           |
| AN15   | MFM Sub 3                     | 66.00              | <0.01              | <0.01              | 1.00       | <0.10            | <0.01           |
| AN16   | MFM Sub 4                     | 295.0              | <0.01              | <0.01              | 1.00       | <0.10            | <0.01           |
| AN17   | Ikj-MFM TL Iganun             | 86.00              | <0.01              | <0.01              | 2.00       | <0.10            | <0.01           |
| AN18   | Lik- Ejio TL 2-Wichtech       | 82.00              | <0.01              | <0.01              | 3.00       | <0.10            | <0.01           |
| AN19   | Lik- Ejio TL 3- Ori           | 70.00              | <0.01              | <0.01              | 1.00       | <0.10            | <0.01           |
| AN20   | Lik- Ejio TL 5-Ifesowapo      | 132.0              | <0.01              | <0.01              | 1.00       | <0.10            | <0.01           |
| AN21   | Lik- Ejio TL 6 Adewolu        | 133.0              | <0.01              | <0.01              | 1.00       | <0.10            | <0.01           |
| AN22   | Lik- Ejio TL 7 Jaguna         | 179.0              | <0.01              | <0.01              | <1.00      | <0.10            | <0.01           |
| AN23   | Lik- Ejio TL 8 Ibokuru        | 118.0              | <0.01              | <0.01              | <1.00      | <0.10            | <0.01           |
| AN24   | Lik- Ejio TL 9 Ejio           | 109.0              | <0.01              | <0.01              | 1.00       | <0.10            | <0.01           |
| <b>Range of EMP Wet Season Baseline data</b> |                               | <b>56-450</b>      | <b>0.01</b>        | <b>0.04-0.06</b>   | <b>1-3</b> | <b>&lt;0.01</b>  | <b>&lt;0.10</b> |
| <b>FME<sub>n</sub>V Limit</b>                |                               | <b>600</b>         | <b>0.1</b>         | <b>0.04 - 0.06</b> | <b>10</b>  | <b>-</b>         | <b>-</b>        |
| <b>IFC standatrd<sup>1</sup></b>             |                               | <b>-</b>           | <b>0.007-0.045</b> | <b>0.1</b>         | <b>-</b>   | <b>-</b>         | <b>-</b>        |

<sup>1</sup> IFC EHS Guideline, AIR EMISSIONS AND AMBIENT AIR QUALITY, table 1.1.1

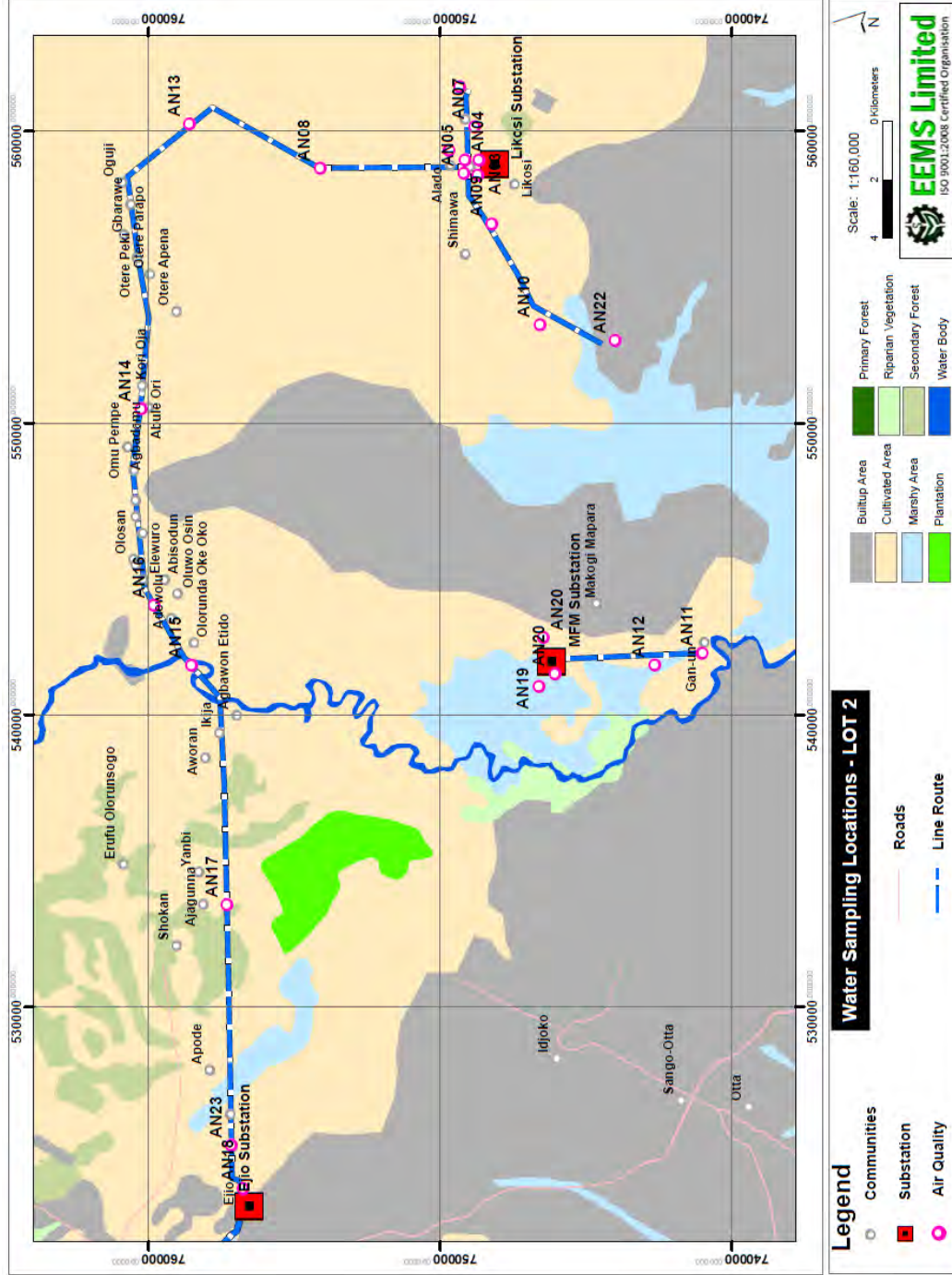


Figure 2-1: Air and noise Quality sampling point for Lot2

## 2.2 Noise Quality

### 2.2.1 Sampling Location

Sampling location is same as Air Quality.

### 2.2.2 Result of Noise quality survey

The summary results of the 10-minute measurements are shown in below.

Noise levels along proposed Transmission Lines and Substations ranged from 34.60 dBA to 66.50 dBA during dry season field work. The highest noise level was obtained at Iganun town due to human conversation and commercial activities. However, the values obtained are within the Federal Ministry of Environment allowable limit.

**Table 2-3: Result of Noise Quality Survey**

| <b>ID</b>       | <b>Location</b>                       | <b>Noise Level (LAeq dBA)</b>   |
|-----------------|---------------------------------------|---|
| AN1             | Likosi Sub 1                          | 39.6  |
| AN2             | Likosi Sub 2                          | 40.9  |
| AN3             | Likos1 Sub 3                          | 42.3  |
| AN4             | Likosi Sub 4                          | 40.8  |
| AN5             | Lik-Sag TL 1                          | 51.0  |
| AN6             | Lik-Sag TL 2                          | 51.8  |
| AN7             | Lik-Redeem TL 1                       | 55.3  |
| AN8             | Redeem Sub                            | 32.6  |
| AN9             | Lik-Ejio TL 1                         | 40.4  |
| AN10            | Lik-Redeem TL 2- Ologbun              | 38.9  |
| AN11            | Lik-Redeem TL 3- Sosho Ogbara         | 37.4  |
| AN12            | Lik- Ejio TL 4-Dagunja                | 35.2  |
| AN13            | MFM Sub 1                             | 36.4  |
| AN14            | MFM Sub 2                             | 41.8  |
| AN15            | MFM Sub 3                             | 39.8  |
| AN16            | MFM Sub 4                             | 40.6  |
| AN17            | Ikj-MFM TL Iganun                     | 66.5  |
| AN18            | Lik- Ejio TL 2-Wichtech               | 39.5  |
| AN19            | Lik- Ejio TL 3- Ori                   | 34.6  |
| AN20            | Lik- Ejio TL 5-Ifesowapo              | 41.7  |
| AN21            | Lik- Ejio TL 6 Adewolu                | 35.8  |
| AN22            | Lik- Ejio TL 7 Jaguna                 | 43.9  |
| AN23            | Lik- Ejio TL                          | 36.9  |
| <b>Standard</b> | <b>FME<sub>env</sub> (Work place)</b> |   |
|                 | <b>IFC Standard<sup>1</sup></b>       | <b>Residential</b><br>- 55dB: Day<br>- 45dB: Night<br><br><b>Industrial</b><br>- 77dB |

<sup>1</sup> IFC EHS guildiene, noise management (table 1.7.1)

## 2.3 Groundwater and Surface water Quality

### 2.3.1 Sampling Location

Groundwater and surface water quality measurements were carried out at sampling locations along the project site as shown in Table 1-4 and **Error! Reference source not found.**

**Table 2-4: Sampling Locations for Meteorology, Air Quality and Noise**

| SN | Station    | Water Type/Source               | Site Description   | Location/Grid Coordinate |             |
|----|------------|---------------------------------|--|--------------------------|-------------|
|    |            |                                 |  | Northing (N)             | Easting (E) |
| 1  | Station 1  | Underground water/Borehole      | Road adjacent to Remson Royal Schools around Likosi Sub-Station  | 0558497                  | 0748469     |
| 2  | Station 2  | Underground water/Borehole      | Shagamu Steel Rolling Company Borehole   | 0561234                  | 0748541     |
| 3  | Station 3  | Surface water/Stream            | Stream at Oriola Village, Via Ijagon at the back of proposed Golden Crown Estate by Bustom Homes and Properties Ltd. | 0558889                  | 0754209     |
| 4  | Station 4  | Underground water/Borehole      | Borehole at the last building before the valley at Ologbun   | 0556809                  | 0748206     |
| 5  | Station 5  | Surface water/Stream            | Stream at the entrance of Shosho-Ogbara village  | 0554174                  | 0747125     |
| 6  | Station 6  | Underground water/Borehole      | Borehole at Shosho-Ogbara village  | 0554157                  | 0747145     |
| 7  | Station 7  | Underground water/Borehole      | Borehole at Gan-Un Community, Magboro  | 0542420                  | 0741270     |
| 8  | Station 8  | Surface water/River             | Rver at the bridge on the road to Gan-Un Community, Magboro  | 0543116                  | 0741709     |
| 9  | Station 9  | Surface water/Stream            | Stream at proposed MFM Sub-Station in Makogi Community   | 0542512                  | 0746593     |
| 10 | Station 10 | Surface water/Stream            | Stream at the channel along the proposed Green Spring Estate Project Magboro.  | 0541800                  | 0743233     |
| 11 | Station 11 | Surface water/Stream            | River at Ori village (River Kori)  | 0550877                  | 0760129     |
| 12 | Station 12 | Surface water/Stream            | Stream down the fish pond at Omu-Apempe Community  | 0549122                  | 0760463     |
| 13 | Station 13 | Surface water/River             | Ogun River at Ifesowapo, Oke-Oko Community   | 0541662                  | 0758525     |
| 14 | Station 14 | Underground water/Hand-dug well | Hand-dug well at Ifesowapo, Oke-Oko Community  | 0542368                  | 0758540     |
| 15 | Station 15 | Surface water/River             | River at Adewolu Community   | 0543193                  | 0760502     |
| 16 | Station 16 | Surface water/Stream            | Stream at Jaguna village towards the Transmission Line crossing  | 0533482                  | 0757639     |
| 17 | Station 17 | Underground water/Hand-dug well | Hand-dug well at Jaguna village  | 0533523                  | 0758126     |
| 18 | Station 18 | Surface water/Stream            | Stream at Abese Community  | 0524119                  | 0757129     |
| 19 | Station 19 | Surface water/Stream            | Stream at Ibokuru Community  | 0526004                  | 0757159     |
| 20 | Station 20 | Underground water/Hand-dug well | Hand-dug well at Ibokuru Community   | 0525880                  | 0757080     |
| 21 | Station 21 | Underground water/Hand-dug well | Hand-dug well at Ejio Community (with water pumping machine)   | 0523145                  | 0757042     |

### **2.3.2 Result of Groundwater and Surface water quality survey**

The result of groundwater and surface water quality survey is shown in Table 2-5 and Table 2-6.

Table 2-5: Result of Underground water quality

| S/N  | Parameter                                     | Unit                  | Station |       |       |       |       |       |       |       |       |                        | D.W.Stds. |
|--|---|-----------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|------------------------|-----------|
|  |   |                       | 1       | 2     | 4     | 6     | 7     | 14    | 17    | 20    | 21    |                        |           |
| <b>Physical parameters/general chemical parameters</b> |   |                       |         |       |       |       |       |       |       |       |       |                        |           |
| 1  | Air Temperature                               | °C                    | 30.1    | 31.6  | 28.9  | 27    | 29    | 32.5  | 32    | 29    | 31    | Ambient <sup>+</sup>   |           |
| 2  | Water Temperature                             | °C                    | 28.3    | 28    | 28.9  | 31    | 27.8  | 28.9  | 29.5  | 28.5  | 29.2  | Ambient <sup>+</sup>   |           |
| 3  | Apparent Colour                               | Pt-Co                 | 23.49   | 23.11 | 24.05 | 24.60 | 27.77 | 73.78 | 25.16 | 26.65 | 27.58 | 15 (TCU) <sup>+</sup>  |           |
| 4  | True Colour                                   | Pt-Co                 | 27.03   | 26.09 | 23.49 | 21.81 | 25.35 | 40.44 | 23.11 | 22.00 | 22.18 | 15 (TCU) <sup>+</sup>  |           |
| 5  | Turbidity                                     | NTU                   | 59.03   | 57.72 | 58.02 | 57.60 | 58.58 | 64.82 | 58.32 | 59.21 | 57.66 | 5.0 <sup>+</sup>       |           |
| 6  | Total Dissolved Solids (TDS)                  | mg/L                  | 53.8    | 24.8  | 224   | 43.3  | 61.6  | 62.7  | 344   | 35.1  | 87.3  | 1000*                  |           |
| 7  | Conductivity                                  | µS/cm                 | 80.7    | 37.6  | 335   | 64.7  | 92.9  | 94.4  | 516   | 51.8  | 130.2 | 1500*                  |           |
| 8  | pH  |                       | 4.94    | 4.75  | 7.47  | 5.03  | 5.67  | 5.56  | 6.67  | 5.34  | 5.93  | 6.5 – 8.5 <sup>+</sup> |           |
| 9  | Acidity                                       | mg/LCaCO <sub>3</sub> | 4.0     | 4.0   | 8.0   | 10.0  | 8.0   | 10.0  | 4.0   | 6.0   | 12.0  | NS                     |           |
| 10   | Alkalinity                                    | mg/LCaCO <sub>3</sub> | 8.0     | 12.0  | 186.0 | 14.0  | 20.0  | 30.0  | 162.0 | 16.0  | 54.0  | 200*                   |           |
| 11   | Total Hardness                                | mg/LCaCO <sub>3</sub> | 1.56    | 2.08  | 48.97 | 1.85  | 2.08  | 1.41  | 1.51  | 1.47  | 1.23  | 150 <sup>+</sup>       |           |
| 12   | Non-Carbonate Hardness                        | mg/LCaCO <sub>3</sub> | 0.00    | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 150 <sup>+</sup>       |           |
| <b>Anions and cations</b>                              |   |                       |         |       |       |       |       |       |       |       |       |                        |           |
| 13   | Calcium (Ca <sup>2+</sup> )                   | mg/L                  | 0.28    | 0.39  | 0.68  | 0.23  | 0.39  | 0.09  | 0.11  | 0.26  | 0.18  | NR**                   |           |
| 14   | Magnesium (Mg <sup>2+</sup> )                 | mg/L                  | 0.21    | 0.27  | 11.53 | 0.31  | 0.27  | 0.29  | 0.3   | 0.2   | 0.19  | NR**                   |           |
| 15   | Sodium (Na <sup>+</sup> )                     | mg/L                  | 3.75    | 3.90  | 7.06  | 3.30  | 2.81  | 2.18  | 1.86  | 1.22  | 1.06  | 200 <sup>+</sup>       |           |
| 16   | Potassium (K <sup>+</sup> )                   | mg/L                  | 0.30    | 0.28  | 2.34  | 0.73  | 1.14  | 0.62  | 0.35  | 0.38  | 0.63  | NS                     |           |
| 17   | Chloride (Cl <sup>-</sup> )                   | mg/L                  | 5.14    | 3.94  | 2.15  | 5.14  | 0.35  | 8.13  | 18.91 | 3.94  | 6.34  | 250 <sup>+</sup>       |           |
| 18   | Sulphate (SO <sub>4</sub> <sup>2-</sup> )     | mg/L                  | 1.21    | 1.28  | 0.93  | 0.79  | 1.27  | 1.21  | 1.06  | 1.04  | 1.22  | 100 <sup>+</sup>       |           |
| 19   | Bicarbonate (HCO <sub>3</sub> <sup>-</sup> )  | mg/L                  | 9.6     | 14.4  | 223.2 | 16.8  | 24.0  | 36.0  | 194.4 | 19.2  | 64.8  | 100*                   |           |
| 20   | Nitrate (NO <sub>3</sub> <sup>-</sup> )       | mg/L                  | 0.07    | 0.06  | 0.07  | 0.08  | 0.10  | 0.09  | 0.09  | 0.07  | 0.07  | 50 <sup>+</sup>        |           |
| <b>Oxygen parameters and nutrient compounds</b>        |   |                       |         |       |       |       |       |       |       |       |       |                        |           |
| 21   | Dissolved Oxygen (DO)                         | mg/L                  | 6.0     | 5.6   | 4.4   | 4.0   | 6.4   | 1.4   | 4.8   | 2.8   | 4.4   | -                      |           |
| 22   | Dissolved Oxygen (DO % Sat.)                  | %                     | 77.8    | 72.3  | 57.5  | 53.9  | 82.4  | 18.3  | 63.3  | 36.4  | 57.8  | -                      |           |
| 23   | Chemical Oxygen Demand (COD)                  | mg/L                  | 10.21   | 8.51  | 2.27  | 12.48 | 9.65  | 3.97  | 1.13  | 19.86 | 9.08  | -                      |           |
| 24   | Biochemical Oxygen Demand (BOD <sub>5</sub> ) | mg/L                  | 1.6     | 3.0   | 1.0   | 0.4   | 2.6   | 1.0   | 1.2   | 0.6   | 1.0   | -                      |           |



| S/N                                | Parameter                  | Unit | Station |       |       |       |       |       |       |       |       |                   |    |    |    |  |  |  |  |  | D.W.Stds. |
|------------------------------------|----------------------------|------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------|----|----|----|--|--|--|--|--|-----------|
|                                    |                            |      | 1       | 2     | 4     | 6     | 7     | 14    | 17    | 20    | 21    | 15                | 16 | 18 | 19 |  |  |  |  |  |           |
| 25                                 | Total Organic Carbon (TOC) | mg/L | 3.83    | 3.19  | 0.85  | 4.68  | 3.62  | 1.49  | 0.43  | 7.45  | 3.40  | 5.0 <sup>+</sup>  |    |    |    |  |  |  |  |  |           |
| 26                                 | Organic Matter (OM)        | mg/L | 6.60    | 5.50  | 1.47  | 8.07  | 6.23  | 2.57  | 0.73  | 12.83 | 5.87  | -                 |    |    |    |  |  |  |  |  |           |
| <b>Heavy metals/trace elements</b> |                            |      |         |       |       |       |       |       |       |       |       |                   |    |    |    |  |  |  |  |  |           |
| 27                                 | Cadmium (Cd)               | mg/L | 0.013   | 0.009 | 0.014 | 0.013 | 0.008 | 0.013 | 0.007 | 0.010 | 0.009 | 0.005**           |    |    |    |  |  |  |  |  |           |
| 28                                 | Cobalt (Co)                | mg/L | 0.004   | 0.001 | 0.002 | 0.004 | 0.016 | 0.013 | 0.011 | 0.004 | 0.002 | 0.04*             |    |    |    |  |  |  |  |  |           |
| 29                                 | Chromium (Cr)              | mg/L | 0.004   | 0.001 | 0.002 | 0.006 | 0.004 | 0.004 | 0.001 | 0.007 | 0.004 | 0.05 <sup>+</sup> |    |    |    |  |  |  |  |  |           |
| 30                                 | Copper (Cu)                | mg/L | 0.030   | 0.010 | 0.030 | 0.050 | 0.003 | 0.003 | 0.003 | 0.002 | 0.003 | 1.0 <sup>+</sup>  |    |    |    |  |  |  |  |  |           |
| 31                                 | Iron (Fe)                  | mg/L | 0.220   | 0.100 | 0.140 | 0.130 | 0.002 | 0.001 | 0.004 | 0.002 | 0.001 | 0.3 <sup>+</sup>  |    |    |    |  |  |  |  |  |           |
| 32                                 | Manganese (Mn)             | mg/L | 0.010   | 0.001 | 0.010 | 0.060 | 0.006 | 0.010 | 0.005 | 0.002 | 0.003 | 0.2 <sup>+</sup>  |    |    |    |  |  |  |  |  |           |
| 33                                 | Nickel (Ni)                | mg/L | 0.015   | 0.022 | 0.028 | 0.030 | 0.016 | 0.014 | 0.009 | 0.009 | 0.011 | 0.2 <sup>+</sup>  |    |    |    |  |  |  |  |  |           |
| 34                                 | Lead (Pb)                  | mg/L | 0.005   | 0.018 | 0.006 | 0.000 | 0.015 | 0.005 | 0.011 | 0.007 | 0.003 | 0.01**            |    |    |    |  |  |  |  |  |           |
| 35                                 | Zinc (Zn)                  | mg/L | 0.060   | 0.010 | 0.020 | 0.030 | 0.008 | 0.003 | 0.005 | 0.003 | 0.002 | 3.0 <sup>+</sup>  |    |    |    |  |  |  |  |  |           |

Table 2-6: Result of Surface water quality survey

| S/N  | Parameter                    | Unit                  | Station |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
|--|------------------------------|-----------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|--|--|
|  |                              |                       | 3       | 5     | 8     | 9     | 10    | 11    | 12    | 13    | 15    | 16    | 18    | 19    |  |  |  |  |
| <b>Physical parameters/general chemical parameters</b> |                              |                       |         |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 1  | Depth                        | m                     | 0.16    | 0.28  | 0.12  | 0.11  | 0.41  | 0.6   | 0.68  | 0.91  | 0.22  | 0.31  | 0.19  | 0.21  |  |  |  |  |
| 2  | Transparency                 | m                     | 0.16    | 0.28  | 0.12  | 0.11  | 0.23  | 0.6   | 0.42  | 0.25  | 0.22  | 0.15  | 0.19  | 0.21  |  |  |  |  |
| 3  | Air Temperature              | °C                    | 30.0    | 28.0  | 30.0  | 32.0  | 35.4  | 25.9  | 27.2  | 32.5  | 32.0  | 33.9  | 27.0  | 27.8  |  |  |  |  |
| 4  | Water Temperature            | °C                    | 27.0    | 27.1  | 28.0  | 28.4  | 31.0  | 25.8  | 26.0  | 32.0  | 26.7  | 29.0  | 27.0  | 27.5  |  |  |  |  |
| 5  | Apparent Colour              | Pt-Co                 | 31.31   | 35.41 | 39.32 | 54.78 | 50.31 | 37.83 | 22.37 | 60.00 | 35.59 | 71.55 | 34.85 | 28.14 |  |  |  |  |
| 6  | True Colour                  | Pt-Co                 | 25.35   | 26.84 | 29.45 | 34.85 | 28.52 | 27.58 | 19.95 | 32.06 | 27.77 | 44.91 | 34.66 | 27.96 |  |  |  |  |
| 7  | Turbidity                    | NTU                   | 56.59   | 59.00 | 59.35 | 60.81 | 61.43 | 60.19 | 59.62 | 59.68 | 58.85 | 64.64 | 59.38 | 58.02 |  |  |  |  |
| 8  | Total Dissolved Solids (TDS) | mg/L                  | 29.9    | 33.3  | 178.0 | 120.6 | 102.1 | 32.3  | 38.4  | 98.7  | 36.3  | 73.8  | 31.4  | 34.3  |  |  |  |  |
| 9  | Conductivity                 | µS/cm                 | 43.9    | 49.2  | 264.0 | 183.6 | 153.1 | 42.4  | 56.9  | 147.6 | 53.3  | 109.5 | 46.3  | 50.6  |  |  |  |  |
| 10   | pH                           |                       | 5.91    | 5.87  | 6.79  | 6.84  | 6.60  | 6.00  | 6.10  | 7.02  | 5.90  | 6.32  | 6.81  | 6.65  |  |  |  |  |
| 11   | Acidity                      | mg/LCaCO <sub>3</sub> | 6.0     | 6.0   | 8.0   | 10.0  | 2.0   | 8.0   | 6.0   | 6.0   | 22.0  | 8.0   | 10.0  | 8.0   |  |  |  |  |
| 12   | Alkalinity                   | mg/LCaCO <sub>3</sub> | 8.0     | 12.0  | 106.0 | 64.0  | 66.0  | 10.0  | 16.0  | 64.0  | 20.0  | 38.0  | 6.0   | 16.0  |  |  |  |  |
| 13   | Total Hardness               | mg/LCaCO <sub>3</sub> | 7.41    | 5.85  | 1.93  | 1.45  | 1.74  | 2.17  | 1.93  | 1.80  | 1.01  | 1.14  | 1.67  | 1.66  |  |  |  |  |

| S/N   | Parameter                                     | Unit                  | Station |       |       |       |       |       |       |       |       |       |       |       |      |      |      |  |  |
|---|---|-----------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|--|--|
|   |   |                       | 3       | 5     | 8     | 9     | 10    | 11    | 12    | 13    | 15    | 16    | 18    | 19    |      |      |      |  |  |
| 14  | Non-Carbonate Hardness                        | mg/LCaCO <sub>3</sub> | 0.00    | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 | 0.00 | 0.00 |  |  |
| <b>Anions and cations</b>                       |   |                       |         |       |       |       |       |       |       |       |       |       |       |       |      |      |      |  |  |
| 15  | Calcium (Ca <sup>2+</sup> )                   | mg/L                  | 1.52    | 1.19  | 0.28  | 0.27  | 0.32  | 0.41  | 0.33  | 0.21  | 0.11  | 0.08  | 0.21  | 0.32  |      |      |      |  |  |
| 16  | Magnesium (Mg <sup>2+</sup> )                 | mg/L                  | 0.88    | 0.70  | 0.30  | 0.19  | 0.23  | 0.28  | 0.27  | 0.31  | 0.18  | 0.23  | 0.28  | 0.21  |      |      |      |  |  |
| 17  | Sodium (Na <sup>+</sup> )                     | mg/L                  | 3.31    | 4.23  | 3.27  | 2.36  | 4.11  | 1.86  | 2.12  | 2.37  | 3.22  | 2.74  | 1.90  | 1.14  |      |      |      |  |  |
| 18  | Potassium (K <sup>+</sup> )                   | mg/L                  | 0.20    | 0.59  | 0.90  | 0.58  | 0.63  | 0.28  | 0.33  | 0.36  | 0.53  | 0.43  | 0.29  | 0.27  |      |      |      |  |  |
| 19  | Chloride (Cl <sup>-</sup> )                   | mg/L                  | 4.54    | 0.35  | 17.12 | 14.12 | 9.33  | 4.54  | 8.73  | 2.15  | 5.14  | 8.73  | 5.74  | 5.14  |      |      |      |  |  |
| 20  | Sulphate (SO <sub>4</sub> <sup>2-</sup> )     | mg/L                  | 1.04    | 0.81  | 1.33  | 1.27  | 1.61  | 1.47  | 1.38  | 1.16  | 1.08  | 1.23  | 1.27  | 1.18  |      |      |      |  |  |
| 21  | Bicarbonate (HCO <sub>3</sub> <sup>-</sup> )  | mg/L                  | 9.6     | 14.4  | 127.2 | 76.8  | 79.2  | 12.0  | 19.2  | 76.8  | 24.0  | 45.6  | 7.2   | 19.2  |      |      |      |  |  |
| 22  | Nitrate (NO <sub>3</sub> <sup>-</sup> )       | mg/L                  | 0.09    | 0.07  | 0.12  | 0.11  | 0.13  | 0.11  | 0.1   | 0.11  | 0.10  | 0.09  | 0.07  | 0.07  |      |      |      |  |  |
| <b>Oxygen parameters and nutrient compounds</b> |   |                       |         |       |       |       |       |       |       |       |       |       |       |       |      |      |      |  |  |
| 23  | Dissolved Oxygen (DO)                         | mg/L                  | 3.0     | 1.8   | 0.4   | 3.2   | 5.6   | 6.4   | 3.6   | 5.8   | 2.2   | 0.6   | 4.2   | 4.4   |      |      |      |  |  |
| 24  | Dissolved Oxygen (DO % Sat.)                  | %                     | 38.2    | 22.9  | 5.2   | 41.6  | 75.5  | 79.9  | 45.1  | 79.2  | 27.8  | 7.9   | 53.4  | 56.3  |      |      |      |  |  |
| 25  | Chemical Oxygen Demand (COD)                  | mg/L                  | 19.86   | 2.84  | 15.89 | 11.35 | 11.35 | 9.08  | 13.62 | 20.43 | 16.45 | 1.13  | 11.35 | 9.65  |      |      |      |  |  |
| 26  | Biochemical Oxygen Demand (BOD <sub>5</sub> ) | mg/L                  | 1.8     | 8.0   | 128.0 | 56.0  | 8.0   | 2.2   | 0.6   | 4.6   | 8.0   | 32.0  | 3.6   | 0.4   |      |      |      |  |  |
| 27  | Total Organic Carbon (TOC)                    | mg/L                  | 7.45    | 1.06  | 5.96  | 4.26  | 4.26  | 3.40  | 5.11  | 7.66  | 6.17  | 0.43  | 4.26  | 3.62  |      |      |      |  |  |
| 28  | Organic Matter (OM)                           | mg/L                  | 12.83   | 1.83  | 10.26 | 7.33  | 7.33  | 5.87  | 8.80  | 13.20 | 10.63 | 0.73  | 7.33  | 6.23  |      |      |      |  |  |
| <b>Heavy metals/trace elements</b>              |   |                       |         |       |       |       |       |       |       |       |       |       |       |       |      |      |      |  |  |
| 29  | Cadmium (Cd)                                  | mg/L                  | 0.013   | 0.010 | 0.010 | 0.006 | 0.004 | 0.012 | 0.013 | 0.015 | 0.009 | 0.010 | 0.011 | 0.009 |      |      |      |  |  |
| 30  | Cobalt (Co)                                   | mg/L                  | 0.002   | 0.004 | 0.009 | 0.019 | 0.021 | 0.016 | 0.019 | 0.023 | 0.014 | 0.018 | 0.010 | 0.017 |      |      |      |  |  |
| 31  | Chromium (Cr)                                 | mg/L                  | 0.002   | 0.004 | 0.013 | 0.006 | 0.013 | 0.008 | 0.004 | 0.002 | 0.002 | 0.005 | 0.006 | 0.001 |      |      |      |  |  |
| 32  | Copper (Cu)                                   | mg/L                  | 0.010   | 0.020 | 0.002 | 0.001 | 0.003 | 0.001 | 0.002 | 0.001 | 0.006 | 0.002 | 0.003 | 0.005 |      |      |      |  |  |
| 33  | Iron (Fe)                                     | mg/L                  | 0.610   | 0.380 | 0.001 | 0.005 | 0.003 | 0.002 | 0.003 | 0.005 | 0.002 | 0.003 | 0.002 | 0.001 |      |      |      |  |  |
| 34  | Manganese (Mn)                                | mg/L                  | 0.030   | 0.030 | 0.010 | 0.003 | 0.006 | 0.008 | 0.004 | 0.006 | 0.008 | 0.003 | 0.005 | 0.003 |      |      |      |  |  |
| 35  | Nickel (Ni)                                   | mg/L                  | 0.018   | 0.023 | 0.023 | 0.018 | 0.014 | 0.015 | 0.021 | 0.013 | 0.020 | 0.019 | 0.013 | 0.017 |      |      |      |  |  |
| 36  | Lead (Pb)                                     | mg/L                  | 0.003   | 0.003 | 0.013 | 0.018 | 0.009 | 0.010 | 0.008 | 0.003 | 0.011 | 0.008 | 0.008 | 0.009 |      |      |      |  |  |
| 37  | Zinc (Zn)                                     | mg/L                  | 0.030   | 0.010 | 0.001 | 0.005 | 0.003 | 0.011 | 0.010 | 0.008 | 0.005 | 0.007 | 0.003 | 0.005 |      |      |      |  |  |

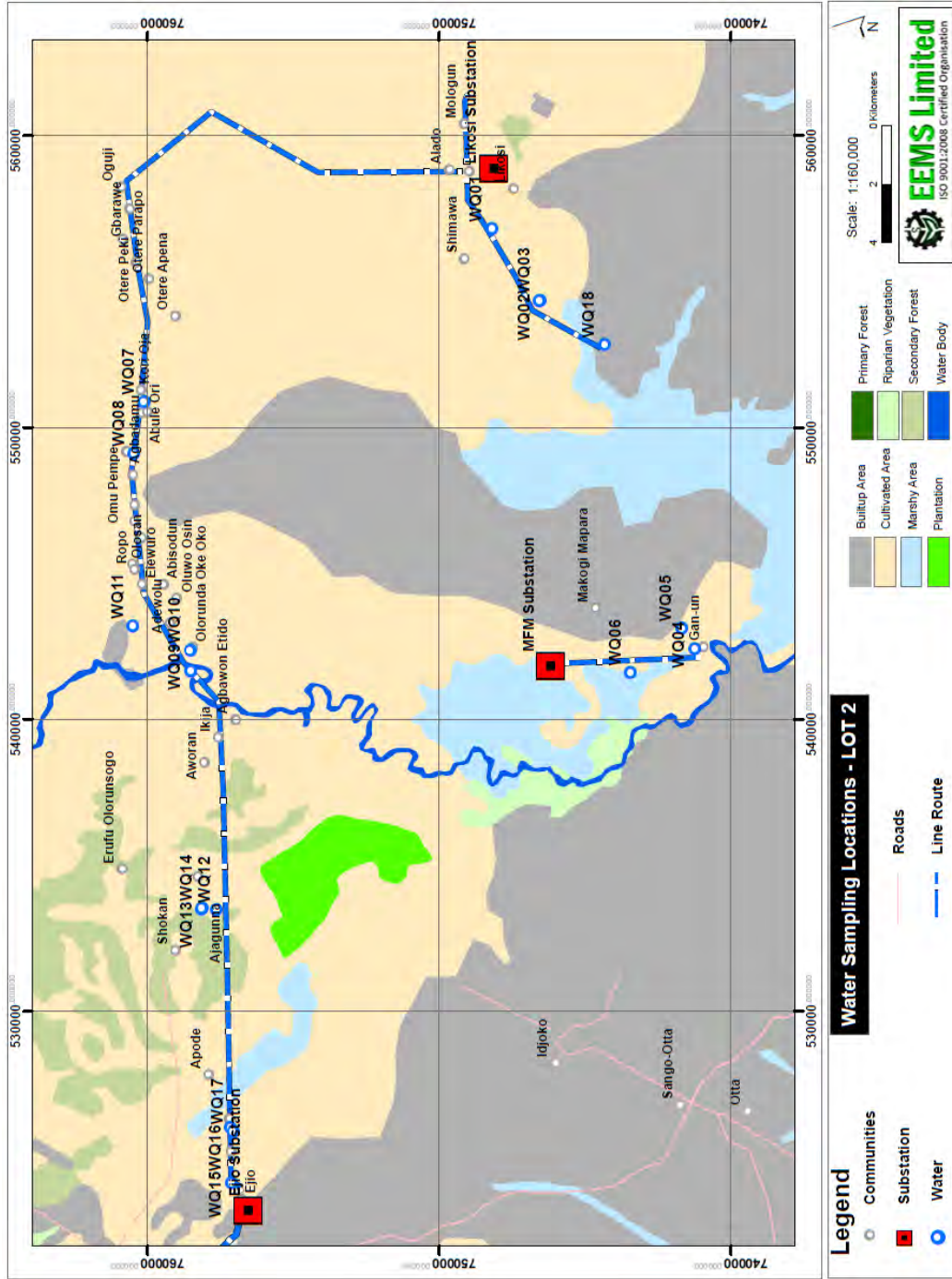


Figure 2-2: Groundwater and Surface water quality sampling point for Lot2

## **2.4 Soil Quality**

### **2.4.1 Sampling Location**

Soil samples were collected at 18 stations. At each observation point, 10 core soil samples spatially distributed around the point were taken using the auger where feasible. The core samples were bulked, mixed and sub-sampled for laboratory analysis. Four composite samples from 0 – 15 cm, and 15–50 cm soil depths were taken at every observation point. The sampling location is shown in Figure 2-3.

### **2.4.2 Soil Analysis Results**

The result of soil analysis is shown in Table 2-7 for Physico-chemical properties and Table 2-8 for Heavy Metal.

**Table 2-7: Result of Soil quality survey : Physico-chemical properties**

| Depth  | pHH2O | pHCaCl2 | Sand | Silt | Clay | OrgC | NO3   | PO4   | Ca   | Mg   | K    | Na   | Acid | CEC  | BS    |
|--|-------|---------|------|------|------|------|-------|-------|------|------|------|------|------|------|-------|
| <b>Likosi Location 1 (UTM 31N 0558885N 0748567E)</b>     |       |         |      |      |      |      |       |       |      |      |      |      |      |      |       |
| 0-15   | 6.21  | 4.79    | 68   | 21   | 11   | 0.05 | 0.163 | 71.16 | 4.63 | 1.41 | 0.00 | 0.16 | 0.28 | 6.47 | 93.26 |
| 15-50  | 5.84  | 5.31    | 26   | 46   | 28   | 0.13 | 0.095 | 4.69  | 2.43 | 0.61 | 0.46 | 0.21 | 0.31 | 4.03 | 87.11 |
| <b>Likosi Location 2 (UTM 31N 0558530N 0748778E)</b>     |       |         |      |      |      |      |       |       |      |      |      |      |      |      |       |
| 0-15   | 7.14  | 7       | 65   | 12   | 23   | 0.09 | 0.044 | 0.23  | 2.52 | 0.68 | 0.32 | 0.12 | 0.09 | 3.73 | 94.32 |
| 15-50  | 6.05  | 5.65    | 52   | 46   | 2    | 0.87 | 0.101 | 4.37  | 1.91 | 1.12 | 0.12 | 0.12 | 0.29 | 3.55 | 88.40 |
| <b>Likosi Location 3 (UTM 31N 05587645N 0749066E)</b>    |       |         |      |      |      |      |       |       |      |      |      |      |      |      |       |
| 0-15   | 6.21  | 5.75    | 54   | 41   | 5    |      |       |       | 1.87 | 1.07 | 0.46 | 0.16 | 0.32 | 3.88 | 87.70 |
| 15-50  | 5.43  | 5.36    | 58   | 36   | 6    | 0.15 | 0.092 | 10.80 | 3.02 | 0.97 | 0.12 | 0.12 | 0.35 | 4.58 | 89.70 |
| <b>Thames Valley College (UTM 31N 0561208N 0748648E)</b> |       |         |      |      |      |      |       |       |      |      |      |      |      |      |       |
| 0-15   | 5.3   | 4.61    | 63   | 10   | 27   | 0.07 | 0.079 | 0.89  | 1.52 | 1.09 | 0.29 | 0.17 | 0.33 | 3.41 | 85.21 |
| 15-50  | 4.73  | 4.16    | 41   | 8    | 51   | 0.15 | 0.085 | 0.88  | 1.15 | 0.70 | 0.12 | 0.17 | 0.25 | 2.39 | 82.26 |
| <b>Ologbun (UTM 31N 0556836N 0748197E)</b>               |       |         |      |      |      |      |       |       |      |      |      |      |      |      |       |
| 0-15   | 6.02  | 5.97    | 74   | 12   | 14   | 0.48 | 0.176 | 63.80 | 3.88 | 1.38 | 0.46 | 0.21 | 0.24 | 6.17 | 92.73 |
| 15-50  | 6.43  | 5.82    | 32   | 46   | 22   | 0.30 | 0.097 | 8.44  | 2.43 | 1.56 | 0.46 | 0.21 | 0.33 | 4.99 | 89.20 |
| <b>Shosho Ogbara (UTM 31N 0558885N 0748567E)</b>         |       |         |      |      |      |      |       |       |      |      |      |      |      |      |       |
| 0-15   | 5.62  | 4.97    | 85   | 8    | 7    | 0.07 | 0.078 | 4.55  | 3.15 | 1.34 | 0.33 | 0.14 | 0.22 | 5.18 | 93.07 |
| 15-50  | 5.48  | 4.45    | 81   | 10   | 9    | 0.12 | 0.039 | 0.78  | 1.73 | 0.61 | 0.46 | 0.21 | 0.23 | 3.24 | 86.46 |
| <b>Oriola-Ijagbon (UTM 31N 05541345N 0748567E)</b>       |       |         |      |      |      |      |       |       |      |      |      |      |      |      |       |
| 0-15   | 4.93  | 4.19    | 81   | 10   | 9    | 0.11 | 0.048 | 0.45  | 2.99 | 1.40 | 0.27 | 0.17 | 0.35 | 5.18 | 89.88 |
| 15-50  | 5.6   | 4.2     | 79   | 12   | 9    | 0.58 | 0.053 | 0.33  | 1.41 | 2.72 | 0.35 | 0.33 | 0.31 | 5.11 | 87.48 |
| <b>Wichtech (UTM 31N 0560240N 0758598E)</b>              |       |         |      |      |      |      |       |       |      |      |      |      |      |      |       |
| 0-15   | 4.9   | 4.47    | 75   | 10   | 15   | 0.22 | 0.071 | 7.95  | 3.02 | 0.99 | 0.12 | 0.16 | 0.28 | 4.56 | 90.43 |
| 15-50  | 5.01  | 4.63    | 72   | 16   | 12   | 0.17 | 0.073 | 0.74  | 2.51 | 1.16 | 0.46 | 0.17 | 0.32 | 4.62 | 89.32 |

|   |      |      |    |    |    |      |       |       |      |      |      |      |      |      |       |
|---|------|------|----|----|----|------|-------|-------|------|------|------|------|------|------|-------|
| <b>Ori (UTM 31N 0550496N 0760275E)</b>            |      |      |    |    |    |      |       |       |      |      |      |      |      |      |       |
| 0-15  | 5.86 | 5.56 | 68 | 21 | 11 | 0.09 | 0.149 | 7.01  | 1.80 | 1.00 | 0.35 | 0.17 | 0.37 | 3.69 | 85.27 |
| 15-50   | 5.12 | 5    | 58 | 18 | 24 | 0.51 | 0.144 | 3.75  | 3.37 | 1.31 | 0.92 | 0.14 | 0.38 | 6.13 | 91.53 |
| <b>Oke-Oko (UTM 31N 0541721N 0758526E)</b>        |      |      |    |    |    |      |       |       |      |      |      |      |      |      |       |
| 0-15  | 5.2  | 4.59 | 55 | 28 | 17 | 0.05 | 0.076 | 0.43  | 2.53 | 0.73 | 0.12 | 0.17 | 0.34 | 3.89 | 86.78 |
| 15-50   | 5.47 | 5.01 | 77 | 14 | 9  | 0.12 | 0.054 | 0.42  | 1.30 | 0.36 | 0.35 | 0.12 | 0.34 | 2.47 | 81.30 |
| <b>Adewolu (UTM 31N 0543771N 0759816E)</b>        |      |      |    |    |    |      |       |       |      |      |      |      |      |      |       |
| 0-15  | 6.59 | 5.76 | 24 | 51 | 25 | 0.27 | 0.086 | 7.10  | 2.05 | 0.73 | 1.04 | 0.14 | 0.34 | 4.30 | 88.85 |
| 15-50   | 6.39 | 5.29 | 28 | 41 | 31 | 0.08 | 0.063 | 2.37  | 2.68 | 1.86 | 0.23 | 0.19 | 0.38 | 5.34 | 89.30 |
| <b>Jaguna (UTM 31N 0533528N 0757318E)</b>         |      |      |    |    |    |      |       |       |      |      |      |      |      |      |       |
| 0-15  | 6.7  | 6.01 | 72 | 9  | 9  | 0.05 | 0.125 | 0.51  | 1.13 | 0.74 | 0.26 | 0.12 | 0.32 | 2.57 | 82.82 |
| 15-50   | 6.5  | 5.26 | 71 | 18 | 11 | 0.19 | 0.102 | 0.39  | 1.00 | 0.60 | 0.12 | 0.17 | 0.41 | 2.30 | 74.65 |
| <b>Ibokuru (UTM 31N 0525306N 0757140E)</b>        |      |      |    |    |    |      |       |       |      |      |      |      |      |      |       |
| 0-15  | 6.76 | 6.37 | 48 | 27 | 25 | 0.13 | 0.069 | 0.66  | 1.90 | 0.96 | 0.23 | 0.12 | 0.28 | 3.50 | 88.52 |
| 15-50   | 5.87 | 5.32 | 46 | 12 | 42 | 0.08 | 0.056 | 0.34  | 1.63 | 1.15 | 0.35 | 0.19 | 0.32 | 3.63 | 85.93 |
| <b>Ejio (UTM 31N 0523333N 0757111E)</b>           |      |      |    |    |    |      |       |       |      |      |      |      |      |      |       |
| 0-15  | 6.7  | 6.6  | 67 | 14 | 19 | 0.27 | 0.116 | 0.56  | 4.27 | 1.45 | 0.33 | 0.19 | 0.12 | 6.36 | 95.11 |
| 15-50   | 6.43 | 6.03 | 51 | 18 | 31 | 0.40 | 0.128 | 0.34  | 2.02 | 0.92 | 0.35 | 0.14 | 0.08 | 3.50 | 93.74 |
| <b>MFM Location 1 (UTM 31N 0542626N 0746296E)</b> |      |      |    |    |    |      |       |       |      |      |      |      |      |      |       |
| 0-15  | 4.85 | 4.03 | 37 | 36 | 27 | 0.07 | 0.070 | 5.00  | 1.31 | 0.57 | 0.23 | 0.77 | 0.36 | 3.23 | 65.17 |
| 15-50   | 4.94 | 3.61 | 57 | 30 | 13 | 0.11 | 0.089 | 0.87  | 1.45 | 0.67 | 0.12 | 0.10 | 0.34 | 2.68 | 83.43 |
| <b>MFM Location 2 (UTM 31N 0542633N 0746174E)</b> |      |      |    |    |    |      |       |       |      |      |      |      |      |      |       |
| 0-15  | 4.57 | 3.78 | 56 | 19 | 25 | 0.74 | 0.011 | 4.95  | 2.67 | 2.08 | 0.81 | 0.42 | 0.36 | 6.34 | 87.73 |
| 15-50   | 4.58 | 3.84 | 44 | 34 | 22 | 0.17 | 0.095 | 6.47  | 2.92 | 1.36 | 0.58 | 0.50 | 0.33 | 5.69 | 85.34 |
| <b>Magboro (UTM 31N 0541952N 0743058E)</b>        |      |      |    |    |    |      |       |       |      |      |      |      |      |      |       |
| 0-15  | 5.05 | 4.14 | 76 | 17 | 7  | 0.06 | 0.090 | 1.38  | 2.49 | 1.97 | 0.35 | 0.31 | 0.41 | 5.52 | 86.91 |
| 15-50   | 5.85 | 4.19 | 54 | 18 | 28 | 0.15 | 0.165 | 12.72 | 2.08 | 0.82 | 0.23 | 0.45 | 0.43 | 4.01 | 77.99 |

| <b>Ganum (UTM 31N 0542416N 0741227E)</b> |      |      |    |    |    |      |       |      |      |      |      |      |      |      |       |
|--|------|------|----|----|----|------|-------|------|------|------|------|------|------|------|-------|
| 0-15                                     | 5.85 | 5.47 | 72 | 5  | 23 | 0.05 | 0.042 | 0.64 | 1.59 | 0.82 | 0.31 | 0.12 | 0.34 | 3.18 | 85.50 |
| 15-50                                    | 5.01 | 3.55 | 57 | 14 | 29 | 0.10 | 0.036 | 0.21 | 1.80 | 0.85 | 0.28 | 0.19 | 0.23 | 3.35 | 87.44 |

**Table 2-8: Result of Soil quality survey : Heavy Metal**

| Depth  | Cu    | Zn    | Cr    | Cd    | Pb    | Ni    |
|--|-------|-------|-------|-------|-------|-------|
| <b>Likosi Location 1 (UTM 31N 0558885N 0748567E)</b>     |       |       |       |       |       |       |
| 0-15   | 0.05  | 0.518 | 0.005 | 0.009 | 0.014 | 0.026 |
| 15-50  | 0.207 | 1.261 | 0.001 | 0.001 | 0.001 | 0.024 |
| <b>Likosi Location 2 (UTM 31N 0558530N 0748778E)</b>     |       |       |       |       |       |       |
| 0-15   | 0.152 | 1.529 | 0.005 | 0.007 | 0.255 | 0.004 |
| 15-50  | 0.231 | 1.147 | 0.001 | 0.001 | 0.001 | 0.023 |
| <b>Likosi Location 3 (UTM 31N 05587645N 0749066E)</b>    |       |       |       |       |       |       |
| 0-15   |       |       |       |       |       |       |
| 15-50  | 0.193 | 1.642 | 0.006 | 0.011 | 0.026 | 0.011 |
| <b>Thames Valley College (UTM 31N 0561208N 0748648E)</b> |       |       |       |       |       |       |
| 0-15   | 0.214 | 0.906 | 0.006 | 0.012 | 0.532 | 0.008 |
| 15-50  | 0.185 | 0.441 | 0.004 | 0.01  | 0.223 | 0.009 |
| <b>Ologbun (UTM 31N 0556836N 0748197E)</b>               |       |       |       |       |       |       |
| 0-15   | 0.12  | 0.425 | 0.004 | 0.009 | 0.011 | 0.023 |
| 15-50  | 0.133 | 1.682 | 0.001 | 0.015 | 0.012 | 0.034 |
| <b>Shosho Ogbara (UTM 31N 0558885N 0748567E)</b>         |       |       |       |       |       |       |
| 0-15   | 0.094 | 0.794 | 0.005 | 0.008 | 0.008 | 0.008 |
| 15-50  | 0.057 | 0.565 | 0.001 | 0.009 | 0.016 | 0.001 |

|  |  |       |       |       |       |       |       |       |       |
|--|--|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>Oriola-Ijagbon (UTM 31N 05541345N 0748567E)</b> |  |       |       |       |       |       |       |       |       |
| 0-15   |  | 0.097 | 0.947 | 0.01  | 0.008 | 0.018 | 0.01  | 0.008 | 0.01  |
| 15-50  |  | 0.05  | 0.819 | 0.01  | 0.008 | 0.011 | 0.016 | 0.008 | 0.016 |
| <b>Wichtech (UTM 31N 0560240N 0758598E)</b>        |  |       |       |       |       |       |       |       |       |
| 0-15   |  | 0.271 | 0.459 | 0.001 | 0.012 | 0.399 | 0.008 | 0.012 | 0.008 |
| 15-50  |  | 0.102 | 0.51  | 0.001 | 0.011 | 0.199 | 0.023 | 0.011 | 0.023 |
| <b>Ori (UTM 31N 0550496N 0760275E)</b>             |  |       |       |       |       |       |       |       |       |
| 0-15   |  | 0.239 | 0.599 | 0.001 | 0.008 | 0.01  | 0.028 | 0.008 | 0.028 |
| 15-50  |  | 0.101 | 0.877 | 0.005 | 0.009 | 0.01  | 0.019 | 0.009 | 0.019 |
| <b>Oke-Oko (UTM 31N 0541721N 0758526E)</b>         |  |       |       |       |       |       |       |       |       |
| 0-15   |  | 0.35  | 1.077 | 0.005 | 0.01  | 0.215 | 0.008 | 0.01  | 0.008 |
| 15-50  |  | 0.166 | 0.589 | 0.008 | 0.009 | 0.03  | 0.004 | 0.009 | 0.004 |
| <b>Adewolu (UTM 31N 0543771N 0759816E)</b>         |  |       |       |       |       |       |       |       |       |
| 0-15   |  | 0.224 | 0.753 | 0.005 | 0.008 | 0.011 | 0.018 | 0.008 | 0.018 |
| 15-50  |  | 0.143 | 0.855 | 0.001 | 0.001 | 0.011 | 0.022 | 0.001 | 0.022 |
| <b>Jaguna (UTM 31N 0533528N 0757318E)</b>          |  |       |       |       |       |       |       |       |       |
| 0-15   |  | 0.102 | 0.435 | 0.01  | 0.011 | 0.065 | 0.01  | 0.011 | 0.01  |
| 15-50  |  | 0.1   | 0.268 | 0.001 | 0.013 | 0.022 | 0.001 | 0.013 | 0.001 |
| <b>Ibokuru (UTM 31N 0525306N 0757140E)</b>         |  |       |       |       |       |       |       |       |       |
| 0-15   |  | 0.101 | 0.807 | 0.005 | 0.014 | 0.087 | 0.019 | 0.014 | 0.019 |
| 15-50  |  | 0.095 | 0.594 | 0.001 | 0.012 | 0.016 | 0.015 | 0.012 | 0.015 |
| <b>Ejio (UTM 31N 0523333N 0757111E)</b>            |  |       |       |       |       |       |       |       |       |
| 0-15   |  | 0.022 | 0.525 | 0.001 | 0.009 | 0.001 | 0.005 | 0.001 | 0.005 |
| 15-50  |  | 0.051 | 0.387 | 0.004 | 0.009 | 0.189 | 0.003 | 0.009 | 0.003 |
| <b>MFM Location 1 (UTM 31N 0542626N 0746296E)</b>  |  |       |       |       |       |       |       |       |       |
| 0-15   |  | 0.061 | 0.676 | 0.014 | 0.011 | 0.008 | 0.014 | 0.011 | 0.014 |
| 15-50  |  | 0.299 | 0.694 | 0.001 | 0.013 | 0.59  | 0.01  | 0.013 | 0.01  |



| <b>MFM Location 2 (UTM 31N 0542633N 0746174E)</b> |  |       |       |       |       |       |       |       |       |
|---|--|-------|-------|-------|-------|-------|-------|-------|-------|
| 0-15  |  | 0.15  | 0.501 | 0.005 | 0.001 | 0.001 | 0.001 | 0.001 | 0.016 |
| 15-50   |  | 0.271 | 0.691 | 0.005 | 0.001 | 0.001 | 0.01  | 0.018 |       |
| <b>Magboro (UTM 31N 0541952N 0743058E)</b>        |  |       |       |       |       |       |       |       |       |
| 0-15  |  | 0.103 | 1.571 | 0.007 | 0.009 | 0.016 | 0.025 |       |       |
| 15-50   |  | 0.226 | 0.809 | 0.005 | 0.008 | 0.008 | 0.036 |       |       |
| <b>Ganum (UTM 31N 0542416N 0741227E)</b>          |  |       |       |       |       |       |       |       |       |
| 0-15  |  | 0.236 | 0.621 | 0.009 | 0.013 | 0.507 | 0.005 |       |       |
| 15-50   |  | 0.168 | 0.435 | 0.001 | 0.011 | 0.372 | 0.007 |       |       |

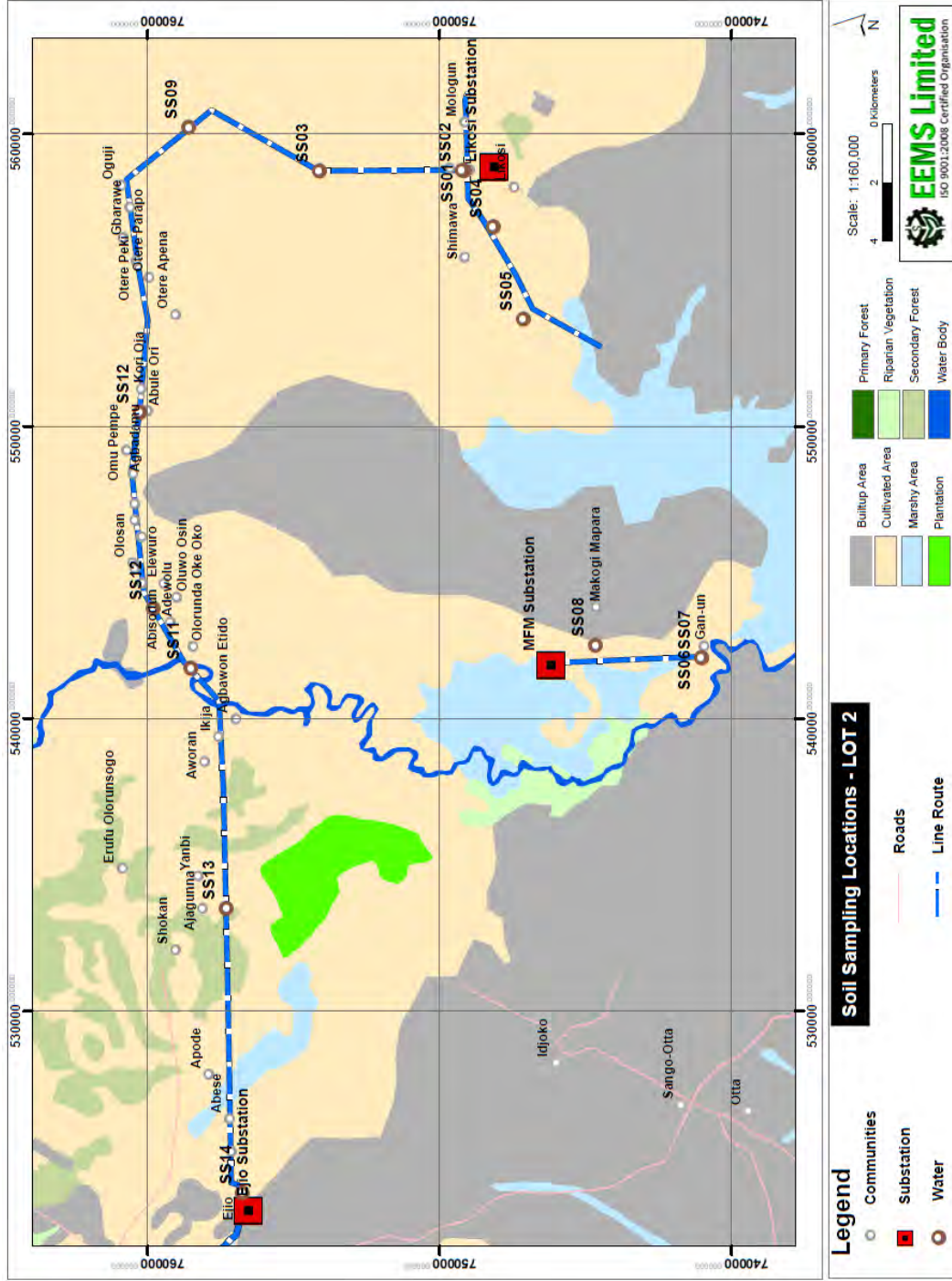


Figure 2-3: Soil quality sampling point for Lot2

## LOT 3 Baseline Study

### 3.1 Ambient Air Quality

#### 3.1.1 Sampling Location

Ambient air and noise quality measurements were carried out at sampling locations along the project sites as shown in Table 1-1 and **Error! Reference source not found.**

**Table 3-1: Sampling Locations for Air Quality and Noise**

| CODE | Latitude | Longitude | Description   |
|------|----------|-----------|---|
| AN1  | 6.848333 | 3.212303  | Ejio proposed substation; built-up environment mostly residential, a lot domestic activities, etc.  |
| AN2  | 6.835194 | 3.215243  | Ejio: Perennial water body; built up areas, mostly residential etc.   |
| AN3  | 6.84818  | 3.19353   | Apomu; Buildings and farmlands  |
| AN4  | 6.82091  | 3.14915   | Ekundayo; Secondary forest interspersed with farmlands, unpaved road.   |
| AN5  | 6.79127  | 3.12773   | Alakpako-Isale; built-up mostly residential, secondary forest, unpaved road, fire spots for commercial and domestic activities, etc             |
| AN6  | 6.78117  | 3.12114   | Ogunwede; sand mining activities, sparsely built up, secondary forest interspersed with farmlands, etc  |
| AN7  | 6.76281  | 3.12012   | Oke-Oji; residential area, partially paved road, etc.   |
| AN8  | 6.74336  | 3.11125   | Ijemo/Olori; built up, secondary forest interspersed with farmland, etc.  |
| AN9  | 6.72053  | 3.11173   | Adie-Owe; Farmlands and buildings   |
| AN10 | 6.70468  | 3.09478   | Leshi; residential, Track roads and farmlands   |
| AN11 | 6.598534 | 3.050337  | Iberese Buildings, secondary vegetation and track road  |
| AN12 | 6.65396  | 3.07285   | Ajeginle proposed substation; Buildings, river and track road   |
| AN13 | 6.623711 | 3.044007  | Apena; Buildings, swamp, sacred sites and farmlands   |
| AN14 | 6.62757  | 3.06336   | Ojuiroko; Buildings, secondary vegetation and track road  |
| AN15 | 6.50876  | 3.08114   | Agbara Buildings, factories swamp,  |
| AN16 | 6.493144 | 3.085523  | Olaoparun; built-up environment mostly residential, a lot domestic activities, etc.   |
| AN17 | 6.493657 | 3.06941   | Buildings, secondary vegetation and track road  |
| AN18 | 6.50758  | 3.06592   | Idoluba; Track road, buildings and farmlands  |
| AN19 | 6.51776  | 3.05383   | Kofelerin; Buildings, secondary vegetation and track road   |
| AN20 | 6.52505  | 3.05039   | Idayin Buildings, secondary vegetation and track road   |
| AN21 | 6.54203  | 3.04022   | Egudu; Buildings, secondary vegetation and track road   |
| AN22 | 6.58203  | 3.02676   | Buildings, secondary vegetation and track road  |
| AN23 | 6.55845  | 3.03179   | Ajogb-Akia; built-up mostly residential, and primary school, secondary forest, unpaved road, fire spots for commercial and domestic activities. |
| AN24 | 6.57327  | 3.00441   | Whezume; residential area, Buildings, secondary vegetation and tracks.  |
| AN25 | 6.55814  | 2.99707   | Isunba; built-up environment mostly residential, domestic activities, etc.  |
| AN26 | 6.857577 | 3.175392  | Kooko Health Resort, builtup area, secondary vegetation   |
| AN27 | 6.54501  | 2.97633   | Onilogbo; sparsely built-up; unpaved road, etc.   |
| AN28 | 6.43715  | 2.854784  | Yafin/ Alakotomeji; Swamp, sacred site and secondary forest   |
| AN29 | 6.454805 | 2.877052  | Okushuldolomo; sparsely built up, Gmalina and Shea plantation, secondary forest interspersed with farmlands,                                    |

| CODE | Latitude | Longitude | Description  |
|------|----------|-----------|--|
| AN30 | 6.52727  | 2.95207   | Bandu; residential area, Swamp, secondary vegetation and farmlands |
| AN31 | 6.43063  | 2.866802  | Buildings, secondary vegetation and track road                     |
| AN33 | 6.520993 | 2.926793  | janvhe; Buildings, secondary vegetation and track road             |
| AN34 | 6.472078 | 2.902143  | Tohun, swamp   |
| AN35 | 6.498304 | 2.915149  | Erekiti/Iragbon axis, Swamp  |
| AN36 | 6.411563 | 2.857518  | Yafin/ Alakotomeji; Swamp , sacred site and secondary forest       |

### 3.1.2 Result of Ambient air quality survey

The result of ambient air quality is presented below.

| SAMPLING PARAMETER                 | SO <sub>2</sub> (ppm)                       | NO <sub>2</sub> (ppm) | CO <sub>2</sub> (ppm) | VOC (ppm)  | HCl (ppm) | CO (ppm)     | H <sub>2</sub> S (ppm) | SPM <sub>10</sub> (ppm) |
|------------------------------------|---|-----------------------|-----------------------|------------|-----------|--------------|------------------------|-------------------------|
| <b>EJIO - AJEGUNLE SECTION</b>     |   |                       |                       |            |           |              |                        |                         |
| <b>Mean</b>                        | 0.6   | 0                     | 441.6                 | 0.17       | 0         | 0.68         | 0.4                    | 0.04380                 |
| <b>Min</b>                         | 0   | 0                     | 303                   | 0.06       | 0         | 0            | 0                      | 0.007                   |
| <b>Max</b>                         | 3.5   | 0                     | 676                   | 0.41       | 0         | 3.7          | 2.7                    | 0.1318                  |
| <b>AJEGUNLE - AGBARA SECTION</b>   |   |                       |                       |            |           |              |                        |                         |
| <b>Mean</b>                        | 2.6   | 0                     | 518.6                 | 0.11       | 0         | 0.15         | 1.8                    | 0.00692                 |
| <b>Min</b>                         | 0   | 0                     | 313                   | 0.05       | 0         | 0            | 0                      | 0                       |
| <b>Max</b>                         | 6.7   | 0                     | 847                   | 0.17       | 0         | 1.4          | 3.4                    | 0.0127                  |
| <b>BERESE - BADAGRY SECTION</b>    |   |                       |                       |            |           |              |                        |                         |
| <b>Mean</b>                        | 3.2   | 0                     | 414.7                 | 0.14       | 0         | 0.5          | 1.2                    | 0.01164                 |
| <b>Min</b>                         | 0   | 0                     | 297                   | 0.04       | 0         | 0            | 0                      | 0.0026                  |
| <b>Max</b>                         | 5.9   | 0                     | 491                   | 0.65       | 0         | 2.8          | 3.1                    | 0.0366                  |
| <b>Overall mean for all areas</b>  | 2.8   | 0                     | 465.9                 | 0.14       | 0         | 0.5          | 1.1                    | 0.020925                |
| <b>Secondary data (ICCL 2015)</b>  | <0.10                                       | NA                    | <0.10                 | <0.10      | NA        | <0.10        | <0.10                  | NA                      |
| <b>WHO/FMENV daily limit (ppm)</b> | <b>0.002</b>                                | <b>0.04-0.06</b>      | <b>5000</b>           | <b>0.1</b> | -         | <b>10-20</b> | <b>&lt;10</b>          | <b>0.15- 0.25</b>       |
| <b>IFC Standard</b>                | <b>0.007-0.045 (20-125ug/m<sup>3</sup>)</b> | -                     | -                     | -          | -         | -            | -                      | -                       |

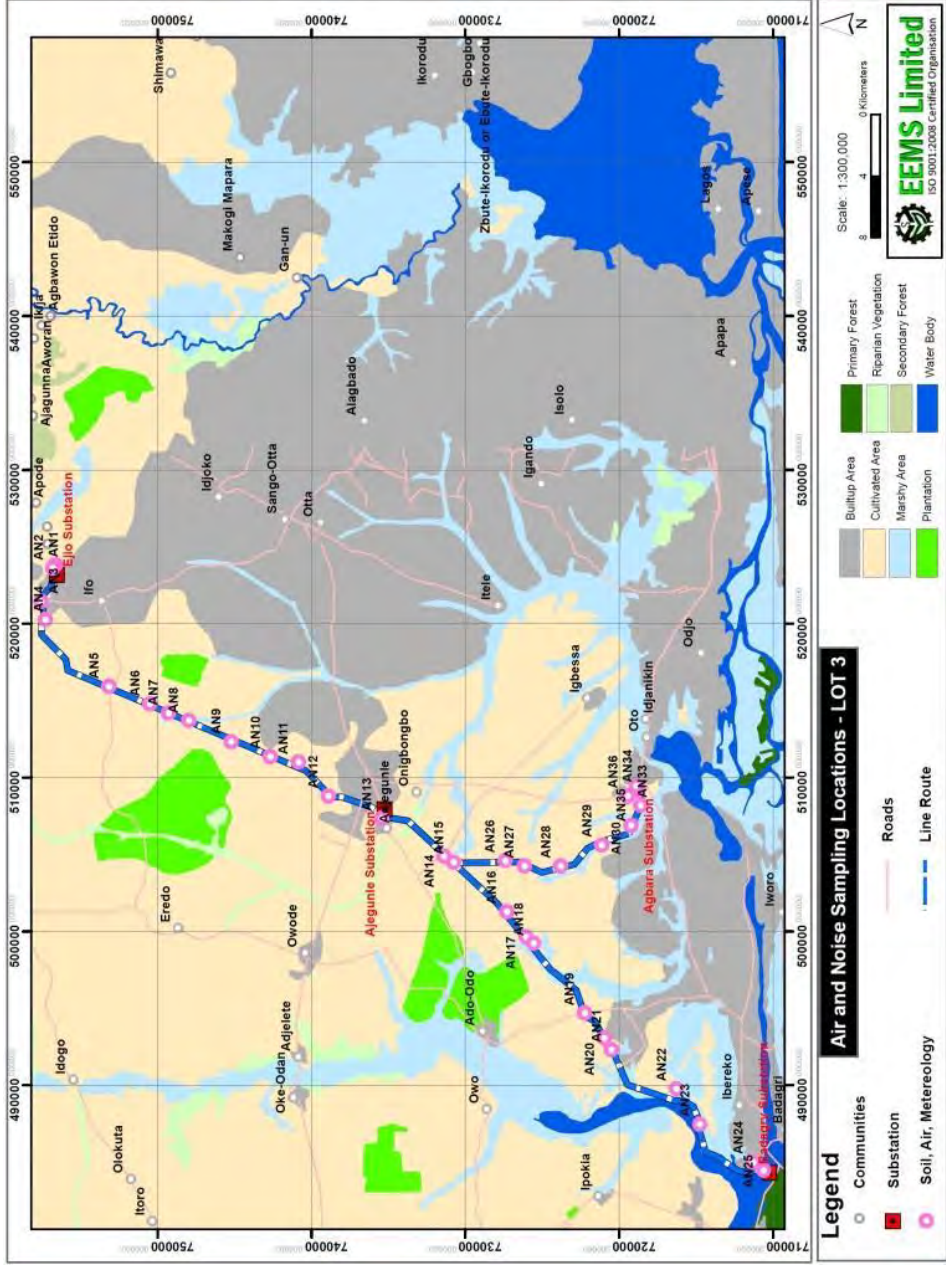


Figure 3-1: Air and Noise Quality sampling point for Lot3

### 3.1 Noise Quality

#### 3.1.1 Sampling Location

Sampling location is same as Air Quality.

#### 3.1.2 Result of Noise quality survey

The summary results of the 12 hours measurements (7:00-19:00) are shown in below.

The result shows that the noise level at Ejio-Ajegunle section and Ahegunle-Agbara section has relatively high noise and exceeds the IFC noise standard. The noise level around Badagry section was below IFC noise standard.

| SAMPLING CODE                        | Noise dB(A)                  | LAF (dBA) | LMIN. (dBA) | LMAX. (dBA) |
|--------------------------------------|------------------------------|-----------|-------------|-------------|
| <b>EJIO - AJEGUNLE SECTION</b>       |                              |           |             |             |
| <b>Mean</b>                          | 60.3                         | 66.7      | 34          | 61.4        |
| <b>Min.</b>                          | 52                           | 57        | 29          | 54          |
| <b>Max.</b>                          | 75.6                         | 88.2      | 43          | 70          |
| <b>AJEGUNLE - AGBARA SECTION</b>     |                              |           |             |             |
| <b>Mean</b>                          | 63.2                         | 67.9      | 28.3        | 60.1        |
| <b>Min.</b>                          | 53                           | 57.7      | 23          | 47          |
| <b>Max.</b>                          | 74.7                         | 84.5      | 42          | 78          |
| <b>BERESE - BADAGRY SECTION</b>      |                              |           |             |             |
| <b>Mean</b>                          | 40.6                         | 60.2      | 30.9        | 59.6        |
| <b>Min.</b>                          | 30.8                         | 49.9      | 22          | 40          |
| <b>Max.</b>                          | 51                           | 72.7      | 38          | 76          |
| <b>Secondary data (ICCL)</b>         | <b>28.4 - 60</b>             |           |             |             |
| <b>FME<sub>env</sub>(Work place)</b> | <b>- 85 dB</b>               |           |             |             |
| <b>IFC Standard</b>                  | <b>Residential</b>           |           |             |             |
|                                      | - 55dB: Day<br>- 45dB: Night |           |             |             |
| <b>IFC Standard</b>                  | <b>Industrial</b>            |           |             |             |
|                                      | - 70dB                       |           |             |             |

### 3.2 Groundwater Quality

#### 3.2.1 Sampling Location

Groundwater quality measurements were carried out at sampling locations along the project site as shown in Table 3-2 and

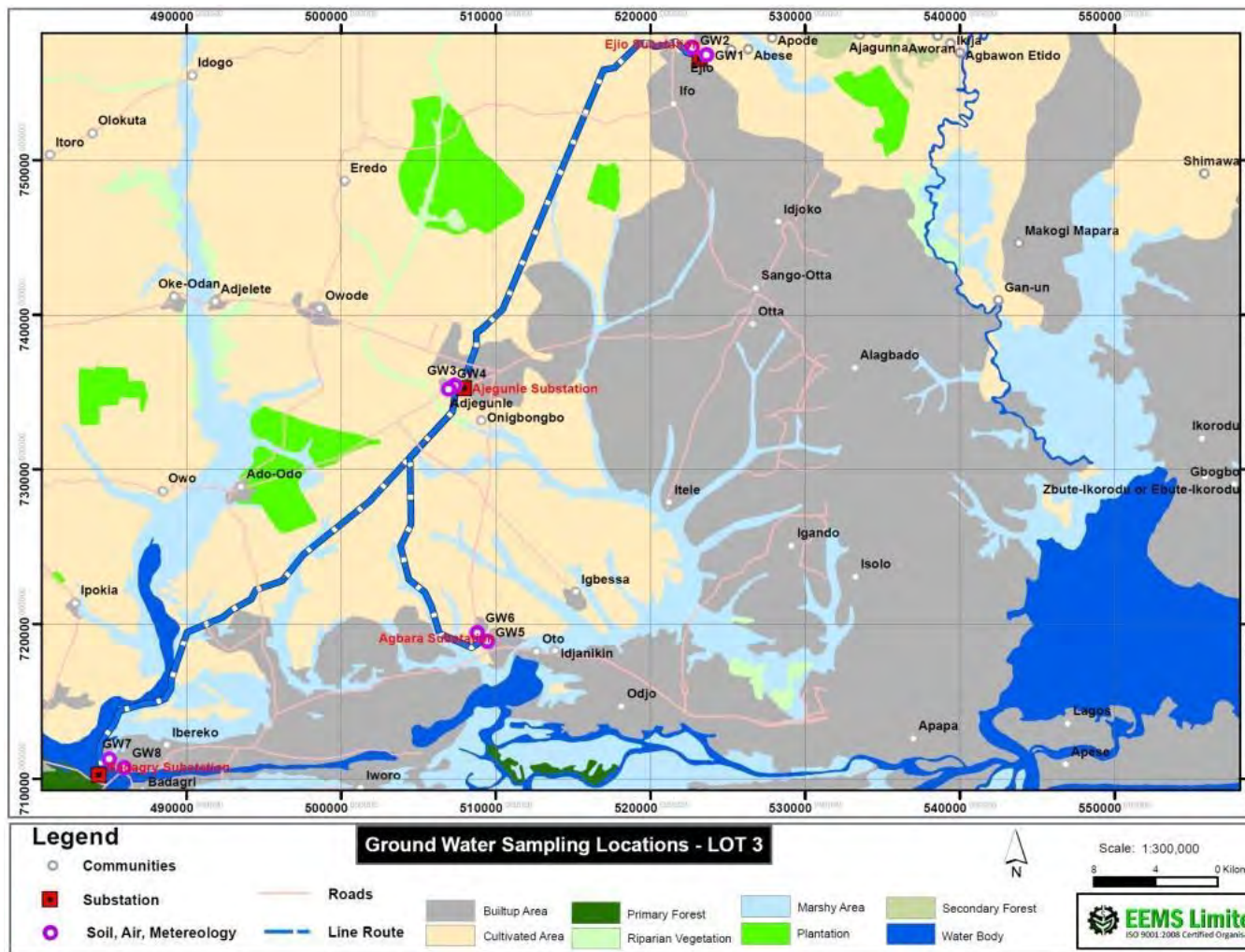


Figure 3-2.

Table 3-2: Sampling Locations for groundwater

| CODE | LOCATION              | LAT       | LONG      |
|------|-----------------------|-----------|-----------|
| GW1  | Ejio Substation1      | 6.8467115 | 3.2136834 |
| GW2  | Ejio Substation2      | 6.8511216 | 3.2052827 |
| GW3  | Ajegunle Substation 1 | 6.6535888 | 3.0664301 |
| GW4  | Ajegunle Substation 2 | 6.6513829 | 3.0629164 |
| GW5  | Agbara Substation 1   | 6.5039265 | 3.0854416 |
| GW6  | Agbara Substation 2   | 6.508766  | 3.0795622 |
| GW7  | Badagry Substation 1  | 6.4350596 | 2.8644276 |
| GW8  | Badagry Substation 2  | 6.4297716 | 2.8730106 |

### **3.2.2 Result of Groundwater quality survey**

Groundwater quality measurements were carried out at sampling locations along the project site. The result shows that the lead and total iron was observed to exceed the Nigerian Drinking Standard as well as WHO drinking water quality guideline.



Table 3-3: Result of Ground water quality survey

| Study section<br>Parameter      | Ejio substation |           | Ajegunle substation |           | Berese substation   |                     | Badagry substation  |                     | ICCL baseline<br>data (2015) | NSDW<br>Limit,<br>2007 <sup>1</sup> | WHO<br>limits |
|---------------------------------|-----------------|-----------|---------------------|-----------|---------------------|---------------------|---------------------|---------------------|------------------------------|-------------------------------------|---------------|
|                                 | GW1             | GW2 CrtH1 | GW3                 | GW4-CrtH2 | GW5                 | GW6 CrtH3           | GW7                 | GW8<br>CrtH4        |                              |                                     |               |
| Well Depth (m)                  | 3.27            | 4.01      | 3.10                | 3.09      | 3.24                | 3.48                | 3.01                | 3.00                | 3-4                          | NA                                  | NA            |
| Water Level(m)                  | 0.98            | 1.4       | 1.12                | 0.93      | 1.05                | 0.84                | 1.10                | 1.61                | 0.7-1.4                      | NA                                  | NA            |
| Colour                          | Clear           | Clear     | Clear               | Clear     | Clear               | Clear               | Clear               | Clear               | Clear                        | Clear                               | Clear         |
| BOD (mg/l)                      | 1.48            | 1.23      | 2.66                | 2.16      | 4.74                | 3.23                | 3.01                | 2.45                |                              |                                     | 10            |
| DO(mg/l)                        | 10.93           | 9.62      | 8.58                | 8.77      | 7.84                | 9.63                | 7.84                | 8.52                |                              | 5                                   | <5            |
| COD(mg/l)                       | 10.2            | 9.8       | 8.2                 | 9.2       | 10.2                | 9.8                 | 8.5                 | 8.2                 |                              |                                     | 10            |
| Hardness (mg/l)                 | 14.2            | 13.6      | 20.6                | 19.9      | 15.4                | 13.9                | 9.73                | 10.1                | 200                          | 150                                 | -             |
| PCB (ng/m <sup>3</sup> )        | ND              | ND        | ND                  | ND        | ND                  | ND                  | ND                  | ND                  | NA                           |                                     | 0.003         |
| TSS (mg/l)                      | 33.1            | 28.2      | 11.05               | 27.6      | 28.2                | 33.1                | 28.4                | 42.1                | -                            | 500                                 | 50            |
| Salinity (g/l)                  | 0.08            | 0.06      | 0.10                | 0.02      | 0.08                | 0.12                | 0.10                | 0.06                |                              |                                     |               |
| pH                              | 3.96            | 6.52      | 6.61                | 7.86      | 6.75                | 6.64                | 7.86                | 6.75                | 5.46 - 5.84                  | 6.5- 8.5                            | 6.5-9.2       |
| Temperature (°C)                | 27.2            | 26.0      | 27.6                | 27.9      | 27.3                | 27.7                | 26.8                | 27.4                | 26.50-27.20                  |                                     | 40°C          |
| Conductivity (mS/cm)            | 55.3            | 54.3      | 18.2                | 50.2      | 54.3                | 55.3                | 55.2                | 55.3                | 41.5-126.8                   | 1000                                | 250           |
| Turbidity (NTU)                 | 6.95            | 1.35      | 1.85                | 2.25      | 4.85                | 2.95                | 2.75                | 1.55                | 1.46-9.51                    | -                                   | 5             |
| Nitrate (mg/l)                  | 0.21            | 0.1       | 0.5                 | 0.3       | 0.4                 | 0.2                 | 0.15                | 0.1                 | <0.1-0.21                    | 50                                  | 10            |
| Sulphate (mg/l)                 | <1.0            | <1.0      | <1.0                | <1.0      | <1.0                | <1.0                | <1.0                | <1.0                | <1.0                         | 100                                 | 500           |
| Phosphate (mg/L)                | 0.55            | 0.68      | 0.22                | 0.25      | 1.10                | 0.32                | 0.45                | 0.65                | 0.22-1.14                    | ≤0.2                                | 5             |
| THC (mg/l)                      | ND              | ND        | ND                  | ND        | ND                  | ND                  | ND                  | ND                  | NA                           | 0.3                                 | 0.05          |
| Potassium (mg/l)                | 0.39            | 0.30      | 0.35                | 0.36      | 0.39                | 0.37                | 0.34                | 0.31                | NA                           |                                     | 10            |
| Lead (mg/l)                     | 0.041           | 0.010     | 0.012               | 0.020     | 0.021               | 0.010               | 0.24                | 0.073               | 0.012-0.24                   | 0.05                                | 0.02          |
| Copper (mg/l)                   | 0.120           | 0.010     | 0.015               | 0.012     | 0.025               | 0.032               | 0.110               | 0.015               | 0.012-0.120                  | 1.0                                 | 2.0           |
| Total Iron (mg/l)               | 0.15            | 0.22      | 0.33                | 0.30      | 1.22                | 0.70                | 2.05                | 0.45                | 0.24-2.11                    | 1.0                                 | 0.3           |
| Barium (mg/l)                   | <0.03           | <0.03     | <0.03               | <0.03     | <0.03               | <0.03               | <0.03               | <0.03               | NA                           | 0.7                                 | 1.3           |
| Total Coliform (cfu/100ml)      | ND              | ND        | ND                  | ND        | 4.2x10 <sup>1</sup> | 5.1x10 <sup>1</sup> | 4.2x10 <sup>1</sup> | 5.1x10 <sup>1</sup> | NA                           |                                     | 0.00          |
| Faecal Coliform (cfu/100ml)     | ND              | ND        | ND                  | ND        | 11                  | 19                  | ND                  | ND                  | NA                           |                                     | 0.00          |
| E-coli (cfu/100ml)              | ND              | ND        | ND                  | ND        | ND                  | ND                  | ND                  | ND                  | NA                           |                                     | 0.00          |
| Faecal Streptococci (cfu/100ml) | ND              | ND        | ND                  | ND        | ND                  | ND                  | ND                  | ND                  | NA                           |                                     | 0.00          |

<sup>1</sup> Nigerian Standard for Drinking Water Quality

<sup>2</sup>WHO Drinking Water Quality Guideline

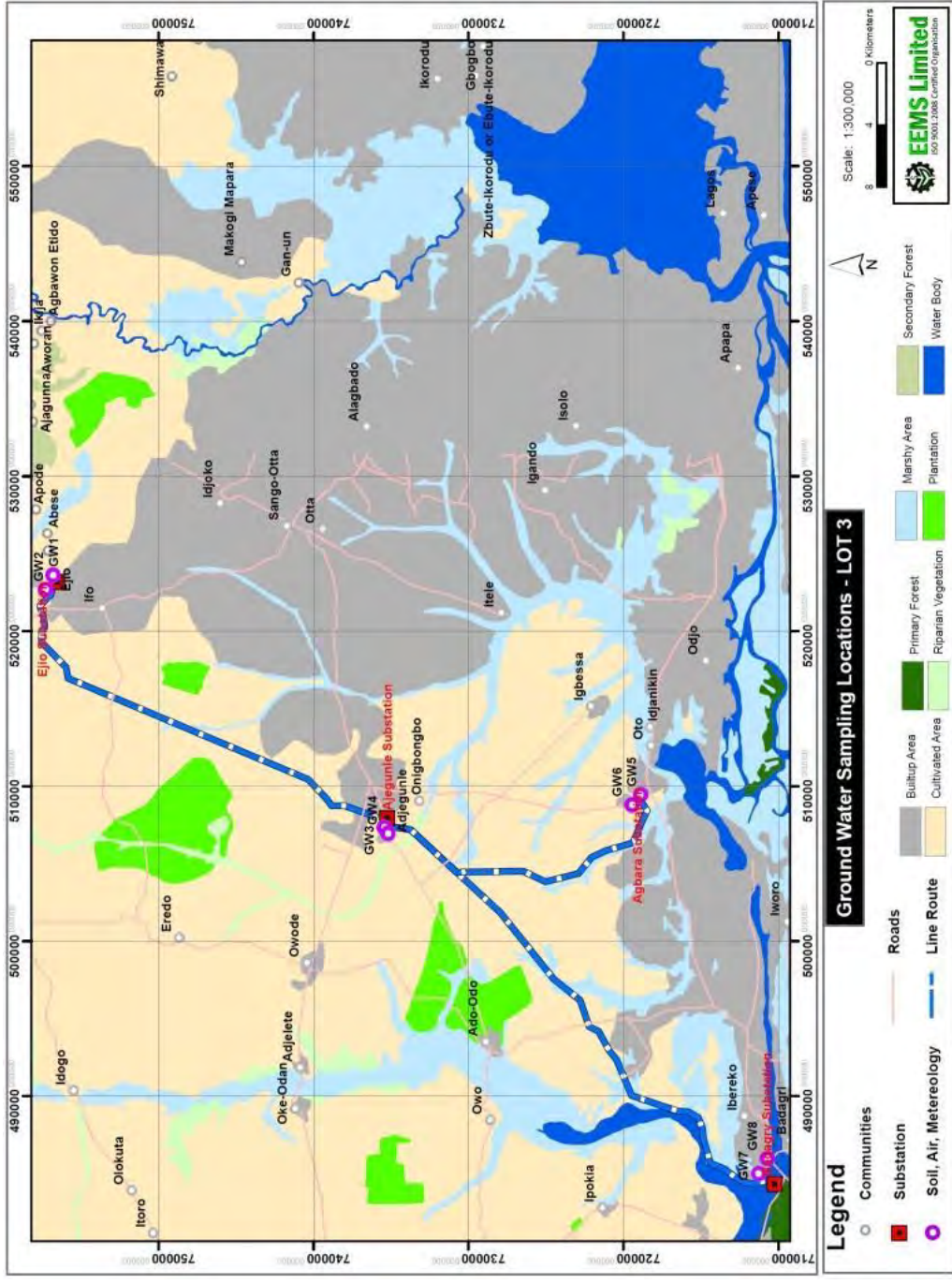


Figure 3-2: Groundwater quality sampling point for Lot3

## 3.1 Surface water Quality

### 3.1.1 Sampling Location

Surfacewater quality measurements were carried out at sampling locations along the project site as shown in Table 3-4 and Figure 3-3.

**Table 3-4: Sampling Locations for Surfacewater**

| <b>CODE</b> | <b>Location</b> | <b>LATITUDE</b> | <b>LONGITUDE</b> |
|-------------|-----------------|-----------------|------------------|
| SW1         | Ayepe           | 6.8474998       | 3.1686115        |
| SW2C        | sojuolu         | 6.8382535       | 3.158505         |
| SW3         | Sojuolu         | 6.8359526       | 3.1594491        |
| SW4         | Oji/AN8         | 6.7670468       | 3.1238723        |
| SW5         | Igbele Ajana    | 6.6744113       | 3.0763865        |
| SW6         | Kooko           | 6.6647994       | 3.0743051        |
| SW7         | AJEGUNLE        | 6.6548889       | 3.0724168        |
| SW8         | Ojuiroko        | 6.6360904       | 3.0623102        |
| SW9         | Agbara          | 6.4991936       | 3.0753136        |
| SW10        | Okaran Akinyele | 6.54230         | 2.9672098        |
| SW11        | Ajobe Zebbe     | 6.5243503       | 2.9378128        |
| SW12        | Erekiti         | 6.4826491       | 2.8999615        |
| SW13        | Panko           | 6.4585991       | 2.8660583        |
| SW14        | YafinSS         | 6.4269144       | 2.8547287        |
| SW15        | YafinSS2        | 6.4214983       | 2.8622818        |
| SW16C       | YafinCtrl       | 6.4288121       | 2.8460598        |

### 3.1.2 Result of Surface quality survey

Groundwater quality measurements were carried out at sampling locations along the project site. The result shows that the lead and total iron was observed to exceed the Nigerian Drinking Standard as well as WHO drinking water quality guideline.

**Table 3-5: Result of Surface water quality**

| PARAMTERS                     | Ejio –Ajegunle |       |       | Ajegunle to Agbara |        |        | Berese to Badagry |        |       | Secondary Data ( ICCL 2015) |
|-------------------------------|----------------|-------|-------|--------------------|--------|--------|-------------------|--------|-------|-----------------------------|
|                               | Min            | Max   | Mean  | Min                | Max    | Mean   | Min               | Max    | Mean  |                             |
| Colour                        | Cloudy         |       |       | Cloudy             |        |        | cloudy            |        |       | NA                          |
| Odour                         | Nil            |       |       | Nil                |        |        | Nil               |        |       | NIL                         |
| pH (H <sub>2</sub> O) @24.2°C | 7.32           | 7.55  | 7.46  | 7.36               | 7.44   | 7.4    | 6.36              | 7.59   | 7.17  | 7.20 - 7.56                 |
| Temp (°C)                     | 25.8           | 27.4  | 23.2  | 26.7               | 27.3   | 27.0   | 32.8              | 27.7   | 26.79 | 24.4-28.1                   |
| Conductivity(µS/cm)           | 46.2           | 259   | 77.79 | 46.2               | 56.6   | 55.9   | 45.8              | 77.2   | 58.27 | 45.1- 287                   |
| Salinity(mg/l)                | 0.03           | 0.09  | 0.04  | 0.03               | 0.06   | 0.05   | 0.03              | 0.06   | 0.04  | 0.04 -0.08                  |
| DO(mg/l)                      | 3.84           | 4.88  | 4.54  | 2.68               | 3.50   | 3.09   | 2.84              | 4.46   | 3.75  | 2.66 - 4.89                 |
| Turbidity(NTU)                | 3              | 60    | 16    | 8.0                | 91.0   | 49.5   | 2.0               | 39.0   | 18.71 | 1-45                        |
| TSS(mg/l)                     | 4              | 50    | 16.86 | 26.0               | 122    | 74.0   | 4.0               | 66.0   | 23.43 | 9 - 74                      |
| TDS(mg/l)                     | 27.2           | 155   | 46.61 | 27.7               | 39.4   | 33.55  | 27.5              | 46.3   | 31.0  | 29 - 43.2                   |
| Oil and Grease(mg/l)          | <0.40          | <0.40 | <0.40 | <0.40              | <0.40  | <0.40  | <0.41             | <0.40  | <0.40 | 1- 4                        |
| BOD(mg/l)                     | 10             | 10    | 10    | 10.0               | 20.0   | 20     | 15.0              | 20.0   | 11.43 | 8 - 15.6                    |
| COD(mg/l)                     | 19.8           | 59.4  | 39.6  | 49.5               | 49.5   | 49.5   | 19.9              | 39.7   | 29.7  | 20.6 - 51.3                 |
| Lead(mg/l)                    | <0.08          | <0.08 | <0.08 | 0.008              | <0.008 | <0.008 | <0.008            | <0.008 | <0.08 | 2 - 16                      |
| Zinc(mg/l)                    | <0.02          | <0.02 | <0.02 | <0.02              | <0.02  | 0.02   | <0.02             | <0.02  | <0.02 | 3-11                        |
| Copper(mg/l)                  | <0.02          | <0.02 | <0.02 | <0.02              | <6.02  | <0.02  | <0.02             | <0.6   | <0.6  | 0.01 - 1.3                  |
| Total Iron(mg/l)              | 0.24           | 1.47  | 0.47  | 0.22               | 3.17   | 1.695  | 1.22              | 3.29   | 0.85  | 2 – 6                       |
| Manganese (mg/l)              | 0.11           | 0.11  | 0.11  | <0.10              | <0.10  | <0.10  | <0.10             | <0.10  | <0.10 | NA                          |
| PCB (ng/m <sup>3</sup> )      | ND             | ND    | ND    | ND                 | ND     | ND     | ND                | ND     | ND    | NA                          |
| Chromium (mg/l)               | <0.01          | <0.02 | <0.01 | <0.01              | <0.01  | <0.05  | <0.01             | <0.03  | <0.01 | NA                          |
| Cadmium (mg/l)                | 0.002          | 0.002 | 0.002 | <0.01              | <0.02  | <0.01  | <0.02             | <0.02  | <0.02 | 0.01                        |
| Mercury (mg/l)                | ND             | ND    | ND    | ND                 | ND     | ND     | ND                | ND     | ND    |                             |
| Nickel(mg/l)                  | 0.06           | <0.06 | <0.06 | <0.06              | <0.06  | <0.06  | <0.06             | <0.06  | <0.06 | 0.00 - 0.12                 |
| Vanadium(mg/l)                | 0.02           | 0.02  | <0.20 | <0.20              | <0.20  | <0.20  | <0.20             | <0.20  | <0.20 | 0.00 - 0.15                 |

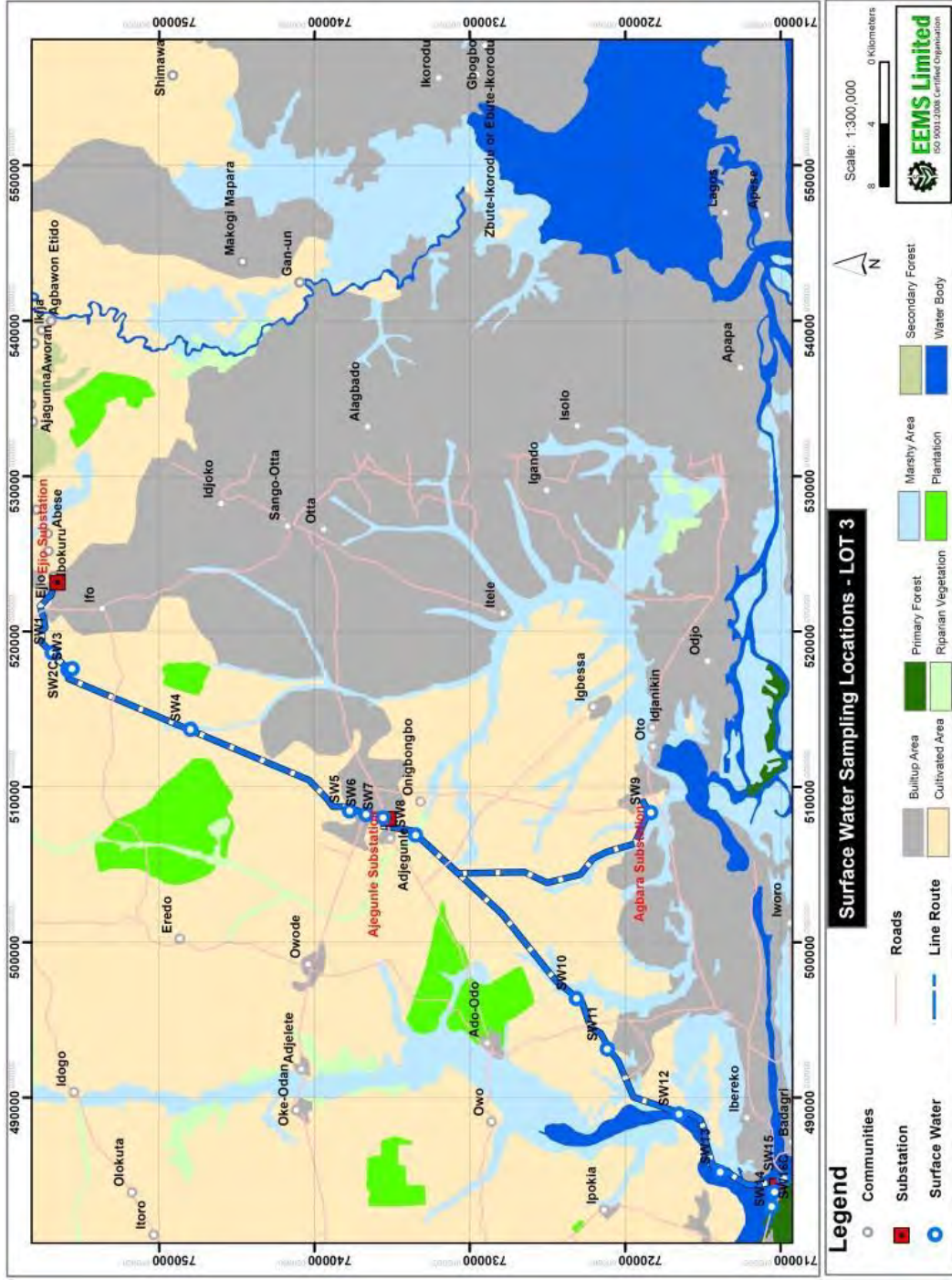


Figure 3-3: Surface water quality sampling point for Lot3

## 3.1 Soil Quality

### 3.1.1 Sampling Location

Soil samples were collected at 36 stations. At each station, soil samples were collected at two depths (0-15cm for top soil and 16-30cm for sub soil). Sampling locations are shown in

**Table 3-6: Location for Soil sampling**

| CODE | LATITUDE  | LONGITUDE | DESCRIPTION   |
|------|-----------|-----------|---|
| SS1  | 6.8450498 | 3.2155609 | Ejio proposed substation; built-up environment mostly residential, a lot of domestic activities, etc.   |
| SS2  | 6.8467115 | 3.2136834 | Ejio: Perennial water body; built up areas, mostly residential etc.   |
| SS3  | 6.8536781 | 3.1938887 | Arigbajo: residential buildings, highway (Lagos-Abeokuta Expressway)  |
| SS4  | 6.8514305 | 3.1832242 | Apomu; Buildings and farmlands  |
| SS5  | 6.8139012 | 3.1439352 | Ekundayo; Secondary forest interspersed with farmlands, unpaved road.   |
| SS6  | 6.7897395 | 3.1337643 | Alakpako-Isale; built-up mostly residential, secondary forest, unpaved road, fire spots for commercial and domestic activities, etc             |
| SS7  | 6.7790645 | 3.1283462 | Ogunwede; sand mining activities, sparsely built up, secondary forest interspersed with farmlands, etc  |
| SS8  | 6.7670468 | 3.1238723 | Oke-Oji; residential area, partially paved road, etc.   |
| SS9  | 6.7420304 | 3.1114483 | Ijemo/Olori; built up, secondary forest interspersed with farmland, etc.  |
| SS10 | 6.7190105 | 3.1028438 | Adie-Owe; Farmlands and buildings   |
| SS11 | 6.7025853 | 3.0995178 | Leshi; residential, Track roads and farmlands   |
| SS12 | 6.6849607 | 3.0796051 | Igbele Ajana: Residential, palm plantation, factory   |
| SS13 | 6.6535888 | 3.0664301 | Ajegunle: proposed substation, busy road partially paved, building buildings  |
| SS14 | 6.6168222 | 3.0441999 | Olakitan: Buildings, secondary vegetation and paved road  |
| SS15 | 6.6112298 | 3.0407506 | Iberese: Buildings, secondary vegetation and track road   |
| SS16 | 6.5809269 | 3.0415177 | Akpabiekun: secondary forest, track road  |
| SS17 | 6.5697144 | 3.0384707 | Ago-Iboro; Buildings, secondary vegetation and track road   |
| SS18 | 6.5483119 | 3.0384064 | Egudu; Buildings, secondary vegetation and track road   |
| SS19 | 6.5240944 | 3.0507231 | Idayin Ishaga: Buildings, secondary vegetation and track road   |
| SS20 | 6.5070392 | 3.062396  | Idayin Idah: Buildings, secondary vegetation and track road   |
| SS21 | 6.5013255 | 3.073951  | Idoluba; Track road, buildings and farmlands  |
| SS22 | 6.5027859 | 3.0829096 | Agbara: Buildings, factories, swamp,  |
| SS23 | 6.5039265 | 3.0854416 | Agbara: Buildings, factories, vehicular movements   |
| SS24 | 6.508766  | 3.0795622 | Agabara: substation site  |
| SS25 | 6.5799677 | 3.0115843 | Ajogb-Akia: built-up mostly residential, and primary school, secondary forest, unpaved road, fire spots for commercial and domestic activities. |
| SS26 | 6.5687125 | 2.9966497 | Whezume; residential area, Buildings, secondary vegetation and tracks.  |
| SS27 | 6.5640867 | 2.9928303 | Isunba; built-up environment mostly residential, domestic activities, etc.  |
| SS28 | 6.534242  | 2.9517817 | Bandu; residential area, Swamp, secondary vegetation and farmlands  |
| SS29 | 6.5226661 | 2.937448  | Gbojo; Buildings, secondary vegetation and track road   |
| SS30 | 6.5184236 | 2.9303026 | Janvhe; Buildings, secondary vegetation and track road  |
| SS31 | 6.4802186 | 2.9075575 | Erekiti/Iragbon axis, Swamp   |
| SS32 | 6.4665732 | 2.8865719 | Tohun, swamp  |
| SS33 | 6.4289827 | 2.8594923 | Yafin: proposed substation, swamp, secondary forest   |
| SS34 | 6.4350596 | 2.8644276 | Yafin/ Alakotomeji; Swamp, sacred site and secondary forest   |

### 3.1.2 Soil Analysis Results

The result of soil analysis is shown in Table 3-7.

Table 3-7: Soil Analysis Results

| Parameters                     | EJIO TO AJEGUNLE |       |       |          |       |        | AJEGUNLE TO AGBARA |       |        |          |       |        | BERESE TO BADAGRY |        |       |          |       |        | 2 <sup>o</sup> (ICCL (2015) | WHO/F MENV Limits (USD/A (2017) |
|--------------------------------|------------------|-------|-------|----------|-------|--------|--------------------|-------|--------|----------|-------|--------|-------------------|--------|-------|----------|-------|--------|-----------------------------|---------------------------------|
|                                | Top soil         |       |       | Sub soil |       |        | Top soil           |       |        | Sub soil |       |        | Top soil          |        |       | Sub soil |       |        |                             |                                 |
|                                | Mean             | Min   | Max   | Mean     | Min   | Max    | Mean               | Min   | Max    | Mean     | Min   | Max    | Mean              | Min    | Max   | Mean     | Min   | Max    |                             |                                 |
| pH (H <sub>2</sub> O) @ 23.3°C | 5.86             | 5.26  | 6.89  | 5.87     | 5.21  | 6.51   | 5.45               | 5.04  | 5.92   | 5.65     | 5.34  | 6.01   | 5.35              | 5.16   | 5.5   | 5.64     | 5.39  | 5.77   | 5.01 - 6.85                 | 5.0 - 8.0                       |
| Moisture Content (%)           | 12.26            | 9.57  | 16    | 11.41    | 8.65  | 14.2   | 13.97              | 10.5  | 17.8   | 12.03    | 7.66  | 14.4   | 12.12             | 8.79   | 16.79 | 10.10    | 7.89  | 15.22  | 7.62 - 18.03                |                                 |
| THC (mg/kg)                    | 0.05             | <0.05 | <0.05 | <0.05    | <0.05 | <0.05  | <0.05              | <0.05 | <0.05  | <0.05    | <0.05 | <0.05  | <0.05             | <0.05  | <0.05 | <0.05    | <0.05 | <0.05  | 3 - 8                       |                                 |
| Clay (%)                       | 4.5              | 2     | 9     | 4.75     | 2     | 9      | 4.36               | 2     | 8      | 5.73     | 2     | 9      | 3.53              | 0      | 9     | 4.46     | 0.2   | 10     | 0 - 16                      |                                 |
| Silt (%)                       | 7.92             | 3     | 17    | 12.58    | 3     | 54     | 15.55              | 3     | 40     | 16.64    | 4     | 44     | 9.15              | 0.9    | 19    | 16.08    | 1.8   | 45     | 1 - 66                      |                                 |
| Sand (%)                       | 87.58            | 81    | 95    | 82.67    | 41    | 95     | 80.09              | 56    | 95     | 77.64    | 48    | 93     | 87.32             | 72     | 98.9  | 79.62    | 98    | 97.5   | 34 - 86                     |                                 |
| Ext. Nitrate (mg/kg)           | 14.27            | 0.02  | 36.3  | 23.09    | 0.02  | 62.9   | 19.77              | 1.91  | 31     | 32.24    | 10.9  | 64.7   | 23.67             | 3.6    | 59.33 | 28.82    | 5.67  | 65.33  | 0.01 - 10                   | 500                             |
| Ext. Sulphate (mg/kg)          | 168.5            | 35    | 410   | 269.25   | 37.5  | 588    | 157.53             | 35    | 345    | 190.25   | 10    | 498    | 70.89             | 10.306 | 200   | 194.08   | 9.98  | 366    | 14 - 688                    |                                 |
| Ext. Phosphate (mg/kg)         | <0.02            | <0.02 | <0.02 | <0.02    | <0.02 | <0.02  | <0.02              | <0.02 | <0.02  | <0.02    | <0.02 | <0.02  | 0.86              | 0.001  | 6     | 0.69     | 0.001 | 6.4    | 0.01 - 26                   | 5                               |
| Total Iron (mg/kg)             | 6,695            | 4,333 | 8,380 | 7,598    | 5,256 | 11,050 | 9,466              | 6,758 | 14,630 | 9,958    | 7,619 | 15,560 | 4,110             | 48     | 7,770 | 5,283    | 73    | 11,260 | 36 - 15,783                 | 30,000                          |
| Copper (mg/kg)                 | 31.12            | 0.5   | 97.6  | 21.45    | 0.5   | 76.9   | 13.441             | 5.2   | 41.5   | 33.74    | 4.34  | 93.6   | 34.30             | 0.5    | 90.3  | 34.06    | 0.5   | 99.1   | 1.0 - 120                   | 36                              |
| Lead (mg/kg)                   | 11.85            | 3.9   | 39.6  | 11.09    | 1     | 30.7   | 12.10              | 4.5   | 29.1   | 21.52    | 4.6   | 49     | 4.40              | 0.001  | 8.5   | 5.24     | 0.001 | 11.5   | 0.001 - 65                  | 85                              |
| Nickel (mg/kg)                 | 9.5              | 5.5   | 14.3  | 11.35    | 6     | 15.8   | 10.55              | 6.8   | 12.4   | 11.84    | 8.2   | 17.9   | 4.62              | 0.09   | 9     | 6.39     | 0.04  | 11.7   | 2 - 21                      | 35                              |
| Zinc (mg/kg)                   | 26.66            | 18.3  | 35.6  | 28.13    | 19.8  | 35.8   | 30.95              | 20.7  | 41.9   | 34.55    | 22.7  | 41.9   | 16.06             | 0.211  | 29.6  | 18.25    | 0.12  | 31.4   | 10 - 138                    | 140                             |
| Vanadium (mg/kg)               | <0.01            | <0.01 | <0.01 | <0.01    | <0.01 | <0.01  | 9.00               | 1     | 45.5   | 11.4     | 1     | 53.9   | <0.01             | <0.01  | <0.01 | <0.01    | <0.01 | <0.01  | 0.01 - 187                  |                                 |

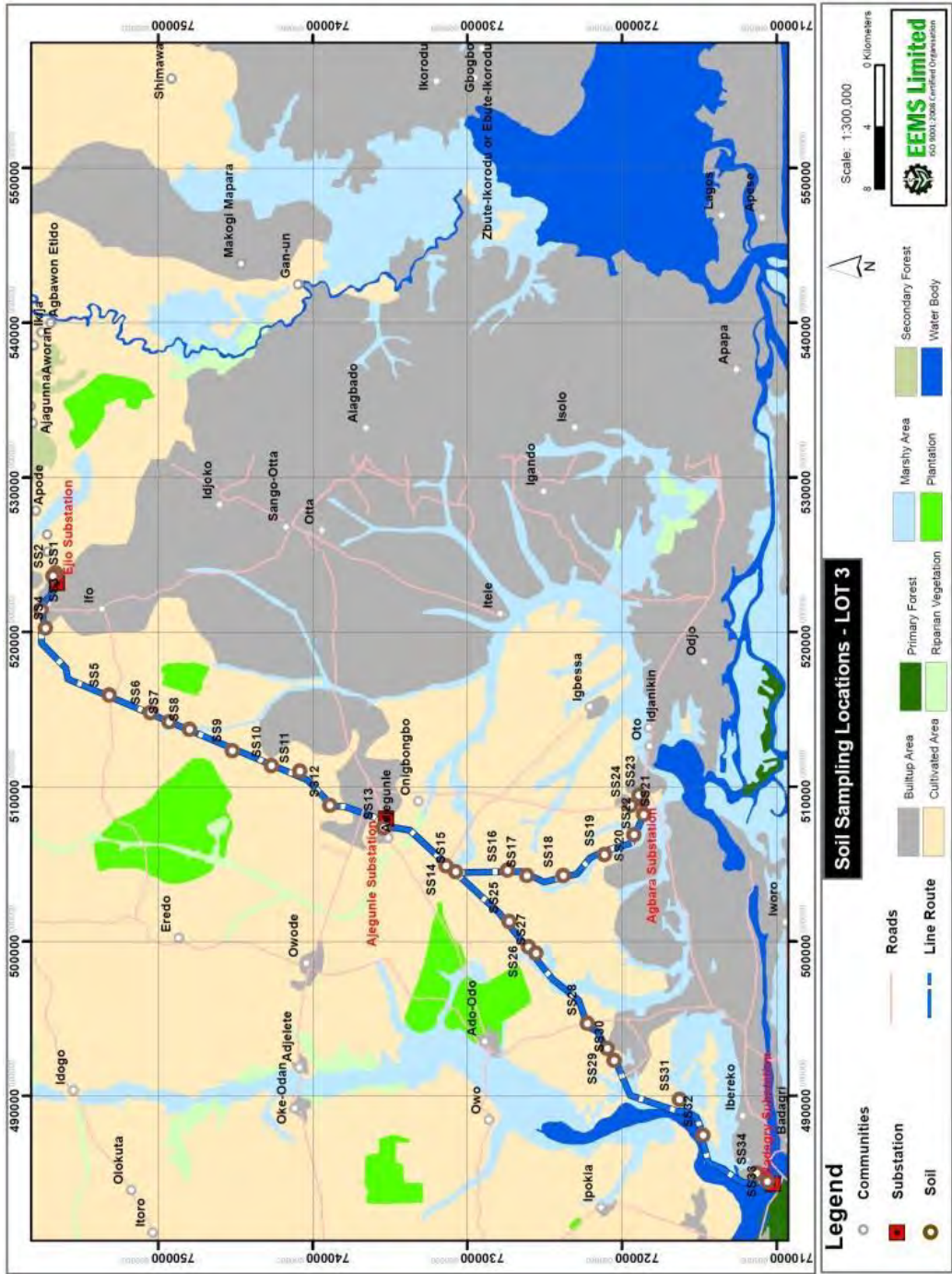


Figure 3-4: Soil sampling locations for Lot1



## 5. ステークホルダーミーティング

(1) Meeting minutes, Register of Signature and Photo  
in Lot 1

## **CHAPTER FOUR: CONSULTATIONS**

### **4.1 Introduction**

In compliance with JICA and World Banks guidelines on requirement for local stakeholder's engagement, our organization in planning and conducting this RAP survey engaged the affected communities and groups in consultations. Consultation mainstreamed all stakeholders including Baales (community leaders), farmers, women, youths and Ministries, Department and Agencies such as State Ministry of Agriculture and Ministry of Land and Survey. The engagement which started at the planning phase will still continue at different stages of the RAP implementation and post implementation. Public consultation and engagement was not only helpful in informing, sensitizing and harvesting inputs of the communities and groups about the TCN project and RAP purpose and processes, but was hugely helpful in achieving a socially acceptable, smooth and inclusive exercise. The lists of attendees are attached as appendix 4.

### **4.2 Stakeholder Identification and Method of Participation**

The consultant in conjunction with TCN mapped out the potential stakeholders and categorized them as primary and secondary stakeholders.

#### ***Primary stakeholders***

These are groups and persons that will be directly affected either by the positive or negative impact of the transmission line project. They include Project Affected Persons (PAPs), Affected LGA Councils, Communities and notable groups such as community leaders, women, youths, vulnerable and minority groups within the communities.

#### ***Secondary stakeholders***

Those classified as secondary stakeholders are people and institutions that have some form of rights, interest and roles to play/protect within the project and/or project area. Secondary stakeholders identified and contacted included Federal Ministry of Environment, Ogun State Ministry of Environment, Federal Ministry of Power, Work and Housing and Ogun state Ministry of Agriculture, Ministry of Physical Planning and Urban Development, NGOs.

### **4.3 Stakeholders Method of Participation**

The participation process of the stakeholders is multifaceted. Letters were written officially to the various Ministries that have statutory functions to play in the project, detailing them about the project and requesting for their involvements. This was also followed up with visits to some ministries for collection of relevant documents at their custodies that are relevant for the RAP study.

In response to the request for participation, the Ogun state Ministry of Environment, Ministry of Agriculture, Ministry of Physical Planning and Urban Development were present to work with the consulting team on daily basis to ensure that the exercise complied with their standards and policies.

Similarly, primary stakeholder's involvement started with courtesy call on the heads of the communities. Initial meetings with heads of communities paved way for wider consultations with communities and affected groups. The heads of the communities (Baales) gave unwieldy support by mobilizing their wards for consultations at given dates of meetings. To ensure inclusive and robust participation, our approach to consultations entailed holding focus group discussions with smaller groups such as the vulnerable, women and minority groups in addition to general community

consultations which were held across centers. Tools of information gathering also included RAP survey instrument and In-depth interview.

#### **4.4 Outcome and Gains of the Stakeholders Consultation Process**

This section discusses the summary of the consultations held at community and group levels. Generally, the consultations dwelled on informing the participants on the project development objectives of the TCN-JICA Transmission Line Project, including the expected benefits and adverse impacts, which may result from construction and implementation work activities. Our scope of consultation covers hearing the perception of stakeholders on the project, to issues of concerns to them, their experience with past development donor funded projects and their experience with involuntary resettlement and livelihood. The people of the project area were sufficiently informed about their rights to participation in the RAP process, and were ensured that their entitlements will be paid before commencement of civil works in line with international best practices. They were also informed that the project will establish Grievance Redress Mechanism where aggrieved persons can channel their grievances for speedy and fair hearing and redress. Highlights of the consultations are presented in section 4.5 while details of the specific consultations held across the communities follows.

#### **4.5 Highlights and Gains of the Consultations**

**OBSERVATIONS AND CONCERNS:** Gratitude from the community leaders was shown towards the project as their livelihood source is not worsened after counting losses as a result of the impact of the project. Promises were made as well as their input to support the project. Their concerns were as follows;

- Employment of locals should be put into consideration prior to the commencement of civil works
- Dates of commencement of fieldwork exercise at respective communities should be communicated to them on time
- Shrines should also be put into consideration for compensation as it is one of their historical values
- Cost of relocation should be the responsibility of the project proponents.

### **QUESTIONS AND RESPONSES:**

The following questions were also raised by the PAPs:

- Will PAPs be permitted to be identified by proxy in case of recorded absentees?
- How would a PAP who has land elsewhere be captured if the data capturing exercise is done simultaneously at different communities?
- If PAPs who have more than one assets located within the community be captured separately?
- Who is the rightful claimant eligible for entitlement for land that has been leased out for crop farming?
- How would a compensation plan between a land owner and a crop farmer on affected portion of land be captured and reconciled?
- What happens to owners of fallow lands in terms of compensation entitlement?
- Will the project consider compensating land owners with statutory rights only or all owners of land irrespective of title holding?
- Will the project create employment opportunity to engage the youths who are not gainfully employed?
- Is there a time limit to which PAPs are given to open a valid and functional bank account if compensation will not be paid in cash?
- Is there some provision or entitlement from the RAP for community leaders who may not be PAPs.

RESPONSES TO THE QUESTIONS:

The above questions were addressed as follows:

| Questions/Concerns   | Answers to Questions   |
|--|--|
| Will PAPs be permitted to be identified by proxy in case of recorded absentees?  | A 2 <sup>nd</sup> party can only be captured as PAP upon receiving a consent (written or phone confirmation) from the 1 <sup>st</sup> PAP that authorizes the second party to act as PAP, and also substantiated by the witnessing of the community leaders that the person representing an absentee PAP is known by them. |
| How would a PAP who has land elsewhere be captured if the data capturing exercise is done simultaneously at different communities? | Census exercise is continuous; even if the enumerators have worked in the location where a PAP has not been captured, they are subject to revisiting for the sake of any PAP who was not available.  |
| Will PAPs who have more than one assets located separately within the community be captured separately?                            | Yes  |
| Who is the rightful claimant eligible for entitlement for land that has been leased out for crop farming?                          | The land owner is eligible for his land, while the farmer on the land is entitled to compensation for his/her crops  |
| How would a compensation plan between a land owner and a crop farmer on affected portion of land be captured and reconciled?       | As explained in above  |
| What happens to owners of fallow lands in terms of compensation entitlement?   | Owners of fallow land are not entitled for compensation, except they hold some statutory rights  |

|   |  |
|---|--|
| Will the project consider compensating land owners with statutory rights only or all owners of land irrespective title holding?                         | Land owners without statutory rights are only entitled to compensation for the value of improvement on the land.                         |
| Will the project create employment opportunity to engage the youths who are not gainfully employed?   | The project will try to create employment directly and indirectly  |
| Is there a time limit to which PAPs are given to open a valid and functional bank account if compensation will not be paid in cash?                     | PAPs will be screened for bank account during implementation of RAP. Those without bank accounts will be requested and assisted to do so |
| Is there some provision or entitlement from the RAP for community leaders who may not be PAPs?  | No provision is made in this RAP   |
| <b>CONCLUSION:</b>  |  |
| Inputs from the consultations have been noted and integrated into the RAP for informed decision as it is hoped to ensure successful RAP implementation. |  |

Outcome of specific consultation processes across project communities is presented below:



**Table 4.1: Consultation Proceedings at Abese Community**

|               |  |
|---------------|--|
| Meeting date  | 18 <sup>th</sup> January, 2018   |
| Meeting venue | Abese community town hall  |
| Attendance    | The meeting was attended by the Community leaders, Community members, PAPs within the project area, Representatives from Ministry of Lands and Urban Survey, State Ministry of Agriculture, RAP Consultant and his team  |
| Preamble      | <p>The project coordinator of Godira Chemicals Ltd introduced the RAP consultant and his team who have been engaged to prepare a Resettlement Action Plan (RAP) for the transmission line network project. Thereafter, the lead consultant, Mr. Daniel Okoh gave a brief introduction of the RAP study, in which he stated that involuntary resettlement is triggered by the TCN line route and sub-station activities. The ROW for the 330kVA is 25meters while 132kVA is 15meters. The project intends to as much as possible avoid land acquisition and other forms of displacement that have adverse impacts on the community. However, where impacts cannot be avoided, TCN is prepared to carryout resettlement and/or compensation to the project affected persons and to restore their livelihood to ensure no net loss.</p> <p>Resettlement or compensation implementation shall take place before the actual line route project implementation, in line with global best practices. According to the consultant, PAPs have right to participate in the resettlement process and therefore, will be consulted from time to time. This project will also establish a Grievance Redress Mechanism (GRM) at various levels, beginning with the village level where aggrieved PAPs can go and lodge their complaints for redress. The Grievance Redress Committee (GRC) shall include members of the community who have good reputation to ensure that matters of complaints received fair hearing and quick processing. PAPs that feel dissatisfied with the judgment of the GRC can exercise their rights by approaching the court of law.</p> <p>Members of this community are therefore, requested to support this project and make inputs and ask questions as deemed appropriate that will help for project sustainability.</p> |

|                              |   |
|------------------------------|---|
|                              | <p>The RAP Lead consultant also requested for the nomination of site representatives who are conversant with individual’s boundaries to help in identification of claimants assets to avoid impersonation.</p>  |
| Responses and Expectation    | <p>The community head, Baale Oluwale Babayemi .Aikulola, on behalf of the community members expressed his gratitude towards the initiative taken by the TCN and GODIRA to take into cognizance the need to compensate PAPs for their land and assets that will be acquired or displaced by the project. According to him, the recent RAP that was carried out as a result of the ongoing railway line project was successful and therefore wished that same should be the outcome of the TCN-JICA transmission line project. He introduced the community site representatives who he nominated to participate in the enumeration exercise.</p>  |
| Questions raised             | <p>The following questions were also raised by the PAPs:</p> <ul style="list-style-type: none"> <li>• If PAP would be permitted to be identified by proxy in case of recorded absentees</li> <li>• How would a PAP who has a land elsewhere be captured if the data capturing exercise is scheduled to be carried out at different communities simultaneously?</li> <li>• If PAPs who own more than one asset will be captured Separately for claims on different assets located within the same community</li> <li>• Who is the rightful claimant of land that has been leased out for crop farming</li> </ul>   |
| How questions were addressed | <p>The RAP lead consultant addressed the questions as follows:</p> <ul style="list-style-type: none"> <li>• That relative of PAPs / representative of the PAPs would be captured only when identified by the community head or affidavit of consent sent by the PAP</li> <li>• With reference to the RAP instrument for survey, a PAP should notify ownership of land elsewhere that would be affected as a result of the project</li> <li>• PAPs who own more than one asset will be captured Separately for claims on different assets located within the same community hence it is within the transmission line route</li> <li>• According to the Nigeria Law on Land Use Act, compensation is paid for development on land but whereby a land has been leased</li> </ul> |

|            |   |
|------------|---|
|            | to a crop owner, then a landowner will be considered and captured for his economic trees and crops. |
| conclusion | January 21 <sup>st</sup> was scheduled for commencement of census of PAPs.                          |

**Table 4.2 : Consultation with Group of Baales from Project Areas held at Sowunmi**

|                               |   |
|-------------------------------|---|
| Date of Consultation          | 20 <sup>th</sup> January 2018   |
| Venue                         | De Kuns Global Hotel , Sowunmi Community  |
| Start and End Time            | Started by 10:20 am and Ended by 12:30pm  |
| Participation<br>Distribution | The meeting was attended to by 26 community leaders from 20 communities along the Olurunso Transmission Line Axis, made up of 20 Baales ( heads of communities) 2 Women leaders and 4 youth leaders.  |
| Introduction                  | The Project Coordinator of Godirra (the Consultant) introduced the RAP team to the community leaders present and informed them that they were on a mission to carry out studies that will lead to the preparation of RAP report which is necessitated by the proposed Transmission Line Project in the area.  |
| Key Information               | The RAP expert thanked the community leaders for responding to the invitation. In addressing them, he reiterated the importance and economic benefits of the TCN-JICA Transmission Line Project. He was however quick to add that certain persons with land, crops, structures and economic trees will be unfortunately displaced/affected by the project. To protect the interest of these groups, the project has commissioned the preparatory of RAP which involves the consultation of affected communities and groups, identification of PAPs, determination of their compensation |

|                       |   |
|-----------------------|---|
|                       | <p>entitlements and the need to engage them meaningfully as much as possible in the process of the implementation of the RAP and through the project implementation. The RAP expert, explained to the leaders the national and international laws guiding the preparation and implementation of RAP in Nigeria. He therefore, appealed for support and cooperation of the Baale's and all leaders of the communities especially, to disseminate the right information to the members of the community about the census exercise and the procedures being followed. He wants them to mobilize all potential PAPs to be available at their sites at designated date and delays to be given to their community. He stated that, a Grievance Redress Mechanism (GRM) will be established to hear and resolve all grievances as much as possible to avoid lengthy court processes associated with litigation. He hinted that the GRM will be such that is built around the principles of existing GRM in the local communities.</p> <p>He persuaded the community leaders to warn their subjects against going to erect structures on land after the census must have been taken as PAPs who are late entry PAPs (those that encumbered the land after cut-off date will not receive compensation.</p> |
| Response from leaders | <p>The responses from the Baales and other leaders are as follow:</p> <p>The project was adjudged a welcome development. They promised to support the project and help contractors to succeed in their tasks. However, the following observations/concerns were made:</p> <ul style="list-style-type: none"> <li>• Previous RAP exercise from Railway Project in the community was marred with unfulfilled promises (e.g in employment of locals);</li> <li>• They want this project to carry the community</li> </ul>  |

|                        |   |
|------------------------|---|
|                        | <p>along by ensuring that their people are employed, giving sub-contracts and supply</p>  |
|                        | <ul style="list-style-type: none"> <li>• The leaders want information communicated early to them on the day/date of census or field work in their respective communities to enable them mobilize their wards for the exercise.</li> <li>• The leaders also requested that the project should factor into consideration for consultation and compensation, affected shrines (local altars) that might be affected by the project.</li> </ul> |
| Questions that came up | <ul style="list-style-type: none"> <li>• What happens to owners of fallow lands?</li> <li>• Will the project consider compensating land owners without statutory rights?</li> </ul>   |
| Response               | <ul style="list-style-type: none"> <li>• Owners of fallow land are not entitled to resettlement/compensation in line with LUA and international laws and policies guiding involuntary resettlement</li> <li>• Land owners without statutory rights are only entitled to compensation for the value of improvements on the land</li> </ul>   |

**Table 4.3: Consultation at Ogidi and Ake Communities**

|               |  |
|---------------|--|
| Meeting Date  | 26 <sup>th</sup> January, 2018   |
| Meeting Venue | Ogidi community town hall  |
| Attendance    | The meeting was attended by the Community leaders, Community members, PAPs within the project area, RAP Consultant and his team.   |
| Preamble      | <p>The meeting started with a word of prayer by one of the community leaders after which the Resettlement Action Plan (RAP) lead consultant who introduced himself as Mr Daniel Okoh thanked the audience who had gathered at the instance of ongoing transmission line project as the consultation was scheduled based on the meeting held previously with the community leaders who their communities have been mapped out as one of the project encroached areas. He also enlightened the community members on the essence of the data capturing exercise which will be carried out to enable Resettlement Action Plan to be prepared successfully. He emphasized on the need for all PAP to ensure access to a valid bank account details as BVN is the trending banking system. He solicited for the cooperation of the community heads, especially the project affected persons (PAPs) in achieving the goals for the TCN-JICA project.</p> <p>The lead consultant clarified the community members on the following issues of their concerns:</p> <p>According to the Nigerian land use Act which clearly states that all land belongs to the government therefore compensation is only applicable when there is development on land such as structures, economic crops, trees etc. and cases whereby a land owner has a backup document or title for the land which he or she has acquired then compensation will be considered.</p> <p>Also, for individuals who are identified as vulnerable including widows, aged persons above 65 years on low income, physically disadvantaged persons and mentally disadvantaged persons will be considered.</p> <p>He further emphasized that the project is void of any form of middlemen as grievance redress mechanism will be adopted to resolve cases where PAPs are omitted or not properly identified and captured as this mechanism is people</p> |

|   |   |
|---|---|
|   | <p>oriented and simple.</p> <p>He requested to know the concerns of the people towards the project and gave opportunities for questions and contributions</p>   |
| Responses and Perception of the community | <p>The community leader expressed his gratitude towards the upcoming development and initiative taken by TCN-JICA to ensure that their livelihood source is not worsen off after counting losses as a result of the impact of the project during civil work.</p>  |
| Questions raised                          | <p>The following questions were asked:</p> <ul style="list-style-type: none"> <li>• If the project is such that will create employment opportunity to engage the youths who are not gainfully employed</li> <li>• If there is a time limit to which PAPs are given to open a valid and functional bank account since compensation will not be paid in cash</li> <li>• How would the compensation plan between a land owner and a crop farmer on affected portion of land be captured and reconciled?</li> <li>• If the project and the capturing exercise grants special allocation and preferences to community leaders</li> </ul>   |
| How questions where addressed             | <p>The RAP lead consultant addressed the questions as follows:</p> <ul style="list-style-type: none"> <li>• Engagement of youths will be recommended to the RAP implementers as RAP document is abiding to further review, consideration and approval</li> <li>• PAPs who has no access to functional bank accounts are advised to process a valid account as soon as they have been identified and captured as the PAPs bears the risk of affidavit of consent</li> <li>• Compensation will be paid only for development on land such as (economic crop, farm land, structures etc.) but not to the land owner except if the economic crop belongs to the land owner then he or she will be considered for capturing</li> <li>• The project has no special provision for the community leaders rather restricted to only Project Affected Persons PAPs)</li> </ul> |
| Conclusion                                | <p>A date was scheduled for the enumeration exercise to take place while the community promised to grant adequate support needed to ensure a successful capturing exercise.</p>   |

**Table 4.4: Consultation at Ajade Communities**

|  |   |
|--|---|
| Meeting date                             | 31 <sup>st</sup> January, 2018  |
| Meeting venue                            | Ajade community   |
| Attendance                               | The meeting was attended by the Traditional ruler, Community leaders from Ajade and Pankere village, Community members, PAPs within the project area, representative from the state ministry of agriculture and the RAP Consultants   |
| Preamble                                 | <p>The meeting commenced with an opening remark by the Resettlement Action Plan (RAP) lead consultant, Mr. Oliver Nwuju who thanked the communities who had gathered for the scheduled consultation and also commended their effort so far having cooperated with the enumerators in achieving the goals for the TCN-JICA project.</p> <p>A critical issue of concern regarding the involuntary resettlement of most of the community members was raised by the RAP lead consultant to be dialogued as this will affect a wholesome number of persons.</p> <p>He probed for the opinion of the community members especially the PAPs on their decision to be totally resettled as the ongoing transmission line route cuts in between their various residence and farm land thus, this project is such that considers the safety and livelihood of people living within the project encroached area.</p> <p>He also inquired to know if they have any choice of location for their resettlement as this will help during the RAP preparation and further requested to know the concerns of the people as their suggestions, questions and contributions will be highly appreciated.</p> |
| Response and Perception of the community | <p>Mr Samson Gbenga Fashola reacted to the negative impact of the project on their community as the 15meters taken side by side from the center point of the transmission line route corridors has divided the community into two sought relocation as a best option.</p> <p>The traditional ruler suggested that relocation should not be limited to only the PAPs because of loss of historical values, archives and other inheritances including the shrine and was of the opinion that the relocation should affect</p>   |



|                               |  |
|-------------------------------|--|
|                               | <p>the entire Ajade community.</p> <p>He further suggested that since Gbangba, Ajade and Ijumo communities are under his royal supervision, then relocation to Gbangba should be considered as an option.</p> <p>A member of the community leaders craved the indulgence of the project proponents including the government to be responsible for the cost of relocation as most the land which has been mapped out during the transmission line route survey where acquired by inheritance while some affected portions were bought by individual families therefore he suggested that compensation and relocation should be appropriately carried out to avoid grievance and conflict.</p> |
| Concerns and questions raised | A major issue of concern was if the relocation will affect only the PAPs or the entire Agade community and who will be responsible for the cost of relocation?   |
| How concerns were addressed   | <p>The RAP lead consultant addressed the questions as follows:</p> <ul style="list-style-type: none"> <li>• That the inventory of the project affected area will be properly taken to be used in preparation of the Rap document as the project proponent will be responsible for the cost of relocation</li> <li>• Relocation will affect only the PAPs and not the entire Ajade community</li> </ul>   |

|            |  |
|------------|--|
| conclusion | <p>An inventory was taken on the affected area with the outcome as follows:</p> <p><b>NUMBER OF AFFECTED HOUSES – 14</b></p> <p><b>SIZE OF AFFECTED AREA- 10957m2 (2.7076 acres)</b></p> <p>The RAP lead consultant requested for the provision of a key in-depth history of the community including their system of operation, cultural values, socio-economics, method of land acquisition etc.</p> <p>According to him, the size of the area of relocation to be mapped out will be same as acquired by the project from their previous location after all necessary survey has been carried out.</p> <p>He encouraged the traditional ruler to schedule a meeting with his community to harmonize on the area of relocation after which a time frame of one week was agreed to send a feedback and other necessary documents as requested.</p> |
|------------|--|

In a meeting with TCN and JICA on 6<sup>th</sup> day of February, 2018 held at TCN project office in Abuja, the outcome of the public consultation and issues of concern in Ajade was discussed. It was agreed that a site visit will be necessary to reconsider the issues raised about Ajade and the possibility of re-aligning the transmission line route to at least minimize impacts.

The Joint inspection and monitoring exercise was led by TCN Project Manager Engr. Ajibade on the 8<sup>th</sup> day of February, 2018. At end of the field inspection/monitoring, TCN/JICA Experts, the Project consultant and the project affected community (Ajade village) reached a consensus to re-align the TCN power transmissions line so as not to transverse the middle of the village. The RAP Project consultant however, considered it appropriate to hold another community consultation meeting following completion of the re-alignment by the line route consultant.

Below is the summary of the outcome of the community consultation meeting with Ajade community on March 2, 2018:

The meeting started at about 2.20p.m at Ajade Community. The RAP team leader in the Person of Mr Okoh Daniel welcomed participants from various communities and especially people of Ajade Community. He thanked the head of the Community for cooperating with Government in ensuring development in the power sector. He informed the community that, the power line will no longer pass through the village as earlier proposed.

The Baale of Ajade Community and PAPs present at the meeting demanded to know reasons for the Power line not to pass through the community as earlier proposed. In respond, the team leader informed the community that the decision was reached after the Joint inspection and monitoring exercise by TCN and JICA Experts led by TCN Project Manager Engr. Ajibade on the 8<sup>th</sup> day of February, 2018. The RAP team leader explained that option 1 was preferred after critical evaluation of two options available which includes:

- Re- alignment of the TCN line to avoid passing through AJADE Village
- Relocation of Ajade Village as earlier recommended during community consultation

The team leader further explained that, the decision was reached after weighing the two options following request by the community for TCN to shift the power line away from the village. He maintained that Federal Government through TCN respect the wishes of the people in carryout any developmental project. According to him, the visit and consultation meeting with the community on the 8<sup>th</sup> day of February 2018 informed the decision made by TCN and JICA which favored option one (1) in line with the community choice.

In response, the Baale of Ajade Community made it clear to the RAP team that, he has no right to obstruct the decisions made by the owners of the project and furthermore,

has communicated to the families that the realignment would affect. The Families to be affected by the new line were also present at the meeting according to the Baale.

Further questions were asked by Ibrahim Aderibigbe Fashola, who wanted to know the date for commencement of the exercise, Mr. Kolawole responded, saying that it will begin immediately after the meeting. Mr. Michael Taiwo asked if there is compensation for those whose houses were marked before the realignment.

One of the community members, Mr. Adekunle reacted to the question by saying that since the assets on ground will no longer be affected, there will be no any form of compensation. Mrs. Adekunle Abeni asked if fallow lands will be compensated for, Mr. Kolawole responded by saying that compensation is only for assets that were on ground and that would be affected during the cause of carrying out the project be it a structure, cash crops, economic trees or any source of livelihood, and that fallow lands are not compensated for. Mr. Taliatu asked why the project was shifted to outskirts of the community; Mr. Okoh explained that, it was in line with people choice and International Best Practices.

In retrospect, Mr. Jolaoso showed concern on the previously marked structures, asking if they will be affected, Mr. Okoh made him to understand that since the power line project has taken another route, the previously marked structures will not be affected and therefore, no compensation will be paid to them.

In conclusion, the community leader and the youth leader further appreciated the consultant (RAP team) for the community consultation meeting. The meeting ended at about 3:10 pm. *Table 4.5*

**Table 4.5: Consultation at Ikereku Communitie**

|  |   |
|--|---|
| Meeting date                             | 3 <sup>rd</sup> February, 2018  |
| Meeting venue                            | Ikereku community   |
| Attendance                               | The meeting was attended by the Community leaders, Community members, PAPs within the project area, RAP Assistant Coordinator and the Team Consultants  |
| Preamble                                 | <p>The meeting commenced with an introduction by the Resettlement Action Plan (RAP) Assistant coordinator, Mrs. Edna Okoh who thanked the communities who had gathered for the scheduled consultation. She sensitized them on the essence of the project in which their community has been identified for total resettlement.</p> <p>According to her, critical issue of concern regarding the involuntary resettlement community is as result of the transmission line route which has positioned the community in between an already existing power line and the proposed power line. She probed for the opinion of the community members especially the PAPs on their decision to be totally resettled as the ongoing project is such that considers the safety and livelihood of people living within the project encroached area.</p> <p>She also inquired to know if they have any choice of location for their resettlement as this will help during the RAP preparation and further requested to know the concerns of the people as their suggestions, questions and contributions where addressed accordingly.</p> |
| Response and Perception of the community | One of the PAPs said that they have a place to be relocated but the cost of relocation should be accrued to the responsibility of the project proponents.   |
| Conclusion                               | An inventory was taken on the affected area and structures in which the PAPs comprise of three families. The RAP Assistant coordinator suggested that a meeting should be held among the PAPs in order to come up with a concrete resolution regarding the process of their relocation.   |

## **CHAPTER FIVE: SOCIO-ECONOMIC BASELINE OF THE PROJECT AREA AND PROJECT AFFECTED PERSONS**

### **5.1 Introduction**

This socio-economic data in this section is largely derived from our Environmental and Social Impact Assessment study which field work took place in the month of December 2017. Other sources of information are also referenced.

### **5.2 Socio Economic Baseline**

#### *Methodology*

Data gathering for the baseline information as reported in this RAP was carried out by our firm during the field work for ESIA. The socio-economic baseline study starts with some reviews and desktop studies of various reports on Nigeria. This provides the context within which the baseline information about Ogun State, the affected Local Government Areas (LGAs) and the immediate settlements around the project site will be appreciated. Finally, mostly data in statistical representation and charts, reflected in this ESIA, were obtained from structured consultations with the traditional rulers, community heads, and officials of the LGAs as well as members of the affected communities.

Human environmental baseline data was gathered using a combination of desktop studies and field surveys. It covers the following social components: demography, land uses, land ownership, administrative and socio-cultural institutions, infrastructures, economics and livelihood, cultural heritage and health.

The baseline socio-economic and health status of the project area was assessed using questionnaires distributed to not less than 50% of the people in the affected

communities (because members of the affected communities were quite few). The data was supplemented by interview of selected adults and youths in each community. A total of five hundred (500) community members and health personnel within each community were interviewed between 16<sup>th</sup> and 23<sup>rd</sup> of December 2017.

*a. Stakeholder Engagement and Consultation*

The communities were first visited and the Chiefs, Elders, Youth leaders and women leaders were contacted. Various meetings were held with these groups on the need for the studies. They were then mobilized to co-operate and participate in the survey. The process of consultations with members of the communities continued throughout the study and is even to continue in the course of execution of the transmission power line plant project in the communities.



**Olorunsogo, Lerin, Ita-Alaji, Akilagun consultation**



**Abese, Soderu Consultation**

**Plate 5.1: Socioeconomic Consultation with the affected communities**



**Oba Eerin consultation**



**Ijumo Ologbomi consultation**



**Women group consultation**



**Youth group consultation**

**Plate 5.2:** Socioeconomic Consultation with the affected communities

***Recruitment and Training of Field Assistants***

With the approval of the community leaders, educated and literate members of the communities were recruited and trained as field assistants in the administration of questionnaires and to conduct the study team round the communities.

***Socio-economic data collection***

This was done mainly by the use of a well-structured questionnaires which addressed all the socio-economic issues e.g. occupation, income, marital status and marriage practice, educational status, historical data, Natural resources management, social groups, land use and on infrastructures like housing, markets, schools, hospital type of water, electricity, roads and other baseline socio-economic data.

***Health Data Collection***



The administered health questionnaires contained questions addressing the socio-demographic data; housing; infrastructure and physical environment; health and well-being including current prevalent communicable and non-communicable diseases; health seeking behaviours, nutritional status; occupational health, lifestyle and social habits as they affects health. Adults, children and infants in the surveyed households were physically examined. Some of the parameters assessed were weight, and height (with which the Body Mass Index was calculated) hair quality and colour, the eyes, skin, ear, mouth, breath and heart sounds, breasts and abdominal examinations. The various disease ailments seen were recorded. Other parameters assessed were common adult and childhood diseases, immunization status, physical body assessment and general appearance of the individuals.

#### *Assessment of Available Health Care Facilities*

The local hospitals/clinic and other orthodox health establishments where available in the communities were visited and their health data and records were obtained. Some of the parameter obtained are as follows:

- Types and number of health professionals
- Types of available equipment
- Types of health services available for the communities
- In-patient and Out-Patients records
- Types and conditions of health infrastructure
- Administrative structure
- Logistic /accessibility of the health facilities to the community members
- Utilization of the facilities as well as baseline health parameters.

#### *Sampling Technique:*

The socio-economic and health questionnaires were administered to the households. A cross sectional stratified random survey method was employed. Questionnaires were administered to 15% of the adult population (i.e. 39% of the total population). A total of 500 questionnaires were randomly administered to adults in the different communities. The study team ensured that the entire communities were covered.

### *Focus Group Discussions (FGD)*

These were held separately with male elders, youths and women groups. All socio-economic and health issues and how they have been affected by previous development projects as well as what is to be expected in the current project were discussed. The felt needs of the communities, and possible ways of mitigating against the identified possible negative impacts due to the negative environmental effects that may arise in the transmission line projects in all the neighbouring communities were also discussed.



**Plate 5.3: Focus Group discussion with adult men and women**

**Source: Godirra Chemicals Fieldwork, 2017/2018**

Appendix4:Attendance List : 個人情報保護のため非公開

(2) Meeting minutes, Register of Signature and Photo  
in Lot 2

## **4.12. Stakeholder Consultation**

### **4.12.1. Objective**

Consultation is the process of seeking information from parties or persons (stakeholders) affected by or having environmental responsibilities or interests about the environmental implications of project activities (Lee and Wood, 1995; Nwafor, 2006). It is designed to establish open and interactive communication that will elucidate community and environmental concerns and proffer appropriate mitigation options for all identified negative impacts. It involves information dissemination and interaction/dialogues with the affected communities and other stakeholders on the ESIA of the proposed project. Interaction with people and eliciting feedback allows the affected populations to influence the decision-making process by raising issues that should be considered in project design, mitigation, monitoring and management plans; and the analysis of alternatives.

Stakeholder identification and consultation at an early stage of an EIA is considered critical in the assessment of interest, concerns, relationships, assumptions, their level of influence and the ways in which they affect project risks. Previous experience shows that certain potentially contentious issues (such as land acquisition, relocation and resettlement) never get to the public domain if the correct consultation process is maintained from the conceptual stage of any development. A number of regulatory bodies including the World Bank (Operational Directive (OD) 4.01), International Finance Corporation (IFC), Nigeria Federal Ministry of Environment (FMEnv) and JICA also require that affected groups and non-governmental organizations (NGOs) be consulted as part of the environmental assessment of projects and particularly those with potentially significant impacts.

The primary purpose of consultation is to protect the interests of affected settlements, especially the poor and vulnerable and ensure project sustainability. This process gives room for effective discussion, dialogue and agreements amongst all parties interested in or are to be affected by a proposed project. The overall result would be the optimization of the potentials of the proposed project and maximization of its benefits. Furthermore, it ensures that any fear or apprehension about the nature, scale and impact of the project shall be addressed fully; hence eliminating costly delays.

In accordance with the regulatory requirements, consultation was accorded high priority in the proposed project planning and pre-development activities as an integral part of the Environmental and Social Impact Assessment (ESIA) of the proposed project. The consultation programme was set up prior to baseline data gathering to ensure that stakeholders were involved from onset and duly informed on progress of the works, and that the concerns (issues) raised by the stakeholders, with regard to the project works, could be identified and addressed. The issues were fed back into the EIA process and tied into environmental and social sensitivities that were used in the description of potential impacts.

### **4.12.2. Stakeholder Information and Consultation Rounds**

Three stakeholder information and consultation rounds were planned, and two has been implemented through the development of the line route survey, the ESIA study and RAP of this project. They were planned according to key stages, or decision moments, throughout the

study where the informed participation of stakeholders were likely to make the most significant contribution to the success of the project.

These included the scoping stage (1st round), the preliminary route assessment and the documentation of the affected communities and displaced households stage (2nd round). The third round of consultations is scheduled for the disclosure of ESIA Draft Report which will be anchored by Federal Ministry of Environment (3rd round).

Table 4.12.1 outlines the studies' stakeholder engagement process and presents, for each consultation round, the specific engagement objectives, target groups and implementation periods.

**Table 4.12.1 Stakeholder Consultation Implementation**

| <b>ROUND</b>  | <b>OBJECTIVES</b>  | <b>TARGET GROUPS</b>   | <b>IMPLEMENTATION PERIOD</b>                        |
|---|--|--|---|
| Stage 1:<br>Environmental<br>and Social<br>Scoping  | Present the project and the ESIA process to key authorities;<br>Identify key issues, concerns and expectations related to the project and study area;<br>Complete the stakeholders' list and validate the general approach for consultations.  | Transmission Company of Nigeria (TCN)<br>Concerned Ministries<br>State and LGA Administration<br>Customary Chief's of areas affected by the line<br>National Conservation of Nigeria   | May/June 2017                                       |
| Stage 2: Line<br>Route<br>Survey/ESIA/<br>RAP Stage | Involve key stakeholders in the analysis of the « hot spots » identified along with the provisional line route.<br>Inform affected communities and involve them in environmental and social optimization of the line route;<br>Identify the concerns and expectations of affected communities, displaced households and women;<br>Inform affected households of their rights and options for resettlement. | Transmission Company of Nigeria (TCN)<br>Concerned ministries<br>Local authorities<br>State-level and LGA-level authorities and technical services.<br>Affected people and their leaders.<br>Women representatives.<br>Customary chiefs. | Oct./Nov. 2017                                      |
| Stage 3:<br>Disclosure of<br>ESIA Report            | Ensure compliance of the proposed measures with the requirements of regulatory authorities;<br>Evaluate the social acceptability of the project and its proposed measures.   | Federal Ministry of Environment<br>Transmission Company of Nigeria (TCN)<br>Concerned ministries at national and state levels.<br>Local authorities and community leaders from affected LGAs.<br>NGOs                                    | To be determined by Federal Ministry of Environment |

### 4.12.3. Stakeholder Identification and Mapping

Two main categories of Stakeholders have been identified:

- Primary stakeholders - are those that will be directly or indirectly affected by the project; and
- Secondary stakeholders - are those having an interest in the project or the ability to influence its outcome, either positively or negatively.

In the case of the project, the scenario is such that the land is acquired from the leaders and members of the affected communities who have consented. These communities have been informed and have agreed to release the portions covered by the transmission line and substations based on adequate compensation. However, it should be noted that land in Likosi substation had already been acquired by TCN since 2008 and it is expected that no compensation will be paid on Likosi land. This historical fact may influence the list of stakeholders. Hence, the next few paragraphs will discuss the identified stakeholders for the transmission lines and substations as well as indication of their stake in the project.

#### *a. Government Authorities*

Federal and State governments as well as Local government constitute important stakeholders within the projects engagement framework. Some are regulators who issue the necessary permits while others may provide information on demography, climatic conditions, etc. Engagement with these agencies must live throughout the project life span. During this scoping phase of this project, the following stakeholders were identified.

- Federal Ministry of Environment (FMEnv), Abuja;
- The Federal Ministry of Power, Works and Housing, Abuja;
- The Nigerian Electricity Regulatory Commission (NERC), Abuja;
- The Ogun State Team;
- The Nigerian Gas Company (NGC);
- Energy Commission of Nigeria (ECN)
- Nigerian Railway Corporation (NRC)

The Project falls within four LGAs located within Ogun state. TCN together with the consultants engaged with the relevant council departments of the LGAs and asked them to consider the project activities in the wider planning for the LGAs. In addition, the following Ministries and Ministerial Agencies within Ogun state and Federal Government will be engaged throughout the project lifecycle to ensure that they are kept informed and are given an opportunity to provide input in their respective planning areas

#### *b. Communities and Traditional Institutions*

Traditional institutions, their councils and the leaders of the social groups in the community (such as women, youths, market women and local farmers) is engaged on a continu The last sentence in this section has actually answered the question about how the vulnerable groups were treated during the survey. Meetings with these groups follow local practices and norms and is held prior to any wider communication in the villages in order to respect the traditional structures. The Project affected communities so far identified are listed in Table 4.11.3

#### *c. Vulnerable Groups*

Typical Corporate Social Responsibility (CSR) initiatives are designed to favour these groups as much as practicable. Women have been identified as vulnerable group for the project, due



to their economic vulnerability and inability to participate in decision-making processes within the traditional context. Women in the project area are not always able to attend or speak freely at open meetings and/or may have household restrictions on when they are able to attend such meetings. In most of the community's consultations women were given privilege to participate and make contributions. Some of them were engaged in special interviews to have an in-depth knowledge of their plights and their concern.



**Plate 4.12.1: Interview with Physically Challenged Man at Ologbun Community**

Other potential vulnerable groups identified as part of the EIA include the elderly, youth and migrant farmers. Vulnerability of these groups is also based on reduced opportunities to participate in local decision-making, as well as their economic vulnerability, particularly with regard to employment. As such, engagement activities have been designed to ensure representation of these groups among stakeholders, and to seek to understand potential project interactions with their livelihood opportunities and agency within the communities.

#### ***d. Non-Governmental Organizations (NGOs)***

NGOs are organisations which declare interest in a given project and try to influence decisions on such projects through direct contact or public opinion. NGOs may also have data and insight into the dynamics of a given project and may become useful partners in the project. The main mechanism for engagement with relevant NGOs germane to the project will be through face-to-face meetings at key stages of project development (during the EIA and at the onset of construction). NGO (NCF) was involved during scoping of this study to contribute how the project will be executed without issues that can affect the masses and environment.

It is important to note that stakeholder identification is an ongoing process, and thus stakeholders will continue to be identified during different stages of the project. Table 8 presents the main stakeholder groups

**Table 4.12.2: List of identified stakeholders**

| Stakeholder Groups   | Primary Stakeholders   | Secondary Stakeholders   |
|--|--|--|
| Neighbouring/Host Communities<br>(See Table 4 for the list of communities) | <ul style="list-style-type: none"> <li>Communities living along the Transmission Lines and close to the substations site ;</li> <li>Other communities within the project area of influence;</li> <li>Vulnerable groups within these communities; and</li> <li>Workforce recruited from the communities.</li> </ul> | <ul style="list-style-type: none"> <li>Village Head ('Baale');</li> <li>Community Development Association;</li> <li>Religious leaders;</li> <li>Village elders; and</li> <li>Sagamu, Ewekoro, Obafemi Owode and Ifo LGAs</li> </ul>  |
| Institutional Stakeholders   | <ul style="list-style-type: none"> <li>Social infrastructure, like schools, health facilities and emergency services.</li> </ul>   | <ul style="list-style-type: none"> <li>Political Parties; and</li> <li>Project investors (TCN, JICA).</li> </ul>   |
| Regulatory Authorities   |  | <ul style="list-style-type: none"> <li>Federal Ministry of Environment;</li> <li>The Federal Ministry of Power, Works and Housing, Abuja;</li> <li>The Transmission Company of Nigeria (TCN), Abuja;</li> <li>Ogun State Team</li> <li>The Nigerian Gas Company</li> <li>National Environmental Standards and Regulations Enforcement Agency (NESREA)</li> </ul> |
| Other Groups   |  | <ul style="list-style-type: none"> <li>NGOs and Civil Society;</li> <li>Media;</li> <li>Other projects in the area; and</li> <li>Universities and other institutions doing research in the area.</li> </ul>  |

Table 4.12.3 below gives an overview of the stakeholder groups and their concerns, expectations and influence on the Project.

**Table 4.12.3: Stakeholder Mapping**

| Stakeholder Category | Relevant Stakeholders   | Profile/Status   | Concerns surrounding the Project                                | Expectations from the project                                | Nature of influence on Project                          |
|----------------------|---|--|---|--|---|
| Primary              | Communities living along the Transmission Lines and close to the substations site | These communities may directly be impacted by the project and may experience cumulative impacts    | Additional impacts and risks to existing situation.             | Support in social infrastructure and employment at the site. | Protest and/or causing delays.                          |
| Primary              | Other communities within the Project area of influence.                           | Directly impacted by cumulative impacts and risks from Lafarge's site with past impacts and risks. | Additional impacts and risks to existing situation.             | Support in social infrastructure and employment at the site. | Protest and/or causing delays.                          |
| Primary              | Construction labour force recruited from the communities.                         | Temporary employment and income from construction activities.                                      | Labour and Working Standard risks and employment opportunities. | Employment and good wages.                                   | Protests if employment opportunities are disappointing. |
| Secondary            | Community.  | - Discussion of community concern;   | - Youth empowerment;  | - Youth empowerment;   | Protest and/or causing delays.                          |

| Stakeholder Category | Relevant Stakeholders  | Profile/Status  | Concerns surrounding the Project  | Expectations from the project  | Nature of influence on Project       |
|----------------------|--|---|---|--|--------------------------------------|
|                      |  | <ul style="list-style-type: none"> <li>- Discussion with the vulnerable groups, women and youths;</li> <li>- Discussion on TCN workers integration into the community; and</li> <li>- The need for a grievance mechanism throughout the project.</li> </ul>               | <ul style="list-style-type: none"> <li>- Provision of basic social amenities and infrastructure; and</li> <li>- Influx of workers.</li> </ul> | <ul style="list-style-type: none"> <li>- Provision of basic social amenities and infrastructure; and</li> <li>- Compensation.</li> </ul> |                                      |
| Secondary            | Federal Ministry of Environment.   | <ul style="list-style-type: none"> <li>- Registration of the Project;</li> <li>- Scope of data collection and ToR approval;</li> <li>- Issues concerning site visits;</li> <li>- ESIA process and scope of the ESIA</li> <li>- Approval for one season waiver.</li> </ul> | No concerns on the status of the project.   | Submission of Draft Report and processing fee payment.<br><br>Panel review meeting as part of third stage stakeholder consultation       | ESIA Permit.                         |
| Secondary            | Transmission Company of Nigeria.   | Transmission of generated power to the national grid  | <ul style="list-style-type: none"> <li>- Transmission Line (TL) and Substation operation;</li> <li>- MOU between TCN and JICA</li> </ul>      | <ul style="list-style-type: none"> <li>- Agreed MOU;</li> <li>- Approved TL design; and</li> <li>- Approved Substation site</li> </ul>   | Permit and Execution of the project. |
| Secondary            | Federal Ministry of Works, Power and Housing.  | Moderation of parties involved.   | MOU between TCN and JICA  | <ul style="list-style-type: none"> <li>- Agreed MOU; and</li> <li>- Electricity supply.</li> </ul>                                       | Permit and Execution of the project. |
| Secondary            | Nigerian Gas Company/ Nigerian Railway Corporation   | Meeting with TCN on the RoW acquisition.  | Transmission line alignment design.   | Notification on transmission line construction.  | Project execution.                   |
| Secondary            | Ogun State Ministry of Environment; and<br><br>Ogun State Environmental Protection Agency (OGEPA). | Compliance monitoring of approved ESMP.   | Environmental degradation.  | Compliance with approved ESMP.   | Project execution.                   |
| Secondary            | National Environmental Standards and Regulations Enforcement Agency (NESREA).                      | Compliance monitoring of approved ESMP.   | Environmental degradation.  | Compliance with approved ESMP.   | Project execution.                   |
| Secondary            | Local Government Area (LGA)/ Local Council Development Authority (LCDA)                            | <ul style="list-style-type: none"> <li>- Engagement with affected communities;</li> <li>- Potential positive impacts (employment opportunities for local people and provision of electricity); and</li> <li>- Community Development.</li> </ul>                           | Environmental degradation and community development programme implementation.   | Compliance with approved ESMP and implementation of community projects.  | Project Execution.                   |

The host Local Government Areas are: Ifo, Ewekoro, Obafemi Owode and Sagamu and the host communities include those listed in Table 4.3.4. Pre-entry consultations were held with the Executive Councils, Elders and Youths of the host communities between December 15 and 16 at Local Government Secretariat. During these periods discussions and consultations enabled the stakeholders to be informed of the intent of the proponent and a collection of the views of the people about the proposed project.

#### **4.12.4. Consultation Activity**

The summary of consultation activity conducted to date are given in Table 4.12.4. The detail is provided in Appendix 5.

**Table 4.12.4: Stakeholder Engagement Activities to Date**

| Stakeholder Engagement  | Engagement Activity                             | Stakeholders  | Number of Participants | Venue   | Date/Time                                       | Specific Discussion Areas  |
|---|---|---|------------------------|---|---|--|
| <b>STAGE 1: SCOPING</b>   |   |   |                        |   |   |  |
| Government Agencies – Federal, State and Local Government Authority Regulatory Authorities. | Meeting with State and Local Council Officials. | Federal Ministry of Environment, Abuja.                       | 6                      | Environment House, Abuja  | May 10, 2017<br>July 11, 2017                   | <ul style="list-style-type: none"> <li>Registration of the Project;</li> <li>Scope of data collection and ToR approval;</li> <li>Issues concerning site visitation;</li> <li>EIA process and scope of the EIA;</li> <li>Approval for one season waiver; and</li> <li>Approval for the substation and the lines.</li> </ul> |
|   |   | Ogun States   | 35                     | Governor’s office Secretariat   | May 3, 2017<br>Every last Thursday of the Month |  |
|   |   | Sagamu, Ewekoro, Owode Obafemi & Ifo LGA                      | 7                      | Each Secretariat  | November 19 -30<br>January 10, 2018             |  |
| <b>STAGE 2: Line Route survey/ESIA/RAP Studies</b>  |   |   |                        |   |   |  |
| Government Agencies – Federal, State and Local Government Authority Regulatory Authorities. | Meeting with Traditional Rulers and Youths.     | The head and chiefs of host communities.                      | 129                    | Each host community as in Table 4.11.3  | December 18 -23, 2017                           | <ul style="list-style-type: none"> <li>Formal presentation of the project;</li> <li>Discussion of community concern; and</li> <li>The need for a grievance mechanism throughout the project life.</li> </ul>   |
|   |   | Sagamu South; Sagamu West and Ofada/Mokoloki LCDAs and others | 155                    | Sagamu South LCDA Secretariat, Ejio Town Hall and Ofada/Mokoloki LCDA Secretariat | December 15-16, 2017                            | <ul style="list-style-type: none"> <li>Engagement with affected communities;</li> <li>Potential positive impacts (provision of electricity and employment of opportunities for local people; and</li> <li>Community development in general.</li> </ul>   |
|   |   | Federal Ministry of Environment,                              | 18                     | Redemption Camp   | July 11, 2017                                   | <ul style="list-style-type: none"> <li>Issues pertaining to appropriate location of the Substations</li> </ul>   |

ESIA for the Proposed Lagos and Ogun States Transmission Lines and Associated Substations Project (Lot 2)

|                                 |  |    |                          |                   |   |
|---------------------------------|--|----|--------------------------|-------------------|---|
| Non-Governmental Agency (NGO) – | Abuja.                                 | 10 | Redemption Camp          | December 20, 2017 | <ul style="list-style-type: none"> <li>Engagement with Redeem Officials to take decision on the appropriate substation location</li> </ul>  |
|                                 | Nigerian Conservation Foundation (NCF) | 12 | NCF Office, Lekki, Lagos | March 7, 2018     | <ul style="list-style-type: none"> <li>Discussion on potential impacts of proposed projects on biodiversity</li> <li>NCF shows their interest for the collaboration of TCN's project if there is any opportunity</li> </ul> |



**Plate 4.12.1: Meeting with Bales at Likosi axis**



**Plate 4.12.2: Monthly progress meeting with Ogun State team**



**Plate 4.12.3: Meeting with Dejuwo/Alado/Mosu community**



**Plate 4.12.4: Stakeholder engagement meeting at Ejio town**



**Plate 4.12.5: Meeting at Ewusi Place, Sagamu**



**Plate 4.12.6: Stakeholder engagement meeting at Likosi/Redeem axis**



**Plate 4.12.7: Stakeholder meeting at MFM/Ofada axis**



**Plate 4.12.8: Meeting with Jaguna Community**



#### 4.12.5. Outcome of the consultation

**Table 4.12.5: Stage1- Scoping Stage**

| Topic                      | Concerns, Comments and Recommendations   | Stakeholders having made the comment / recommendation | Actions to Address Concerns  |
|----------------------------|--|---|--|
| Location of Proposed Sites | Some sites are under acquisition while others are free. The ones that are free, Government will acquire for the project in the interest of the public but the project will be responsible for the processing charges.  | OGSG/ Bureau of Lands and Survey                      | The lands needed will be compiled and sent to OGSG   |
|                            | The Governor mentioned need to raise the lines where crossing rail lines eg. Lagos –Ewekoro (Lafarge Cement) rail line at Apomu village  | Bureau of Lands and Survey                            | This shall be included in the EPC contract   |
| Project Components         | Requested additional substation besides Lot 1,2 &3 project components. These are as follows; <ul style="list-style-type: none"> <li>In Ijebu Area, which will be in Obere to feed Ogun East.</li> <li>Aiyetoro to feed the communities along Benin Border, Idi-Iroko, Waasimi axis.</li> </ul> The State Government will provide land and fast track approval of the substation sites and RoW acquisition, while TCN will pay for the processing only. | Department Power/Energy, Governor’s Office            | TCN explained that there will be no need for building substations as the proposed substations will be sufficient for the areas mentioned. All that is needed is to invest in distribution infrastructure |
| Substations Sites          | <b>Likosi/Dejuwogbo</b> – Confirmation of Survey plan because of trespasser. TCN needs to send survey plan in order to know the steps to take possession of TCN acquired land<br><br><b>Redeem and MFM Substations:</b> - Preparation and signing of MOU between the parties   | Ogun State Team/ TCN Team                             | Application along with supporting documents will be prepared and submitted   |
| Transmission Lines Row     | <b>Ejio – Likosi/Dejuwogbo</b> – Issue of approval for the Transmission Line (TL) to pass through Makun City Estate<br><b>Likosi- Existing Sagamu/Ikorodu</b> – Confirmation of proposed Omotosho- Benin 330Kv DC TL coordinates   | Ogun State Property Investment Corporation (OPIC)     |  |

**Table 4.12.6: Stage2- Line Route Survey, ESIA and RAP studies**

| <b>Topic</b>                 | <b>Concerns and Comments</b>   | <b>Stakeholders having made the comment / recommendation</b>                                 | <b>Actions to Address Concerns</b>  |
|------------------------------|--|--|---|
| <b>Social Infrastructure</b> | There is a general concern regarding the provision of basic social infrastructure and amenities such as health facilities, schools, and potable water supply. These facilities are grossly inadequate in the affected communities  | Affected Communities Leader  | The participants were informed that the project will attract development to the communities.  |
| <b>Health and Safety</b>     | <ul style="list-style-type: none"> <li>• Concern on the likely problem for the neighbouring communities and the fear that the project would not generate additional problems like vibration, noise, EMF and gaseous emission;</li> <li>• Concern on health hazard and EMF effect; and</li> <li>• Hoped that the substations would be built in line with the highest safety standards and would create the minimum disruption to communities</li> </ul> | Affected Communities (Community Leader, Women Leader Youth Leader)                           | The interests and concerns of the community will be put into consideration. Their project will be executed with the highest standard and in a way that their safety and health will not be jeopardized.   |
| Electricity                  | <ul style="list-style-type: none"> <li>• Non-availability of power to aid artisanship, thereby affecting quality of life.</li> <li>• Where available, power supply has been irregular</li> </ul>   | Affected Communities (Community Leader, Women Leader Youth Leader)                           | The participants were informed that the transmission line will evacuate power to the substations which will in turn step it down before it is distributed through the national grid where it will get to the populace and enhance the quality of life.  |
| Compensation for lost assets | The issue of fair and adequate compensation was raised in virtually all communities especially for those whose occupation will be affected by the TL RoW   | Local Government Chairmen/Affected Communities (Community Leader, Women Leader Youth Leader) | The stakeholders were informed that the project already has in place a RoW acquisition process which includes enumeration, valuation and compensation. They were informed that this process will be followed with community survey to ensure that all affected persons are identified and included in the compensation program. They were also assured that compensation payment will be in line with current market prices. In |

| <b>Topic</b>      | <b>Concerns and Comments</b>   | <b>Stakeholders having made the comment / recommendation</b>  | <b>Actions to Address Concerns</b>  |
|-------------------|--|---|---|
|                   |  |   | <p>addition, a grievance redress mechanism will be developed and communicated to all affected parties in case there are issues</p>  |
| <p>Employment</p> | <ul style="list-style-type: none"> <li>• Requested that some of their indigenes who are qualified are given special consideration in employment so as to forestall a situation whereby their folks can only be labourers; and</li> <li>• Appeal for employment of their youths in order to give empower them economically</li> </ul> | <p>Local Government Chairmen/Affected Communities (Community Leader, Women Leader Youth Leader)</p> | <p>The participants were informed that a Community Relations and Engagement Plan will be developed prior to project commencement that will cover all terms and modalities of engagement to ensure that affected communities are equitably represented</p> |

## **APPENDIX 5**

**(ATTENDANCE SHEETS AND MINUTE OF MEETINGS)**

Attendance Sheetsは個人情報保護のため非公開

## **Minutes of the Consultation with Baale, Community Representatives and Stakeholders in Ejio Community on 15<sup>th</sup> December, 2017**

### **1. Opening**

The meeting commenced at 3.30pm with an opening prayer. At the meeting were the Elejio of Ejio Community, and members of his cabinet, Baale of most of the settlements along the Transmission Line and more than 100 other members of all the affected communities.

The Paramount ruler of Ejio community, the Baales (Head of villages and settlements along the Transmission line from Ejio to Likosi) and the key stakeholder were introduced.

### **2. In Attendance (See the attached list above)**

### **3. Meeting objectives**

- i. To inform the community members and the stakeholders about the proposed Transmission Line project
- ii. To explain the likely impacts of the project on portions falling within the Right of Way (RoW)
- iii. To obtain their concerns with regards to the effects of the proposed project on their land, economic trees, structures (completed and uncompleted) and business
- iv. To explain the likely effects of the project on existing utilities and what will be done to mitigate the effects
- v. To inform the community members about the mode of valuation of compensation and how grievances will be addressed.

### **4. Project Description**

The project team among whom are TCN representatives (including the Project Manager and Project Coordinator), Consultants from SEEMS Nigeria Limited (the firm handling the project) and representative of Ogun State Government were introduced.

After the introduction, the Project Manager gave an overview of the project and took time to explain the reason why the stakeholder engagement is necessary. He informed the participants about the various stages and phases of the projects. The participants were informed that the entire project is divided into three LOTs and that SEEMS has been given LOT2 under which Ejio community falls. The essence of ESIA was explained which include assessment of the likely impacts of the projects and suggestions on how any identified negative impacts arising from the project will be mitigated.

The Project Coordinator, reinforcing what the Project Manager told the participants requested for the cooperation and support of all affected communities and participants for the project. She informed them that in the next one week the consultants will be in the community for public consultation as part of Environmental and Social Impact Assessment (ESIA). This exercise according to her will involve interviewing some members of the community and conducting some tests.

The representative of Ogun State Government at the meeting reiterates the interest of the State Government in that project. He encouraged the community to give full support to TCN and all the consultants that will be working in the area. He appealed to Kabiyesi, the Elejio of

Ejio to ensure that the community members give necessary support to the project so that it can be executed successfully and without unnecessary interference.

### **5. Project Plan**

An overview of various activities that will take place as from Monday 18<sup>th</sup> December, 2017 and about Resettlement Action Plan (RAP) coming up early next year (specifically from January 8, 2018) was given. The participants were informed that some members of the affected communities will definitely lose portions of their land within the right of way (ROW) and properties therein to the project. They were however asked not to entertain any fear as those that will be affected by the project will be duly compensated for their losses.

He said the consultants will be in the area as from Monday 18<sup>th</sup> December for ESIA and to establish a baseline of existing conditions in the project area and assess proactively the potential impacts as well as associated impacts of the project. This exercise involves quantitative measure and characterization of basic environmental baseline indicators such as air quality, noise level, geology and soil, and hydrogeology etc. The participants were further informed that the team will interact with the owners of affected area and some members of adjoining settlements and as well engage some individuals in the area in social consultation and socio-economic enumeration. Meeting will also be held with community leaders and some key stakeholders during the period.

The participants were further informed the participants that there will be RAP from January 8<sup>th</sup>, 2018 to identify the people that the project will affect, so as to advice the project proponent (TCN) on measures that must be taken to mitigate the recognized impacts and settle the affected individuals. He noted that the fundamental principle guiding this exercise is that the proposed project should not leave affected people worse than they were before the project. So, in order to achieve the set objectives for transmission line and the Substation (that will be handled by another firm), survey teams will be on ground to identify the rightful owners of the affected portions of the affected land and properties. The affected individuals will be interviewed using questionnaires. The records of these individuals and their properties will be taken and their pictures will be linked to their properties.

### **6. Reactions and Comments**

The community leaders expressed their appreciation to the team for deeming it fit to acquaint them early enough about the proposed project. The participants requested to know the impact of the Substation and the Transmission Line on the community and how these impacts will be mitigated.

In response to this enquiry, Kabiyesi, the Elejio of Ejio informed the community members that SEEMS will only be handling the Transmission Line component of the project and urged all those that have properties in the site chosen for Substation not to worry as necessary dialogue is currently going on between the leaders of the community and the contractor handling the Substation project. The explanation of Kabiyesi, the Elejio concerning LOT2 (SEEMS) assignment in the area (coverage the route from Ejio to Likosi) was further highlighted by the team. They were reminded that the exercise is going to be in three phases – Line Route, ESIA and RAP. He said the consultants will be in the community as from Monday 18<sup>th</sup> for the EISA component of the project. However, he said RAP will take place early next year, specifically from January 8, 2018.

The Elejio then formally welcome the team to the community and asked the representative of the State Governor to extend the appreciation of the community to the government for their support and assistance to the community. He however expressed his concern for those that will be affected along the proposed line, especially those that will lose their properties. He therefore appealed to the project proponent to ensure that the affected properties are correctly evaluated and valued so that the affected individuals will not be surcharged. The Kabiyesi also used the opportunity to make some demands from the governments, most especially from the State government. He appealed to the government to fix the main road leading the community which is in bad shape.

One community member, Mr Julius Arigbabowo also expressed his appreciation to the government for the choice of their community for the project but requested that their leader, the Elejio of Ejio should be adequately carried along and be acquainted with all development pertaining to the projects.

Mr Oladipupo Odunayo wish to know how the youths of the community can be gainfully employed through the project. He also expressed the fear that their stream which is the main source of water in the community may be polluted during construction and so requested that the community be provided with pipe borne water.

Chief Olasode Oladokun expressed his appreciation to the team but asked if members of the community will be included among those that will be employed to execute the project. He requested that there should be memorandum of understanding (MOU) between the community and TCN.

To all the questions and issues raised, the spokesperson for the team reminded the participants that the essence of coming now was to inform the community about the project and get them acquainted with various activities involved in the execution the project. He informed them that the project has not reached the stage many of the participants are assuming. The next stage which will commence on Monday 18<sup>th</sup> December, 2018 will be to conduct ESIA and by early January to conduct RAP. He made them realize that there will still be series of consultations and meetings where some other important issues will be discussed. He reminded them that the government representative will take their request concerning the road, pipe borne water and other needs to His Excellency, the Governor of the State for consideration.

To the Mrs Oyebo question on know how the issue of compensation and property valuation will be handled, Professor informed the participants that the team that will be coming for RAP in January and will take adequate record of their land and properties. He told them that among the consultants coming for RAP are different professionals/experts including qualified Estate Surveyor, Land Surveyor, and Demographers/Socioeconomic experts. The Estate Surveyor will use appropriate measures based on existing standard to calculate whatever is due to each individual; each affected person will sign a form where the quantity and value of his/her properties will be recorded. His/her photograph will also be included in the form which will be countersigned by a witness and a recognized community leader.

The community youth leader asked question pertaining to the benefit the land owners who are not the owners of whatever is on the land will derive from the project. Professor Ogunjuyigbe answered this question by reminding the participants that records of whatever is

on the land will be taken, affected persons will be identified and whatever is due to each of the affected persons will be calculated and recorded in the RAP.

Finally, the team expressed its appreciation to Kabiyesi and to members of the Ejio community and other settlements along the Transmission Line for honouring our invitation and for expressing their readiness to cooperate with consultants when they are in the community.

**Closing:** The meeting ended with closing prayer at 05.45pm, Nigerian time.



## **Minutes of the Consultation with Baale, Community Representatives and Stakeholders in Ogijo (Likosi) Community on 16<sup>th</sup> December, 2017**

### **1. Opening**

The meeting started with opening prayer from Chief Lasisi Fatoba Olugbenga, Baale of Kogberegbe Community at 4.15pm. At the meeting were the Chairman of Sagamu West LCDA, leaders of various communities along Likosi-Ikorodu/Sagamu route, Youth leader and CDC Chairman and a sizeable number of members of affected communities.

### **2. In Attendance (see the List Attached above)**

### **3. Introduction**

The team members including those from TCN, SEEMS and representatives of Ogun State Government were introduced. The Secretary of Sagamu West LCDA, who acted as the Master of Ceremony introduced the Local Government Officials, Baale of affected communities and the other key stakeholders in attendance.

Thereafter, the Project Manager gave the project overview and highlighted the benefits of the projects to the communities around the area and the companies operating in the area. The Project Manager elaborated on how important Ogijo (Likosi) is to the project. He informed the participants that consultants from SEEMS will be in the area as from Monday 18<sup>th</sup> December, 2017 to conduct ESIA and RAP which will start early next year. He also used the occasion to introduce SEEMS, the firm that will carry out the assignment to the community. The Project Coordinator also made some remarks. She appreciated the participants for the warm reception and admonished them to give necessary support to all those that will be involved in the execution of the project. She also informed the participants that the consultants will be on ground as from Monday 8<sup>th</sup>, 2017 for consultation and come back in January 8, 2018 for RAP.

One of the Ogun State Government representatives conveyed the greetings of His Excellency, Governor Ibikunle Amosu to the participants. He highlighted how important the project is to the State Government and for the development of communities around the area. He, therefore solicited for the cooperation of all communities along the routes and affected communities.

The Chairman, Sagamu West LCDA in his welcome address expressed the appreciation of the Local Government to the State and Federal Governments for siting the project to their area. He also highlighted some of the benefits the project will bring to all communities around the area and therefore indicated the readiness of the Local Government to fully support the project. He gave an assurance that none of the affected communities will do anything to thwart the effort of government to develop the area by considering the area for the project. He however used the occasion to request for the assistance of governments in providing stable electricity and also to help fix the dilapidated roads within the LCDA most especially the main road that connects the LCDA to the major highway.

### **4. Project Plan**

The relevance of the project to the affected communities, especially with the presence of so many companies that will need electricity was elaborated. He said apart from the companies, people living in the area, especially the artisans will benefit a lot from the project when fully operational. He however said there can be no development without some impact (both positive and negative). Therefore the essence of this stakeholder engagement is to inform the participants about the various activities that will soon commence in the area and explain how negative impacts as a result of the project will be mitigated. He informed the participants that

SEEMS consultants will be in the area as from Monday December 8<sup>th</sup>, 2017 for ESIA. The ESIA that will start on Monday will involve consultations with some key stakeholders along the routes, conduct study on the existing conditions in the project area and assess the potential impacts and associated impacts of the project. He also informed them that as from January 2018, RAP team will also be around to conduct census of people and properties of the affected persons along the Transmission Lines. He told them that during the exercise, some youths from communities along the Transmission Line will temporarily be engaged as labour to assist those that will be conducting the ESIA and RAP. To allay the fears of some properties owners in the area, the participants were informed that the Chairman of the LCDA will always be consulted each time the consultants are in the area for the project.

## **5. Reactions and Comments**

Reacting to the question from Mrs Ajeh Gloria who wished to know if there is any opportunity for an independent Estate Surveyor to participate in the exercise, the team spokesperson said SEEMS Nigeria Limited which is a qualified firm that will execute the project will only work within the scope as provided by the project proponent. Fortunately, the firm has registered Estate Surveyor among the team that will conduct the RAP. So the question of independent Estate Surveyor may not arise. However, the consultants said any land owners who is interested in seeking for the assistance of independent Estate Surveyor can go ahead, but this is not known to the SEEMS and TCN.

One participants requested to know whether the affected persons will be allowed to ask questions when the exercise is ongoing regarding the boundary of the project and some other issues. To this question, our response was in affirmative. The properties owners are free to make enquiry and ask questions that are relevant to the project. However, the participants were informed that there are some questions that the Consultants may not be able to answer. Such question(s) will be referred to the project proponent. For instance, the consultants will not answer questions pertaining to ‘when compensation will be paid and how it will be paid’. But an assurance was given that all affected properties owners will be duly accounted for and the costing of their properties will be done by qualified Surveyor. This will be part of what will be in RAP report that will be submitted TCN.

Comrade Kehinde Segun and some members of the affected communities raised some issues pertaining to some exiting projects in the locality. Addressing this issue, the Project Manager advised them that in case of other time and to avoid unnecessary conflict, the community should endeavour to make enquiry about the company involved, type of project and seek for other necessary information.

The issue of location name was raised by Comrade Femi. He said the location name must be clearly specified to avoid confusion and crisis. He said three communities are claiming the ownership of the location where the substation will be sited – Dejuwogbo, Alado and Mosu communities. Mr Anjorin said at a particular time Alado was used as the name of the site. He therefore suggested that the name of community with larger portion in the affected site should be used. But this was opposed by some members of the affected communities. Chief Lasisi Fatoba also suggested that the place should be called Jagba since Sagamu area is known as Jagba. This was vehemently opposed by the participants. The Project Coordinator therefore suggested that the three concerned communities (Dejuwogbo, Alado and Mosu) should meet to resolve the issue. However, up till when the matter is resolved, the location will be known as Likosi.

Both Alhaji Sani and Chief Lasis Fatoba expressed the appreciation of the people of the area to government for bringing the project to their vicinity and promised to fully support the project. On behalf of the affected communities, Chief Lasis thanked the team for coming to clear some burning issues, provide necessary information and for carrying them along. Finally, the team thanked the participants for their patients, understanding and for expressing their readiness to support the project.

#### **6. Closing Remark**

The closing remark was given by Secretary, Sagamu West CDA and the meeting came to an end at 11.35 am with a closing prayer.

## **Minutes of the Consultation with Baale, Community Representatives and Stakeholders in Ofada Mokolojki LCDA on 16<sup>th</sup> December, 2017**

### **1. Opening**

The meeting started with opening prayer at 3.15pm. At the meeting were the Ofada/Mokoloki LCDA, the Baale and leaders of various communities along Likosi-Redeem/Sagamu route and some members of the LCDA in attendance.

### **2. In Attendance (see the Attached List above)**

### **3. Introduction**

The Chairpersons and all the key stakeholders in attendance were introduced. Thereafter, the visitors including those from TCN, SEEMS and representatives of Ogun State Government were introduced.

The Project Manager gave the project overview and specifically described the route and areas affected within the jurisdiction of the LCD. He solicited for the support of the LCDA for the project and the cooperation of members of affected communities for the SEEMS, the firm that will work on the MFM/Ofada axis of the project. He informed the participants that the consultants will be on ground as from Monday December 18, 2017 to conduct ESIA and will come back later in January 8, 2018 for RAP. Mrs Sako, the Project Coordinator in her remarks, highlighted the importance of the exercise to the community. She admonished the participants to give necessary support to all those that will be involved in the execution of the project.

The appreciation of Ogun State Government was conveyed to the people of the area for their support for government activities and programmes. He highlighted the relevance of the project to the State and for the development of communities around the area. He therefore solicited for the cooperation of the LCDA and all the affected communities for the project.

### **4. Project Plan**

The relevance of the project was explained to the affected communities in the area especially with the presence of so many companies that will need electricity. He informed the participants that SEEMS consultants will as from Monday December 8<sup>th</sup>, 2017 commence ESIA which is one of the major aspects of the projects. The ESIA that will start on Monday will involve consultations with some key stakeholders along the routes, conduct study on the existing conditions in the project area and assess the potential impacts and associated impacts of the project. He also informed them that as from January 8, 2018, RAP team will visit the area to conduct census of people and properties that will be affected by the Transmission Lines. To allay the fears of some properties owners in the area, the team promised that the Chairman of the LCDA will always be consulted each time the consultants are in the area for the project.

### **5. Reactions and Comments**

Virtually all the Baale and members of the various communities in attendance expressed their readiness to support the project by wish to be adequately compensated for any loss properties. Responding to the issues raised, the participants were promised that all individuals that may likely be affected by the Transmission Line will be accounted for and duly compensated.

The Chairman, Ofada/Mokoloki LCDA, Honourable Balogun in her remarks expressed the appreciation of the Local Government to the State and Federal Governments for counting the LCDA worthy and for the Transmission Line. She also highlighted some of the benefits the project will bring to the communities around the area and therefore indicated the readiness of

the LCDA to give full support to the firm that handle the project. She allayed the fears of the people of the area by reiterating the readiness of government to adequately compensate those that will be affected by the project but warn the inhabitants not to put up any new structure along the RoW. She also used the occasion to solicit for government assistance in fixing the main road that pass through the LCDA and ensure adequate supply of electricity to the area. The Kabiyesi of Abisodun, one of the affected communities appreciated the team for coming and for carrying them along. He prayed that all will be well.

#### **6. Closing Remark**

The closing remark was given by Dr Abiodun Sorunke and the closing prayer was said by Mr Olaniyi Saheed. The meeting came to an end at 5.15 pm with a closing prayer by Mr Olaniyi Saheed.

## **MINUTES OF PROGRESS MEETING FOR LAGOS/OGUN STATES TRANSMISSION LINE AND SUBSTATIONS PROJECTS HELD ON 26<sup>TH</sup> OCTOBER, 2017**

**Venue:** Ogun State Government Secretariat, Room 138, Block C, Oke-Mosan, Abeokuta

**1. Attendance:** Attached

### **2. Opening:**

The Project Manager was unavoidably absent. In his absence, the meeting was coordinated by Consultant to Ogun State Government on Power and Energy who welcomed members to the meeting and prayed for a fruitful deliberation.

The meeting commenced at about 11.14 am with a short opening prayer from Consultant to Ogun State Government on Power and Energy. This was followed with the introduction of members. Thereafter, the minutes of last meeting held on 29<sup>th</sup> September, 2017 was presented by LOT 1 representative. Motion for adoption of the minutes was moved by Mr Fagbemi and seconded by Engineer Balogun.

### **3. Matters Arising**

Before the adoption of the minutes, a number of amendments were made; among these are the following:

- i. The attention of the meeting was drawn to a motion adopted at the last meeting where it was decided that names of members that move motion for adoption of minutes of any of the subsequent meetings should be mentioned.
- ii. It was noted that the section on ‘matters arising’ was missing from the minutes
- iii. On page 2, paragraphs 2 of the minutes, corrections were made on issue pertaining to Ejio Substation. The Environmental Coordinator reported that she had been mandated to inform those concerned about this matter that Ejio Substation will now be handled by LOT3 simply because substantial grounds had been covered by the team.
- iv. The statement on page 3, paragraph 2, was corrected to indicate that ‘all letters that should have been forwarded to Ogun State Government had been written and sent as appropriate’.

The Coordinator thereafter requested each of the LOTs to give the updates on their activities starting with LOT1.

### **4. Consultants’ update**

#### **LOT1 Update**

Corrections on the Line Route Survey have been concluded and physical assessment had been carried out by TCN, Ogun State Representative and the consultant. The inspection was carried out on the 25<sup>th</sup> of October, 2017. Necessary corrections had been effected. Some of the hotspots discovered were visited.

Based on the visitation, it was recommended that the line route should align with the same corridor with EEMS (LOT3). On the line coming from Olorunsogo Power Plant to Ejio Sub-Station, two hotspots were discovered; these are Oil Palm Plantation and a University that had already been surveyed. However, it was reported that necessary efforts will be made to

meet with the Baale of the concerned community. Also, it was suggested that the clearance of 45m should be maintained and should not be reduced.

It was recommended that the angle on the line coming from Abeokuta Substation at Kobape to New Abeokuta should be removed and the steep along the line should be avoided.

The meeting solicited for the support of Ogun State Government to help identify the owners of those hotspots for further dialoging. And that all the issues pertaining to this line route should be taken together to resolve them at once.

### **LOT2 Update**

As indicated in the outlook of LOT2 for the month of October, the map of Redeemed and MFM Substations had been submitted. Also, the major work on profiling and line route survey had been completed; the map of the line route was presented at the meeting. The meeting was informed that letter of rejection had been received from OPIC for approval of JICA line. The map presented showed the alternative route being proposed by LOT2 for OPIC approval. The request has been submitted to OPIC office while acknowledgement copy was given to OPIC representative for the follow-up.

The alternative route was proposed by LOT2 for Likosi – Redeem Transmission Line due to the future development plan of Redemption Camp, however, the meeting adopted the option. The meeting was informed that though the problem with Redeem axis had been resolved, but there are still some unresolved problems in Likosi area of the project. Ogun State government is therefore being called upon to intervene to avoid unnecessary disruption and delay in project execution.

### **LOT3 Update**

As indicated in the outlook of LOT3 for October, 2017, the team had already submitted the line route. However, there are still some issues with the substation line route. The team has not been able to submit the substation line route draft report as proposed because the coordinates for Ejio substation has not been supplied. The team has tentatively fixed the training of participants for early December. Though the training work plan had been prepared but is yet to be submitted.

## **5. General Discussion**

The Environmental coordinator would wish to know the latest about the inception reports; whether final inception reports had been submitted by the three LOTs. The meeting was informed that all necessary corrections have been effected but not submitted. It was mentioned that the basic for the delay in getting the final inception submitted and approved was due to lack of uniformity in the style of writing of the three groups. JICA representatives at the meeting observed that each of the LOTs used different format for their inception report; they said the format should be the same since the three groups are working on one project. The meeting therefore agreed that the same template should be adopted for the subsequent reports pertaining to the project.

Also, there were a lot of deliberations on which format to adopt for the ESIA report – whether the structure should align with the Ministry of Environment or to adopt the World Bank format. The consensus was that the same format should be used by the three groups. The expectation therefore was that the three groups should come up with one specific format that will be used for the report.

The meeting also deliberated on whether the project should be for ‘Wet’ and ‘Dry’ seasons. But it was reported that the Federal Ministry of Environment gave approval for one season. The Ministry will be satisfied with this one season provided reference can be made to previously approved EIA report in the area.

## **6. Outlook for November**

### **LOT1**

The outlook for LOT1 for November includes: Make necessary corrections on the adopted optional line and to resolve all issues pertaining to the names and other matter on the hotspots. It is expected that the preliminary line route map will be submitted and line route report will equally be submitted. The team hopes to commence ESIA report subject to approval of preliminary report.

### **LOT2**

For LOT2, the outlook for November will include: Submission of preliminary line report, ESIA work plan and first training work plan. The stakeholders’ engagement plan will also be submitted and the affected community will be identified.

### **LOT3**

For LOT3, the outlook for next month include: Submission of line route after the issue with LOT1 might have been resolved. The team hopes to submit prepared work plan, plan for necessary training and conclude plan on ESIA data collection. The team also plans to embark on second round of community engagement.

## **7. AOB**

It was proposed that the November meeting should be the last for the year. This was extensively deliberated upon and it was supported by most of the members. However, it was also suggested that necessary arrangement should be made for the December meeting that may not likely hold at the next meeting.

## **8. Closing and closing remarks**

Motion for adjournment was moved by Mrs Nwachukwu, TCN representative for Lot 1 and seconded by Engineer Balogun, Government Official from Ministry of Rural Development. The meeting came to a close around 1.15pm. While giving closing remarks, the Coordinator expressed his appreciation to everybody present and thanked them for their contributions to issues. The date of next meeting was fixed for 30<sup>th</sup> November, 2017.

Signed

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For TCN

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For JICA

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For Ogun State Rep

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For LOT 1

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For LOT 2

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For LOT 3



**Minutes of Meeting**

|   |  |
|---|--|
| Project   | Lagos and Ogun states transmission lines and associated substation project                 |
| Date  | March 07 2018, 11:00-12:00   |
| Venue   | Head quarter of NCF (Nigeria Conservation Foundation)                                      |
| Participants  | NCF<br>TCN<br>ESIA/RAP consultants (Lot 1 – 3)<br>JICA study team<br>See attendance sheet. |
| Agenda  | ESIA study for the project   |
| <b>Discussion item</b>  |  |
| <p>After explanation of the overall of proposed transmission line project by Mr. Ajibade of TCN, followings have been discussed.</p> <ul style="list-style-type: none"> <li>▪ NCF is currently working on IWC (International Water bird Census), which is organized by Wetlands International, to monitor the migratory birds in Badagry area. IWC was also conducted in December 2017- January 2018 at Badagry area. The IWC report in 2017 is available and can be shared with the team.</li> <li>▪ Some of the bird species listed as migratory bird is not migratory species, therefore, further review may be necessary. It is agreed that TCN will share the draft ESIA report to NCF to provide their feedback for the potential impact on ecosystem from the proposed project.</li> <li>▪ There is no fact that the presence of transmission line causes bird strike around the project area. However, since no bird strike survey has been conducted, NCF has been planning to carry out such a survey to understand actual situation of bird strike.</li> <li>▪ Migration route is not main concern for NCF since bird can fly over transmission lines; however NCF concerns place to stay in winter.</li> <li>▪ December is a good timing for bird survey since many species of bird visit the area since the migratory birds fly from outside of Nigeria, e.g. Europe from December to February in general (the biodiversity survey in this ESIA study was conducted in December 2017).</li> <li>▪ NCF has been working on several projects for local community to enhance their way of livelihood in sustainable manner. For example, NCF is educating local people to find alternative livelihood resource such as chicken farming, instead of hunting.</li> <li>▪ NCF accommodates about 90 staffs and there are several project offices throughout Nigeria. The staff of NCF works as project officer for the community support project.</li> <li>▪ NCF shows their interest for the collaboration of TCN's project if there is any opportunity.</li> </ul> |  |

(3) Meeting minutes, Register of Signature and Photo  
in Lot 3

## CHAPTER FOUR

### 4.0 STAKEHOLDER CONSULTATIONS

This chapter outlines the public information and consultation process that has been designed and implemented in order to facilitate the informed participation of the project affected persons (PAPs), communities and other stakeholders affected by or with interest in the project. As such, consultation objectives, activities and outcomes are reported.

#### 4.1 CONSULTATION FRAMEWORK

##### 4.1.1 General Objectives

General stakeholder engagement objectives of this study were to:

- Inform stakeholders on the proposed infrastructures and activities and seek their informed opinion about the socio-environmental risks and opportunities potentially associated with the project as well as take the measures and actions in order to manage the anticipated impacts;
- Obtain feedback from stakeholders on issues of concern and expectations in order to optimize the project;
- Generate a social and institutional dialogue in order to assess and strengthen the project's social acceptability;
- Help to consolidate, through the ESIA and RAP process, the efforts made by the TCN in order to establish lasting relationships with affected communities and other stakeholders.

##### 4.1.2 Target Stakeholder Groups

Target stakeholder groups for the stakeholder engagement process include:

- Concerned agencies and organisations at State and National levels;
- State-level (Ogun and Lagos) agencies;
- LGA-level agencies
- Customary authorities in communities affected by the line; -Obas, Ba'ales and Village Heads crossed by the line route.
- Industrial and commercial actors affected by the line, including relevant TCN departments, and JICA.
- Security agencies, national civil security and defence corps, department of security service, and the Nigerian Police

##### 4.1.3 Stakeholder Information and Consultation Stages

Three stakeholder information and consultation rounds were planned, and two has been implemented through the development of the line route survey, the ESIA/ESMP study and RAP of this project. They were planned according to key stages, or decision moments, throughout the study where the informed participation of stakeholders were likely to make the most significant contribution to the on-going analysis.

These included the scoping stage (1st stage), the preliminary route assessment and the documentation of the affected communities and displaced households stage (2nd stage). The third stage of consultations is scheduled for the disclosure of the Final Line Route, ESIA, ESMP and RAP preliminary results (3rd stage).

Table 4.1 outlines the studies' stakeholder engagement process and presents, for each consultation stage, the specific engagement objectives, target groups and implementation periods.

**TABLE 4.1 STAKEHOLDER CONSULTATION IMPLEMENTATION**

| STAGE  | OBJECTIVES   | TARGET GROUPS  | IMPLEMENTATION PERIOD |
|--|--|--|-----------------------|
| STAGE 1:<br>Environmental and Social Scoping                       | <ul style="list-style-type: none"> <li>• Present the project and the ESIA process to key authorities;</li> <li>• Identify key issues, concerns and expectations related to the project and study area;</li> <li>• Complete the stakeholders' list and validate the general approach for consultations.</li> </ul>  | <ul style="list-style-type: none"> <li>• Transmission Company of Nigeria (TCN)</li> <li>• Concerned ministries</li> <li>• State and LGA Administration</li> <li>• Customary Chief's of areas affected by the line</li> </ul>   | May/Jun 2017          |
| STAGE 2: Line Route Study  | <ul style="list-style-type: none"> <li>• Involve key stakeholders in the analysis of the « hot spots » identified along with the provisional line route.</li> <li>• Inform affected communities and involve them in environmental and social optimization of the line route;</li> <li>• Identify the concerns and expectations of affected communities, displaced households and women;</li> <li>• Inform affected households of their rights and options for resettlement.</li> </ul> | <ul style="list-style-type: none"> <li>• Transmission Company of Nigeria (TCN)</li> <li>• Concerned ministries</li> <li>• Local authorities</li> <li>• State-level and LGA-level authorities and technical services.</li> <li>• Affected people and their leaders.</li> <li>• Women representatives.</li> <li>• Customary chiefs.</li> </ul> | Oct./Nov. 2017        |
| STAGE 3:<br>Disclosure of Preliminary Results (ESIA, ESMP and RAP) | <ul style="list-style-type: none"> <li>• Present, validate and enhance preliminary ESIA and RAP results.</li> <li>• Ensure compliance of the proposed measures with the requirements of regulatory authorities;</li> <li>• Evaluate the social acceptability of the project and its proposed measures.</li> </ul>  | <ul style="list-style-type: none"> <li>• Transmission Company of Nigeria (TCN)</li> <li>• Concerned ministries at national and state levels.</li> <li>• Local authorities and community leaders from affected LGAs.</li> <li>• NGOs.</li> </ul>  | Feb. 2018             |

## 4.2 FIRST STAGE CONSULTATIONS

The first consultation stage took the combined format of individual semi-structured interviews with community members and customary chiefs as well as group meetings with institutional stakeholders (organisations at national, state and LGA level). This approach has proved to be useful to better define the scope and framework of the RAP study.

The objectives of these meetings are as follows;

- Present the project and the ESIA process to the communities and relevant agencies;
- Identify key issues, concerns and expectations of the communities and agencies related to the project and study area;
- Identify current practices and requirements of each agency related to the project;
- Complete the stakeholders' list and validate the general approach for consultations;
- Identify relevant information sources and collect available data and reports.

### 4.2.1 Activities Performed in Ogun State

The activities carried out as part of the first-stage stakeholders’ engagement in Ogun State are:

- Meeting between TCN top management headed by the MD/CEO and the Governor of Ogun State and other Senior Government Officials at Government House Abeokuta.
- Meetings at State level in Abeokuta with relevant State Ministries, Agencies and affected LGAs in Ogun States.
- Meetings at community level, held in each community within the project area in Ogun States.

Table 4.2 show list of the stakeholders met in Ogun State during the first stage of consultations.

**TABLE 4.2 OGUN STATE STAKEHOLDER GROUPS CONSULTED**

| STAKEHOLDER GROUP   | TYPE OF STAKEHOLDER    | LOCATION OF MEETING                           | DATE       |
|---|------------------------|---|------------|
| Ejio (Arigbajo) Communities                                       | PAPs/ Customary Chiefs | Palace of the Kabiyesi of Ejio                | 25-03-2017 |
| Korogboji Community, Agbara                                       | PAPs/ Customary Chiefs | Baale of Korogboji’s Palace                   | 26-03-2017 |
| Ajgunle(New Agbara) Communities                                   | PAPs/ Customary Chiefs | Baale of Ajgunle’s Palace                     | 25-03-2017 |
| Ogun State Bureau of Lands  | Institutional          | Dept of Energy Office, Ogun State             | 11-05-2017 |
| Ogun State Ministry of Rural Development                          | Institutional          | Dept of Energy Office, Ogun State Secretariat | 11-05-2017 |
| Ogun State Ministry of Communication, Development and Cooperation | Institutional          | Dept of Energy Office, Ogun State Secretariat | 11-05-2017 |
| Ogun State Bureau Of Electrical                                   | Institutional          | Dept of Energy Office, Ogun State             | 11-05-2017 |
| Ogun State Ministry Of Housing                                    | Institutional          | Dept of Energy Office, Ogun State             | 11-05-2017 |
| Ogun Governor’s Office  | Institutional          | Dept of Energy Office, Ogun State             | 11-05-2017 |
| Transmission Company of Nigeria                                   | Promoter               | Dept of Energy Office, Ogun State             | 11-05-2017 |



**Plate 4.1 Scoping Meeting with Ogun State**



**Plate 4.2 Scoping Meeting with Ejio Community**

### 4.2.2 Activities Performed in Lagos State

The activities carried out as part of the first-stage stakeholders’ engagement are:

- Meeting between TCN top management headed by the MD/CEO and the representative of the Governor of Lagos State in Abuja.
- Meetings at State level in Ikeja with relevant Federal and State Ministries, Agencies and affected LGAs
- Meetings at community level, held in each community within the project area in Lagos State.

Table 4.3 show lists the stakeholders met during the first consultation stage.

**TABLE 4.3 LAGOS STATE STAKEHOLDER GROUPS CONSULTED**

| STAKEHOLDER GROUP                                   | ROLE OF STAKEHOLDER   | LOCATION OF MEETING             | DATE       |
|---|---|---------------------------------|------------|
| Yafin Community, Badagry                            | Beneficiary   | Baale's Palace                  | 26/03/2017 |
| Badagry LGA   | Local Government administration   | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| NBET  | Electricity trading (link between generators, transmitter and distribution) | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| NSCDC   | security safeguard of national infrastructures                              | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Office of the Surveyor General                      | Issues land permit  | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Federal Road Safety Corp                            | Safety of road transportation system  | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Ministry of Water Front Infrastructure              | regulates developments in water fronts in Lagos State                       | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| LASIMRA   | regulates infrastructural developments in Lagos State                       | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Lagos State Ministry of Transport                   | Owens Lagos state government constructed roads                              | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Ministry of Physical Planning and Urban Development | coordinates urban development   | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Lagos State Ministry of Environment                 | protection of Lagos environment   | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| JICA  | Financier of the project through a loan                                     | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Transmission Company of Nigeria                     | owner of the project  | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| LASEPA  | regulatory agency for environment in Lagos State                            | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Tripod Limited                                      | NGO   | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Ikeja Electric Distribution Company                 | electricity distribution on Lagos mainland                                  | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Nigerian Inland Waterways Agency                    | controls water transport  | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Nigerian Conservation Foundation                    | NGO   | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Lagos State Electricity Board                       | Provides electricity infrastructure in rural Lagos                          | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| NEMSA   | Electricity measurement standard agency                                     | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |

| STAKEHOLDER GROUP            | ROLE OF STAKEHOLDER                      | LOCATION OF MEETING             | DATE       |
|------------------------------|--|---------------------------------|------------|
| Eko Electricity Distribution | electricity distribution on Lagos Island | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Lands Bureau                 | Administration of land in LAgos          | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Department of State Services | National security                        | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |



**Plate 4.3 Scoping Meeting in Lagos State**

### 4.2.3 Outcomes and Results Obtained

The following results were achieved from the consultations:

- The communities understood the objectives and requirements of the project and pledged support and cooperation;
- The relevant agencies are aware of the project and the ESIA process (team, objectives and schedules);
- The requirements of Ogun State and Lagos State Laws and Regulations relevant to the project were highlighted by the agencies and understood by TCN and its consultants;
- The main stakeholders' concerns and expectations were documented and have been considered for inclusion in the scope of the studies;
- A preliminary list of stakeholders was completed and the orientations of the Stakeholder Engagement Framework was enhanced;
- The Ogun State Governor established a committee to provide support for the project, while Lagos State Governor provided a high ranking cabinet member (Commissioner for Energy) to coordinate LAgos State support for the project.

Table 4.4 provides a summary of the main comments and recommendations made by stakeholders in Ogun State on different social and environmental issues of concern to them with respect to the project. Responses provided on the spot, where applicable were also provided.

**TABLE 4.4 COMMENTS BY STAKEHOLDERS IN OGUN STATE**

| TOPIC                      | CONCERNS, COMMENTS AND RECOMMENDATIONS  | STAKEHOLDERS THAT MADE THE COMMENT / RECOMMENDATION | ACTIONS THAT ADDRESS CONCERNS  |
|----------------------------|---|---|--|
| Location of Proposed Sites | Some sites are under acquisition while others are free. The ones that are free, Government will acquire for the project in the interest of the public but the project will be responsible for the processing charges.   | OGSG/ Bureau of Lands and Survey                    | The lands needed will be compiled and sent to OGSG   |
|                            | The Governor mentioned that need to raise the lines where crossing rail lines eg. Lagos – Ewekoro (Lafarge Cement) rail line at Apomu village   | Bureau of Lands and Survey                          | This shall be included in the EPC contract   |
| Project Components         | Requested additional substation as follows<br>In Ijebu Area, which will be in Obere to feed Ogun East.<br>Aiyetoro to feed the communities along Benin Border.<br>Idi-Iroko, Waasimi axis.<br>The State Government will provide land and fast track approval of the substation sites and ROW acquisition, while TCN will pay for the processing only. | Department Power/Energy, Governor’s Office          | TCN explained that there will be no need for building substations as the proposed substations will be sufficient for the areas mentioned. All that is needed is to invest in distribution infrastructure |
| Substations Sites          | <b>Ejio</b> – Under Government acquisition. TCN needs to apply for de-acquire and re-acquire  | Bureau for Lands and Survey                         | Application along with supporting documents will be prepared and submitted   |
| Line corridor              | <b>Ajegunle SS</b> – Free, Government will acquire on behalf of TCN and issue C of O  | Bureau for Lands                                    |  |
|                            | <b>Ejio – Ajegunle</b> – Within Government acquisition and some are free<br><b>Ajegunle- Badagry</b> – Partly free and within Government acquisition  | Bureau for Lands and Survey                         |  |

Table 4.5 provides a summary of the main comments and recommendations made by stakeholders in Lagos State on different social and environmental issues of concern to them with respect to the project. Responses to these inputs from stakeholders are also provided, where applicable.

**TABLE 4.5 COMMENTS BY STAKEHOLDERS IN LAGOS STATE**

| TOPIC    | CONCERNS, COMMENTS AND RECOMMENDATIONS  | STAKEHOLDERS THAT MADE THE COMMENT / RECOMMENDATION | ACTIONS TO ADDRESS CONCERNS  |
|----------|---|---|--|
| Security | Give warning signals where challenges from host communities may arise, provide real time security | DSS   | Schedule of field activities will be shared with security agencies |
|          | Where security issues occur, there should be a formal request to the Commandant General           | NSCDC   |  |



| TOPIC                     | CONCERNS, COMMENTS AND RECOMMENDATIONS   | STAKEHOLDERS THAT MADE THE COMMENT / RECOMMENDATION | ACTIONS TO ADDRESS CONCERNS  |
|---------------------------|--|---|--|
|                           | requesting for man power/ motorised patrols and aerial surveillance.<br>Collaboration with other security agencies   |   |  |
| Compensation/ RAP         | Who is responsible for compensation  | Lands Bureau  | TCN is responsible for payment   |
| Lines Crossing Water Ways | Seek for permission before it crosses any major water ways and obtain permit. Any line of construction between 100m of the shore line will need permit   | NIWA  | There is no Section of the line that crosses navigable or major waterway   |
| Survey                    | Is it the office of the Surveyor General that will do the survey?<br>Provide preliminary line route to see how it will affect the development in that area.<br>What informed the choice of Yafin community as location for substation?<br>There is plan for a deep sea port in Badagry area. Supply maps to the Surveyor General's office, to check against other plans. | Office of the Surveyor General                      | TCN has hired consultants to do the line survey, ESIA and RAP. Surveyor General will be consulted                                    |
| Environment               | Consult Lagos State Environment Protection Amendment Law 2017<br>Asses Alternative Routes?<br>Ensure safety of workers and community<br>You need a forest permit from LASPARK before any tree can be cut.<br>Do not permit use of herbicide<br>protect birds and biodiversity areas<br>Waste Management issue  | LASEPA  | These will be included in the scope of the studies.<br>Requirement for forest permit will be included in the ESMP                    |
|                           | Biodiversity Management should be developed and included in the ESMP.<br>Stick to faithful implementation of the report  | NCF   | These will be included in the scope of the studies   |
| Traffic                   | How do we handle traffic generated from movement of equipment during the construction phase  | Ministry of Transport and FRSC                      | Traffic study will be carried out at major road crossings  |
| Line route/ ESIA          | Would like to know the scope of work, duration of the project and advised to consult Ministry of Local Government Community Affairs  | LSEB  | Scope of the project was further clarified   |
| Cultural heritage         | Respect Historical Heritage sites. Local Government is the coordinator for CDC's   | Badagry LGA   | Physical cultural properties including heritage sites is in the scope of the ESIA (see physical cultural resources management plan). |

| TOPIC                   | CONCERNS, COMMENTS AND RECOMMENDATIONS   | STAKEHOLDERS THAT MADE THE COMMENT / RECOMMENDATION | ACTIONS TO ADDRESS CONCERNS   |
|-------------------------|--|---|---|
|                         |  |   | Physical cultural resources was also one of the criteria for line route.  |
| Line route              | ROW in that area has been given to NIPP so if additional ROW is needed, TCN should check with the Ministry to see if it can be accommodated within the gazetted ROW<br>Respect physical planning regulations 2005 with emphases on setbacks, substations | Ministry of Physical Planning                       | The NIPP project is not in the same area. The line covered by this project is from Ajegunle to Yafin Village.<br>Setback distance by NERC is 15m and is respected by this project |
| Encroachment            | How do we intend to stop construction under ROW/ transmission line   | IKEDC   | Periodic monitoring and involvement of NSCDC  |
| Support for the project | Will like to collaborate with TCN/Consultants to ensure hitch free process   | EKEDC   | EKEDC is a critical partner in the project  |
| Support for the project | Want to be part of the project from commencement to decommissioning  | NEMSA   | NEMSA has been involved in the project along with other key stakeholders  |

### 4.3 SECOND STAGES OF CONSULTATION

The second stage of stakeholder information and consultation to present the preliminary line route, as well as methodology and approach for ESIA and RAP study. At the same obtain feedback to refine the approach and the methodology and include concerns expressed in the study.

#### 4.3.1 Activities Performed

The activities carried out as part of the second stakeholder engagement stage are:

- Meetings in Abuja, Abeokuta and in the communities with relevant ministries and agencies.
- Meetings with PAPs in each community affected by the line route
- Field trip to show to stakeholders where the line will pass.
- Printed and digital line route map as well as images illustrating examples of the type of proposed infrastructure (pylons and lines) were also exhibited. A project background information document, in a poster form was produced and distributed by the consultant to the authorities and representatives prior to meetings for public advertising.
- PAPs were invited to attend the village level meetings with the Village Chief or District Head in their communities. The meetings included women (17%) as well as youths in each village (see attendance register in Appendix).

**TABLE 4.6 STAKEHOLDER GROUPS MET DURING SECOND STAGE CONSULTATIONS**

| Stakeholder Group   | Type of Stakeholder        | Location of Meeting                            | Date                |
|---|----------------------------|--|---------------------|
| Transmission Company of Nigeria                                     | Promoter                   | TCN Office, Abuja                              | 31-08-17            |
| Field Visit with TCN and Relevant Agencies in Lagos and Ogun States | Institutional              | Various Hotspots along the proposed line route | 05-09-17 & 06-09-17 |
| Affected Communities  | Community leaders and PAPs | Apomu  | 19-11-17            |
|   |                            | Leshi  | 20-11-17            |
|   |                            | Joga Owode                                     |                     |
|   |                            | Sowole   |                     |
|   |                            | Oke Oji  |                     |
|   |                            | Atan Iju Ilogbo                                |                     |
|   |                            | Alapako  | 21-11-17            |
|   |                            | Coker Igbogun                                  |                     |
|   |                            | Gbeko  |                     |
|   |                            | Idolehin                                       |                     |
|   |                            | Ijegemo  |                     |
|   |                            | Onilogbo                                       |                     |
|   |                            | Iberese  |                     |
|   |                            | Abisoeye                                       |                     |
|   |                            | Asokere  | 26-11-17            |
|   |                            | Bandu  |                     |
|   |                            | Adigbon  |                     |
|   |                            | Igbele Ajana                                   |                     |
| Ajeginle  | 01-12-17                   |  |                     |
| Ejio  | 02-12-17                   |  |                     |
| Erekiti   | 08-12-17                   |  |                     |
| Tohon   |                            |  |                     |
|   |                            | Yafin  |                     |

**NOTE:** The communities listed were the ones known to have been affected by the project at that time. Full list of communities affected, as identified during the field survey is Appendix



**Plate 4.4 Presentation of the Line Route to Baale of Ajegunle, Ado Odo/Ota LGA**



**Plate 4.5 Presentation of the Line Route to Institutional Stakeholders in Abeokuta**

### 4.3.2 Outcomes and Results Obtained

Issues raised by stakeholders during second stage consultations are in Table 4.7

**TABLE 4.7 COMMENTS BY STAKEHOLDERS DURING SECOND STAGE CONSULTATIONS**

| SECTIONS OF THE LINE      | COMMENTS AND RECOMMENDATIONS   | STAKEHOLDERS THAT MADE THE COMMENT / RECOMMENDATION | ACTIONS THAT ADDRESSES COMMENTS                              |
|---------------------------|--|---|--|
| Ejio-Arighbajo-Apomu axis | <b>Option C:</b> consider running parallel to the Lagos-Ibadan Expressway on the left- | TCN   | This was not possible, because of the need to avoid a shrine |

| SECTIONS OF THE LINE   | COMMENTS AND RECOMMENDATIONS  | STAKEHOLDERS THAT MADE THE COMMENT / RECOMMENDATION | ACTIONS THAT ADDRESSES COMMENTS   |
|--|---|---|---|
|  | hand side of the road (Northwards) before going left.   |   | (6.848790°N, 3.201160°E) in Arigbajo Forest as well as Mobile Petrol Station (6.854169°N, 3.191616°E) along the road  |
|  | <b>OPTION B:</b> Try to avoid the structures around Lat 6.835046, Long 3.138859.  | TCN   | The line route has been amended to avoid the structures indicated   |
|  | <b>Option B:</b> Try to avoid a ware house around Lat 6.612138 and Long 3.013081  | TCN   | The warehouse has been avoided  |
|  | <b>Option C:</b> Try to reduce the number of angle greater than 15 <sup>0</sup>   | TCN   | The multi-criteria modelling used in analyses of route alternatives took into account the number of angle points.   |
| 330kV Line Crossing Lagos-Abeokuta Expressway at Apomu Village | Take the line to avoid Mobil filling station at Apomu village, to minimise compensation costs.  | TCN   | The Mobile Petrol station has been avoided completely.  |
| 330kV line at Igbogun-Olaogun Village                          | <b>Option B:</b> Realign the line to avoid the police station opposite Obasanjo's House Also avoid the telecommunication mast Shift, with at least 10m clearance from the corridor  | Ogun State Ministry of Environment                  | The final line route avoided the Police Stations well as all telecommunication towers along the route.  |
| 132kV line at OPIC Estate Agbara Industrial Estate             | Shift the Line to avoid palm oil mills and houses as much as possible.  | Ogun State Lands Bureau/Ministry of Environment     | All large palm plantations along the route including those in Aiyeye, Igbele, Agbara, etc has been avoided  |
| Yafin Community Jetty  | <b>Option B:</b> passing by the shoreline, but shift the line, such that the corridor is least 10m from nearest residence and completely avoiding crossing over the jetty at Yafin Village  | Lands Bureau and LASIMRA                            | The center line is more than 50m from the Yafin Jetty against 15m setback recommended by NERC.  |
| General  | Optimise, and do a cost benefit analysis to ascertain the best line route   | MPP & UD  | The three-line route alternatives subjected to multi-criteria analyses involving, economic, social and environmental issues   |
| General Comments by Community leaders                          | Compensation should be paid directly to PAPs and not through any third party. PAPs request that they be paid in cash instead of building houses for them. They argue that they want to decide the new location by themselves and control the cost and quality to avoid trust issues | Communities   | Although the OP 4.12 discourages cash for land, the Land Use Act allows it. TCN also prefer cash compensation as a policy. Hence, cash payment will be adopted to respect request of the affected people. |
| Yafin Village  | The corridor crossed two shrines, which cannot be moved and also proposed site for Baale's Palace. Need to avoid them   | Baale of Yafin                                      | The line has been re-aligned and the sacred sites were avoided  |
| Tohun Village  | The corridor crossed the middle of the small community of Tohun   | Baale of Tohun                                      | The line was adjusted, to pass at the Southern side of the community, thereby minimising houses affected  |
| Igbele Village   | The corridor affects palm oil factory and its plantations, which should be avoided considering people driving livelihood from the factory as workers  | Community members                                   | The line was adjusted to avoid the factory and its palm plantations.  |

#### 4.4 OUTCOME OF CONSULTATIONS WITH NGO

The Nigerian Conservation Foundation (NCF) is an NGO dedicated to nature conservation and sustainable development in Nigeria, established in 1980 and was registered in 1982 as a Charitable Trust under the Land (Perpetual Succession) Act of 1961 - a policy that was replaced by the Company and Allied Matters Act of 1990.

NCF was invited to participate in the scoping meeting held in Lagos on 22<sup>nd</sup> June 2017. A meeting of stakeholders also took place on March 07 2018 with the participation of TCN and JICA, where the results of ESIA and RAP was discussed.

After presentation of the project and results achieved the following discussions took place.

- NCF is currently working on IWC (International Water bird Census), which is organized by Wetlands International, to monitor the migratory birds in Badagry area. IWC was also conducted in December 2017- January 2018 at Badagry area. The IWC report in 2017 is available and can be shared with the team.
- Some of the bird species listed as migratory bird is not migratory species, therefore, further review may be necessary. It is agreed that TCN will share the draft ESIA report to NCF to provide their feedback for the potential impact on ecosystem from the proposed project.
- There is no fact that the presence of transmission line causes bird strike around the project area. However, since no bird strike survey has been conducted, NCF has been planning to carry out such a survey to understand actual situation of bird strike.
- Migration route is not main concern for NCF since bird can fly over transmission lines; however NCF concerns place to stay in winter.
- December is a good timing for bird survey since many species of bird visit the area since the migratory birds fly from outside of Nigeria, e.g. Europe from December to February in general (the biodiversity survey in this ESIA study was conducted in December 2017).
- NCF has been working on several projects for local community to enhance their way of livelihood in sustainable manner. For example, NCF is educating local people to find alternative livelihood resource such as chicken farming, instead of hunting.
- NCF accommodates about 90 staffs and there are several project offices throughout Nigeria. The staff of NCF works as project officer for the community support project.
- NCF shows their interest for the collaboration of TCN`'s project if there is any opportunity

As a follow up to the meeting the ESIA report was shared with NCF and the comments received as well as responses generated are in Table 4.8. furthermore, NCF also sent a report of bird survey they conducted in the Mangrove Swamp area around Badagry (See Appendix 3A).

**TABLE 4.8 NCF COMMENTS AND RESPONSE**

|  |                                       |
|--|---------------------------------------|
| <b>COMMENT FROM NCF MINUTES OF MEETING</b> | Some species listed are not migratory |
|--|---------------------------------------|

|   |   |   |
|---|---|---|
| <p><b>RESPONSE</b></p>  | <p>Four (4) species were listed as migratory in the ESIA. These species are;</p> <ul style="list-style-type: none"> <li>• <i>Ardea alba</i>,</li> <li>• <i>Ardea cinerea</i>,</li> <li>• <i>Egreta garzetta</i>, and</li> <li>• <i>Milvus migrans</i></li> </ul> <p>All were either full migrants or partial.</p> | <p>References;</p> <ul style="list-style-type: none"> <li>• Habitat/Ecology section of IUCN RED LIST 2017 version 3</li> <li>• Ringim, A. S., Magige, F. J. &amp; Jasson, R. M. (2017). ‘A comparative study of species Diversity of Migrant Birds Between Protected and Unprotected Areas of the Hadejia-Nguru Wetlands, Nigeria’</li> <li>• Checklist of Western Palearctic birds species migrating within Africa 2004</li> </ul> |
| <p><b>RESPONSE TO NCF REQUEST TO INCOPORATE RESULT OF THEIR STUDY (see Appendix ) INTO THE ESIA REPORT</b></p>  |   |   |
| <p>It is believed that the essence of adding the document ‘2016 coastal flyway counts for Nigeria: A water birds count along the coastal creeks and Estuaries in Badagry and Calabar’ is to possibly incorporate the Avian species inventory of Badagry area into the draft ESIA report.</p> <p>It would not be proper to add inventory of species obtained from a mangrove wetland to the LAGUN report. The Badagry SS where the ROW terminates is a Riparian Swamp.</p> |   |   |



Consultation at Iakpa koOke



Consultation at AiogboAkia



Consultation at Ioo



Consultation at Zisu



Consultation at IgboSa



Consultation at Iragbo



Consultation at Zinve



Consultation at IragbonThogli



Consultation at Bandu



Consultation at Shoiulu



Consultation at Eioo



Consultation at Zinsu Ijegemo



Consultation at Egudu Adeshina



Consultation at Ijegemo Isale Odo

**Plate 4.6 Community Consultations**





Meeting at Oba Ejio's Palace



Meeting with Baale of Kuforuji



Scoping Meeting with Institutional Stakeholders in Lagos



Scoping Meeting with Institutional Stakeholders in Lagos



Scoping meeting with relevant Lagos State Government Agencies



Meeting with relevant National Agencies and NGOs | Lagos



Site Visit to Ejio Substation Site during scoping



At the Palace of Elejio of Ejio Kingdom



Meeting with Ogun State Stakeholders



Meeting with Ogun State Stakeholders



Presentation of line route to Baales in Ado Odo



Presentation of Line Route to Community Leaders in Igbele



After presentation of line route in Atan and Kokoo



Field Mission with TCN and JICA to verify Line route



Field Mission with TCN and Community representative at the Ajegunle substation



At Ikeja West Substation

## **6. Lot 1 RAP Report**



## RESETTLEMENT ACTION PLAN (RAP) REPORT (LOT 1)

### FOR

- Ejio (Arigbajo) – New Abeokuta 132kV D/C Transmission Line (35.2km)
- Olorunsogo – Ejio (Arigbajo) 330kV D/C Transmission Line (12.4km)
- Ejio (Arigbajo) – Ikeja West /Osogbo 330kV D/C Turn in-out (6.95km) at Sojuolu



November 2018

## ABBREVIATIONS AND ACRONYMS

|      |  |
|------|--|
| CEO  | Chief Executive Officer                    |
| DC   | Double Circuit                             |
| EIA  | Environmental Impact Assessment            |
| ESC  | Environmental and Social Considerations    |
| ESIA | Environmental and Social Impact Agency     |
| ESMP | Environmental and Social Management Plan   |
| GCNL | Godirra Chemicals Nigeria Limited          |
| GRC  | Grievance Redress Committee                |
| GRM  | Grievance Redress Mechanism                |
| HSE  | Health, Safety and Environment             |
| JICA | Japanese International Co-operation Agency |
| LGA  | Local Government Area                      |
| LR   | Line Route                                 |
| LUA  | Land Use Act                               |
| MC   | Multi –Circuit                             |
| NCC  | National Control Center                    |
| NEPA | National Electric Power Authority          |
| NERC | Nigerian Electricity Regulatory Commission |
| NGO  | Non-Governmental Organization              |
| NIPP | National Integrated Power Project          |
| PAP  | Project Affected Person                    |
| PCR  | Physical Cultural Resources                |
| PIU  | Project Implementation Unit                |
| RAP  | Resettlement Action Plan                   |
| ROI  | Return of Investment                       |
| ROW  | Right of Way                               |
| SC   | Single Circuit                             |
| TCN  | Transmission Company of Nigeria            |
| TL   | Transmission Line                          |
| UN   | United Nation                              |
| UTM  | Universal Transverse Mercator              |
| WB   | World Bank                                 |

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## EXECUTIVE SUMMARY

### ES 1: Introduction

The Transmission Company of Nigeria (TCN) has planned a project targeted at improving power supply to Lagos and Ogun States, in line with the Transmission Lines network capacity development of achieving transmission capacity of 20,000 MW by 2020. This transmission line project in Lagos and Ogun States (“Lagos and Ogun States Transmission Project” or “the entire project”) is to be financed through a loan (Japanese ODA loan) from Japan International Cooperation Agency (JICA). The Transmission Company of Nigeria (TCN) is the implementing agency and owners of the project when completed. This entire project plans reinforcement of transmission capacity, improvement of credibility of electricity supply and reduced electricity loss by installing transmission systems in southwest area Nigeria. It contributes acceleration of economy and development of the communities.

The entire project consists of about 203km high voltage transmission lines and 5 high voltage substations. In view of the need to ensure environmental sustainability and social acceptability, TCN has therefore mandated Godirra Chemicals Nigeria Limited (GCNL) to conduct Line Route (LR) Study, Environmental and Social Impact Assessment (ESIA), Environmental Management Plan (ESMP) and Resettlement Action Plan for Lot 1 of the project area consisting of about 67 communities and villages grouped into the following routes:

- *Ejio (Arigbajo) – New Abeokuta 132kV D/C Transmission Line (35.2km).*
- *Olorunsogo – Ejio (Arigbajo) 330kV D/C Transmission Line (12.4km).*
- *Ejio (Arigbajo) – Ikeja West /Osogbo 330kV D/C Turn in-out (6.95km) at Sojuolu.*

This study is for the Resettlement Action Plan which fulfills the requirement of JICA, Nigerian Government and international best practices for implementing involuntary resettlement which is triggered by this project as a result of land acquisition and displacement of persons from their land or places/sources of livelihood.

### ES 2: Justification for Preparation of RAP

This RAP is prepared as a requirement that fulfills the guideline of JICA and the Nigerian government, as an instrument to addressing involuntary resettlement triggered by the project because the TCN Line Route and Sub-station activities will involve acquiring a Right of Way

(ROW) which is about 50m width for the 330kVA line over a length of 12.4km, and 30m width for the 132kVA line that covers over a length of 35.2km. Land will also be required for campsites / logistics bases which shall be located at and adjacent to the substation locations at Ejio, Olorunsogo and New Abeokuta.

**ES 3: Adverse Social Impacts of the Project**

The involuntary land acquisition and displacement will deplete available scarce agricultural farm lands and forests. It will affect/pollute rivers/streams and displace homes, shops and important cultural properties such as shrines, grave yards, wells and economic trees as well as farm crops. The implication is far reaching and includes causing unemployment, poverty, increased vulnerability and dislocation of family affinity due to disjoint that resettlement brings.

**ES 4: Impact Avoidance Measures taken**

The steps taken to avoid or minimize impacts include:

1. *Ensuring that proper engagement of community and PAPs is undertaken early in the RAP preparation and implementation process in order to ensure that those identified are the real owners of the affected assets. This is a step in the right direction to ensuring that feuds are avoided or reduced amongst community members.*
2. *This RAP preparation was carefully planned in consultation with TCN and JICA, thereby, ensuring that the line route option chosen is one of the least encumbrances. It was also agreed that during construction, TCN will stick to the ROW setback which has been stipulated in this report and shared with all stakeholders.*
3. *The Project proponent will ensure that compensation payment is implemented before construction activities to minimize income loss and economic displacement.*
4. *Prior to compensation, project proponent will carry out enlightenment campaign and sensitization of PAPs on involuntary resettlement, livelihood restoration and use of compensation benefits*

**ES 5: Mitigation Measures to Address Impacts**

This RAP is guided by the process of robust consultation, identification of PAPs, adequate valuation of assets, announcement of cut-off date and establishment of grievance redress channels. To ensure that PAPs do not suffer net economic loss, this RAP in line with the guideline of JICA will ensure that compensation payment is carried out prior to land acquisition and commencement of work in the project area. Project proponents will also notify the community on its work plan to enable them remove and secure their belongings and assets in safe conditions. This RAP has also mainstreamed income restoration and special consideration for vulnerable PAPs into the implementation programme of this project to ensure that those made worse off by the project are restored to their pre-project socio-economic status and assisted to have improved living conditions. 20% (129 persons) of households were covered in income and livelihood survey so as to assure the livelihood restoration is properly addressed.”

**ES 6: Analysis of Affected Assets and Categories**

| s/n | Description                              | Frequency |
|-----|--|-----------|
| 1   | Number of communities affected           | 67        |
| 2   | Number of PAPs                           | 2327      |
| 3   | Total Affected structures/number of PAPs | 451       |
| 4   | Total number of PAPs for Economic trees  | 1440      |
| 5   | Total number of PAPs for annual crops    | 771       |
| 6   | Number of vulnerable people              | 129       |
| 7   | Total number of House hold size          | 2197      |

**ES 7: Vulnerability Status of Project Affected Persons (PAPs)**

Vulnerable people were identified based on the following criteria:

1. *Female headed household/widows*
2. *Physically and mentally disadvantage persons*
3. *Aged persons (65years and above) on income less than N50,000 per month*
4. *Child headed household*



In sum, 129 vulnerable persons were identified across the project area. It is therefore recommended that 2.5% of the total compensation budget of N11, 201,182.825 be set for a livelihood support programme for the vulnerable.

Further to this, we recommend strongly that TCN should engage the services of qualified firm or an NGO with experience in livelihood needs assessment to carry out a survey of the vulnerable group to identify their needs and livelihood conditions including alternative livelihood menu for their livelihood sustainability.

The list of vulnerable are attached in appendix 5

#### ES 8: Compensation Budget for Structures, Economic trees and crops by Packages and communities.

| CATEGORY   | NAMES OF COMMUNITIES ALONG THE ROUTE  | AMOUNT FOR STRUCTURES | AMOUNT FOR ECONOMIC TREE AND CROPS | TOTAL (N)          |
|------------|---|-----------------------|------------------------------------|--------------------|
| PACKAGE 1  | EJIO  | 80,844,655.00         | 12,021,140                         | 92,865,795.00      |
| PACKAGE 2  | ABESE   | 25,755,500.00         | 14,321,322                         | 40,076,822.00      |
| PACKAGE 3  | SODERU, SEPETI, AYEYE, ADUBIARU, BAASE, AKINBORE, IFADA, ONIKOKO, OLUKE       | 32,609,724.00         | 63,079,970                         | 95,689,694.00      |
| PACKAGE 4  | SOWUNMI, OGUMOLA, ABEREMETA, MOLAJA, OREKE, ELEGBATA, AJEGUNLE, JITADU, MOSHE | 12,073,269.00         | 28,687,681                         | 40,760,950.00      |
| PACKAGE 5  | APENA, OLOWOFELA, OBASA, IKEREKU, LERIN, FENOPA, ITA-ALAJI, OLORUNSOGO        | 36,572,786.00         | 21,916,565                         | 58,489,351.00      |
| PACKAGE 6  | ELEYELE, ILAO, ITORI ALASE, AKE, OGIDI, AKAKUN, ONIBOTUJE, PANKERE            | 1,736,208.00          | 32,207,530                         | 33,943,738.00      |
| PACKAGE 7  | GBANGBA, AJADE, OBOLONTI, IUUMOH, OTEGBOLA, OLUWO, IKIJA, IKIJA-OLOSHE        | 4,834,975.00          | 62,049,970                         | 66,884,945.00      |
| PACKAGE 8  | ODANA, INUDANE, APANIGUNGUN, AGOYON, EREGUN, LUKOSI                           | 2,188,692.00          | 36,134,750                         | 38,323,442.00      |
| PACKAGE 9  | IJEMO, AGBOKE, TOOLU, AWADO, BAMUKUN, IJEUN, OTOTO, MORISA-OKO, OKWURI        | 4,737,955.00          | 58,193,340                         | 62,931,295.00      |
| PACKAGE 10 | IJOMOKO, ISOTA, KEREBE, LISA, ODOFIN, OWODE, OYA, AGBANGBA                    | 464,033.00            | 57,414,875                         | 57,878,908.00      |
|            | <b>GRAND TOTAL COMPENSATION AMOUNTS</b>                                       | <b>201,817,797</b>    | <b>386,027,143</b>                 | <b>587,844,940</b> |

The total sum for compensation is Five Hundred and Eighty Seven Million, Eight Hundred and Forty four Thousand, Nine Hundred and forty Naira (N587,844,940) made up of Two Hundred and One Million, Eight Hundred and Seventeen Thousand, Seven Hundred and Ninety Seven Naira (N201,817,797) for structures, and Three Hundred and Eighty Six Million, Twenty Seven Thousand, One Hundred and forty Three Naira (N386,027,143) for economic trees and crops.

#### ES 10: Rap Implementation Budget Summary

|   |                       |
|---|-----------------------|
| A. Crops  | 386,027,143.00        |
| B. Structures   | 201,817,797.00        |
| <b>Sub-Total</b>  | <b>587,844,940.00</b> |
| C. Support to vulnerable groups (2.0% of A+B)   | 11,201,182.83         |
| D. Security, bank charges, stamp duty and other logistic for compensation payment (2.5%) for crops      | 9,650,679.58          |
| E. Security, bank charges, stamp duty and other logistics for compensation payment (2.5%) for structure | 5,045,445.93          |
| F. Demolition and salvage of structures (5%) of B   | 10,090,889.85         |
| G. Contingency (5%) of A+B  | 29,392,247.00         |
| H. Livelihood restoration & Training for PAPs   | 13,777,454.87         |
| <b>Sub -Total</b>   | <b>79,157,898.05</b>  |
| <b>TOTAL AMOUNT</b>   | <b>667,002,838.05</b> |

**ES 11: Institutional Arrangement and Responsibilities for RAP Implementation**

| S/No | Stakeholders/ Institution     | Responsibilities  |
|------|-------------------------------|---|
| 1    | TCN-PIU                       | <ul style="list-style-type: none"> <li>Co-ordinate all policies, programmes and actions of all related agencies in the States;</li> <li>Ensure that RAP is implemented fully in line with JICA/WB OP 4.12 standard as prescribed in this report</li> <li>Establishment of resettlement implementation committee</li> <li>Appointment of an NGO that will work with the Grievance Redress Committee (GRC),</li> <li>Engaging the services of a consultant to carry out preparation and implementation of RAP and subsequent engaging the service of external monitors for the RAP implementation.</li> <li>Approval of payments to consultants for RAP activities carried out under the project.</li> <li>Submission of Reports to World Bank for review.</li> </ul> |
| 2    | JICA                          | <ul style="list-style-type: none"> <li>Responsible for the final review, clearance and approval of the RAP.</li> <li>Ensures that its guideline /approved entitlement matrix is followed in the implementation of RAP</li> <li>Monitors RAP implementation</li> </ul>   |
| 3    | State Ministry of Environment | <ul style="list-style-type: none"> <li>Monitors RAP compensation implementation;</li> <li>Responsible for displaying RAP within their domain for public view</li> <li>Ensure environmental safety of sites where PAPs are been relocated to</li> </ul>  |
| 4    | Ministry of Land              | <ul style="list-style-type: none"> <li>Facilitate alternative land acquisition as may be required for resettling PAPs</li> <li>Assist TCN resettlement committee with site preparation including land mapping and authentication</li> <li>Be responsible for the preparation of Certificates of Occupancy which evidence the grant of State lands and the transfer of interest by the customary landholders.</li> </ul>   |
| 5    | Ministry of                   | <ul style="list-style-type: none"> <li>Support the implementing agency with information of rates for</li> </ul>   |

|    |                                       |  |
|----|---------------------------------------|--|
|    | Agriculture                           | <p>compensation,</p> <ul style="list-style-type: none"> <li>Provides technical support to TCN on the agro-based livelihood support;</li> </ul>   |
| 6  | LGA                                   | <ul style="list-style-type: none"> <li>Monitors RAP implementation in their LGAs;</li> <li>Assist with the acquisition of rural land for agriculture for PAPs under land resettlement for agriculture</li> </ul>   |
| 7  | Resettlement Implementation Committee | <ul style="list-style-type: none"> <li>Responsible for coordinating RAP implementation under the supervision of TCN</li> <li>Works closely with the Consultant to ensure the consultation, enlightenment and participation of PAPs in the implementation activities,</li> <li>Responsible for instituting the grievance redress committee in collaboration with TCN-PIU</li> </ul>   |
| 8  | Community Baales and Obas             | <ul style="list-style-type: none"> <li>Responsible for mobilization of PAPs and their interface with TCN</li> <li>Anchor and Supervise the working of the grievance redress committee at community level</li> </ul>  |
| 9  | Project Affected Persons (PAPs)       | <ul style="list-style-type: none"> <li>Entitled to be heard, make inputs and participate in RAP implementation processes</li> <li>Attend meetings, workshops and capacity building meetings for this RAP;</li> <li>Comply with agreements reached during consultations to ensure successful RAP implementation and livelihood restoration</li> </ul>   |
| 10 | Environmental and Social Desk Officer | <ul style="list-style-type: none"> <li>Provides the various committees (resettlement committee and grievance redress committee) with necessary documents and support</li> <li>Advice on JICA/World Bank policies on OP 4.12;</li> <li>Ensures coordination between the implementing committees and TCN,</li> <li>Write periodic reports on RAP implementation for submission to the TCN and JICA;</li> <li>Monitors and reports RAP implementation including livelihood restoration of PAPs</li> </ul> |
| 11 | RAP implementin                       | <ul style="list-style-type: none"> <li>Ensure communication and participation of PAPs in resettlement process</li> </ul>   |

|   |                             |   |
|---|-----------------------------|---|
|   | g consultant                | <ul style="list-style-type: none"> <li>• Undertake training on livelihood restoration to PAPs and vulnerable;</li> <li>• Work with TCN to ensure revalidation of PAPs</li> <li>• Ensure that all legible PAPs are compensated based on their entitled values</li> <li>• Write report on RAP implementation</li> </ul>   |
| 9 | Grievance Redress Committee | <ul style="list-style-type: none"> <li>• Provide support to PAPs on problems arising from loss of private properties and business area.</li> <li>• Record the grievance of the PAPs, categorize and prioritize the grievances that need to be resolved by the committee;</li> <li>• Report to the aggrieved parties about the developments regarding their grievances and the decision of the project authorities and,</li> <li>• Ensure that grievances are settled locally and in time as much as possible</li> </ul> |

## CHAPTER ONE: INTRODUCTION

### 1.1 Background Information

The Transmission Company of Nigeria (TCN) is one of the companies unbundled from the defunct Power Holding Company of Nigeria (PHCN), and the only one wholly owned by the Government. TCN is charged with the responsibility of transmitting electric power from the various power stations to the load centres across the country and beyond, ensuring efficient and cost-effective transmission, system operation, and improved service delivery. TCN is also responsible for the management of assets of the High Voltage Transmission System Operations, generation dispatch functions, as well as the development of the network through the construction of new transmission lines and substations for efficient transmission and system operations.

The Transmission Company of Nigeria (TCN) has planned a project targeted at improving power supply to Lagos and Ogun States, in line with the Transmission Lines network capacity development of achieving transmission capacity of 20,000 MW by 2020. This transmission line project in Lagos and Ogun States (“Lagos and Ogun States Transmission Project” or “the entire project”) is to be financed through a loan (Japanese ODA loan) from Japan International Cooperation Agency (JICA). The Transmission Company of Nigeria (TCN) is the implementing agency and owners of the project when completed. This entire project plans reinforcement of transmission capacity, improvement of credibility of electricity supply and reduced electricity loss by installing transmission systems in southwest area of Nigeria. It contributes acceleration of economy and development of the communities.

The entire project consists of about 203km high voltage transmission lines and 5 high voltage substations. In view of the need to ensure environmental sustainability and social acceptability, TCN has therefore mandated Godirra Chemicals Nigeria Limited (GCNL) to conduct Line Route (LR) Study, Environmental and Social Impact Assessment (ESIA), Environmental Management Plan (ESMP) and Resettlement Action Plan for Lot 1 of the project consisting of the following components as described in the TOR;

- *Ejio (Arigbajo) – New Abeokuta 132kV D/C Transmission Line (35.2km).*
- *Olorunsogo – Ejio (Arigbajo) 330kV D/C Transmission Line (12.4km).*
- *Ejio (Arigbajo) – Ikeja West /Osogbo 330kV D/C Turn in-out (6.95km) at Sojuolu.*

The execution of the LR Study, ESIA, ESMP and RAP is funded by Transmission Company of Nigeria (TCN), as a pre-requisite for project implementation.

## 1.2 Aims and Objectives of the RAP

The aim of the RAP is to identify and assess the impact of the TCN transmission line work activities on the affected communities and population and to prepare an Action Plan for implementing resettlement/compensation to project affected persons (PAPs). RAP is to be implemented in coordination with the civil works in line with JICA guideline and Nigerian LUA. This will entail to design methods and schemes for resettling or compensating the Project Affected Persons (PAPs) whose lands and other social and economic resources will be affected, including those whose access to common productive natural resources will be denied or obstructed within the area due to the intervention. The goal is to improve decision-making as regards the resettlement and compensation of persons that would be affected by the proposed project.

The specific objectives of the RAP are to:

- *Conduct a census survey of impacted persons and valuation of assets;*
- *Consult with the would be impacted Persons(PAPs) and communities;*
- *Ascertain the number of vulnerable persons among PAPs and design livelihood restoration measures suitable to addressing their economic sustenance.*
- *Describe compensation and other resettlement assistance to be provided; and*
- *Prepare a budget and time table for resettlement action.*

This RAP covers direct economic and social impacts that result from project funded by JICA and are caused by:

*(a) The involuntary taking of land resulting in:*

- (i) Relocation or loss of shelter;*
- (ii) Loss of assets or access to assets, or*
- (iii) Loss of income sources or means of livelihood, whether or not the affected persons must move to another location; or not*

*(b) The involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons.*

## 1.3 Justification for Preparation of RAP

This RAP is prepared as an instrument to address involuntary resettlement triggered by the project. The TCN Line Route and Sub-station activities will involve acquiring a Right of Way (ROW) which is about 50m width for the 330kVA line over a length of 12.4km, and 30m width for the 132kVA line that covers over a length of 35.2km. Land will also be required for campsites / logistics bases which shall be located at and adjacent to the substation locations at Ejio, Olorunsogo and New Abeokuta. The direct implication on human environment is that agricultural farm lands, communities, forests, rivers/streams and other important cultural properties will be displaced or affected. In line with the Nigerian extant law, the Land Use Act, 1978 and international policies and guidelines on involuntary resettlement, such as the World Bank and JICA, the proposed project triggers involuntary resettlement, World Bank OP 4.12.

## 1.4 Scope of Work

The scope of work underlying this RAP is the identification of project impacts and affected population through the following:

- *Consultation;*
- *Line route map and Engineering Drawings*
- *Census that enumerates project affected persons(PAPs) and registers them according to location;*
- *An inventory of lost and affected assets at the house hold, enterprise, and community level;*
- *Analysis of surveys and studies to establish compensation parameters, to design appropriate income restoration and sustainable development initiatives;*
- *Identify baseline monitoring indicators*
- *Consultation with affected populations regarding mitigation of impacts and development opportunities*
- *Establish a "cut-off date" after which any new structures or arrivals within the project*

area will be barred from benefitting from the re-planning or resettlement exercises

- *Provide a definition of displaced persons and compensation eligibility criteria*
- *Valuation of and compensation for losses*
- *Provide a description of resettlement assistance and restoration of livelihood activities*
- *Provide a detailed budget and implementation schedule*
- *Provide description of provisions for redress of grievances*
- *Provide a description of organizational responsibilities and,*
- *Provide a framework for monitoring, evaluation and reporting.*

### **1.5 RAP Methodology**

This RAP study involves a number of coordinated approaches and action plans tailored to addressing the scope of work and objectives set out in the TOR. The RAP team took the following steps and approaches:

#### **1) Initial meetings with the TCN Project Implementation Unit and Stakeholders**

One of the meetings was held in Msquare Hotel, Ikeja-Lagos in December 2017. It was strategic and convened by the proponent for our firm to present her work plan and approach for conducting the proposed RAP study. Stakeholder ministries connected with RAP implementation were present, including Federal Ministry of Environment, Federal Ministry of Power, Work and Housing and Federal Ministry of Agriculture. A follow up meeting also took place at TCN Project Office in Maitama Abuja in February 2018. This meeting was convened by TCN and JICA to listen to the Consultants Interim Report after field work in the project area. The meetings offered the opportunity to clarify relevant issues in the terms of reference, examine preliminary findings from project area, and agree on impact avoidance measures for critical flash points, including taking a decision to create an alternative route, with minimal encumbrances to avoid impacts at Ajade community that reported significant displacement of community.

#### **2) Literature Review**

The consultants duly reviewed all relevant documents including the Land Use Act (1978), JICA guideline (2010) for Environmental and Social Considerations, World Bank Safeguards Policy on Involuntary Resettlement, TCN EIA Sectoral guideline, Electric Power Sector Reform Act No 6 of 2005, the Ogun State Urban and Regional Planning Law No 20 of 2005 and the Crops

Harmonized Rate Gazette for South-West Nigeria. The review exercise on land laws and involuntary resettlement were helpful in understanding the relationship and gaps in the policy frameworks of the World Bank and the country laws and policies on involuntary resettlement. Also, the review of the TCN EIA Sectoral guideline and Electric Power Sector Reform Act No 6 of 2005 showed that there is a strong policy guiding the activities of the TCN in the areas of procedures and responsibilities in the acquisition of right of ways (ROW). This underscores the TCN capacity and legislation to implement this RAP. Similarly the review of the Crops Harmonized Rate Gazette for South-West Nigeria was very helpful in ascertaining the adequacy of compensation rates applicable in the project area in terms of acceptable international best practices.

#### **3) Field work and Stakeholder Consultation**

Field work started on the 15th of January 2018 with initial preparations, reconnaissance survey and engagement and training of local adhoc staff. The need for engagement of local adhoc staff was because of their local understanding of the project area and their capacity to communicate in the local language. It was also targeted to provide temporal employment to the youths of the area. At least, 3 local staff were recruited from each major community and trained on the use of the survey instruments and the necessary procedures.

Quality assurance measures taking in the recruitment of the local adhoc staff (enumerators) include setting a minimum educational standard of OND/HND or BSC for those enumerators that were recruited. Another measure was to ensure that all were trained and passed the mock survey exercise test conducted after the training.

#### **4) Consultations**

Consultation as tool for social survey engagement was given priority at every stage of the fieldwork. The approach was to identify the head of each major community, known as Baale in the Yoruba language. The Baales were visited individually and collectively. Meetings with the Baales as the custodians of culture and heads of the traditional institutions were germane and helpful in providing them first-hand information on the PDO of TCN-JICA project and the RAP purpose and procedure. Based on that, it was easier to coordinate the town hall public consultation, identification of PAPs and census of the affected persons. Chapter 4 is devoted for details on public consultation.

### 5) Identification of PAPS and Affected Assets

Identification of project-affected persons (PAPs) was facilitated in conjunction with TCN PIU and the Heads of the Communities (Baales). The Baales ensured that their respective community members were mobilized for public consultation and for the enumeration/census of the PAPs. To ensure that all genuine PAPs were identified and enumerated, inventory of all affected items was thorough and systematic. This implies that for each property/asset identified to be affected by the project, identification of the owner/PAP was done, and where the PAP was not available, note was taken including the GPS coordinate of the place. At the end of every working day, the names of unavailable PAPs were compiled and sorted out in conjunction with the community leaders who provided assistance on how to reach/invite the PAPs on subsequent dates for completion of their census.

Thus, PAPs were identified as: 1) those whose lands will be affected, 2) those whose structures might be potentially affected 3) those whose farms, crops and economic trees might be affected, 4) those whose sacred cultural properties such as shrine and Tombs will be affected and 5) those whose fences /walls, wells will be affected.

### 6) Market price enquiry of affected items

Current market prices of the affected items were conducted within the locality.

## CHAPTER TWO: PROJECT DESCRIPTION

### 2.1 The Proponent

Transmission Company of Nigeria (TCN), wholly owned by the Federal Government of Nigeria and having its headquarters at 14, Zambezi Crescent, Maitama, Abuja, is the project proponent. The company was incorporated in November 2005, emerging from the defunct National Electric Power Authority (NEPA) as a product of the merger of the Transmission and Operations sectors on April 1, 2004.

TCN has eight Transmission Regions and a National Control Centre, NCC. Each of these is headed by a General Manager (Transmission), who is responsible for the running and maintenance of transmission and transformation facilities in their areas of operation. The Transmission Regions are Lagos, Osogbo, Kaduna, Bauchi, Benin, Shiroro, Enugu and Port Harcourt and the National Control Centre (NCC) located at Osogbo.

Being one of the 18 unbundled Business Units under the Power Holding Company of Nigeria (PHCN), TCN was issued a transmission license on 1st July 2006 by the Nigerian Electricity Regulatory Commission (NERC) to carry out electricity transmission, system operation and electricity trading which is ring fenced.

The mandate of TCN includes the following:-

- *Management of assets of the High Voltage Transmission System Operations as well as generation dispatch functions;*
- *Operate as the provider of open access transmission service based on regulated transmission tariff and non-discriminatory system operations and economic dispatch services within a regulatory framework provided by the Nigerian Electricity Regulatory Commission (NERC), the Grid Code and the Market Rules.*
- *Load forecasting and system expansion planning;*
- *Acquiring the necessary ancillary service for defined reliability and quality service standards;*
- *Managing the market settlement system;*

- Development of the network through the construction of new transmission lines and substations for efficient Transmission and System operations, hence all stakeholders should observe the Grid Code, Distribution Code and Market rules.

## 2.2 Description of the project

The entire project consists of about 203km high voltage transmission lines and 5 high voltage substations located in Lagos and Ogun State. The entire project is divided into three (3) Lots and the proposed project subject to this RAP is Lot 1, which is a linear project crossing three LGAs of Ogun State (Ewekoro, Ifo and Obafemi Owode). The transmission lines has a total length of 54.55 km, consisting of 35.2km from Ejio (Arigbajo) – New Abeokuta 132kV D/C Transmission line which will traverse some communities, forest, farmlands, river/streams etc. and terminate at New Abeokuta substation in Kobape area Obafemi Owode LGA. Then 12.4km from Olorunsogo – Ejio (Arigbajo) 330kV D/C Transmission Line will emerge from Olorunsogo Power Station in Ifo LGA traversing Agricultural farmlands, railway line, Gas pipeline, major road etc. and terminates at the proposed Ejio (Arigbajo) substation in Ewekoro LGA. Finally 6.95km from Ejio (Arigbajo) – Ikeja West/Osogbo 330kV D/C turn in- turn out transmission line will traverse few communities, major road, forest etc. and terminates at Sojuolu also in Ewekoro LGA.

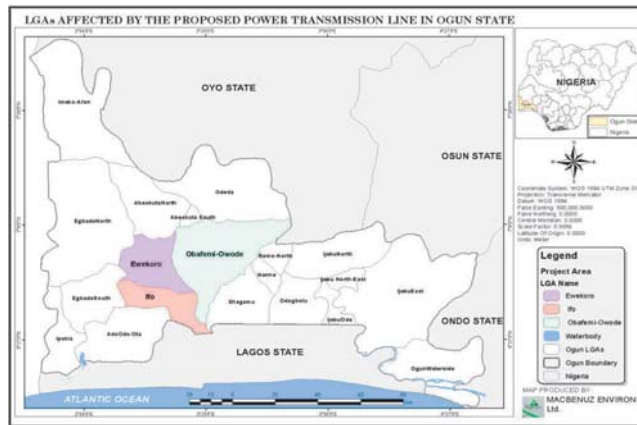


Figure 2.1: Map of Ogun State Showing the LGAs

## 2.3 Descriptions of the Transmission Lines

The description of the coordinates used in this report is based on the UTM MINNA-NIGERIA DATUM ZONE31. Furthermore, angle points and turning points are described in number of degrees it turns away from its rectilinear direction.

### 2.3.1 330kv DC line: Ikeja West to Osogbo Line Turning In-and-Out Of Ejio Substation (6.95km)

This section of the line is the shortest part and is designed to Loop-In-and-Loop-Out (LILO) of the proposed Ejio substation. The total distance of this transmission line is 6.95km with ten (10) angle points. This transmission line will proceed to the breaking point (Existing Ikeja West-Osogbo SC line) from the western side of Ejio substation. The major crossings by this transmission line are the existing 132kV DC NIPP line from Otta to Papalanto, Lagos-Abeokuta Expressway and a railway line which is out of operation. The communities affected by this transmission line are Ejio, Arigbajo, Apomu, Ayepe and Sojuolu Communities.

The transmission line commences from the Ejio substation at point (523223.522 mE, 756723.323 mN) and move towards the East along a bearing of 285.5° for about one kilometre, where it took a right turn of 30.62° from its rectilinear direction, in order to avoid the densely populated Arigbajo Town. Furthermore, to avoid a Shrine in the Arigbajo Forest, an angle point of 15.34° to the left was introduced at point AP-002. About 700 m from this point another angle point of 65° to the left, to avoid crossing over a Mobil Petrol Station and the Lafarge Housing Estate. This transmission line crosses the Lagos-Abeokuta Expressway (Trunk A5) at 6.853224°N, 3.192264°E between AP4 and AP5, after about 2.3km from the Ejio substation. This transmission line crossed the existing 132kV DC NIPP line from Otta to Papalanto and a railway line between AP6 and AP7. From AP7 which is 214m away from AP8, the transmission line turned right at a bearing of 275° to avoid the built up areas in Sojuolu/Apomu community before heading to AP9.

The existing single circuit transmission line from Ikeja West to Osogbo is to be cut at AP 10. The Osogbo-Ikeja West line will be looped in and out of the Ejio substation. The transmission line from Ejio S/S to the crossing point is four circuit; double circuit x 2 (consist of two circuit going to Ajegunle, two circuits from Osogbo-Ikeja West going in and out of Ejio). The cutting

point is located at Latitude 6.838162° N, Longitude 3.154384° E and about 6.95km from the Ejio substation.

The altitude of Ejio S/S site is approximately 80m and the altitude of the distance of 5km Westward is approximately 110m, transmission line is gradually upslope from Ejio S/S to the Westward. The route map is shown in Figure 2.2.



**Figure 2.2: Ejio to Ikeja West-Osogbo line showing the breaking point**

### 2.3.2 330kV DC line: Ejio To Olorunsogo Substation (12.33km)

This transmission line runs majorly along Papalanto – Sagamu road. The total distance of this transmission line is 12.4km. It is worthy to note that this road is in a very poor state, this makes the movement on this axis to be very slow. The vegetation of the line route is relatively light bush with a lot of cassava, corn and Sugarcane farmland with few dense forests with Bamboo and some forest trees. The right of way along this line route is almost totally free of any obstruction except with few low medium structures in few places. The lists of villages affected by this line route are: Ejio, Iludun, Abese, Shoderu, Sowunmi, Ajitadun, Mose, Olowofela, Oreke, Ajegunle, Lerin, Elegbata, Aberemeta, Ogunmola, Ikereku, Ita Alhaji and Olorunsogo. This transmission line route is divided into ten (10) Angle Points (AP). The line starts from AP1(523849.750mE, 756688.905mN) with a bearing of 61 degrees to AP2, turning left at AP2

towards AP3. The communities between AP1 and AP3 are Ejio, Iludun and Abese communities (lightly populated) in Ewekoro Local Government Area, Ogun state. The major Agricultural activities in the communities are cassava, Sugar cane and Plantain plantation. At about 213m from AP2, there exists a marshy area in Iludun community which spanned about 200m along the line.

At AP3, this line is running parallel with the existing 330kV Ejio – Olorunsogo line route and the proposed 132kV DC Ejio – New Abeokuta line route. These three lines run parallel from AP3 towards AP4. Between AP3 and AP4, the line has three major crosses. It crosses the High pressure pipeline, a railway track and Papalanto – Sagamu road. The High pressure pipeline is the pipeline that supplies gas to the Olorunsogo Power Plant while the railway line is coming from the back of Ewekoro cement factory and heading towards Osoosun Railway Station. After the railway crossing, the line crosses a major road (Papalanto – Sagamu road) before having a right turn at AP4. The community covered by this AP3 and AP4 are Abese and Soderu communities. There is a sugarcane plantation at about 513m from AP3 in Abese community, this farm spanned for about 500m along the line route. A river is located at about 400m from AP4 (525570mE, 758698mN) in Soderu. From AP4, the line heads 94 degrees to AP5. This line route runs parallel with the existing 330kV transmission line turning in-and-out of Olorunsogo Substation by the Right. There is a seasonal season at about 395m from AP4 (526163mE, 759036mN) in Sowunmi community and a swampy area which spanned for 180m under the line and started from about 182m from AP4. After AP5, there is a pond with coordinates 528016mE, 759043mN which is about 690m from AP5. There also exist a swampy area between AP5 and AP6 which started at (528157mE, 759065mN) and ended at (528485mE, 759110mN). There may not be need for construction of access road along this section as the access road for the existing transmission line would be used. However, for areas where the existing access road may not serve, new access roads will be constructed by means of driving over the vegetation where possible to avoid permanent removal of the existing vegetation.

The line made a 66 degree turn from the North pole at AP6 heading to AP7. At AP8, the line made 65 degree turn to AP9. From AP9, the bearing about 85 degrees to AP10 (534599.8mE, 760856.9mN) in Olorunsogo power station switchyard.





Figure 2.3 Ejo to Olorunsogo Line showing line route

## 2.4 Project Components

The Lagos and Ogun Transmission Projects involve the construction of:

Lot 1 –

- Arigbajo – New Abeokuta 132kV D/C Transmission Line (37.8km)
- Olorunsogo – Arigbajo 330kV D/C Transmission Line (12.9km)
- Arigbajo – Ikeja West / Osogbo 330kV D/C Turn in-turn out at Sojuolu (5.9km)

Lot 2 –

- Ogijo – Arigbajo D/C Transmission Line (43.7km)
- 132kV Quad Line (2.3km) from Ogijo – Existing Ikorodu/Shagamu 132 kV 2x D/C Transmission Line
- 132kV D/C Transmission Line (10.3km) from Ogijo – Redeem.
- MFM – Existing Benin (Omotosho)/Ikeja West 330kV 2 x D/C Transmission Line (4.2km)

- 2x300MVA 330/132kV + 2 x 100MVA 132/33kV Transformer capacity at Ogijo, Lagos
- 2x60MVA, 132/33kV Substation at Redeem.
- 2x150MVA, 330/132kV + 2x60MVA 132/33kV Substation at MFM

Lot 3 –

- Arigbajo – New Agbara 330kV D/C Transmission Line (30.6km)
- New Agbara – Agbara 132kV D/C Transmission Line (20.8km)
- New Agbara – Badagry 132kV D/C Transmission Line (34.2km)
- 2x150MVA, 330/132kV + 2x60MVA 132/33kV Substation at New Agbara
- 2x60MVA, 132/33kV substation at Badagry.

However, this RAP covers only the Lot 1 routes and communities while Lot 2 and Lot 3 are handled separately by other consultants engaged by TCN and JICA.

## CHAPTER THREE: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

### 3.1 Introduction

The consultant reviewed a collection of documents pertinent to the preparation of RAP in Nigeria. The list of instruments reviewed included: 1) the Land Use Act (1978), Ogun State Urban and Regional Planning Law No 20 of 2005, 3) Electric Power Sector Reform Act 2005; 4) JICA guidelines on Environmental and Social Consideration amongst others. The brief account of the reviewed instruments is discussed below.

#### 3.1.1 JICA Guideline (2010) for Environmental and Social Considerations (ESC)

In the past, the guidelines of former Japan Bank for International Cooperation (JBIC) had been applied for Loan Aid, while the guidelines for the former JICA were applied for Grant Aid and Technical Cooperation. These have now all been integrated into a single set of guidelines known as the JICA guideline (2010) for Environmental and Social considerations

The new guideline has a higher degree of compliance with the Safeguard Policies of the World Bank, by confirming that there are no major disparities with these policies. ESC in a JICA project must be in line with the World Bank's Safeguard Policies including Operational Policy on Environmental Assessment (OP 4.01), Natural Habitats (OP 4.04), Involuntary Resettlement (OP 4.12), Indigenous Peoples (OP 4.10), and other relevant policies.

Pertinent specific clauses in the JICA (2010) ESC are denoted as follows:

- *Compliance with host country laws, standards and plans: ESC in a JICA project must comply with the laws, standards, policies and plans of the host country. If the standards set by the host country differs from the international standard, the project proponents are advised to adopt the standard that better serves the purpose of attaining a higher ESC;*
- *Information disclosure: Information disclosure is key in ESC. Project proponents must proactively release relevant information to the public. By sharing information with a wide range of stakeholders from the early stage, the project proponents can utilize their feedback to improve the plan/project. In addition, the project proponents can ensure that unnecessary concerns and misunderstandings among the stakeholders are ameliorated.*

- *However, information disclosure excludes personal information that may compromise the privacy of project-affected peoples when disclosed or information that requires confidentiality for commercial reason;*

- *Participation of Local stakeholders in resettlement process: The ESC Guidelines defines „local stakeholders” as local residents (including non-titleholders) who could be affected by the project, and local NGOs. By involving local stakeholders from the early stage of the project, the project proponents can receive their inputs and plan appropriate measures to address their concerns, avoid conflict, and achieve higher results with their support. For this reason, the project proponents should conduct a series of consultations with local stakeholders in an interactive and meaningful manner. During this process, appropriate consideration must be given to socially vulnerable or different people such as women, children, the elderly and ethnic minorities.*

#### 3.1.2 Ogun State Urban and Regional Planning Law No 20 of 2005

The Urban and Regional Planning Law No 20 of 2005, established the Ogun State Urban and Regional Planning Board as the agency responsible for development control in the state. The substation sites as well as the ROW in Ogun State needs to be approved by the board as part of the process for granting right of occupancy by the Governor. The State Ministry of Urban and Physical Planning also derives its statutory functions from section 3 line 246 of this law as the policy arm of the government related to physical planning in the State.

#### 3.1.3 Electric Power Sector Reform Act No. 6, 2005

The Act established the Nigerian Electricity Regulatory Commission (NERC) as an independent regulatory agency. NERC was inaugurated in October 2005, and is mandated to carry out:

- *The monitoring and regulation of the electricity industry*
- *Issuance of licenses to market participants, and*
- *Ensure compliance with market rules and operating guidelines.*

This Act also deals with acquisition of land and access rights. Section 77 of the Act empowers the NERC to make a declaration that land is required by a license for purpose of generation or distribution of electricity. Section 77 (9) states: “where the President issues a notice under subsection 6, the Governor shall in accordance with the provisions of section 28(4) of the Land Use Act, revoke the existing right of occupancy respecting the land and grant a certificate of occupancy in favour of the concerned licensee in respect of the land identified by the

commission in such notice who shall be entitled to claim compensation in accordance with the provisions of the Land Use Act”.

#### 3.1.4 Nigerian Land Use Act of 1978

The Land Use Act of 1978 now Cap L5 Laws of the Federation of Nigeria 2004, is the key legislation that has direct relevance to this project. Relevant sections of these laws that may relate to this project with respect to land ownership and property rights, resettlement and compensation are summarized in this section.

The Land Use Act is the applicable law regarding ownership, transfer, acquisition and all such dealings on Land. The provisions of the Act vest every parcel of Land, in every State of the Federation, in the Executive Governor of the State. He holds such parcels of land in trust for the people and government of the State.

The Act categorized the land in a State to urban and non-urban or local areas. The administration of the urban land is vested in the Governor, while the latter is vested in the Local Government Councils. At any rate, all land irrespective of the category belongs to the State while individuals only enjoy a right of occupancy as contained in the Certificate of Occupancy, or where the grants are “deemed”.

The concept of ownership of land as known in the western context is varied by the Act. The Governor administers the land for the common good and benefits of all Nigerians. The law makes it lawful for the Governor to grant statutory rights of occupancy for all purposes; grant easements appurtenant to statutory rights of occupancy and to demand rent. The Statutory Rights of Occupancy are for a definite time (the limit is 99 years) and may be granted subject to the terms of any contract made between the state Governor and the Holder.

The Local Government Councils may grant customary rights of Occupancy for agricultural (including grazing and ancillary activities), residential and other purposes. But the limit of such grants is 500 hectares for agricultural purposes and 5,000 for grazing except with the consent of the Governor. The Local Government, under the Act is allowed to enter, use and occupy for public purposes any land within its jurisdiction that does not fall within an area compulsorily acquired by the Government of the Federation or of relevant State; or subject to any laws relating to minerals or mineral oils.

The State is required to establish an administrative system for the revocation of the rights of occupancy, and payment of compensation for the affected parties. So, the Land Use Act provides for the establishment of a Land Use and Allocation Committee in each State that determines disputes as to compensation payable for improvements on the land (**Section 2 (2) (c)**).

In addition, each Local Government is required to set up a **Land Allocation Advisory Committee**, to advise the Local Government on matters related to the management of land. The holder or occupier of such revoked land is to be entitled to the value of the unexhausted development as at the date of revocation. (**Section 6**) (5). Where land subject to customary rights of Occupancy and used for agricultural purposes is revoked under the Land Use Act, the local government can allocate alternative land for the same purposes (**section 6**) (6).

If Local Government refuses or neglects within a reasonable time to pay compensation to a holder or occupier, the Governor may proceed to effect assessment under section 29 and direct the Local Government to pay the amount of such compensation to the holder or occupier. (**Section 6**) (7).

Where a right of occupancy is revoked on the ground either that the land is required by the Local, State or Federal Government for public purpose or for the extraction of building materials, the holder and the occupier shall be entitled to compensation for the value at the date of revocation of their unexhausted improvements. Unexhausted improvement has been defined by the Act as: anything of any quality permanently attached to the land directly resulting from the expenditure of capital or labour by any occupier or any person acting on his behalf, and increasing the productive capacity the utility or the amenity thereof and includes buildings plantations of long-lived crops or trees, fencing walls, roads and irrigation or reclamation works, but does not include the result of ordinary cultivation other than growing produce.

**Developed Land** is also defined in the generous manner under **Section 50(1)** as follows: land where there exists any physical improvement in the nature of road development services, water, electricity, drainage, building, structure or such improvements that may enhance the value of the land for industrial, agricultural or residential purposes.

**It follows from the foregoing that compensation is not payable on vacant land on which there exist no physical improvements resulting from the expenditure of capital or labour.**

**The compensation payable is the estimated value of the unexhausted improvements at the date of revocation.**

Payment of such compensation to the holder and the occupier as suggested by the Act may appear confusing as it raises the following question: Does it refer to holder in physical occupation of the land or two different parties entitled to compensation perhaps in equal shares? The correct view appears to follow from the general tenor of the Act.

First, the presumption is more likely to be the owner of such unexhausted improvements. Secondly, the provision of **section 6(5)** of the Act, which makes compensation payable to the holder and the occupier according to their respective interests, gives a pre-emptory directive as to who shall be entitled to what.

Again the Act provides in **section 30** that where there arises any dispute as to the amount of compensation calculated in accordance with the provisions of **section 29**, such disputes shall be referred to the appropriate Land Use and Allocation Committee. It is clear from **section 47 (2)** of the Act that no further appeal will lie from the decision of such a committee. If this is so, then the provision is not only retrospective but also conflicts with the fundamental principle of natural justice, which requires that a person shall not be a judge in his own cause.

The Act must, in making this provision, have proceeded on the basis that the committee is a distinct body quite different from the Governor or the Local Government. It is submitted, however, that it will be difficult to persuade the public that this is so since the members of the committee are all appointees of the Governor.

Where a right of occupancy is revoked for public purposes within the state of the Federation; or on the ground of requirement of the land for the extraction of building materials, the quantum of compensation shall be as follows:

- *In respect of the land, an amount equal to the rent, if any, paid by the occupier during the year in which the right of occupancy was revoked.*
- *In respect of the building, installation, or improvements therein, for the amount of the replacement cost of the building, installation or improvements to be assessed on the basis of prescribed method of assessment as determined by the appropriate officer less any depreciation, together with interest at the bank rate for delayed payment of compensation. With regards to reclamation works, the quantum of compensation is such cost as may be substantiated by documentary evidence and proof to the satisfaction of the appropriate*

officer.

- *In respect of crops on land, the quantum of compensation is an amount equal to the value as prescribed and determined by the appropriate officer.*

Where the right of occupancy revoked is in respect of a part of a larger portion of land, compensation shall be computed in respect of the whole land for an amount equal in rent, if any, paid by the occupier during the year in which the right of occupancy was revoked less a proportionate amount calculated in relation to the area not affected by the revocation; and any interest payable shall be assessed and computed in the like manner.

Where there is any building installation or improvement or crops on the portion revoked, the quantum of compensation shall follow that outlined in paragraph (ii) above and any interest payable shall be computed in like manner.

This project will require acquisitions of land for the substation sites and ROW for the transmission lines, hence triggers involuntary resettlement.

### [3.1.5 International requirements for land acquisition and resettlement: World Bank Operational Policy 4.12](#)

Based on lessons learned from early investments that caused significant resistance, public and private actors in Nigeria gradually started to use international standards and approaches to access and value assets and land involving compulsory acquisition or displacement. The World Bank OP 4.12 has become common and popular as guideline for international requirements for addressing involuntary resettlement.

The OP 4.12 applies to all components of this Project including activities resulting in involuntary resettlement that are (a) directly and significantly related to the project, (b) necessary to achieve its objectives as set forth in the project documents and (c) carried out, or planned to be carried out, contemporaneously with the investments.

The OP 4.12 covers direct economic and social impacts caused by the involuntary taking of land resulting in (i) relocation or loss of shelter; (ii) loss of assets or access to assets; or (iii) loss of income sources or means of livelihood, whether or not the affected persons must move to another location. RAPs are prepared to ensure that the displaced persons are (i) informed about their options and rights pertaining to resettlement, (ii) consulted on, offered choices among, and provided with technically

and economically feasible resettlement alternatives, and (iii) provided prompt and effective compensation at full replacement cost for losses of assets attributable directly to the investment.

Where the impacts include physical relocation, the RAPs include measures to ensure that the displaced persons are (i) provided assistance (such as moving allowances) during relocation; and (ii) provided with residential housing, or housing sites, or, as required, agricultural sites for which a combination of productive potential, location advantages, and other factors is at least equivalent to the advantages of the old site. Where necessary, the RAPs also include measures to ensure that displaced persons are (i) offered support after displacement, for a transition period, based on a reasonable estimate of the time likely to be needed to restore their livelihood and standards of living and (ii) provided with development assistance in addition to compensation measures outlined above such as land preparation, credit facilities, training, or job opportunities, particular attention should be paid to the needs of vulnerable groups among those displaced, especially those below the poverty line, the landless, the elderly, women and children, indigenous peoples, ethnic minorities, or other displaced persons who may not be protected through national land compensation legislation.

The implementation of the land acquisition and resettlement activities shall be linked to the implementation of the investments to ensure that displacement does not occur before necessary measures for resettlement are in place. These measures include provision of compensation and of other assistance required for relocation, prior to displacement, and preparation and provision of resettlement sites with adequate facilities, where required. In particular, taking of land and related assets according to OP 4.12, shall take place only after compensation has been paid and, where applicable, resettlement sites and moving allowances have been provided to the displaced persons. As indicated for displaced people whose livelihoods are land-based, OP 4.12 states that preference should be given to land-based resettlement strategies and resettlers provided with land for which a combination of productive potential, location advantages, and other factors is at least equivalent to the advantages of the land taken. If land is not the preferred option of the displaced persons or sufficient land is not available at a reasonable price, non-land-based options built around opportunities for employment or self-employment should be provided in addition to cash compensation for land and other assets lost. The lack of adequate land must be demonstrated and documented to the satisfaction of the Bank.

Payment of cash compensation for lost assets may be appropriate where (a) livelihoods are land-based but the land taken for the project is a small fraction of the affected asset and the residual is economically viable; (b) active markets for land, housing, and labour exist, displaced persons use such markets, and there is sufficient supply of land and housing; or (c) livelihoods are not land-based. Cash compensation levels should be sufficient to replace the lost land and other assets at full replacement cost in local markets.

Displaced persons may be classified in one of the following three groups:

- *those who have formal legal rights to land (including customary and traditional rights recognized under the laws of the country);*
- *those who do not have formal legal rights to land at the time the census begins but have a claim to such land or assets--provided that such claims are recognized under the laws of the country or become recognized through a process identified in the RAP; and*
- *those who have no recognizable legal right or claim to the land they are occupying.*

Persons covered under para. (a) and (b) are provided compensation for the land they lose, and other assistance. Persons covered under para. (c) are provided resettlement assistance in lieu of compensation for the land they occupy, and other assistance, as necessary, to achieve the objectives set out in this policy, if they occupy the project area prior to a cut-off. Persons who encroach on the area after the cut-off date are not entitled to compensation or any other form of resettlement assistance. All persons are provided compensation for loss of assets other than land.

### **3.2 GAP analysis between national and international standards and gap filling measures**

Table 3.1 below provides assessment of key relevant clauses in the Nigerian extant law (LUA 1978) regarding involuntary resettlement/land acquisition and that of the principles of operational Policy 4.12 of the World Bank, and provides solutions to existing gaps.

**Table 3.1: Comparison of Nigerian Law and WB Operational Policy 4.12**

| Category                     | Nigerian Law   | World Bank OP4.12  | Measures to Filling the Gaps  |
|------------------------------|--|--|---|
| Minimization of resettlement | No requirement to consider all options of project design in order to minimize the need for resettlement or displacement        | Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs  | Re-alignment of Design of Line Route ROW will be undertaken where necessary so as to minimize resettlement.   |
| Information and Consultation | It's lawful to revoke or acquire land by the governor after issuance of notice. No consultation is required.                   | PAPs are required to be meaningfully consulted and participate in the resettlement process   | PAPs shall be meaningfully consulted and engaged in the resettlement process  |
| Timing of Compensation       | The law is silent on timing of payment   | Compensation implementation to take precedence before construction or displacement   | Compensation and resettlement implementation to take place before construction or displacement  |
| Livelihood restoration       | Makes no proscription on livelihood restoration measures   | Requires that vulnerable PAPs be rehabilitated   | Livelihood restoration measures will be put in place for vulnerable PAPs  |
| Grievance Process            | The land use and allocation committee appointed by the Governor is vexed with all disputes/grievances and compensation matters | Requires that a grievance redress mechanism be set early constituting the representative of PAPs and, prefers local redress mechanism. The law court is the last resort when available mechanism or outcome is unsatisfactory to PAP | A grievance redress committee (GRC) shall be established early and existing local redress process shall be considered to address issues of project induced grievances. PAPs or their representatives shall be members of the GRC. |

|   |  |  |  |
|---|--|--|--|
| Owners of economic trees and crops        | Compensation for an amount equal to the value as prescribed by the appropriate officer of the government             | Compensation for the market value of the yield plus the cost of nursery to maturity (for economic tree) and labour | Compensation for the market value of the yield plus the cost of nursery to maturity (for economic tree) and labour |
| Community land with customary right       | Compensation in cash to the community, chief or leader of the community for the benefit of the community             | Land for land compensation or any other in-kind compensation agreed to with the community                          | Land for land compensation or any other in-kind compensation agreed to with the community                          |
| Agricultural land                         | Entitled to alternative agricultural land <sup>1</sup>   | Land for land compensation   | Land for land compensation   |
| Fallow land                               | No compensation  | Land for land compensation   | Land for land compensation   |
| Statutory and customary right Land Owners | Cash compensation equal to the rent paid by the occupier during the year in which the right of occupancy was revoked | Recommends land-for-land compensation or other form of compensation at full replacement cost.                      | Recommends land-for-land compensation or other form of compensation at full replacement cost.                      |
| Land Tenants                              | Entitled to compensation based upon the amount of rights they hold upon land.  | Are entitled to some form of compensation whatever the legal recognition of their occupancy.                       | Are entitled to some form of compensation whatever the legal recognition of their occupancy.                       |
| Squatters settlers and migrants           | Not entitled to compensation for land, but entitled to compensation for  | Are to be provided resettlement assistance in addition to compensation for affected assets; but no                 | Are to be provided resettlement assistance in addition to compensation for affected assets; but no                 |

|  | crops.   | compensation for land   | compensation for land   |
|--|--|---|---|
| Owners of “Non-permanent” Buildings            | Cash compensation based on market value of the building (that means depreciation is allowed)                               | Entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, prior to displacement. | Entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, prior to displacement. |
| Owners of “Permanent” buildings, installations | Resettlement in any other place by way of reasonable alternative accommodation or Cash Compensation based on market value. | Entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, prior to displacement. | Entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, prior to displacement. |

### 3.3 Country Location and Administrative structure

Nigeria lies between latitudes 4° and 14° north of the equator and longitudes 3° and 15° east of the Greenwich meridian on the west coast of Africa. It covers a total area of 923,766 square kilometres consisting of 910,768 square kilometres of land and 13,000 square kilometres of water with the coast line stretching up to 853 kilometres. The entire country is divided into 36 states and federal capital territory. These are further sub-divided into 770 local government areas which form the third tier of government while the central and state governments form the first and second tier respectively. The third tier consists of the Local Government Areas. The country practices a presidential system of government consisting three arms of government: the executive, the legislature and the judiciary (Nigerian 1999 Constitution). The executive consists of both elected and appointed members, while members of legislature, both at federal and state levels are elected. This pattern is similar to what obtains at the Local Government level, except that there is no third arm (the judiciary) at the LGA level. Another major difference between the central government structure and that of the state is the presence of two legislative chambers at the center (i.e. the Senate and the House of Representatives), while the states have just one.

The LGA administration is run by an elected Executive Chairman and appointees of the Chairman representing the executive arm of local government administration. There is also the legislature made up of ten Counselors elected from the wards in the LGA. The Chairman is the chief security officer of the LGA and the office is important in the operations of the proposed project.

The communities have a well-defined hierarchical political structure with traditional leadership through Kings (Oba) or *Baale*, chiefs and community Heads. The traditional authority structures are similar in all the communities. This governance structure is graphically represented in Figure 3.1

At the community level, the traditional authority structure hardly varies from one community to another with the traditional head (King or *Baale*) and chiefs jointly administering their political, economic and social affairs. Authority in each community is at two levels. The first is the traditional ruling council composed of the village chiefs and headed by the village head (the “*Baale*”). The second is the Community Development Association (CDA) comprising of an elected Chairman and some Executive Members. All CDAs operate under the leadership of one Community Development Secretary (CDS) who coordinates the activities of all CDAs in the area. The Community Development Association (CDA) mobilizes the different sections and interest groups in the Community for development purposes. The CDA reports to the CDS who takes issues to Council of Elders. There is also a Youth Organization with elected Chairman and members in each community.

Three broad groups are identifiable in each of the communities – male elders, youths and women. The role of male elders is traditional governance of the communities. They dominate the political arena and the decision-making positions, while the youth leaders are usually at the bottom rungs of the ladder of authority. The traditional role of the youths includes constituting a labour force in development projects, security of the community and to enforce law and order. Traditionally, there is a limit to the involvement of women in the political governance of these local settlements. Generally, women play a subdued role in the communities, usually placed at the background. Each of the communities has a patriarchal familial arrangement. There is also the women group led by the women leader (*Iya Olode*) who organizes and co-ordinates the activities and role of women in the community. The children as well as the non-indigenes or visitors are at the base of the governance system. The system rewards good and hardworking

people and reprimands troublesome and unprogressive individuals. The communities have very high respect for the *Baale* who is the overall ruler.

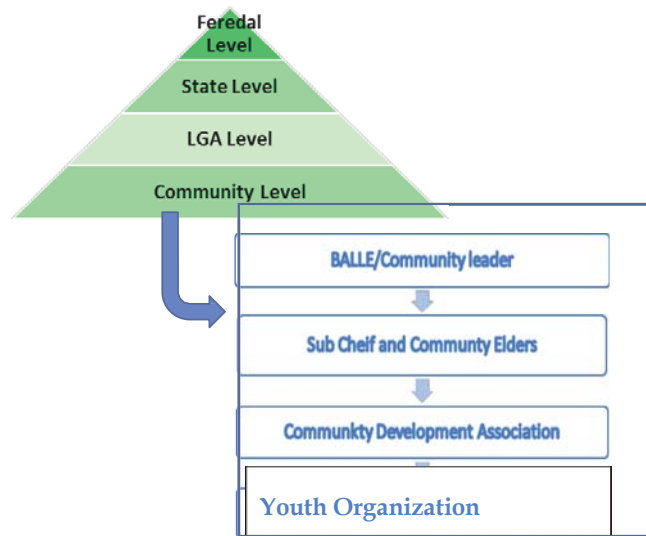


Figure 3.1: Governance Structure in the Project Area

## CHAPTER FOUR: CONSULTATIONS

### 4.1 Introduction

In compliance with JICA and World Banks guidelines on requirement for local stakeholder’s engagement, our organization in planning and conducting this RAP survey engaged the affected communities and groups in consultations. Consultation mainstreamed all stakeholders including Baales (community leaders), farmers, women, youths and Ministries, Department and Agencies such as State Ministry of Agriculture and Ministry of Land and Survey. The engagement which started at the planning phase will still continue at different stages of the RAP implementation and post implementation. Public consultation and engagement was not only helpful in informing, sensitizing and harvesting inputs of the communities and groups about the TCN project and RAP purpose and processes, but was hugely helpful in achieving a socially acceptable, smooth and inclusive exercise. The lists of attendees are attached as appendix 4.

### 4.2 Stakeholder Identification and Method of Participation

The consultant in conjunction with TCN mapped out the potential stakeholders and categorized them as primary and secondary stakeholders.

#### *Primary stakeholders*

These are groups and persons that will be directly affected either by the positive or negative impact of the transmission line project. They include Project Affected Persons (PAPs), Affected LGA Councils, Communities and notable groups such as community leaders, women, youths, vulnerable and minority groups within the communities.

#### *Secondary stakeholders*

Those classified as secondary stakeholders are people and institutions that have some form of rights, interest and roles to play/protect within the project and/or project area. Secondary stakeholders identified and contacted included Federal Ministry of Environment, Ogun State Ministry of Environment, Federal Ministry of Power, Work and Housing and Ogun state Ministry of Agriculture, Ministry of Physical Planning and Urban Development, NGOs.

### 4.3 Stakeholders Method of Participation

The participation process of the stakeholders is multifaceted. Letters were written officially to the various Ministries that have statutory functions to play in the project, detailing them about



the project and requesting for their involvements. This was also followed up with visits to some ministries for collection of relevant documents at their custodies that are relevant for the RAP study.

In response to the request for participation, the Ogun state Ministry of Environment, Ministry of Agriculture, Ministry of Physical Planning and Urban Development were present to work with the consulting team on daily basis to ensure that the exercise complied with their standards and policies.

Similarly, primary stakeholder's involvement started with courtesy call on the heads of the communities. Initial meetings with heads of communities paved way for wider consultations with communities and affected groups. The heads of the communities (Baales) gave unwieldy support by mobilizing their wards for consultations at given dates of meetings. To ensure inclusive and robust participation, our approach to consultations entailed holding focus group discussions with smaller groups such as the vulnerable, women and minority groups in addition to general community consultations which were held across centers. Tools of information gathering also included RAP survey instrument and In-depth interview.

#### 4.4 Outcome and Gains of the Stakeholders Consultation Process

This section discusses the summary of the consultations held at community and group levels. Generally, the consultations dwelled on informing the participants on the project development objectives of the TCN-JICA Transmission Line Project, including the expected benefits and adverse impacts, which may result from construction and implementation work activities. Our scope of consultation covers hearing the perception of stakeholders on the project, to issues of concerns to them, their experience with past development donor funded projects and their experience with involuntary resettlement and livelihood. The people of the project area were sufficiently informed about their rights to participation in the RAP process, and were ensured that their entitlements will be paid before commencement of civil works in line with international best practices. They were also informed that the project will establish Grievance Redress Mechanism where aggrieved persons can channel their grievances for speedy and fair hearing and redress. Highlights of the consultations are presented in section 4.5 while details of the specific consultations held across the communities follows.

#### 4.5 Highlights and Gains of the Consultations

**OBSERVATIONS AND CONCERNS:** Gratitude from the community leaders was shown towards the project as their livelihood source is not worsened after counting losses as a result of the impact of the project. Promises were made as well as their input to support the project. Their concerns were as follows;

- *Employment of locals should be put into consideration prior to the commencement of civil works*
- *Dates of commencement of fieldwork exercise at respective communities should be communicated to them on time*
- *Shrines should also be put into consideration for compensation as it is one of their historical values*
- *Cost of relocation should be the responsibility of the project proponents.*

#### QUESTIONS AND RESPONSES:

The following questions were also raised by the PAPs:

- *Will PAPs be permitted to be identified by proxy in case of recorded absentees?*
- *How would a PAP who has land elsewhere be captured if the data capturing exercise is done simultaneously at different communities?*
- *If PAPs who have more than one assets located within the community be captured separately?*
- *Who is the rightful claimant eligible for entitlement for land that has been leased out for crop farming?*
- *How would a compensation plan between a land owner and a crop farmer on affected portion of land be captured and reconciled?*
- *What happens to owners of fallow lands in terms of compensation entitlement?*
- *Will the project consider compensating land owners with statutory rights only or all owners of land irrespective of title holding?*
- *Will the project create employment opportunity to engage the youths who are not gainfully employed?*
- *Is there a time limit to which PAPs are given to open a valid and functional bank account if compensation will not be paid in cash?*
- *Is there some provision or entitlement from the RAP for community leaders who may not be PAPs*

RESPONSES TO THE QUESTIONS:

The above questions were addressed as follows:

| Questions/Concerns   | Answers to Questions   |
|--|--|
| Will PAPs be permitted to be identified by proxy in case of recorded absentees?  | A 2 <sup>nd</sup> party can only be captured as PAP upon receiving a consent (written or phone confirmation) from the 1 <sup>st</sup> PAP that authorizes the second party to act as PAP, and also substantiated by the witnessing of the community leaders that the person representing an absentee PAP is known by them. |
| How would a PAP who has land elsewhere be captured if the data capturing exercise is done simultaneously at different communities? | Census exercise is continuous; even if the enumerators have worked in the location where a PAP has not been captured, they are subject to revisiting for the sake of any PAP who was not available.  |
| Will PAPs who have more than one assets located separately within the community be captured separately?                            | Yes  |
| Who is the rightful claimant eligible for entitlement for land that has been leased out for crop farming?                          | The land owner is eligible for his land, while the farmer on the land is entitled to compensation for his/her crops  |

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| How would a compensation plan between a land owner and a crop farmer on affected portion of land be captured and reconciled?                            | As explained in above  |
| What happens to owners of fallow lands in terms of compensation entitlement?  | Owners of fallow land are not entitled for compensation, except they hold some statutory rights  |
| Will the project consider compensating land owners with statutory rights only or all owners of land irrespective title holding?                         | Land owners without statutory rights are only entitled to compensation for the value of improvement on the land.                         |
| Will the project create employment opportunity to engage the youths who are not gainfully employed?   | The project will try to create employment directly and indirectly  |
| Is there a time limit to which PAPs are given to open a valid and functional bank account if compensation will not be paid in cash?                     | PAPs will be screened for bank account during implementation of RAP. Those without bank accounts will be requested and assisted to do so |
| Is there some provision or entitlement from the RAP for community leaders who may not be PAPs?  | No provision is made in this RAP   |
| <b>CONCLUSION:</b>  |  |
| Inputs from the consultations have been noted and integrated into the RAP for informed decision as it is hoped to ensure successful RAP implementation. |  |

Outcome of specific consultation processes across project communities is presented below:

**Table 4.1: Consultation Proceedings at Abese Community**

|               |  |
|---------------|--|
| Meeting date  | 18 <sup>th</sup> January, 2018   |
| Meeting venue | Abese community town hall  |
| Attendance    | The meeting was attended by the Community leaders, Community members, PAPs within the project area, Representatives from Ministry of Lands and Urban Survey, State Ministry of Agriculture, RAP Consultant and his team  |
| Preamble      | <p>The project coordinator of Godira Chemicals Ltd introduced the RAP consultant and his team who have been engaged to prepare a Resettlement Action Plan (RAP) for the transmission line network project. Thereafter, the lead consultant, Mr. Daniel Okoh gave a brief introduction of the RAP study, in which he stated that involuntary resettlement is triggered by the TCN line route and sub-station activities. The ROW for the 330kVA is 25meters while 132kVA is 15meters. The project intends to as much as possible avoid land acquisition and other forms of displacement that have adverse impacts on the community. However, where impacts cannot be avoided, TCN is prepared to carryout resettlement and/or compensation to the project affected persons and to restore their livelihood to ensure no net loss.</p> <p>Resettlement or compensation implementation shall take place before the actual line route project implementation, in line with global best practices. According to the consultant, PAPs have right to participate in the resettlement process and therefore, will be consulted from time to time. This project will also establish a Grievance Redress Mechanism (GRM) at various levels, beginning with the village level where aggrieved PAPs can go and lodge their complaints for redress. The Grievance Redress Committee (GRC) shall include members of the community who have good reputation to ensure that matters of complaints received fair hearing and quick processing. PAPs that feel dissatisfied with the judgment of the GRC can exercise their rights by approaching the court of law.</p> <p>Members of this community are therefore, requested to support this project and make inputs and ask questions as deemed appropriate that will help for</p> |

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|                              | <p>project sustainability.</p> <p>The RAP Lead consultant also requested for the nomination of site representatives who are conversant with individual's boundaries to help in identification of claimants assets to avoid impersonation.</p>  |
| Responses and Expectation    | <p>The community head, Baale Oluwale Babayemi .Aikulola, on behalf of the community members expressed his gratitude towards the initiative taken by the TCN and GODIRA to take into cognizance the need to compensate PAPs for their land and assets that will be acquired or displaced by the project. According to him, the recent RAP that was carried out as a result of the ongoing railway line project was successful and therefore wished that same should be the outcome of the TCN-JICA transmission line project. He introduced the community site representatives who he nominated to participate in the enumeration exercise.</p>   |
| Questions raised             | <p>The following questions were also raised by the PAPs:</p> <ul style="list-style-type: none"> <li>• If PAP would be permitted to be identified by proxy in case of recorded absentees</li> <li>• How would a PAP who has a land elsewhere be captured if the data capturing exercise is scheduled to be carried out at different communities simultaneously?</li> <li>• If PAPs who own more than one asset will be captured Separately for claims on different assets located within the same community</li> <li>• Who is the rightful claimant of land that has been leased out for crop farming</li> </ul>  |
| How questions were addressed | <p>The RAP lead consultant addressed the questions as follows:</p> <ul style="list-style-type: none"> <li>• That relative of PAPs / representative of the PAPs would be captured only when identified by the community head or affidavit of consent sent by the PAP</li> <li>• With reference to the RAP instrument for survey, a PAP should notify ownership of land elsewhere that would be affected as a result of the project</li> <li>• PAPs who own more than one asset will be captured Separately for claims on different assets located within the same community hence it is within the transmission line route</li> <li>• According to the Nigeria Law on Land Use Act, compensation</li> </ul> |

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|            | is paid for development on land but whereby a land has been leased to a crop owner, then a landowner will be considered and captured for his economic trees and crops. |
| conclusion | January 21 <sup>st</sup> was scheduled for commencement of census of PAPs.   |

**Table 4.2 : Consultation with Group of Baales from Project Areas held at Sowunmi**

|                            |  |
|----------------------------|--|
| Date of Consultation       | 20 <sup>th</sup> January 2018  |
| Venue                      | De Kuns Global Hotel , Sowunmi Community   |
| Start and End Time         | Started by 10:20 am and Ended by 12:30pm   |
| Participation Distribution | The meeting was attended to by 26 community leaders from 20 communities along the Olurunso Transmission Line Axis, made up of 20 Baales ( heads of communities) 2 Women leaders and 4 youth leaders.   |
| Introduction               | The Project Coordinator of Godirra (the Consultant) introduced the RAP team to the community leaders present and informed them that they were on a mission to carry out studies that will lead to the preparation of RAP report which is necessitated by the proposed Transmission Line Project in the area.   |
| Key Information            | The RAP expert thanked the community leaders for responding to the invitation. In addressing them, he reiterated the importance and economic benefits of the TCN-JICA Transmission Line Project. He was however quick to add that certain persons with land, crops, structures and economic trees will be unfortunately displaced/affected by the project. To protect the interest of these groups, the project has commissioned the preparatory of RAP which involves the consultation of affected communities and groups, identification of PAPs, determination of their compensation entitlements and the need to engage them meaningfully as much as possible in the process of the implementation of the RAP and through the project implementation. The RAP expert, explained to the leaders |

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|                       | the national and international laws guiding the preparation and implementation of RAP in Nigeria. He therefore, appealed for support and cooperation of the Baales and all leaders of the communities especially, to disseminate the right information to the members of the community about the census exercise and the procedures being followed. He wants them to mobilize all potential PAPs to be available at their sites at designated date and delays to be given to their community. He stated that, a Grievance Redress Mechanism (GRM) will be established to hear and resolve all grievances as much as possible to avoid lengthy court processes associated with litigation. He hinted that the GRM will be such that is built around the principles of existing GRM in the local communities. He persuaded the community leaders to warn their subjects against going to erect structures on land after the census must have been taken as PAPs who are late entry PAPs (those that encumbered the land after cut-off date will not receive compensation. |
| Response from leaders | The responses from the Baales and other leaders are as follow:<br>The project was adjudged a welcome development. They promised to support the project and help contractors to succeed in their tasks. However, the following observations/concerns were made: <ul style="list-style-type: none"> <li>• Previous RAP exercise from Railway Project in the community was marred with unfulfilled promises (e.g in employment of locals);</li> <li>• They want this project to carry the community along by ensuring that their people are employed, giving sub-contracts and supply</li> </ul>   |
|                       | <ul style="list-style-type: none"> <li>• The leaders want information communicated early to them on the day/date of census or field work in their respective communities to enable them mobilize their wards for the exercise.</li> <li>• The leaders also requested that the project should factor into consideration for consultation and compensation, affected shrines (local altars) that might be</li> </ul>  |

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|                        | affected by the project.  |
| Questions that came up | <ul style="list-style-type: none"> <li>• What happens to owners of fallow lands?</li> <li>• Will the project consider compensating land owners without statutory rights?</li> </ul>   |
| Response               | <ul style="list-style-type: none"> <li>• Owners of fallow land are not entitled to resettlement/compensation in line with LUA and international laws and policies guiding involuntary resettlement</li> <li>• Land owners without statutory rights are only entitled to compensation for the value of improvements on the land</li> </ul> |

**Table 4.3: Consultation at Ogidi and Ake Communities**

|               |  |
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| Meeting Date  | 26 <sup>th</sup> January, 2018   |
| Meeting Venue | Ogidi community town hall  |
| Attendance    | The meeting was attended by the Community leaders, Community members, PAPs within the project area, RAP Consultant and his team.   |
| Preamble      | <p>The meeting started with a word of prayer by one of the community leaders after which the Resettlement Action Plan (RAP) lead consultant who introduced himself as Mr Daniel Okoh thanked the audience who had gathered at the instance of ongoing transmission line project as the consultation was scheduled based on the meeting held previously with the community leaders who their communities have been mapped out as one of the project encroached areas. He also enlightened the community members on the essence of the data capturing exercise which will be carried out to enable Resettlement Action Plan to be prepared successfully. He emphasized on the need for all PAP to ensure access to a valid bank account details as BVN is the trending banking system. He solicited for the cooperation of the community heads, especially the project affected persons (PAPs) in achieving the goals for the TCN-JICA project.</p> <p>The lead consultant clarified the community members on the following issues of their concerns:</p> <p>According to the Nigerian land use Act which clearly states that all land belongs to the government therefore compensation is only applicable when there is development on land such as structures, economic crops, trees etc. and cases whereby a land owner has a backup document or title for the land which he or she has acquired then compensation will be considered.</p> <p>Also, for individuals who are identified as vulnerable including widows, aged persons above 65 years on low income, physically disadvantaged persons and mentally disadvantaged persons will be considered.</p> <p>He further emphasized that the project is void of any form of middlemen as grievance redress mechanism will be adopted to resolve cases where PAPs are omitted or not properly identified and captured as this mechanism is people</p> |

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|   | oriented and simple.<br>He requested to know the concerns of the people towards the project and gave opportunities for questions and contributions   |
| Responses and Perception of the community | The community leader expressed his gratitude towards the upcoming development and initiative taken by TCN-JICA to ensure that their livelihood source is not worsen off after counting losses as a result of the impact of the project during civil work.  |
| Questions raised                          | The following questions were asked: <ul style="list-style-type: none"> <li>• If the project is such that will create employment opportunity to engage the youths who are not gainfully employed</li> <li>• If there is a time limit to which PAPs are given to open a valid and functional bank account since compensation will not be paid in cash</li> <li>• How would the compensation plan between a land owner and a crop farmer on affected portion of land be captured and reconciled?</li> <li>• If the project and the capturing exercise grants special allocation and preferences to community leaders</li> </ul>   |
| How questions where addressed             | The RAP lead consultant addressed the questions as follows: <ul style="list-style-type: none"> <li>• Engagement of youths will be recommended to the RAP implementers as RAP document is abiding to further review, consideration and approval</li> <li>• PAPs who has no access to functional bank accounts are advised to process a valid account as soon as they have been identified and captured as the PAPs bears the risk of affidavit of consent</li> <li>• Compensation will be paid only for development on land such as (economic crop, farm land, structures etc.) but not to the land owner except if the economic crop belongs to the land owner then he or she will be considered for capturing</li> <li>• The project has no special provision for the community leaders rather restricted to only Project Affected Persons PAPs)</li> </ul> |
| Conclusion                                | A date was scheduled for the enumeration exercise to take place while the community promised to grant adequate support needed to ensure a successful capturing exercise.   |

**Table 4.4: Consultation at Ajade community**

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| Meeting date                             | 31 <sup>st</sup> January, 2018   |
| Meeting venue                            | Ajade community  |
| Attendance                               | The meeting was attended by the Traditional ruler, Community leaders from Ajade and Pankere village, Community members, PAPs within the project area, representative from the state ministry of agriculture and the RAP Consultants  |
| Preamble                                 | The meeting commenced with an opening remark by the Resettlement Action Plan (RAP) lead consultant, Mr. Oliver Nwuju who thanked the communities who had gathered for the scheduled consultation and also commended their effort so far having cooperated with the enumerators in achieving the goals for the TCN-JICA project.<br><br>A critical issue of concern regarding the involuntary resettlement of most of the community members was raised by the RAP lead consultant to be dialogued as this will affect a wholesome number of persons.<br><br>He probed for the opinion of the community members especially the PAPs on their decision to be totally resettled as the ongoing transmission line route cuts in between their various residence and farm land thus, this project is such that considers the safety and livelihood of people living within the project encroached area.<br><br>He also inquired to know if they have any choice of location for their resettlement as this will help during the RAP preparation and further requested to know the concerns of the people as their suggestions, questions and contributions will be highly appreciated. |
| Response and Perception of the community | Mr Samson Gbenga Fashola reacted to the negative impact of the project on their community as the 15meters taken side by side from the center point of the transmission line route corridors has divided the community into two sought relocation as a best option.<br><br>The traditional ruler suggested that relocation should not be limited to only the PAPs because of loss of historical values, archives and other inheritances including the shrine and was of the opinion that the relocation should affect   |

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|                               | <p>the entire Ajade community.</p> <p>He further suggested that since Gbangba, Ajade and Ijumo communities are under his royal supervision, then relocation to Gbangba should be considered as an option.</p> <p>A member of the community leaders craved the indulgence of the project proponents including the government to be responsible for the cost of relocation as most the land which has been mapped out during the transmission line route survey where acquired by inheritance while some affected portions were bought by individual families therefore he suggested that compensation and relocation should be appropriately carried out to avoid grievance and conflict.</p> |
| Concerns and questions raised | A major issue of concern was if the relocation will affect only the PAPs or the entire Agade community and who will be responsible for the cost of relocation?   |
| How concerns were addressed   | <p>The RAP lead consultant addressed the questions as follows:</p> <ul style="list-style-type: none"> <li>• That the inventory of the project affected area will be properly taken to be used in preparation of the Rap document as the project proponent will be responsible for the cost of relocation</li> <li>• Relocation will affect only the PAPs and not the entire Ajade community</li> </ul>   |

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|------------|--|
| conclusion | <p>An inventory was taken on the affected area with the outcome as follows:</p> <p><b>NUMBER OF AFFECTED HOUSES – 14</b></p> <p><b>SIZE OF AFFECTED AREA- 10957m2 (2.7076 acres)</b></p> <p>The RAP lead consultant requested for the provision of a key in-depth history of the community including their system of operation, cultural values, socio-economics, method of land acquisition etc.</p> <p>According to him, the size of the area of relocation to be mapped out will be same as acquired by the project from their previous location after all necessary survey has been carried out.</p> <p>He encouraged the traditional ruler to schedule a meeting with his community to harmonize on the area of relocation after which a time frame of one week was agreed to send a feedback and other necessary documents as requested.</p> |
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In a meeting with TCN and JICA on 6<sup>th</sup> day of February, 2018 held at TCN project office in Abuja, the outcome of the public consultation and issues of concern in Ajade was discussed. It was agreed that a site visit will be necessary to reconsider the issues raised about Ajade and the possibility of re-aligning the transmission line route to at least minimize impacts.

The Joint inspection and monitoring exercise was led by TCN Project Manager Engr. Ajibade on the 8<sup>th</sup> day of February, 2018. At end of the field inspection/monitoring, TCN/JICA Experts, the Project consultant and the project affected community (Ajade village) reached a consensus to re-align the TCN power transmissions line so as not to transverse the middle of the village. The RAP Project consultant however, considered it appropriate to hold another community consultation meeting following completion of the re-alignment by the line route consultant.

Below is the summary of the outcome of the community consultation meeting with Ajade community on March 2, 2018:

The meeting started at about 2.20p.m at Ajade Community. The RAP team leader in the Person of Mr Okoh Daniel welcomed participants from various communities and especially people of Ajade Community. He thanked the head of the Community for cooperating with Government in ensuring development in the power sector. He informed the community that, the power line will no longer pass through the village as earlier proposed.

The Baale of Ajade Community and PAPs present at the meeting demanded to know reasons for the Power line not to pass through the community as earlier proposed. In respond, the team leader informed the community that the decision was reached after the Joint inspection and monitoring exercise by TCN and JICA Experts led by TCN Project Manager Engr. Ajibade on the 8<sup>th</sup> day of February, 2018. The RAP team leader explained that option 1 was preferred after critical evaluation of two options available which includes:

- *Re- alignment of the TCN line to avoid passing through AJADE Village*
- *Relocation of Ajade Village as earlier recommended during community consultation*

The team leader further explained that, the decision was reached after weighing the two options following request by the community for TCN to shift the power line away from the village. He maintained that Federal Government through TCN respect the wishes of the people in carryout any developmental project. According to him, the visit and consultation meeting with the community on the 8<sup>th</sup> day of February 2018 informed the decision made by TCN and JICA which favored option one (1) in line with the community choice.

In response, the Baale of Ajade Community made it clear to the RAP team that, he has no right to obstruct the decisions made by the owners of the project and furthermore, has communicated to the families that the realignment would affect. The Families to be affected by the new line were also present at the meeting according to the Baale.

Further questions were asked by Ibrahim Aderibigbe Fashola, who wanted to know the date for commencement of the exercise, Mr. Kolawole responded, saying that it will begin immediately after the meeting. Mr. Michael Taiwo asked if there is compensation for those whose houses were marked before the realignment. One of the community members, Mr. Adekunle reacted to the question by saying that since the assets on ground will no longer be affected, there will be no any form of compensation. Mrs. Adekunle Abeni asked if fallow lands will be compensated for, Mr. Kolawole responded by saying that compensation is only for assets that were on ground and that would be affected during the cause of carrying out the project be it a structure, cash crops, economic trees or any source of livelihood, and that fallow lands are not compensated for. Mr. Taliatu asked why the project was shifted to outskirts of the community; Mr. Okoh explained that, it was in line with people choice and International Best Practices.

In retrospect, Mr. Jolaoso showed concern on the previously marked structures, asking if they will be affected, Mr. Okoh made him to understand that since the power line project has taken another route, the previously marked structures will not be affected and therefore, no compensation will be paid to them.

In conclusion, the community leader and the youth leader further appreciated the consultant (RAP team) for the community consultation meeting. The meeting ended at about 3:10 pm.



**Table 4.5 Summary of Public Consultation at Ikereku Community**

|  |  |
|--|--|
| Meeting date                             | 3 <sup>rd</sup> February, 2018   |
| Meeting venue                            | Ikereku community  |
| Attendance                               | The meeting was attended by the Community leaders, Community members, PAPs within the project area, RAP Assistant Coordinator and the Team Consultants   |
| Preamble                                 | <p>The meeting commenced with an introduction by the Resettlement Action Plan (RAP) Assistant coordinator, Mrs. Edna Okoh who thanked the communities who had gathered for the scheduled consultation. She sensitized them on the essence of the project in which their community has been identified for total resettlement.</p> <p>According to her, critical issue of concern regarding the involuntary resettlement community is as result of the transmission line route which has positioned the community in between an already existing power line and the proposed power line. She probed for the opinion of the community members especially the PAPs on their decision to be totally resettled as the ongoing project is such that considers the safety and livelihood of people living within the project encroached area.</p> <p>She also inquired to know if they have any choice of location for their resettlement as this will help during the RAP preparation and further requested to know the concerns of the people as their suggestions, questions and contributions were addressed accordingly.</p> |
| Response and Perception of the community | One of the PAPs said that they have a place to be relocated but the cost of relocation should be accrued to the responsibility of the project proponents.  |
| Conclusion                               | An inventory was taken on the affected area and structures in which the PAPs comprise of three families. The RAP Assistant coordinator suggested that a meeting should be held among the PAPs in order to come up with a concrete resolution regarding the process of their relocation.  |

## **CHAPTER FIVE: SOCIO-ECONOMIC BASELINE OF THE PROJECT AREA AND PROJECT AFFECTED PERSONS**

### **5.1 Introduction**

This socio-economic data in this section is largely derived from our Environmental and Social Impact Assessment study which field work took place in the month of December 2017. Other sources of information are also referenced.

### **5.2 Socio Economic Baseline**

#### *Methodology*

Data gathering for the baseline information as reported in this RAP was carried out by our firm during the field work for ESIA. The socio-economic baseline study starts with some reviews and desktop studies of various reports on Nigeria. This provides the context within which the baseline information about Ogun State, the affected Local Government Areas (LGAs) and the immediate settlements around the project site will be appreciated. Finally, mostly data in statistical representation and charts, reflected in this ESIA, were obtained from structured consultations with the traditional rulers, community heads, and officials of the LGAs as well as members of the affected communities.

Human environmental baseline data was gathered using a combination of desktop studies and field surveys. It covers the following social components: demography, land uses, land ownership, administrative and socio-cultural institutions, infrastructures, economics and livelihood, cultural heritage and health.

The baseline socio-economic and health status of the project area was assessed using questionnaires distributed to not less than 50% of the people in the affected communities (because members of the affected communities were quite few). The data was supplemented by interview of selected adults and youths in each community. A total of five hundred (500) community members and health personnel within each community were interviewed between 16<sup>th</sup> and 23<sup>rd</sup> of December 2017.

#### *a. Stakeholder Engagement and Consultation*

The communities were first visited and the Chiefs, Elders, Youth leaders and women leaders were contacted. Various meetings were held with these groups on the need for the studies. They were then mobilized to co-operate and participate in the survey. The process of consultations with members of the communities continued throughout the study and is even to continue in the course of execution of the transmission power line plant project in the communities.



Olorunsogo, Lerin, Ita-Alaji, Akilagun consultation



Abese, Soderu Consultation

**Plate 5.1: Socioeconomic Consultation with the affected communities**



Oba Eerin consultation



Ijumo Ologbomi consultation



Women group consultation



Youth group consultation

**Plate 5.2: Socioeconomic Consultation with the affected communities**

### ***Recruitment and Training of Field Assistants***

With the approval of the community leaders, educated and literate members of the communities were recruited and trained as field assistants in the administration of questionnaires and to conduct the study team round the communities.

### ***Socio-economic data collection***

This was done mainly by the use of a well-structured questionnaires which addressed all the socio-economic issues e.g. occupation, income, marital status and marriage practice, educational status, historical data, Natural resources management, social groups, land use and on infrastructures like housing, markets, schools, hospital type of water, electricity, roads and other baseline socio-economic data.

### ***Health Data Collection***

The administered health questionnaires contained questions addressing the socio-demographic data; housing; infrastructure and physical environment; health and well-being including current prevalent communicable and non-communicable diseases; health seeking behaviours, nutritional status; occupational health, lifestyle and social habits as they affects health. Adults, children and infants in the surveyed households were physically examined. Some of the parameters assessed were weight, and height (with which the Body Mass Index was calculated) hair quality and colour, the eyes, skin, ear, mouth, breath and heart sounds, breasts and abdominal examinations. The various disease ailments seen were recorded. Other parameters assessed were common adult and childhood diseases, immunization status, physical body assessment and general appearance of the individuals.

### ***Assessment of Available Health Care Facilities***

The local hospitals/clinic and other orthodox health establishments where available in the communities were visited and their health data and records were obtained. Some of the parameter obtained are as follows:

- *Types and number of health professionals*
- *Types of available equipment*
- *Types of health services available for the communities*
- *In-patient and Out-Patients records*

- *Types and conditions of health infrastructure*
- *Administrative structure*
- *Logistic /accessibility of the health facilities to the community members*
- *Utilization of the facilities as well as baseline health parameters.*

**Sampling Technique:**

The socio-economic and health questionnaires were administered to the households. A cross sectional stratified random survey method was employed. Questionnaires were administered to 15% of the adult population (i.e. 39% of the total population). A total of 500 questionnaires were randomly administered to adults in the different communities. The study team ensured that the entire communities were covered.

**Focus Group Discussions (FGD)**

These were held separately with male elders, youths and women groups. All socio-economic and health issues and how they have been affected by previous development projects as well as what is to be expected in the current project were discussed. The felt needs of the communities, and possible ways of mitigating against the identified possible negative impacts due to the negative environmental effects that may arise in the transmission line projects in all the neighbouring communities were also discussed.



**Plate 5.3: Focus Group discussion with adult men and women Source: Godirra Chemicals Fieldwork, 2017/2018**

**Study of infrastructures and other environmental Issues**

A walk-through the communities was conducted and all infrastructures that can be seen e.g. Electricity, Schools, Roads, Hospitals and markets were located geo-referenced using the GPS location of its latitude and longitude and studied. Also observations were made on the environmental living conditions, noting the following: types of housing, environmental sanitation, source and quality of water supply, evidence of erosion and flooding and general environmental degradation.

**Social and Health hazards:**

The social and health hazards identified during the studies and the overall possible impact of the transmission line project on the communities were assessed and rated in accordance with Hazard identification and inventorization (HAZID) and Hazards and Effects Management process (HEMP) practices in development projects. Recommendations of the possible environmental management to mitigate the observed hazards as well as the negative impact remediation measures were accordingly proffered.

**5.3 Demographic Overview of project area**

The official population figure in Nigeria is the 2006 national population census. According to the population figure, Ogun state has a population of 3,751,140 people made up of 1,864,907 for males and 1,886,223 for females. Table 5.1 depicts the population of the project areas.

**Table 5.1: Population Distribution of the project area**

| LGA           | MALE           | FEMALE         | TOTAL          |
|---------------|----------------|----------------|----------------|
| IFO           | 269,206        | 269,964        | 539,170        |
| EWEKORO       | 28,212         | 26,881         | 55,093         |
| OBAFEMI OWODE | 118,574        | 116,497        | 235,071        |
| <b>Total</b>  | <b>415,992</b> | <b>413,342</b> | <b>829,334</b> |

Table 5.1 above shows that the three (3) LGAs that constitute the project area have an aggregated population of 829,334 in which about 65% are from Ifo, 28% are from Obafemi- Owode while 7% are from Ewekoro.

**Host Communities**

It is expected that there would be over 60 communities and villages within the spatial boundary of the proposed project. The information and location of affected communities is presented in Table 5.2.

**Table 5.2 Affected Communities and LGAs**

|    | Sections   | LGA/ State      | Communities |
|----|------------|-----------------|-------------|
| 1  | Ejio –     | Ewekoro, Ogun   | Ejio        |
| 2  | Shojuolu   | State           | Arigbajo    |
| 3  |            |                 | Apomu       |
| 4  |            |                 | Ayepe       |
| 5  |            |                 | Sojuolu     |
| 6  | Olorunsogo | Ifo, Ogun State | Olorunsogo  |
| 7  | – Ejio     |                 | Ita – Alaji |
| 8  |            |                 | Fenopa      |
| 9  |            |                 | Lerin       |
| 10 |            |                 | Ikereku     |
| 11 |            |                 | Obasa       |
| 12 |            |                 | Olowofela   |
| 13 |            |                 | Mose        |
| 14 |            |                 | Ajgunle     |
| 15 |            | Ewekoro, Ogun   | Molaja      |
| 16 |            | State           | Ajitadun    |
| 17 |            |                 | Elegbata    |
| 18 |            |                 | Oreke       |
| 19 |            |                 | Aberemeta   |
| 20 |            |                 | Ogunmola    |
| 21 |            |                 | Sowunmi     |
| 22 |            |                 | Soderu      |
| 23 |            |                 | Abese       |
| 24 |            |                 | Iludun      |
| 25 |            |                 | Ejio        |
| 26 | Ejio – New | Ewekoro, Ogun   | Ejio        |
| 27 | Abeokuta   | State           | Iludun      |

|    |  |                |                 |
|----|--|----------------|-----------------|
| 28 |  |                | Abese           |
| 29 |  |                | Soderu          |
| 30 |  |                | Adubi-Aro       |
| 31 |  |                | Ayeye           |
| 32 |  |                | Sepeti          |
| 33 |  |                | Baase           |
| 34 |  |                | Akinbore        |
| 35 |  |                | Ifada           |
| 36 |  |                | Onikoko         |
| 37 |  |                | Oluke – Orile   |
| 38 |  |                | Afowowa Eleyele |
| 39 |  |                | Ilao            |
| 40 |  |                | Itori – Alase   |
| 41 |  |                | Awado           |
| 42 |  |                | Ate             |
| 43 |  |                | Ogidi           |
| 44 |  |                | Akakun          |
| 45 |  |                | Onibotuje       |
| 46 |  |                | Pankere         |
| 47 |  |                | Gbagba          |
| 48 |  |                | Ajade           |
| 49 |  |                | Obolonti        |
| 50 |  |                | Otude           |
| 51 |  |                | Ijumo           |
| 53 |  | Obafemi Owode, | Igboti          |
| 54 |  | Ogun State     | Ikija           |
| 55 |  |                | Otegbola        |
| 56 |  |                | Oluwo           |
| 57 |  |                | Ikija – Olose   |
| 58 |  |                | Odana           |

|    |  |  |                |
|----|--|--|----------------|
| 59 |  |  | Okuri          |
| 60 |  |  | Inandan        |
| 61 |  |  | Opanigangan    |
| 62 |  |  | Iregun         |
| 63 |  |  | Aganyan        |
| 64 |  |  | Lukosi – Kenta |
| 65 |  |  | Ijemo – Efon   |
| 66 |  |  | Ijeun          |
| 68 |  |  | Kerebe         |
| 69 |  |  | Tolu           |
| 70 |  |  | Ototo          |

### 5.3.1 Household Characteristics

A total of 500 household questionnaires were administered, 488 retrieved representing a success rate of 98%, and 2% of health personnel from the various health centres.

The 2017 projected population estimates of all the communities within the project area of influence from 2006 population figures at 2.83% growth rate was about 12,500 consisting of about 6,150 males and 6350 females. The study population profile comprised of 10% infants (between 0 – 4yrs), 25% in the primary school age (5 – 11yrs), 20% in the adolescent group (12 - 21), 36% in the mature adults and elders group (22 – 59yrs), while the least of 3% were in the very elderly group (60yrs and above). The family size is moderate with an average of about 7-8 persons per house

#### a. Age and Gender Distribution

Based on the interactions with members of the communities, it was observed that majority of the people residing in the communities are between 45 and 65 years (>25%) while those above 65 year of age were the least (<19%) represented in the project area . According to participants in focus group discussions, a significant number of youths have moved to urban area to work in the factories, to school in better education facilities and to look for white collar jobs. However, the proportion of youth in various area is still fairly large which indicates a general likelihood for future growth of the populations in the communities.

The field survey revealed that the household population structure is made up of 46.5% male and 53.5% female.

**Table 5.3: Age and Gender Distribution**

| Age Bracket | Ifo      |            | Ewekoro  |            | Obafemi  |            |
|-------------|----------|------------|----------|------------|----------|------------|
|             | Male (%) | Female (%) | Male (%) | Female (%) | Male (%) | Female (%) |
| 1-18        | 10       | 14         | 11.4     | 14.6       | 10.9     | 10.1       |
| 19-39       | 9        | 10         | 16.3     | 17.7       | 18.2     | 21.8       |
| 40-65       | 20       | 18         | 10.6     | 12.4       | 7.7      | 11.3       |
| >65         | 8        | 11         | 7.4      | 9.8        | 9.9      | 10.1       |

Source: GCNL, 2017

**b. Marital status of head of household**

The total adults sampled consisted of 280 males and 208 females. Among them, 11% were single, 81% were married, 8% widowed. The marriage practice in the community is mainly polygamy (45%) and monogamy (55%) which is only evident mostly among the elderly members of the community. Monogamy is fast becoming more dominant due to increase in the Christian faith and the poor economy making it difficult for a man to care for more than one wife and several children. However members of the communities marry at an early age of about 19 years old. The older men claimed that the several wives and children enabled them to maintain their farms and to support their farming and fishing occupations to feed and maintain the family.

**Table 5.4: Nature of Marriage in Households**

| Nature of marriage | Ifo | Ewekoro | Obafemi | TOTAL | PERCENT (%) |
|--------------------|-----|---------|---------|-------|-------------|
| Monogamous         | 47  | 104     | 41      | 192   | 55%         |
| Polygamous         | 37  | 90      | 32      | 159   | 45%         |
| TOTAL              | 84  | 194     | 73      | 351   | 100%        |

Source: GCNL, 2017

**Table 5.5: Marital Status of Heads Of Household**

| Marital status     | Ifo | Ewekoro | Obafemi Owoode | TOTAL | PERCENT (%) |
|--------------------|-----|---------|----------------|-------|-------------|
| Single             | 8   | 16      | 0              | 24    | 11%         |
| Married            | 42  | 100     | 32             | 174   | 81%         |
| Widowed            | 3   | 8       | 5              | 16    | 8%          |
| Divorced/Separated | 0   | 0       | 0              | 0     | 0%          |
| TOTAL              | 53  | 124     | 37             | 214   |             |

**Household size**

Information on household size of the communities in each of the LGAs is presented in Table 5.6

**Table 5.6: Household Size of Project Area**

| Members of household | Ifo  |        | Ewekoro |        | Obafemi Owoode |        | TOTAL |        | Percentage (%) |
|----------------------|------|--------|---------|--------|----------------|--------|-------|--------|----------------|
|                      | Male | Female | Male    | Female | Male           | Female | Male  | Female |                |
| 1-2                  | 3    | 4      | 9       | 8      | 0              | 0      | 12    | 12     | 2.7            |
| 3-5                  | 44   | 45     | 83      | 117    | 2              | 1      | 151   | 192    | 38.3           |
| 6-10                 | 40   | 54     | 128     | 148    | 6              | 7      | 205   | 239    | 49.7           |
| 11-15                | 25   | 35     | 10      | 13     | 0              | 0      | 35    | 48     | 9.3            |
| >15                  | 0    | 0      | 0       | 0      | 0              | 0      | 0     | 0      | 0              |
| TOTAL                | 112  | 138    | 230     | 286    | 8              | 8      | 403   | 491    |                |

Source: GCNL 2017

As could be seen in Table 5.6, the dominant household sizes in the project area are those made up of 6-7 persons, accounting for 49.7% of the households. This was followed by those made up of 3-5 persons (38.3%). About 9.3% and 2.7% households have family sizes of between 11-15 persons and 1-2 persons respectively. Also, the population of females in households of all the LGA was higher than the males, except in Ifo LGA where both sexes shared equal numbers.

**Ethnic Composition**

The over 60 communities studied belong to the Yoruba ethnic group and speak the Yoruba language with the Egba dialect. The communities are located in Ifo, Ewekoro and Obafemi Owode local government areas (LGAs) in Ogun state, Nigeria. The inhabitants claimed that they were born in their communities and have lived all their life in the communities. The settlements appear nucleated with houses facing each other along the road which tends to bend round and round enclosing the communities. The houses are also crowded together living very little spaces between them. This kind of settlement affords the people the necessary security making it difficult for thieves, invaders and outsiders to single out a house for an attack. At one call, the whole community can rise almost at once. In almost all cases there are no fences separating one building from another. Whatever affects one household immediately affects the whole community. The communities clearly demonstrate a very good example of communal living.

The communities also have the same culture and tradition of the Yoruba people in general. This is clearly demonstrated in their marriage, burial, traditional religious practices and in their general living habits and conditions. Festivals and ceremonies are marked with eating of pounded yams and rice (called “Ofada rice”), drumming and dancing by masquerades or people wearing masks and with tattooed bodies as well as people wearing various apparels. Some of these apparels distinguish the celebrants and their relatives from other people in the ceremony.



**Plate 5.4: Ofada rice processing at Opanigangan Community**



**Plate 5.5: Burying family members in front of their homes at Abese community**

Eight ethnic groups were observed to be present within the project area. These ethnic groups and their respondent populations in each affected LGA are presented in Table 4.48.

| Ethnicity | Local Governments |         |         | Average (%) |
|-----------|-------------------|---------|---------|-------------|
|           | Ifo               | Ewekoro | Obafemi |             |
| Yoruba    | 40                | 75      | 30      | 48.3        |
| Egun      | 40                | 12      | 55      | 35.7        |
| Igede     | 5                 | 4       | 2       | 3.67        |
| Ogoja     | 3                 | 2       | 3       | 2.67        |
| Aja       | 1                 | 2       | 1       | 1.35        |
| Ihori     | 1                 | 2       | 2       | 1.67        |
| Ibo       | 5                 | 2       | 5       | 4.0         |
| Hausa     | 5                 | 1       | 2       | 2.67        |

**Religion**

The inhabitants in all the communities of study practice three religions namely Christianity, Islam (Muslim religion) and Traditional religion. In some communities Christianity is dominant while in others Islam is dominant. On the average only about 10% are the traditional religion worshippers in all the communities, studied and these traditionalist maintain and still retain the shrines in the communities. Putting all the communities together, the modern day Christianity is

the dominant religion with various churches in the communities like Catholic, Anglican, Baptist, Methodist, Assemblies of god and other Pentecostal churches.



**Plate 5.6: Four Square church @ Soderu and Redeem church @Sowunmi communities**

Those that still adhere to traditional religion have their shrines located in the community. Some of the major shrines are as follow:

- *Obatanla*
- *Oju Osun (eyes of the river god)*
- *Ogun (god of iron)*
- *Erinle*
- *Oro*
- *Yemoja*
- *Egungun*
- *Shango (god of thunder)*
- *Oya*
- *Papa*
- *Iguniko*
- *Esu (devil)*
- *Egun (god of Masquerade)*
- *Alale*
- *Aragbo*
- *Ogunyemoja*

- *Uso*
- *Igbogunko kuso*
- *Angora*
- *Shokpono and*
- *Ogboni (brotherhood fraternity)*

Despite the presence of the three religions, the people have no religion crisis and they live together peacefully. The major forbidden/evil forest in the communities is the Igbo-oro. Women, children and strangers are not allowed into these forests. Others are Igbo fa, Igbo meiro, Igbo Ounuko and Makpere land.



**Plate 5.7: Esu (devil's) shrine at Abese community**

#### *Traditional style*

All the communities studied claimed that their ancestors migrated from Abeokuta in Ogun State to settle in their present day communities. They claimed that their forefathers were great farmers and till date farming is still their main occupation. The quest to acquire more expanded land for farming and to acquire more independence and freedom influenced their forefathers' migrations. The migration thus afforded the people the opportunity to acquire the land on which they settled for agricultural, hunting and development purposes.

Traditionally, the first settler became the head of the community where they settled and in most cases the community is named after him; that is how most communities bear the name of the founder or first settler.



The major festivals of the communities are the New Yam Festival whereby they celebrate the harvest and the dawn of new farming year. It is marked by eating, drinking and various dances with the traditional ruler chairman the occasion. They are also said to make sacrifices to their gods for provision, protection and blessings. The other major festivals are the worshipping of their gods at their various shrines. The days set aside for each of these festivals are usually determined and announced by the traditional rulers (the Baale and the chiefs) and the chief priest of the various shrines. The information is announced to the people by the town crier (information officer).

The communities also observe and celebrate other modern day festivals like the Christmas, New Year, Independence Day and Easter celebrations. The Muslims also celebrate Muslim festivals and holidays (e.g. Eid el kabir, Eid el malud) as it happens in other parts of Nigeria.

Marriage and Burial ceremonies are also marked in their Yoruba traditional ways as has always been the case. These ceremonies are marked with various cultural dances and traditional rites and have not changed since the advent of modern day developments. The culture and tradition of these communities are very rich and admirable.

Generally the people forbid adultery and incest and the eating of sacred animals e.g. the vulture, snakes, alligator, dove, deer and millipedes. Apart from these the people really do not have so many forbidden food (except eating of millets or drinking of palm wine “Emu Okpe”) or cultural/traditional taboos. Strangers therefore find it easy to mix freely with the people.

### 5.3.2 Economic Environment

#### *Occupation*

The major occupations of the people of the communities are farming (75%), trading (50%), fishing (40%), hunting (20%) labourers (10%) and others e.g. civil servants, skilled workers etc. (10%). Some people, as shown from the prevalence figures of the occupations combined two or more occupations (e.g. fishing and farming, fishing and trading or even farming and civil service job) in order to improve their quality of life which was generally poor. The people engaged in farming, fishing and other labourious work which make them susceptible to injuries and other health hazards associated with these labourious occupations. Among the farmers, common crops

grown are cassava, yams, cocoyam plantain/Banana, vegetables maize, ofada rice and beans. The farmers claimed that for more than 20 years now the yields have been poor due to land overuse with no shifting cultivation and the non-use of fertilizers.

Fishing is done in communities that have rivers or streams e.g. Opanigangan, Iregun, Inandan and Okuri communities fish at river Ogun; Illudun-Ejio, Abese uses Osun stream; Soderu, Sepeti, Ayeye and Adubi aro communities use the Wagunnu River; while Ijumo-Ologboni, Ajade community uses the Odo Ipa River. Those that used to fish in the nearby creeks and rivers were said to also have very poor fish yields possibly due to the effects of over fishing and water pollution. Some of the common fishes caught from the water include mostly, cat fishes, tilapia, momyrups and other freshwater fishes. The people also fish out periwinkles, aquatic snails, oyster and other aquatic animals for local consumption.

Most of the youths (about 85%) complained of unemployment hence they resorted to self-employment jobs of fishing, farming, trading or other labourious jobs. There have been no help from governments or any other organizations in the employment of the youths and no help to even enable them enhance their occupations of farming, trading or other jobs.

#### *Industry*

Olorunsogo Power Plant Phase 1 at Olorunsogo managed by Pacific Energy Company Limited, Lafarge Cement Company Limited at Papalanto community and Ice block fabrication industry at Abese are the most known industry in the area. However, Garri processing industries, oil palm processing industries, block industries, pure water industries and bakeries are some examples. It was revealed that most of them are owned by non-indigenes. Hospitality industries –Hotels are also present in the area.

#### *Income*

The average monthly income in the communities was very poor and most people earned below ₦20,000 monthly. The breakdown of the income levels from respondents was as follows: Less than ₦10,000 per month (25%): ₦10,000 to ₦19,999 (55%): ₦20,000 to ₦29,999 (15%), and ₦30,000 and above (5%). The respondents claimed that they engage in informal savings method to be able to raise money at the end of the year. They claimed to spend their income on feeding, paying rents, clothing, children’s education, medical care, transportation and general living expenses.

They do not own many possessions and claimed to be partially involved in saving any money since the money was not even enough to spend. To live sustainably on the average nowadays, particularly in the modern day when goods and services are very expensive, an individual has to earn sufficiently in the neighbourhood of at least ₦50,000 monthly.

#### *Education Level*

The Educational status showed that about 70% of respondents have had at least primary education and can speak (i.e. communicate orally) as well as read and write using English Language. However, most of the people (about 95%) were very well informed and speak Pigeon English. The educational status in the communities at the time of study was as follows: No formal education (30%), Primary education only (30%) secondary education attained (30%), Tertiary education (University graduates) (8%); HND/Technical education and Higher Degrees (Master's/Doctorate degrees) (2%). The people were thus very well informed on socio-economic and health issues relating to the overall development of the community.

### **5.3.3 Existing Infrastructure**

#### *a. Educational facility*

Most communities do not have schools. A few have only the primary school while the secondary schools are even fewer. Children have to travel long distances on foot on very bad roads to attend school daily. All the schools are however very poorly maintained by government. They do not have educational facilities and no enough teachers. There are no tertiary institutions. For example, Ise have only one primary school at Olorunsogo for the five communities living in the axis, namely Olorunsogo, Lerin, Akinleun, Fenopa and Ita Alhaji while for the secondary education the children go far outside the communities to Papalanto or Itori or Abeokuta which are over 10kms away. Also at Moshe, Olowofela, Ajegunle, Ijoko and Apena communities, only Moshe has a primary school. The children also have to go far away to Papalanto, Itori and Abeokuta for their secondary education and only a few wealthy ones can afford this.



**Plate 5.8: Methodist Nursery and Primary**

**Plate 5.9: Primary school donated by the**

#### *Water Supply/Infrastructure*

Inhabitants of the impacted community obtain water from rivers, streams and wells (95%) while only about 50% use borehole water provided by some individuals (i.e. private boreholes). There were also some old ring wells and mono-pump boreholes established in the 1970's by Directorate of Food, Road and Rural Infrastructure (DFRRI) but are no longer in use, as the water produced, if at all, were of very poor quality. Almost all the people in the communities use mostly pure water in sachets as their drinking water. These are sold at 10 naira per sachet.





**Plate 5.10: Community water well facility in Olorunsogo Community**

#### *Electricity*

Most of the communities (80%) have no electricity supply from the National Grid of Power Holdings Company of Nigeria (PHCN). Only financially capable individuals generate their own power supply by use of petrol powered generators. This is a major problem in the community.



**Plate 5.11: Electricity line and Transformer at Soderu Community**

#### *Health care facility*

The communities had only one Primary Health Care Centre each at Olorunsogo, Sowunmi and Oba-Eerin communities which is in a very bad state; the beds are unusable, untrained medical personnel (auxiliary nurses), etc. All other communities had no clinic or health centre. For proper medical care the people go to Ifo, Itori, Abeokuta and Shagamu Hospitals which are over 1 hour distance by road for only serious medical cases. There are a few private clinics which were usually too expensive for the masses.

There were also said to be a very few herbalists and Traditional Birth Attendants (TBA) in the communities although their numbers were not officially known or disclosed by the people. Most people were said to simply embark more on self-medication with drugs purchased from the several medicine stores and people only go to the hospital when their cases are serious. Personnel and medical facilities in the Health centres are very poor as the centre has no resident doctor.



**Plate 5.12: Health Facility at Olorunsogo**



**Plate. 5.13: Toilet as kitchen at the health centre**

#### *Security facility*

The existence of police station was only noticed at Oba Eerin and Ejio Communities out of the 70 communities of the project area. Most communities surveyed practiced local community policing (vigilante groups) or solely rely on tradition medium in tackling crime. According to the respondents, one of such traditional medium is the Esu deity. They claim that the Esu is capable of punishing anyone who does evil in the community; hence, there is a reduced crime rate in the affected communities.



**Plate 5.14: Police station at Oba Eerin**

**Transportation facility**

The major roads that linked the major towns were all tarred by the Government but with lots of pot holes and gallops. They were also narrow and windy at the time of study. The major road that linked the communities is the Papalanto - Shagamu road. This road is very bad as the pot holes have turned to trenches making it very difficult even for lorries and trailers to pass and certainly impassable to cars. The adjoining roads linking the communities to the Papalanto - Shagamu road as well as the roads within each impacted community were earth roads, and were untarred. They still had lots of pot holes. The roads also had no drainages. Other feeder roads in the communities were also earth roads and very poor.



**Plate 5.15: Devastating state of the major road**



**Plate 5.16: Papalanto–Soderu Road**

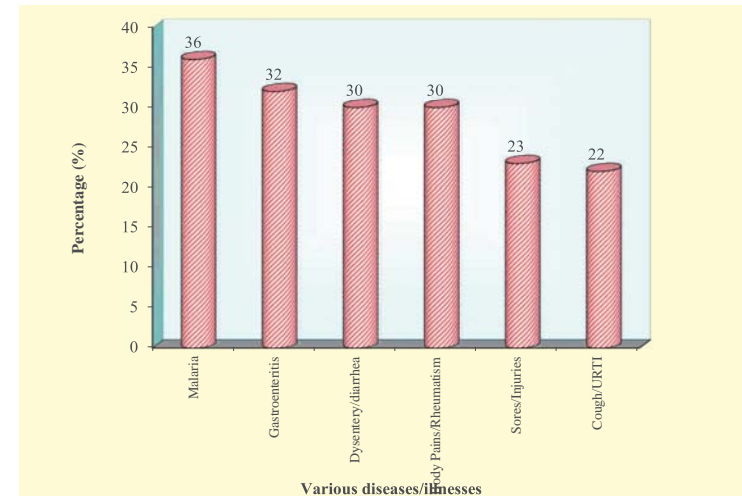
**Waste management**

Most residents from the affected communities dump their wastes into the bush while others dump their refuse at specific designated places at the back of their homes for final disposal by burning or burying. Most of the people (85%) use the pit latrines or bush while a few (12%) use the river water. It was only about 3% that use the modern day water cistern flush toilets. The people of the impacted communities are generally clean and the entire communities were also seen to be neat.

**5.3.4 Community Health**

**a. Adult Health Problems**

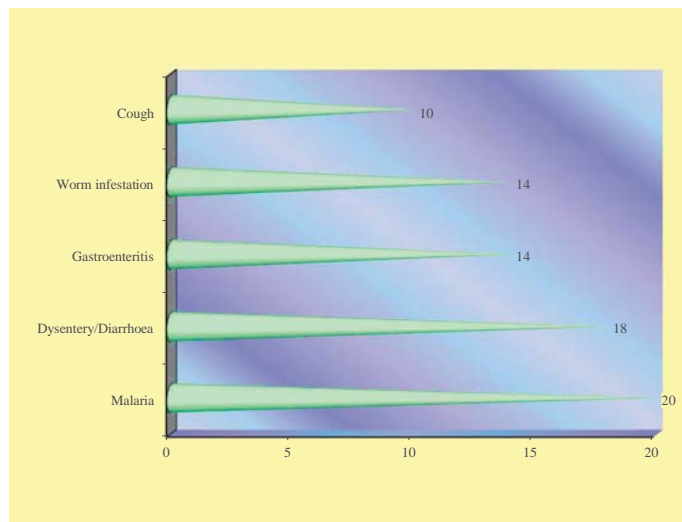
The common health problems identified among the adult population from ages 21 years and above were malaria (36%), Gastroenteritis (32%), Dysentery/diarrhea (30%), Body pains/Rheumatism (30%), Sores/injuries (23%) and Cough/URTI (22%), as shown in Fig. 4.47 some individuals have more than one ailment.



**Fig. 5.2: Prevalence of various diseases and illnesses among adults**

### *b. Children Health Problems*

Among the children the most common health problems were also malaria (20%), Dysentery/Diarrhoea (18%) Gastroenteritis (14%) worm infestation (14%) and cough (10%) as shown in Fig. 4.28 some individuals have more than one ailment.



**Fig. 5.3: Prevalence of various diseases and illnesses among children**

The diseases recorded are those that have been endemic in the communities as far back as they can remember and no modern development projects were said to have adversely affected the health of the people.

#### *Disease ailments according to Age groups and Sex*

Among the adults the most elderly in the 50yrs and above age group had the highest number of cases with diseases while the 21-30 years age group had the least number of cases. Among the children, the number of cases with diseases was highest among the 6-10yrs age group and least among the 11-15yrs age group. Generally males seemed to harbour more cases of diseases ailments than females. This may not be unconnected with the fact that males were probably more exposed to these infections due to their occupation and various outdoor activities.

### *Causes of disease ailments*

The major causes of the diseases can be attributed to the poor unhygienic living conditions exposing them to flies and mosquito bites and other disease pathogens in air and water thereby causing malaria fever and other gastrointestinal diseases. Cough and respiratory ailments may be due to air pollution due to poor sanitation and emissions from the Lafarge cement factory in the locality. Among the non-communicable diseases body pains was mostly due to their fishing and farming occupation and hard labour. Injuries were mostly due to occupational or home accidents or due to fighting/assault while boat accidents were least common. Other non-communicable diseases like Hernia, Diabetes and High Blood Pressure seemed to be acquired with age due to the unguarded and unregulated or free lifestyle of the people as the diseases occurred mostly among the elderly people. The people have always had these ailments from time. The prevalent diseases seen during the studies are the typical tropical diseases endemic in local communities.

### *Knowledge, Attitude and practices on health issues*

The results showed that the inhabitants know very well the nature and causes of the common diseases e.g. Malaria, Dysentery, Body pains etc. they suffer. They also know how such diseases can be prevented or controlled but their major constraint has been their poor financial status (poverty) and lack of good medical care in the communities. For the same reason most people (60%) buy drugs or obtain herbs to treat themselves (through self-medication) when sick and most pregnant women go to Traditional Birth Attendants (TBA"s) to deliver their babies rather than go to the hospitals. However, only (30%) of the people go to the hospital only to take prescription from the doctor and purchase their drugs from chemist stores by themselves. Six percent (6%) of the people go to native herbalists while 4% rely on spiritual healing and go to prayer houses for their healings.

The inhabitants also claimed that children particularly those under 5 years of age seem to die more in the communities than the teenagers and adults. This according to them was due to lack of proper medical care, poor feeding and self-medication practices. They claimed that people only go to hospitals when the sickness is very serious and complicated and after self-medication has failed. On environmental issues on health, the people agreed that poor toilet facilities, poor sanitation and living conditions, poor waste disposal methods, poor housing and poor personal hygiene, all contribute to poor health in the communities.

### Nutritional status of the respondents

The food items consumed by the respondents in the communities are starchy staples such as cassava (and its by-products like *garri*, *starch*, *fufu* or *Santana* etc) plantain, cocoyam, rice (*ofada* rice), beans and yams. Animal protein foods are fish, shrimps, snails and bush meat from antelopes, grass cutter and giant rats. Animals such as domestic fowls and ducks are also reared for meat. The people also eat lots of vegetables and fruits (e.g. vegetables are used for production of the local common soup).

Most people (85%) eat twice a day (i.e. morning and evenings (50%) or afternoons and evenings (35%). The rest (15%) claimed to eat only one solid meal in a day and usually between afternoon and evening periods.

There are no special food items for breakfast, lunch or dinner but the people simply eat any food items as they are available at any time of the day.

The Body Mass Index (BMI) was calculated for the adults and it is the weight in kilograms over the height in metres<sup>2</sup>. The result showed that 68% of the respondents have normal nutritional status (Table 5.7).

**Table 5.7: Nutritional status of Adult respondents as estimated by the Body Mass Index (BMI)**

| Health indicator | Standard Reference value of BMI | Number of respondents | Percentage of Respondents |
|------------------|---------------------------------|-----------------------|---------------------------|
| Under Nutrition  | <20                             | 10                    | 20%                       |
| Normal           | 20-24.9                         | 34                    | 68%                       |
| Overweight       | 25-29.9                         | 6                     | 12%                       |
| Obese            | 30-39.9                         | -                     | -                         |
| Grossly obese    | ≥40                             | -                     | -                         |
| <b>Total</b>     |                                 | 50                    | 100.0%                    |

For the children, indices for stunting, wasting and underweight were calculated.

Underweight (Malnutrition) was obtained by comparing the mean weight of children under study over the mean weight of normal children of same age and compared with standard or reference values.

Stunting was obtained by comparing the mean height of children under study over the mean height of normal children of same age and expressed with standard or reference values.

Wasting was obtained by comparing the mean weight of children of study over the mean weight of normal children of same height and expressed with standard or reference values.

The calculated value of the nutritional status in the children showed no malnutrition, no stunting and no wasting (Table 5.8).

**Table 5.8: Calculated values of Nutritional Status for underweight, Wasting and Stunting for 50 Children at the impacted Communities**

| S/No | Age (Months) | (A) MALNUTRITION OR UNDERWEIGHT |   |                                | (B) STUNTING<br>Mean height (study) x 100<br>Mean height (Std) |                          | (C) WEIGHT FOR HEIGHT (WASTING) |                      |
|------|--------------|---------------------------------|---|--------------------------------|--|--------------------------|---------------------------------|----------------------|
|      |              | Mean weight (kg)                | Standard Range for children of same age | Remarks                        | Percentage Height for Age                                      | Remarks                  | Percentage weight for height    | Remark               |
| 1.   | 0-10         | 6.50                            | 3.5-9.4                                 | No underweight or malnutrition | 97.50%   | Above 90%<br>No Stunting | 96.50%                          | Above 80% no wasting |
| 2.   | 11-20        | 10.5                            | 9.5-12.4                                | "                              | 97.55%   | "                        | 92.15%                          | "                    |
| 3.   | 21-30        | 13.2                            | 12.5-14.4                               | "                              | 98.20%   | "                        | 92.45%                          | "                    |
| 4.   | 31-40        | 15.6                            | 14.5-17.4                               | "                              | 98.77%   | "                        | 95.32%                          | "                    |
| 5.   | 41-50        | 18.5                            | 17.5-19.4                               | "                              | 99.53%   | "                        | 90.52%                          | "                    |

### Immunization status:

At the family and household levels the immunization coverage of the infants and children for oral polio and measles vaccine could not be correctly ascertained due to absence of health records. Only 20% of parent respondents claimed to have given their children vaccination at birth in the health centers. Everybody was said to benefit in the house to house polio and measles vaccine given by the Federal Government of Nigeria. The immunization given according to the parents, are also always incomplete.

### **Social Habits and life style**

- (1) *Drinking: Generally most adult males (about 60% recorded by the use of questionnaire) drink alcohol in each community. Those that do not drink are mostly Christians. Of those that drink alcohol, only about 20% were said to occasionally drink excessively. The male to female ratio in alcohol consumption was 10:1*
- (2) *Smoking: About 40% of the males smoke cigarettes or snuff ground tobacco while 5% of the female agreed to take snuff ground tobacco only but no female agreed to smoking cigarette. A few unknown numbers among the youths are said to smoke Indian hemp but other drugs like cocaine, heroine etc. are said to be non-existent. Nowadays most people do not smoke due to their Christian faith.*
- (3) *Physical exercise/leisure: Except for the very elderly which constituted about (2%) that can no longer move about, other inhabitants in each communities are very active and get exercised during their physical manual labour in the daily occupation of mostly fishing farming and other labourous jobs. Also the youths play various games like tennis, draughts, ludo and also engage in competitive football matches with other communities.*
- (4) *Prostitution: Prostitution is known to exist in the communities but only about 5% of the women are said to be involved. The prostitutes are not officially known. Sexually transmitted diseases (STD) are said to be very low in prevalence and only 2.0% (in teenagers 11-15yrs old) and 10% (in adults) infection rates with STD was recorded in the communities. Oral interviews and analysis of questionnaire showed that (100%) members of the communities are aware of the AIDS disease but according to them, no AIDS has been recorded in the communities.*
- (5) **Personal Cleanliness and Hygiene**  
On personal cleanliness and hygiene the respondents claimed to have good hygiene practices and good sanitation in the communities. All respondents (100%) claimed to wash their hands before and after meals and after going to toilet, and all still claimed to sweep their floors as well as take bath every day.

### **5.3.5 Housing and Living Conditions**

In the host communities of study, most of the houses (about 80%) were permanent structures, of which some are constructed with brick walls and roofed with corrugated iron sheets (zinc) and a large proportion are of mud bricks. The houses were more or less similar to the type of average living houses found in most rural and semi-urban areas of Nigeria. Modern buildings account for 5% of the stock of housing while the rest (95%) houses are locally and poor in appearances; with some having weak walls (made with sticks and mud) and lack proper ventilation. In most houses in the communities, the kitchen and toilets are built outside and behind the main house.





**Plate 5.17: Type of Residential Houses in the Project Area**

#### *Indigenous People*

IFC Performance Standard 7 recognizes Indigenous Peoples as social groups with identities that are distinct from mainstream groups in national societies. Indigenous people are not applicable in Nigeria. However, the Federal Government recognises ethnicity. Nigeria has three largest ethnic groups that include the Yoruba, Hausa–Fulani and Igbo, representing 71 percent of the population. The project is located in South-west Nigeria and the people living in this region are mainly the Yoruba ethnicity.

#### **5.3.6 Land Use**

Analysis of the survey from the project area reveals 8 thematic categories for land use and their relative proportions in the area. They include Crop farming (62.3%), Fallow/barren land (14%), Afforestation (9%), Residential building (8%), River and Swampy Lands (7%), Shrine and artifact (3%), Livestock (2%), Church, Mosque and Commercial (0.5%).

The above result underscores the fact that the project area is rural and the primary livelihood is farming.

Table 5.9 above gives a detailed presentation of the land use analysis in descending order with names of communities where each item are predominant.

**Table 5.9: Land Use Ratio around communities in the project area**

| S/N | LAND USE                                | Percentage (%) | COMMUNITY / NAME   |
|-----|---|----------------|--|
| 1   | CROP FARMING                            | 62.3%          | ACROSS ALL<br>ABESE- SUGAR CANE, PLANTAIN, BANANA<br>ITA ALAJI- CASSAVA, PEPPER, PINEAPPLE, YAM  |
| 2   | FALLOW/ BARREN LAND                     | 14%            | ITA ALAJI (25), AKE (9), OLORUNSOGO (16), OGIDI (22), MOLAJA (11), AKAKUN (11), ODOFIN (6), AGBANGBA (1), ISOTA (3), BAMUKUN(4), OYA (5), LUKOSI (2), SEPETI (20), AKINBORE (2), PAKERE (13), AYEYE (3), IFADA(10), ABESE (6), SODERU (3), ONIKOKO (11), ADUBIARO (2), ONIBOTUJE (7), AJADE (2), EJIO (1), BAASE (9), OWODE (1), INUDANE (8), OKWURI (1), MOSHE (4), AGONYON (2), OBOLONTI (1) |
| 3   | AFFORESTTATION                          | 9%             | ELEYELE, IJUMO, ILAO, APANIGUNGUN, SOWUNMI, IJEUN, OLUKE, MOSHE  |
| 4   | RESIDENTIAL                             | 8%             | ITA ALAJI, MOLAJA, IKEREKU, TOOLU, LUKOSI, OREKE, FENOPA, ABESE, LERIN, EJIO, AKINBORE, SODERU, ADUBIARO, AJADE, BAASE, SOWUNMI, OLOWOFELA, ABEREMETA, OLUKE, MOSHE, APENA, IJEMO, AJITADUN, AJEGUNLE  |
| 5   | RIVER/ SWAMPY LAND                      | 7%             | ADUBIARO (RIVER), INUDANE & BAASE (RIVER) GBANGA (SWAMPY LAND)   |
| 6   | SHRINE, Archaeological And Sacred Sites | 3%             | OGUN SHRINE, OOSHA SHRINE, OBATALA SHRINE, IDI EGBE SHRINE, SANGO SHRINE, OYA SHRINE, ERINLE SHRINE, AGBOMOLA SHRINE, TEMIDIRE SHRINE, OGUN SHRINE, IGBORO SHRINE, <u>Communities of location of shrines</u><br>OBASA, JITADU, ILAO, IKIJA, FENOPA, OLUWO, LERIN, IKIJA OLOSHE, EJIO, ABESE, INUDANE, BAASE AND ABEREMETA.   |
| 7   | LIVESTOCK/ FISH FARMING                 | 2%             | AS IN CROP FARMING   |
| 8   | CHURCH, MOSQUE & COMMERCIAL             | 0.5%           | OBASA, EJIO, SODERU, ONIKOKO, AJADE, OLOWOFELA   |



### 5.3.7 Land Ownership

The two major ways in which land is owned in the project area are by family inheritance and by community holding. Land owned by the communities are usually under the care of the community head (i.e. the Baale and Chiefs). Land reserved for development is under the care or custodian of the village head and paramount ruler. This is because land is a very scarce commodity and requires good protection for generations yet unborn. By virtue of the Land Use Act (1978) all lands owned by the community are integral parts of public/government land. The host communities for this RAP study agree that all land belong to the Federal Government of Nigeria who have the right to acquire any land for use by Government in the interest of the people.

Families and individual land owners keep their land by cultivating it yearly to prevent its acquisition by other people. At the time of study there were no cases of lingering or existing land dispute within the communities.

### 5.3.8 Shrines and Cultural Heritages

There are archaeological and sacred sites, such as traditional burial grounds and shrines in the communities. These sites are highly valued by the people and considered sacred and encroachment in such areas would attract serious resentment from the communities. The people celebrate several traditional festivals, the observance of which is believed to be for the general well-being of the people.

There are shrines and believers in the traditional worship. Many of the people that have shrines are also either Christians or Muslims. They believe that their shrines depict their ancestral believe and heritage. They believe that the gods of the shrines listen to their needs and offer them protection against evil. They also informed us that the gods of the shrines provide people with children for the barren, protection from evil, good luck in life endeavor, etc. It is cultural belief to bury their loved ones in front of their houses except in the following cases: if the person commits suicide and/or dies in the course of doing evil/forbidden things then the remains of the person is buried at the evil forest which is out of reach to strangers.



Plate 5.18: Sacred place for Shokpono

5.19: Tombs by residential homes at Abese



Plate 5.20: Sacred Esu deity at Ijumo

## **CHAPTER SIX: PROJECT IMPACTS ON HUMAN ENVIRONMENT**

### **6.1 Introduction**

The ESIA report of this project has covered extensively on the wide range impacts of the project resulting from the different stages of project cycle, including positive and negative impacts. For example, the activities of work will involve vegetation cover clearing for installation of towers, power lines and sub-stations. Given that vegetation and shrubs are carbon sinkers that protect the mother environment against global warming and soil erosion; when depleted or removed, it could lead to global warming, increase soil vulnerability to erosion, cause soil infertility and extinction of wide animals which the locals game for livelihood and for their proteins.

While the ESIA has articulated the impacts of the project at a global level, this RAP would be specific on the impacts of the involuntary resettlement (land acquisition and displacement) on the affected population.

### **6.2 Impact on Farmers**

Majority of the local population depend on farming as source of their livelihood. The line route project estimated to acquire right of way of 30 meters for the 132kva route and 50 meters for the 330kva route in about 55km length (for Lot1) spanning across 67 villages, will significantly affect land available in the local area. This is further underscored by the recent land acquisition for Railway Project which is simultaneously being implemented by the government of Nigeria. Farmers may have to face with increasing cost of land induced by land acquisition from the line route project, and those who are unable to afford the cost of land will be out of farming livelihood.

### **6.3 Impact on Gender**

Women have limited access to assets and productive resources, owing both to legislation and to social norms; also, employment opportunities are limited as a result of disadvantaged schooling and the cultural expectation to perform domestic responsibilities. There is a high number of female farmers in the project affected area, however they often have less productive tracts of land due to lack of finance, labour and technology. Women farmers are more likely to be tenants than owners of land due to traditional customs, such as inheritance and polygamy mores. The proposed land acquisition in the area as a result of the line route project in addition to the

existing situation orchestrated by other projects (Railway Line Project) in the area will lead to scarcity of land and high cost of lease for agricultural land for which women will be worse hit. The final implication is that women in farming livelihood may be discouraged from production due to high cost of leasing farm land.

### **6.4 Impact on Vulnerable Group**

This project may not be the cause of vulnerability but it is not inconceivable that those that are already vulnerable (the widows, physically disadvantaged, aged persons, unemployed youths) who depended on agricultural land and natural resources for their livelihood are likely to suffer more than others by the shock that follows land depletion and removal/destruction of natural and economic assets that they depended upon for sustenance. Some of the vulnerable people may not be able to participate fully in the RAP process without assistance due to their vulnerability status. Therefore, this RAP is sensitive and responsive to the vulnerable PAPs by ensuring that adequate programme and enlightenment on livelihood restoration is planned for them.

### **6.5 Impact on Minority Groups**

Minority groups in the project area include migrants from other states such as Benue, Lagos and Ebonyi. Many of the minority residents are into trading but also engage in farming activities. It was confirmed that some of the lands they farm on were freely given to them by the community land owners or the Baale. The post land acquisition era impact on the minority groups includes difficulty to have access to affordable land from the project area due to land depletion and its attendant rising cost.

### **6.6 Impact on Owners of affected Structures**

Owners of affected residential houses will suffer from loss of houses. They may end up becoming tenants after they have lost their permanent buildings. Also, those who owned rented houses risk loss of income from rent.

### **6.7 Impacts on Renters**

Residents on rent at the affected houses might face the challenge of squatting as a result of loss of accommodation. Expectedly, the project may trigger high cost of rent, which may be difficult

to afford, for many renters who suffered loss of accommodation. This impact induces poverty and hardship on the affected groups.

### **6.8 Impact on Owners of Shrines, archaeological and sacred properties**

Shrines, Tombs and other archaeological properties are symbolic representation of history and culture for the people of the project area. It is believed that loss of these cultural properties raises a phenomenal question of identity and loss of history. Many of the potential losers of these properties would prefer that the project would assist them to fulfil the religious rites of transfer or relocation of their sacred properties to ensure that their gods and ancestors are not displeased.

### **6.9 Impact on Social Affinity and Trust in the community**

Relocation will affect the existing communal living structure and culture. When people are relocated they are likely to lose social affinity and shared traditions. For example, they may relocate in locations where they are received as aliens. Their new locations may not offer them with the opportunity to have large expanse of land and natural resources such as water and forest trees. They may also be far away from their local markets, schools, church and other social organizations. Building the frontiers of social institutions in the new locations may not only take time but may result in loss of affinity, culture and wellbeing.

On the other hands, awareness of compensation benefits is synonymous with fuelling discords among people of same kindred and neighbourhood. The drive for compensation benefits results in conflicts over lands and assets and causes sharp divides among claimants which are usually difficult to reconcile.

### **6.10 Impact of Compensation on lifestyle, Welfare and Security**

Where compensation entitlement is largely in cash, beneficiaries may fall under money illusion, change their living standards and redirect their focuses. For instance, it is documented from other projects experiences that cash compensation had led to men marrying more wives and/or indulging in alcoholism which led them to precarious state of poverty after they had squandered the money. On the other hand, payment of compensation exposes recipients to armed robbery attacks and overbearing expectation from relatives and acquaintances.

### **6.11 Impact Avoidance Measures taken**

In accordance with the principles of involuntary resettlement as shared by World Bank and JICA, involuntary resettlement should be avoided where feasible, or minimized where avoidance is not possible. This RAP has therefore; critically followed steps that will help to avoid or minimize impacts while also providing mitigation measures for the sets of impacts that cannot be readily avoided.

The steps taken to avoid or minimize impacts include:

- 1. Ensure that proper engagement of community and PAPs is undertaken early in the RAP preparation and implementation process in order to ensure that those identified are the real owners of the affected assets. This is a step in the right direction to ensuring that feuds are avoided or reduced amongst community members.*
- 2. RAP preparation in consultation with TCN and JICA, thereby, ensuring that the line route option chosen is the one of least encumbrances. During construction, TCN will stick to the ROW setback which has been stipulated in this report*
- 3. Payment of compensation before construction activities to minimize income loss and economic displacement.*
- 4. Prior compensation, project proponent will carry out enlightenment campaign and sensitization of PAPs on involuntary resettlement, livelihood restoration and use of compensation benefits*

### **6.12 Mitigation Measures to Address Impacts**

This RAP envisages that not all project related impacts can be avoided, and therefore, proffers mitigation measures which is built around adequate and fair compensation of PAPs for the assets they will potentially lose to the project. Key to successful mitigation measures is believed to be anchored on proper RAP preparation process which identifies and consults with PAPs and local stakeholders in the RAP preparation process and implementation.

As a consequent of the above, this RAP is guided by the process of robust consultation, identification of PAPs, adequate valuation of assets, announcement of cut-off date and establishment of grievance redress channels.

To ensure that PAPs do not suffer net economic loss, this RAP in line with the guideline of JICA will ensure that compensation payment is carried out prior to land acquisition and

commencement of work in the project area. Project proponents will also notify the community on its work plan to enable them remove and secure their belongings and assets in safe conditions. This RAP has also mainstreamed income restoration and special consideration for vulnerable PAPs into the implementation programme of this project to ensure that those made worse off by the project are restored to their pre-project socio-economic status and assisted to have improved living conditions.

### 6.13 Summary and Categories of Affected Assets (Lot 1)

**Number of PAPs who will receive relocation assistance (Equivalent to compensation for land)**

| Category                       | Land Use             | Number of owner (Project Affected Units) | Area Size (m <sup>2</sup> ) | Relocation Assistance Needed |
|--------------------------------|----------------------|--|-----------------------------|------------------------------|
| Government Land                | Residential Land     | NA                                       | NA                          | No                           |
|                                | Commercial Land      | NA                                       | NA                          |                              |
|                                | Agricultural Land    | NA                                       | NA                          |                              |
|                                | Public Facility Land | NA                                       | NA                          |                              |
|                                | Others               | NA                                       | NA                          |                              |
|                                | Sub-Total            | 0  | 0                           |                              |
| Community Land or Private Land | Residential Land     | NA                                       | NA                          | Yes                          |
|                                | Commercial Land      | NA                                       | NA                          |                              |
|                                | Agricultural Land    | 127                                      | 55421.5                     |                              |
|                                | Non-used land        | NA                                       | NA                          |                              |
|                                | Others               | NA                                       | NA                          |                              |
| <b>Lot 1 Total</b>             |                      | <b>127</b>                               | <b>55,421.50</b>            |                              |

### Number of Project Affected Units (Primary Structures) and displaced persons (Physically or Economically)

| Category | Type of Primary Structure    | Project Affected Units (PAUs) | Project Affected Persons (PAPs) |  | Project Affected Units (PAUs) | Project Affected Persons (PAPs)        |  |          |
|----------|------------------------------|-------------------------------|---------------------------------|--|-------------------------------|--|--|----------|
|          |                              |                               | Number of owner (HHs)           | Number of Physically displaced persons |                               | Number of Physically displaced persons | Number of Economically displaced persons |          |
|          |                              | Title holder                  |                                 |  | Non-title holder (Encroacher) |  |  |          |
| Lot 1    | Residential Structure        | Occupied                      | 44                              | 239                                    |                               |  |  |          |
|          |                              | Unoccupied                    | 163                             | 163 <sup>*2</sup>                      |                               |  |  |          |
|          | Residential Tenant Structure | Occupied                      | 0                               | 0                                      |                               |  |  |          |
|          | Commercial Structure         |                               | 27                              | 27 <sup>*1</sup>                       | 27 <sup>*1</sup>              |  |  |          |
|          | Other Structure              | Public and Religious          | 140                             |  |                               |  |  |          |
|          | <b>Sub-Total</b>             |                               | <b>374</b>                      | <b>239</b>                             | <b>27</b>                     | <b>0</b>                               | <b>0</b>                                 | <b>0</b> |

### Number of Agricultural Land

|      | Category                       | Project Affected Units      | Project Affected Persons                  |
|------|--------------------------------|-----------------------------|---|
|      |                                | Number of Agricultural Land | Number of Economically Affected Persons*1 |
| Lot1 | Government Land                | NA                          | NA  |
|      | Community Land or Private Land | 127                         | 127                                       |
|      | <b>Lot 1 Total</b>             | <b>127</b>                  | <b>127</b>                                |

## CHAPTER SEVEN: METHODS OF VALUATION OF ASSETS

### 7.1 Census Cut-off Date

The overall established cut off-date was March 4<sup>th</sup> 2018. This date represents the date on which final field work was carried out in the last community (Ajade). Ajade was the last community for extended census due to the need for re-alignment of the line route in that community as earlier reported in this RAP. This cut-off date was extended from the previously stated cut-off date due to the review and update of the PAPs in the RAP. This is the day when census of PAPs ended. The cut-off-date was communicated in the language of the people during community consultation and through the district heads and village heads.

Therefore, any other person entering the ROW to build, settle, trade, farm or embark on any form of improvement would not be entitled to any form of compensation. The WB OP 4.12 sets a caveat for nullifying new claims as follows *“provided that there has been an effective public dissemination of information on the area delineated, and systematic and continuous dissemination subsequent to the delineation to prevent further population influx”*

### 7.2 Method of valuation of assets

This section describes valuation methods for the various categories of affected assets in the project area and the methods that were used in determining and valuing the assets. The methods described below are also consistent with the entitlement matrix for Project Affected Persons as described in this RAP.

### 7.3 Valuation Method for Land

For Donor funded projects, the Replacement Cost Method (Land for land) is the preferred method as recommended by WB 4.12. However, in consultation with the project affected people (PAP), cash compensation or Relocation Assistance based on the rate given by Ogun State for the area was adopted. Land in Ejio community adjudged to be semi-urban was valued for 2million naira per hectare. Therefore, land in Ejio community was valued at N200 per meter square, while land in other areas was valued at N100 per meter square. Land clearing and other miscellaneous administrative costs are inclusive in both rates.

#### 7.4 Valuation Method for House structures

The Replacement Cost Method was used in estimating the value of the house/structure. The Replacement Cost Method is based on the assumption that the capital value of an existing development can be equated to the cost of reinstating the development on the same plot at the current labour, material and other incidental costs. The estimated value represents the cost of the property as if new. In arriving at appropriate rate for structures, the quantity surveyor within our team embarked on market survey of building materials and labour in the project area. Although a few variations exist from one local market to the other, the upper price of materials was adopted to ensure that PAPs suffer no net loss but are made better off in line with the pro-poor objective which OP 4.12 supports.

Table 7.1 below provides the description of types of structures in the project area (as shown in the shaded portion), level of completion and finishing as well as rates (in naira) per meter square. Conversely, valuation of building/structures recognized that structures are of different levels of construction and finishing. Therefore, they are categorized by stages of completion and type of finishing, and cumulative cost of building for each applicable type of structure was obtained and divided to obtain the unit rate per meter square.

**Table 7.1: Rates for Structures/Houses**

| CATEGORY | DIFFERENT STAGES OF COMPLETION AND FINISHING LEVELS |   | RATES PER M <sup>2</sup> OF THE BUILDING |
|----------|---|---|--|
| 1        | MUD HOUSE   | MUD HOUSE WITH THATCH ROOF, NOT RENDERED            | 15,000                                   |
| 2        |   | MUD HOUSE WITH CORRUGATED SHEET RENDERED INTERNALLY | 17,000                                   |
| 3        | BLOCK BUNGALOW                                      | FOUNDATION LEVEL                                    | 3,000 - 3,500                            |
| 4        |   | DPC LEVEL   | 5,500                                    |
| 5        |   | WINDOW SEAT LEVEL                                   | 4,500 - 6,000                            |
| 6        |   | LINTEL LEVEL  | 7,000 - 9,000                            |
| 7        |   | FINAL BLOCK WORK/ HEAD COURSE                       | 9,000 - 10,000                           |
|          | COMPLETION  |   |  |

|    |             |   |                 |
|----|-------------|---|-----------------|
| 8  | LEVELS      | ROOFED, NOT RENDERED INTERNALLY OR EXTERNALLY, NO DOORS OR WINDOWS, NO PLUMBING OR ELECTRICAL   | 16,000          |
| 9  | FINISHING A | COMPLETED WITH MODERN FINISHINGS, ASEBESTO/PVC CEILING, RENDERED INTERNALLY AND EXTERNALLY, ELECTRICAL/PLUMBING WORKS, PAINTED                                  | 23,000 - 25,000 |
| 10 | FINISHING B | ROOFED, POP CEILIN, ALUMINIUM SLIDING WINDOWS, RENDERED INTERNALLY AND EXTERNALLY, ELECTRICAL/PLUMBING WORKS, PAINTED, FLOOR TILES AND INTERLOCK EXTERNAL FLOOR | 35,000          |
| 11 | FINISHING C | ROOFED, PVC CEILING, RENDERED SMOOTH ONLY INTERNALLY, WOODEN DOORS AND WINDOWS, NO ELECTRICAL WORK, NOT PAINTED, CEMENT SCREED FLOOR FINISHINGS                 | 32,000          |
| 12 | FINISHING D | ROOFED, NOT RENDERED BOTH EXTERNALLY AND INTERNALLY, WOODEN DOORS AND WINDOWS, CEMENT SCREED FLOOR FINISHINGS, NO PLUMBINGS/ ELECTRICAL WORKS                   | 20,000 - 25,000 |

#### 7.5 Valuation method for Economic Tree

Valuation for economic tree was based on the harmonized rate for economic trees in South West Zone of Nigeria. In adopting the rate, market survey in the locality was undertaken to ensure that

the rates conform to the appropriate market value of the trees. The South West Harmonized rate is higher than the National Gazette Rate as prescribed in the Land Use Act. The highest value rate in the harmonized gazette which assumed that economic trees to be affected are all of maturity status was used. A copy of the South West Harmonized Rate for Valuation of Economic Trees and Crops is attached as appendix 2.

#### 7.6 Valuation method for farm crops

Compensation for crops is at full market value of crop yield per hectare or number counts of the quantity of the crops within the affected farm land multiplied by the harmonized rate of government of the South West Zone of Nigeria.

#### 7.7 Valuation Method for Shrines, archaeological structures and sacred properties

Since the value of cultural properties cannot be market determined, our approach to compensation was based on wide consultation with custodians of traditions (Baales) and those associated with the affected cultural properties. Outcome of the negotiations is a unified amount of N150, 000 per community shrine and N50, 000 for individual shrine while N50, 000 for Grave/Tomb.

#### 7.8 Payment of Compensation

Payment of compensation will take place after due validation exercise to be conducted by the implementing agency or a qualified firm engaged by it to implement the same. PAPs must be physically present at designated locations for identification and validation. As specified in this RAP, payment of compensation shall take place before the commencement of installations and civil work.

Payment shall be made by cheque or transfer into PAPs authenticated Bank account. There shall not be cash payment in any form. To this end, PAPs without Bank account will be assisted by TCN to open a Bank account.

#### 7.9 Entitlement Matrix

The entitlement matrix is the basis for compensation budget, resettlement and income restoration measures to be administered by the proponent.

The matrix shows specific and applicable categories of PAPs under this project as well as types of losses and entitlement plan for PAPs. Table below provides an entitlement matrix for Project Affected Persons (PAPs).

**Table 7.2: Entitlement Matrix**

| Item           | Type of loss                            | Entitled Persons   | Entitlements  | Responsibility |
|----------------|---|--|---|----------------|
| <b>A. LAND</b> |   |  |   |                |
| A1             | Loss of residential and commercial land | Private landowner with title deed or similar ownership document, and customary recognized in the community | <ul style="list-style-type: none"> <li>• Cash compensation for land will be at market value based on the market survey results conducted by TCN.</li> <li>• Livelihood restoration (assistance and training):G1</li> <li>• Special assistance, if applicable: H1</li> </ul> | TCN/ PIU       |
| A2             | Loss of residential and commercial land | Land user of public owned land   | <ul style="list-style-type: none"> <li>• No compensation for land</li> <li>• Livelihood restoration (assistance and training): G1</li> </ul>  |                |

| Item                 | Type of loss              | Entitled Persons                            | Entitlements   | Responsibility |
|----------------------|---------------------------|---|--|----------------|
|                      |                           |   | <ul style="list-style-type: none"> <li>Special assistance, if applicable: H1</li> </ul>  |                |
| A3                   | Loss of agricultural land | Landowner and land user                     | <ul style="list-style-type: none"> <li>Cash compensation for land</li> <li>Cash compensation for loss of crops and trees during the construction stage at the market value of crops based on the harmonized compensation rate in South- west area in Nigeria (Appendix2)</li> <li>Livelihood restoration (assistance and training): G2</li> <li>Special assistance, if applicable: H1</li> </ul> |                |
| A4                   | Loss of agricultural land | Landowner and land user without legal title | <ul style="list-style-type: none"> <li>No compensation for land</li> <li>Cash compensation for loss of crops and trees during the construction stage at the market value of crops based on the harmonized compensation rate in South- west area in Nigeria (Appendix2)</li> <li>Livelihood restoration (assistance and training): G2</li> <li>Special assistance, if applicable: H1</li> </ul>   |                |
| <b>B. STRUCTURES</b> |                           |   |  |                |
| B1                   | Loss of structure         | Owner of structure                          | <ol style="list-style-type: none"> <li>Replacement cost is estimated based on the information including type of building, type of material, type of finishing and level of completion.</li> <li>Shifting allowance: F1</li> <li>Special assistance, if applicable: H1</li> </ol>   |                |

| Item   | Type of loss   | Entitled Persons  | Entitlements   | Responsibility |
|--|--|---|--|----------------|
| B2   | Loss of rental Structure   | Person renting in a residential or commercial structure with rental agreement or receipt of payment | <ul style="list-style-type: none"> <li>No compensation for structure</li> <li>Shifting allowance: F1</li> <li>Special assistance, if applicable: H1</li> </ul>   |                |
| B3   | Loss of rental Structure   | Owner of structure  | <ul style="list-style-type: none"> <li>Cash compensation will be paid at the replacement cost and associated in-direct cost (e.g. registration tax, etc.) evaluated by TCN.</li> </ul>   |                |
| <b>C. CROPS AND TREES</b>                                  |  |   |  |                |
| C1   | Loss of crops and tress  | Owner Farmer  | <ul style="list-style-type: none"> <li>Cash compensation for loss of crops and trees will be paid at the market value of different types of crops based on the harmonized compensation rate in South- west area in Nigeria (Appendix 2)</li> </ul> |                |
| <b>D. OTHER PRIVATE PROPERTIES OR SECONDARY STRUCTURES</b> |  |   |  |                |
| D1   | Other property or secondary structure (i.e. shed, outdoor latrine, rice store, animal pen etc) | Owners of structures (regardless if the land is owned or not)                                       | <ul style="list-style-type: none"> <li>Cash compensation will be paid at the replacement cost and associated in-direct cost (e.g. registration tax, etc.) evaluated by TCN.</li> </ul>   |                |
| <b>E. LOSS OF INCOME</b>                                   |  |   |  |                |
| E1   | Job loss due to relocation of business to another area or                                      | Business owner  | <ul style="list-style-type: none"> <li>1 month income assistance</li> <li>Shifting allowance : F1</li> <li>Livelihood restoration (assistance and training):G1</li> </ul>  |                |



| Item   | Type of loss                                  | Entitled Persons  | Entitlements  | Responsibility |
|--|---|---|---|----------------|
|  | business operator decides not to re-establish |   |   |                |
| <b>F. REHABILITATION ASSISTANCE</b>                          |   |   |   |                |
| <b>Shifting Allowance</b>                                    |   |   |   |                |
| F1   | Loss of residential/commercial structures     | Relocating APs/ APs reorganizing or rebuilding on same plot                     | <ul style="list-style-type: none"> <li>Moving cost will be paid for assistance at the value evaluated by TCN based on the quantity and size of items need to be moved.</li> </ul>   |                |
| <b>G. LIVELIHOOD RESTORATION (ASSISTANCE &amp; TRAINING)</b> |   |   |   |                |
| G1   | Effects on livelihood                         | All affected commercial owners/operators of businesses/ workers of businesses / | <ul style="list-style-type: none"> <li>Professional assistance and advice to reestablish and develop the business</li> <li>Vocational or skilled training for business owners or their family members</li> <li>Priority is given for PAPs for the position of construction workers</li> </ul>   | TCN/ PIU       |
| G2   | Effects on livelihood                         | All affected owners/operators in agricultural land                              | <ul style="list-style-type: none"> <li>For farmers who have remaining land or farmers who cultivate on new lands will be assisted to increase productivity (i.e. increasing cropping intensity, use of high yielding seeds, diversification and introduction of new seeds or crops etc) and assistance to access existing subsidies.</li> <li></li> </ul> |                |

| Item                         | Type of loss              | Entitled Persons  | Entitlements  | Responsibility |
|------------------------------|---------------------------|---|---|----------------|
|                              |                           |   | <ul style="list-style-type: none"> <li>Introducing new livelihood opportunities for farmers or their family members.</li> <li>Priority for APs for project related employment opportunities during construction period.</li> <li>Vocational or skilled training for farmers or their family members</li> </ul>  |                |
| <b>H. SPECIAL ASSISTANCE</b> |                           |   |   |                |
| H1                           | Effects on vulnerable APs | Vulnerable APs including the female-headed households, elderly people and differently able. | <ul style="list-style-type: none"> <li>300 Naira x 30 days per person of special grant for AP household to improve living standards of vulnerable APs (such as linking to national poverty reduction programs conducted by various government institutions) and assistance to in finding suitable land for relocation and shifting.</li> <li>All women that are part of the resettled households will be informed of the compensation benefits offered to them specifically.</li> <li>Special help will be given such as opening a bank account, budget management, etc.</li> </ul> |                |
| <b>I. COMMUNITY ASSETS</b>   |                           |   |   |                |

| Item                                 | Type of loss  | Entitled Persons  | Entitlements  | Responsibility |
|--------------------------------------|---|---|---|----------------|
| II                                   | Loss of buildings and other structures (schools, shrine, temples, clinics, common wells etc), infrastructure (local roads, footpaths, bridges, irrigation, water points etc.), common resources | Divisional Secretary of the division, local community or local authority owning or benefiting from community property, infrastructure or resources        | <ul style="list-style-type: none"> <li>For shrine, amount of compensation will be calculated by TCN with consultation with PAPs based on replacement cost considering size, equipped item, traditional rites</li> <li>For public assets including well, rebuild a new structure (Not money compensation)</li> </ul> |                |
| <b>J. Unanticipated Resettlement</b> |   |   |   |                |
| J1                                   | Any unanticipated adverse impact due to project intervention  | Any unanticipated consequence of the project will be documented and mitigated based on the spirit of the principles agreed upon in this policy framework. |   |                |

## CHAPTER EIGHT

### 8.0 INCOME AND LIVELIHOOD RESTORATION STRATEGIES

The Transmission Company of Nigeria (TCN) is encouraged to use the guidelines below and involve the affected communities, local leaders, NGOs and other stakeholders to gather opinions in order to assess livelihood restoration procedures.

The World Bank (WB)'s OP, 4.12 paragraph (6c), states the following:

*“Displaced persons should be offered support after displacement, for a transition period, based on a reasonable estimate of the time likely to be needed to restore their livelihood and standards of living; and provided with development assistance, such as land preparation, credit facilities, training, in addition to the compensation they receive.”*

Additionally, WB OP 4.12, paragraph (2c), requires that displaced individuals be given assistance for their efforts to improve their living standards or to at least restore them to the highest standard between pre-displacement or standards prevailing prior to the beginning of the project implementation.

In an effort to define income and develop livelihood restoration strategies, TCN should involve participation for purposes of fostering ownership at an early stage. Assistance will be especially critical to the individual that is to be relocated far away, due to reconstruction costs that may be otherwise avoided.

It is recommended that TCN hire a consultant or partner with an NGO to coordinate the restoration programme.

#### 8.1 COMMUNITIES Within THE TRANSMISSION LINE'S ROW

As discussed in chapter 7 of this report, it is recommended to inform the PAPs of the project at least 3 months before the start of the construction.

In all cases, PAPs shall be advised to construct new structures at locations near the previous ones within the affected community to reduce disruption of community life, established spatial organization and services.

Also worthy of mentioning is the fact that many communities along the ROW have experienced workers that can be hired during the construction phase. Local experienced workers and entrepreneurs with necessary experience and capacity should be given priority work opportunities,

if applicable. Also, as suggested through consultations, the general contractor should liaise with village chiefs to maximise local hiring as well as the purchase of relevant local materials and services.

## **8.2 INCOME Restoration AND IMPROVEMENT**

Different restoration packages will be required for each of the various categories of PAPs and will depend on the type and magnitude of loss suffered, the vulnerability level of the PAPs' household, the indicated preferences associated to their family characteristics and other relevant circumstances.

### **8.2.1 Land base**

As stated in chapter 7 of this report, the households that will lose a piece of land will receive sufficient compensation to be able to buy a new land, off-set loss of crops and rehabilitate the land to similar production level.

Further investigations paired with experience on similar projects indicate that in most cases it would be difficult and cumbersome for the TCN to find and propose replacement land for different reasons (risk of speculation, administrative burden, PAP lack of trust, etc.). It is thus preferable to pay cash compensation to the PAPs to provide them with an opportunity to purchase new land and condition it themselves and continue farming.

However, to limit impoverishment risk, adequate compensation level and implementation conditions are essential. The conditions discussed in chapters 7, 9 and 10 needs to be given to PAPs and are summarized below:

- Sufficient time to find and evaluate their option and possible replacement land and organize the resettlement;
- Support for all legal aspects of the transaction;
- All "transaction costs" such as registration fees, transfer taxes, or customary tributes are to be compensated;
- Adequate control of PAPs' use of compensations by project authorities through different mechanisms like progressive verification of land purchase should be taken.

PAPs whose crops are to be negatively impacted by the project should be provided seedlings and seeds for their gardens and crops on their replacement land.

Furthermore, compensation should cover cost of improvement (fertilized, tilled, weeded, fenced, etc.) to reach the productive condition of the original plot. Affected households will be paid by the project to do this work as much as possible, by themselves.

Additionally, technical assistance will be provided for at least a two-year period to help the impacted households improve their situation. As discussed in chapter 9 Project Implementation Unit is encouraged to engage the services of an experienced Agronomist who will also ensure coordination with governmental agricultural departments for the coordination and efficiency of the work. This specialist will assess concerns, needs and the most relevant aspects of livelihood improvement with PAPs and local administration as well as it will propose improvement and support activities.

This help could include the following:

- Practical training courses on improved agricultural techniques;
- Improved crop varieties;
- Fertilization;
- Small scale irrigation;
- Animal traction and related equipment;
- Post-harvest grain conservation;
- Agroforestry, other relevant techniques.

### **8.2.2 Trees**

Trees will be destroyed during the construction of the transmission line since no trees taller than 4 meters are being kept in the wayleave. Compensation to households will be allocated according to the prescribed rates up to replace these trees. The PIU specialist will help the affected households to plant trees to restore their source of income and livelihoods.

### **8.2.3 Structures**

In a limited number of cases, houses and other structures that are located in the wayleave will have to be displaced. In that case and during the survey campaign, the PAPs indicated that with adequate compensation they would not have problem obtaining an available land to relocate their houses to.

Those buildings should therefore be rebuilt on new land where the risk of spatial disruption of household activities is the lowest. All necessary steps will be taken by the TCN and the PIU or consultants in charge of compensation to make sure that the PAPs find a suitable land for reconstruction and enough time for reconstruction and proper compensation is paid.

Reconstruction is to be done on parcels adjacent to the piece of land being displaced, where possible.

Each of these household will receive additional compensation to cover the following expenses:

- A moving allocation to pay for moving their goods and belongings;
- An income support for of the household to mitigate the inconvenience and time constraints related to the resettlement.
- Cost land administration, taxes and other charges associated with land acquisition.

#### 8.2.4 Vulnerable Groups

A special focus must be given to the livelihood improvement of vulnerable groups prior to the construction of the project. Vulnerable groups include low income families, women, child (under 18 years heading a household) or handicap headed households.

Vulnerable households will be consulted at the onset of the operation to evaluate their concerns and needs. Special help that could be provided include, among others:

- Support to open bank account;
- Help for administrative transactions (land titling);
- Relocation logistics and other support for the physically resettled households such as :
  - Transport assistance;
  - Reconstruction advice (on materials, type of structures, etc.) to ensure the quality of construction;
- Psychological support (information, counseling, discussion);
- Special transitional funds specific to vulnerable households.

Members of affected households should also benefit from the proposed training programs.

Household members within vulnerable households are to be given priority for the allocation of project related employment and other benefits.

Given the current place of females in rural communities, when cash compensations is the only acceptable option, the following possible mitigation measures should also be examined and implemented when feasible:

- Awareness programs on issues directed towards authorities, local administrators and communities;
- Assistance of the PIU to inform and assist vulnerable people and groups;
- Seeking full consent of females in the households and explaining to them the proposed compensation options;
- Payment of large amounts of cash compensation (larger than N 200,000) through carefully distributed instalments (it can be over several months) to mitigate the potential for cash misuse;
- Careful monitoring.

#### 8.2.5 Non-Financial Components

##### Employment and Other Benefits

Priority should be given to all able bodied members of resettled households during the labour recruitment process. This applies to the following employment and contract opportunities :

clearing of the corridor; portorage for movement of construction materials to transmission pylon development and other sites, construction of access roads and construction camps, reconstruction of community buildings and houses, provision of services and goods to the workers; administration of the compensation program, monitoring activities, etc.

Furthermore, all the affected households and communities should be given all the wood that is cut on their parcel for their own use or sale. The materials salvaged from the affected structures should also be left to the affected households and communities.

All goods and services (sand, cement, food, etc.) should be bought locally when possible. This applies to all contractors and specific provisions to that effect must be included in the construction Terms of Reference.

## CHAPTER NINE: GRIEVANCE REDRESS MECHANISM

### 9.1 Introduction

This RAP recognizes that grievances may arise as fallout of the involuntary resettlement implementation (compensation). It therefore, creates a platform and procedure for effective handling of complaints and grievances that is aimed at avoiding lengthy litigation which may mar or delay project implementation and objective. It is envisaged that under this project, grievances may result due to one or a mix of the following factors:

- *Failure to identify all affected land owners and categories of PAPs*
- *Non-payment of compensation*
- *Inadequate compensation or valuation of assets*
- *delay in disbursement of entitlement;*
- *dispute about ownership of land or asset*
- *non-participation or engagement of PAP in compensation negotiation*
- *implementation of project before or without resolving resettlement matters*

### 9.2 Objective of the GRM

The objectives of the grievance redress mechanism are to:

- *Provide an effective avenue for affected persons to expressing their concerns and resolve disputes that are caused by the project*
- *Promote a mutually constructive relationship among PAPs/community and TCN*
- *Prevent and address community concerns, and*
- *Assist larger processes that create positive social change*
- *Identify early and resolve issues that would lead to judicial proceedings.*

### 9.3 Existing Grievance Redress System in the Locality

All the concerned villages within the project area have common cultural procedures that govern the way civil cases and grievances including land disputes are resolved. Ward heads adjudicate on cultural and civil matters that are within their ward purviews under the anchor of the Baale. This includes hearing and settling of disputes and non-criminal cases. Issues that are not satisfactorily resolved at the ward level are taken to the Oba (paramount ruler). The stated local

grievance redress does not in any way impede the right of dissatisfied parties in any case from seeking for redress through judicial means.

### 9.4 Composition of Grievance Redress Committee (GRC) under this Project

The essence of a special GRC for this project is to install a functional and effective GRM which shall be a hybrid of the traditional GRM system and new methods that represent result oriented best practices.

A functional GRC shall be constituted by TCN in collaboration with the affected local government areas and State Ministry of Agriculture and Ministry of Land. TCN-PIU will have the responsibility of spearheading the constitution of this committee whose duty is to monitor and review the progress of implementation of the scheme or compensation of the affected people and to carry out post implementation social audits.

### 9.5 Grievance Redress Committee (GRC)

The TCN-PIU shall establish a Grievance Redress Committee (GRC) overseen by TCN to address complaints from RAP implementation. The first stage of the GRC shall be coordinated by the community Baale and shall be made up of the following parties:

- *1 Representative from each of the Community Associations*
- *1 Representative from the Baale of the Community*
- *1 Representative of the Local Government Area*
- *1 Representative of Ministry of Lands, Survey and Physical Planning.*
- *1 Representative of the Project Affected Persons(PAPs)*
- *Project Desk Environment and Social Officer*
- *1 Representative from the Estate Valuers Association*

This committee shall be the place of first recourse for anyone who has a grievance matter related to the project. The time line for addressing / resolving the issues raised by a complainant by this GRC shall be almost 10days from the last day allowable for grievance and complaints submission following the end of RAP disclosure.

Where the Grievance Redress Committee is unable to resolve the matter at this level, the Complainant may seek redress from *the Project Implementation Unit – Grievance Redress Committee (PIU-GRC)*. This Committee shall be coordinated by the Project Coordinator at the TCN-PIU and made up of the following parties:

- *1 Representative from the department of Flood and Erosion Control in the Ministry of Environment*
- *1 Representative from the Ministry of Lands and Survey*
- *1 Representative of the Project Affected Persons(PAPs)*
- *1 Representative from the NGO*
- *Environmental and Social Officer/Desk Officer*
- *Project Accountant in the PIU*
- *Project Coordinator of the PIU as the Coordinator*

This committee shall be the place of second place of recourse for anyone who has a grievance matter related to the project. The time line for addressing/resolution of the issues raised by a complainant by this PIU-GRC shall be at most 10days from the last day allowable for grievance and complaints submission following the inability of the GRC to resolve the matter.

Where the TCN-PIU GRC is unable to resolve the matter at this level, the Complainant may seek redress from the *TCN Steering and Technical Committee*. This Committee will be coordinated by the Chairman of the Steering Committee, who is the Honourable Minister of Power, Works and Housing. The time line for addressing / resolution of the issues raised by a complainant by this *TCN Steering and Technical Committee* shall be at most 10days from the last day allowable for grievance and complaints submission following the inability of the PIU-GRC to resolve the matter. For the purposes of addressing the grievances, the following parties shall be part of this committee to give guidance and support to the Committee:

- *The Director of Transmission*
- *Project Coordinator of the TCN-PIU as the Secretary*
- *Representative of the Umbrella NGO in the area*
- *Representative of the LGAs chairmen*

The time line for addressing/resolution of the issues raised by a complainant by this committee shall be at most 10days from the last day allowable for grievance and complaints submission following the inability of the PIU- GRC to resolve the matter.

Where the Complainant is not satisfied with the decisions of the *TCN Steering and Technical Committee*, he/she may seek redress in Court.

## **9.6 Training of the Grievance Redress Committees**

The various Grievance Redress Committees shall be provided with training to enable them adequately perform their responsibilities. The trainings shall be organized by the TCN who shall provide logistics such as: writing materials, per diem, transportation, training venue and time.

The details of the training including time and date shall be adequately communicated to all members for their attendance.

At the end of the training, members of the intervention community shall be adequately sensitized on the procedure for submission of complaints and grievances.

## CHAPTER TEN: RAP IMPLEMENTATION, INSTITUTIONAL ARRANGEMENT AND ACCOUNTABILITY

### 10.1 Introduction to Institutional Arrangement

The major institutions and stakeholders that are involved in this resettlement process are the TCN-PIU, Federal Ministry of Environment, State Ministry of Environment, Ogun State Ministry of Land, Ministry of Agriculture, Local Government Chairmen, NGOs and Community Leaders (Baales and Obas). Others are specific committees to be set up by the project such as the Resettlement Committee and Grievance Redress Committee.

### 10.2 Institutional Arrangement

The roles and responsibilities of the institutions regarding Resettlement Implementation are as per Table 10.1

**Table 10.1: Institutional Arrangement and Responsibilities for RAP Implementation**

| S/No | Stakeholders/ Institution | Responsibilities   |
|------|---------------------------|--|
| 1    | TCN-PIU                   | <ul style="list-style-type: none"> <li>Co-ordinate all policies, programmes and action so fall related agencies in the States;</li> <li>Ensure that RAP is implemented fully in line with JICA/WB OP 4.12 standard as prescribed in this report</li> <li>Establishment of resettlement implementation committee</li> <li>Appointment of an NGO that will work with the Grievance Redress Committee (GRC),</li> <li>Engaging the service sofa consultant to carry out preparation and implementation of RAP and subsequent engaging the service of external monitors for the RAP implementation.</li> <li>Approval of payments to consultants for RAP activities carried out under the project.</li> <li>Submission of Reports to World Bank for review.</li> </ul> |
| 2    | JICA                      | <ul style="list-style-type: none"> <li>Responsible for the final review, clearance and approval of the RAP.</li> </ul>   |

|   |                                       |  |
|---|---------------------------------------|--|
|   |                                       | <ul style="list-style-type: none"> <li>Ensures that its guideline /approved entitlement matrix is followed in the implementation of RAP</li> <li>Monitors RAP implementation</li> </ul>  |
| 3 | State Ministry of Environment,        | <ul style="list-style-type: none"> <li>Monitors RAP compensation implementation;</li> <li>Responsible for displaying RAP within their domain for public view</li> <li>Ensure environmental safety of sites where PAPs are been relocated to</li> </ul>   |
| 4 | Ministry of Land                      | <ul style="list-style-type: none"> <li>Facilitate alternative land acquisition as may be required for resettling PAPs</li> <li>Assist TCN resettlement committee with site preparation including land mapping and authentication</li> <li>Be responsible for the preparation of Certificates of Occupancy which evidence the grant of State lands and the transfer of interest by the customary land holders.</li> </ul> |
| 5 | Ministry of Agriculture               | <ul style="list-style-type: none"> <li>Support the implementing agency with information of rates for compensation,</li> <li>Provides technical support to TCN on the agro-based livelihood support;</li> </ul>   |
| 6 | LGA                                   | <ul style="list-style-type: none"> <li>Monitors RAP implementation in their LGAs;</li> <li>Assist with the acquisition of rural land for agriculture for PAPs under land resettlement for agriculture</li> </ul>   |
| 7 | Resettlement Implementation Committee | <ul style="list-style-type: none"> <li>Responsible for coordinating RAP implementation under the supervision of TCN</li> <li>Works closely with the Consultant to ensure the consultation, enlightenment and participation of PAPs in the implementation activities,</li> <li>Responsible for instituting the grievance redress committee in collaboration with TCN-PIU</li> </ul>                                       |
| 8 | Community Baales and Obas             | <ul style="list-style-type: none"> <li>Responsible for mobilization of PAPs and their interface with TCN</li> <li>Anchors and Supervise the working of the grievance redress committee at community level</li> </ul>   |
| 9 | Project                               | <ul style="list-style-type: none"> <li>Entitled to be heard, make inputs and participate in RAP</li> </ul>   |

|    |                                       |   |
|----|---------------------------------------|---|
|    | Affected Persons (PAPs)               | <p>implementation processes</p> <ul style="list-style-type: none"> <li>Attend meetings, workshops and capacity building meetings for this RAP;</li> <li>Comply with agreements reached during consultations to ensure successful RAP implementation and livelihood restoration</li> </ul>   |
| 10 | Environmental and Social Desk Officer | <ul style="list-style-type: none"> <li>Provides the various committees (resettlement committee and grievance redress committee) with necessary documents and support</li> <li>Advice on JICA/World Bank policies on OP 4.12;</li> <li>Ensures coordination between the implementing committees and TCN,</li> <li>Write periodic reports on RAP implementation for submission to the TCN and JICA;</li> <li>Monitors and reports RAP implementation including livelihood restoration of PAPs</li> </ul>          |
| 11 | RAP implementing consultant           | <ul style="list-style-type: none"> <li>Ensure communication and participation of PAPs in resettlement process</li> <li>Undertake training on livelihood restoration to PAPs and vulnerable;</li> <li>Work with TCN to ensure revalidation of PAPs</li> <li>Ensure that all legible PAPs are compensated based on their entitled values</li> <li>Write report on RAP implementation</li> </ul>   |
| 9  | Grievance Redress Committee           | <ul style="list-style-type: none"> <li>Provide support to PAPs on problems arising from loss of private properties and business area.</li> <li>Record the grievance of the PAPs, categorize and prioritize the grievances that need to be resolved by the committee;</li> <li>Report to the aggrieved parties about the developments regarding their grievances and the decision of the project authorities and,</li> <li>Ensure that grievances are settled locally and in time as much as possible</li> </ul> |

## Tasks for RAP implementation and responsibility for each Task

| Task  | PIU (ESMP and RAP) | TCN Head office                                 |                                | Regional office staff (RAP) |           |                            | Consultant team (the team can participate after consultant selection process completed) |                  | others |
|---|--------------------|---|--------------------------------|-----------------------------|-----------|----------------------------|---|------------------|--------|
|   |                    | Chemical, Resettlement and Environment Division | Wayleave and Property Division | Environment unit            | OH S unit | Wayleave And property unit | International consultant (Compensation and Resettlement Manager)                        | Local consultant |        |
| Location  | Abuja              | Abuja   | Abuja                          | Lagos                       |           |                            |   |                  |        |
| # of staff assigned (plan)  | 2                  | 1-2   | 2                              | 1                           | 0         | 1                          | 1   | 3-6 or more      |        |
| <b>Engagement with PAPs</b>   |                    |   |                                |                             |           |                            |   |                  |        |
| - Informed Consent, Consultation to all PAPs (and communities) and agreement with PAPs regarding the entitlement matrix | x                  |   |                                |                             |           | x                          | x   | X                | (LRC)  |
| - Supporting to PAPs (e.g. opening bank account, supports for vulnerable groups)  | X                  |   |                                |                             |           | support                    | x   | x                |        |
| - Signing on agreement with all PAPs  | X                  |   |                                |                             |           | Support                    | x   | x                |        |
| Establishment of organization:  |                    |   |                                |                             |           |                            |   |                  |        |
| - PIU (and consultant group?)   |                    |   |                                |                             |           |                            |   |                  |        |
| - Local   |                    |   |                                |                             |           |                            |   |                  |        |



| Task  | PIU (ESMP and RAP) | TCN Head office                                 |                                    | Regional office staff (RAP) |           |                            | Consultant team (the team can participate after consultant selection process completed) |                  | others                   |
|---|--------------------|---|------------------------------------|-----------------------------|-----------|----------------------------|---|------------------|--------------------------|
|   |                    | Chemical, Resettlement and Environment Division | Wayleave and Property Division     | Environment unit            | OH S unit | Wayleave And property unit | International consultant (Compensation and Resettlement Manager)                        | Local consultant |                          |
| Location  | Abuja              | Abuja   | Abuja                              | Lagos                       |           |                            |   |                  |                          |
| # of staff assigned (plan)  | 2                  | 1-2   | 2                                  | 1                           | 0         | 1                          | 1   | 3-6 or more      |                          |
| resettlement committee(s) in each communities   | x                  |   |                                    |                             |           | x                          |   | x                | LRC                      |
| Administrative activity:  |                    |   |                                    |                             |           |                            |   |                  |                          |
| - Identification of land, structures and assets (variations from original RAP is expected due to arraignment of Line route) | x                  |   |                                    |                             |           | x                          | x   | x                | Witness NGO              |
| - Compensation evaluation (re-evaluation to finalize)   | x                  |   | x                                  |                             |           |                            |   |                  | State (Land bureau etc.) |
| - Entitlement document review for qualification of compensation   |                    |   | X (visited sites and met all PAPs) |                             |           |                            | x   | x                |                          |
| - Financial approval for payment to PAPs  |                    |   |                                    |                             |           |                            |   |                  | TCN management includin  |

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| Task   | PIU (ESMP and RAP) | TCN Head office                                 |                                | Regional office staff (RAP) |           |                            | Consultant team (the team can participate after consultant selection process completed) |                      | others                    |
|--|--------------------|---|--------------------------------|-----------------------------|-----------|----------------------------|---|----------------------|---------------------------|
|  |                    | Chemical, Resettlement and Environment Division | Wayleave and Property Division | Environment unit            | OH S unit | Wayleave And property unit | International consultant (Compensation and Resettlement Manager)                        | Local consultant     |                           |
| Location   | Abuja              | Abuja   | Abuja                          | Lagos                       |           |                            |   |                      |                           |
| # of staff assigned (plan)   | 2                  | 1-2   | 2                              | 1                           | 0         | 1                          | 1   | 3-6 or more          |                           |
|  |                    |   |                                |                             |           |                            |   |                      | g MD, finance, TSP        |
| - Payment (transfer to bank account)                                 | x                  |   |                                |                             |           |                            |   |                      | TCN finance team will pay |
| - Payment (direct by check)  | x                  |   |                                |                             |           | x                          | x   | x                    |                           |
| - Data base management   | x                  |   |                                |                             |           | x                          | x   |                      |                           |
| - Communication with PAPs  |                    |   |                                |                             |           |                            | X   | x                    | (LRC)                     |
| - Physical resettlement assistance when needed                       | x                  |   |                                |                             |           | x                          | x   | x                    | (NGO, LRC)                |
| Monitoring:  |                    |   |                                |                             |           |                            |   |                      |                           |
| - Check the progress of compensation, relocation and RoC acquisition | X                  |   |                                |                             |           | x                          | x   | X weekly and monthly |                           |
| - External monitoring  |                    |   |                                |                             |           |                            |   |                      | X, JICA                   |
| - Reporting at least every   | x (based           |   |                                |                             |           |                            |   | x                    |                           |

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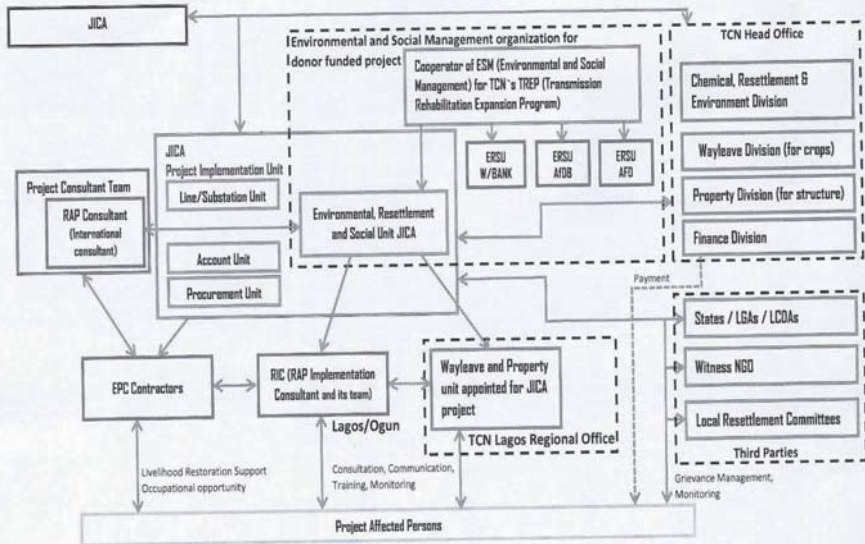
| Task   | PIU (ESMP and RAP)                | TCN Head office                                 |                                | Regional office staff (RAP) |           |                            | Consultant team (the team can participate after consultant selection process completed) |                       | others   |
|--|-----------------------------------|---|--------------------------------|-----------------------------|-----------|----------------------------|---|-----------------------|--|
|  |                                   | Chemical, Resettlement and Environment Division | Wayleave and Property Division | Environment unit            | OH S unit | Wayleave And property unit | International consultant (Compensation and Resettlement Manager)                        | Local consultant      |  |
| Location   | Abuja                             | Abuja   | Abuja                          | Lagos                       |           |                            |   |                       |  |
| # of staff assigned (plan)   | 2                                 | 1-2   | 2                              | 1                           | 0         | 1                          | 1   | 3-6 or more           |  |
| quarter to JICA  | on monthly report from consultant |   |                                |                             |           |                            |   |                       |  |
| - RAP completion audit   | X                                 |   |                                |                             |           |                            |   |                       | Witness NGO, JICA  |
| Certificate of Occupancy issuance:<br>- confirmation of completion of compensation |                                   |   |                                |                             |           |                            |   |                       | State (land bureau) (payment document review or site audit, not specified) |
| - land title (CoO) issuance  |                                   |   |                                |                             |           |                            |   |                       | State  |
| Grievance Management:<br>- Identification  | X (reported)                      |   |                                |                             |           |                            |   | X (reported from LRC) | LRC  |

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| Task   | PIU (ESMP and RAP)               | TCN Head office                                 |                                | Regional office staff (RAP) |           |                            | Consultant team (the team can participate after consultant selection process completed) |                  | others           |
|--|----------------------------------|---|--------------------------------|-----------------------------|-----------|----------------------------|---|------------------|------------------|
|  |                                  | Chemical, Resettlement and Environment Division | Wayleave and Property Division | Environment unit            | OH S unit | Wayleave And property unit | International consultant (Compensation and Resettlement Manager)                        | Local consultant |                  |
| Location   | Abuja                            | Abuja   | Abuja                          | Lagos                       |           |                            |   |                  |                  |
| # of staff assigned (plan)   | 2                                | 1-2   | 2                              | 1                           | 0         | 1                          | 1   | 3-6 or more      |                  |
|  | from consultant or LRC directly) |   |                                |                             |           |                            |   |                  |                  |
| - Solution   | X                                |   |                                |                             |           |                            |   |                  | X                |
| - Reporting  | X                                |   |                                |                             |           |                            |   |                  | LRC              |
| Livelihood restoration:<br>- Training                                |                                  |   |                                |                             |           |                            | x   | x                | NGO              |
| - Restoration assistance (technical support, material support, etc.) | x                                |   |                                |                             |           |                            | x   | x                | NGO, contractors |

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RAP Implementation Organization Chart



Source: TCN JICA PIU (2018)

Figure 10.1: Organizational Chart for Implementation

### 10.3 Training, Capacity Building and Sensitization of PAPs

The training need for RAP Implementation is summarized in the matrix below:

This RAP recommends capacity building for the safeguard officers of the TCN- PIU and other implementing MDAs. This would require training sessions on RAP basics, including the following:

- Principles of Resettlement Action Plan
- Monitoring and Evaluation of ARAP Implementation
- Conflict Management and Resolution in ARAP implementation
- Others

Table 10.2: Proposed Training and Sensitization Needs

| Item  | Description/Module                          | Course content   | Target   | Estimated Amount |
|---|---|--|--|------------------|
| Training & Capacity Building for RAP Implementation | Involuntary Resettlement and Rehabilitation | <ul style="list-style-type: none"> <li>1. Principles of Resettlement Action Plan</li> <li>2. Monitoring &amp; Evaluation of RAP Implementation</li> <li>3. Conflict Management and Resolution in RAP implementation</li> </ul> | Community Conflict/Grievance Redress Committee | N21,000,505      |
| Sensitization                                       | Sensitization and Awareness on RAP process  |  | Community Representative                       | N22,68,000       |
|   | Livelihood and income coaching              |  | Vulnerable PAPs                                |                  |
|   | Record keeping and accountability           |  | Vulnerable PAPs                                |                  |

- Sub-Total : N43,868,505

#### 10.4 Performance Indicators for Assessing Income Restoration

Performance indicators and monitoring are important in evaluating the progress and effectiveness of the resettlement plan vis-a-viz the livelihood/income restoration measures. The events and monitoring indicators for this RAP are itemized below:

**Table 10.3: The Event and Monitoring Indicators for this RAP**

| Events   | Indicators  | Action by             |
|--|---|-----------------------|
| Meetings held with PAPs                          | Date, attendance, topics discussed  | Desk officer, TCN PIU |
| RAP implementation orientation                   | Date, number and attendance of PAPs present, fliers/communication manual distributed, questions asked and answered  | TCN/Consultant        |
| RAP implementation committee                     | Composition of the committee, Representation of PAPs, training and date on RAP implementation, place of training and report of training                                       | TCN PIU               |
| Grievance Redress Committee                      | Report of Composition of committee and attendance list of member composition  | TCN PIU/consultant    |
| Implementation of RAP                            | Date of first compensation, report of compensation, last date of moving PAPs to new residence, nature of assistance rendered, complaints and concerns from RAP implementation | TCN /Consultant       |
| Evidence of PAPs participation in implementation | Report and attendance in meetings of participation in site selection, involvement and consent in the tenancy agreement  | TCN /Consultant       |
| Livelihood                                       | Reports that details PAPs livelihood prior to the project and present, income prior and present, no of children in school prior and present                                   |                       |

## 10.2 Eligibility Criteria for Entitlement by PAPs

This RAP recognizes that all forms of impacts caused by permanent or temporal land acquisition under this project should be mitigated irrespective of their status to land holding and therefore describes below the eligibility criteria for different categories of PAPs:

- a) *Those that have formal rights to land (including statutory, customary, traditional and religious rights, recognized under the Federal and/or State Laws of Nigeria)*
- b) *Those who do not have formal legal rights to land at the time the census began but have a claim to such land or assets provided that such claims are recognized under the state and/or federal laws of Nigeria or become recognized through a process identified in entitlement matrix of this RAP.*
- c) *Those who have no recognizable legal right or claim to the land they are occupying, using or getting their livelihood from, but were occupying or making use of the land before the cut-off date announced by the project.*

Those covered under a) and b) above are to be provided compensation for the land they lose, and other assistance in accordance with this RAP. Persons covered under c) above are to be provided with resettlement assistance in lieu of compensation for the land they occupy, and other assistance, as necessary, to achieve the objectives set out in the OP 4.12 and JICA guideline. However, persons who encroach on the area after the cut-off date are not entitled to compensation or any other form of resettlement assistance.

*d) Those enumerated as owners of assets/improvements on land (Grave, Shrines, Economic trees and/or Crops whether they own the land or are tenants.*

## 10.4 Proof of Eligibility

The resettlement committee that will be set up by TCN or a firm engaged by it for implementing Compensation will rely on the PAP census register prepared for this RAP as a means of identifying eligible PAPs for entitlements. The register contains the name of the PAP, phone number, passport identity (in the census register) and GPS coordinate number of the affected asset. In the case of PAP being indisposed, deceased or incapacitated to be present during compensation his/her next of kin will be entitled to the compensation after he/she has been identified by 2 community leaders with a documented reason of why he/she is standing in for the original PAP.

## CHAPTER ELEVEN: MONITORING AND EVALUATION

### 11.1 Introduction

Monitoring and Evaluation (M&E) is an integral component of this report as it is required at the stage of the implementation of the RAP to ensure that land acquisition, resettlement and compensation activities are conducted in line with stipulated standards and procedures, and to ascertain if the recommended mitigation measures were adequate to achieve the goals of the RAP

### 11.2 Purpose of M & E

Specifically the purpose of resettlement monitoring is to verify that:

RAP will set the following major socio-economic goals by which to evaluate their success:

The M&E indicators should include but not limited to the following:

- *Estimated and actual extent of compensation delivered*
- *The number of structures demolished*
- *The number of new homes, shops, market stalls and other required structures built*
- *And all other matters deemed pertinent for facilitating resettlement and project progress.*
- *delivery and usage of compensation and resettlement entitlements;*
- *allocation of replacement land and residential plots, where applicable;*
- *reconstruction of new houses and other infrastructure, where applicable;*
- *compensation measures applied to cater for damage during construction activities;*
- *reported grievances and action taken;*
- *problems encountered and action taken;*
- *general issues related to the success of compensation and resettlement measures.*
- *implementation progress;*
- *compensation and resettlement policies;*
- *delivery of entitlements, including land replacement where applicable;*
- *changes in livelihoods and incomes among PAPs; and,*
- *affected individuals, households, and communities are able to maintain their pre-project standard of living, and even improve on it;*
- *the local communities remain supportive of the project and the absence or prevalence of conflicts.*

- *In order to access whether these goals are met, RAP will indicate parameters to be monitored, establish monitoring milestones and provide resources necessary to carry out the monitoring activities.*
- *consultation with and participation of PAPs and other Stakeholders.*

### 11.3 Arrangements for monitoring by Implementing Agency

The TCN – PIU co-ordinates all policies, programmes and actions of all related agencies in the States and ensure that RAP is implemented fully in line with JICA/WB OP 4.12 standard as prescribed in this report.

The WB’s safeguard policy (OP 4.12) states that the project proponent is responsible for adequate M&E of the activities set forth in the resettlement instrument. Monitoring will provide both a warning system for the project proponent/sponsor and a channel for the affected persons to make known their needs and their reactions to resettlement execution. The sponsor’s M&E activities and programmes should be adequately funded and staffed.

The RAP implementing consultant will;

- *Ensure communication and participation of PAPs in resettlement process*
- *Undertake training on livelihood restoration to PAPs and vulnerable;*
- *Work with TCN to ensure revalidation of PAPs*
- *Ensure that all legible PAPs are compensated based on their entitled values*
- *Write report on RAP implementation*

In-house monitoring may need to be supplemented by independent external monitors to ensure complete and objective information. Thus the project has developed an extensive M&E system that includes:

- Internal monitoring, in particular reporting by government officials and field consultants, community participatory monitoring;*
- External monitoring, with MDAs and journalists providing independent monitoring; and*
- Impact evaluation.*

Table 11.1 indicates some specific variables to monitor routinely in the course of implementation.

**Table 11.1: Monitoring Indicators**

| Subject  | Indicator   | Variable   |
|--|---|--|
| <b>Land</b>  | Acquisition of land   | ➤ Area of cultivation land acquired for transmission line project  |
|  |   | ➤ Area of communal land acquired for transmission line project   |
| <b>Buildings/ Structure</b>                              | Acquisition of buildings  | ➤ Area of private land acquired?   |
|  |   | ➤ Area of government land acquired?  |
| <b>s</b>   | Acquisition of other structures                                 | ➤ Number, type and size of private buildings acquired  |
|  |   | ➤ Number, type and size of community buildings acquired  |
| <b>Trees and Crops</b>                                   | Acquisition of trees  | ➤ Number, type and size of government buildings acquired   |
|  |   | ➤ Number and type of trees cut   |
| <b>Compensation, Re-establishment and Rehabilitation</b> | Acquisition of other structures                                 | ➤ Crops destroyed by area, type and ownership  |
|  |   | ➤ Number, type and size of other private structures acquired   |
| <b>Rehabilitation</b>                                    | Destruction of crops  | ➤ Number of homesteads affected (buildings, land, trees, crops)  |
|  |   | ➤ Number of owners compensated by type of loss   |
| <b>Hazards and Disturbances</b>                          | Compensation and reestablishment of affected owners/individuals | ➤ Amount compensated by type and owner   |
|  |   | ➤ Number of replacement houses constructed   |
| <b>Rehabilitation</b>                                    | Reestablishment of community resources                          | ➤ Size, construction, durability and environmental suitability of replacement houses   |
|  |   | ➤ Possession of latrines   |
| <b>Hazards and Disturbances</b>                          | Introduction of nuisance factors                                | ➤ Water supply access  |
|  |   | ➤ Number of replacement businesses constructed   |
| <b>Hazards and Disturbances</b>                          | Introduction of nuisance factors                                | ➤ Number of community buildings replaced   |
|  |   | ➤ Number, type of plants lost  |
| <b>Hazards and Disturbances</b>                          | Introduction of nuisance factors                                | ➤ Number of trees planted  |
|  |   | ➤ Number of homesteads affected by hazards and disturbances from construction (noise levels, blasting, increased traffic levels) |

| Subject                        | Indicator                        | Variable  |
|--------------------------------|----------------------------------|---|
| <b>Social/<br/>Demographic</b> | Changes to homestead structure   | <ul style="list-style-type: none"> <li>➤ Homestead size (births, deaths, migration in and out)</li> <li>➤ Age distribution</li> <li>➤ Gender distribution</li> <li>➤ Marital status</li> <li>➤ Relationship to homestead head</li> <li>➤ Status of “vulnerable” homesteads</li> </ul>   |
|                                | Population migration             | <ul style="list-style-type: none"> <li>➤ Residential status of homestead members</li> <li>➤ Movement in and out of the homestead (place and residence of homestead members)</li> </ul>  |
|                                | Changes to educational status    | <ul style="list-style-type: none"> <li>➤ Literacy and educational attainment of homestead members</li> <li>➤ School attendance rates (age, gender)</li> <li>➤ Number, type of educational establishments</li> </ul>   |
|                                | Changes to status of women       | <ul style="list-style-type: none"> <li>➤ Landholding status</li> </ul>  |
|                                | Homestead earning capacity       | <ul style="list-style-type: none"> <li>➤ Ownership of capital assets</li> <li>➤ Landholding size, area cultivated and production volume/value, by crop (cash and subsistence crops)</li> <li>➤ Landholding status (tenure)</li> <li>➤ Redistribution of cultivation land</li> <li>➤ Employment status of economically active members</li> <li>➤ Skills of homestead members</li> <li>➤ Earnings/income by source, separating compensation payments</li> <li>➤ Realization of homestead income restoration plans (components implemented, net income achieved)</li> <li>➤ Possession of bank and savings accounts</li> </ul> |
| <b>Consultation</b>            | Consultation programme operation | <ul style="list-style-type: none"> <li>➤ Number of local committees established</li> <li>➤ Number and dates of local committee meetings</li> <li>➤ Type of issues raised at local committees meetings</li> <li>➤ Involvement of local committees in Transmission line project planning</li> <li>➤ Number of participating MDAs</li> </ul>   |

| Subject           | Indicator                       | Variable  |
|-------------------|---------------------------------|---|
|                   | Grievances resolved             | <ul style="list-style-type: none"> <li>➤ Number of grievances registered, by type</li> <li>➤ Number of grievances resolved</li> <li>➤ Number of cases referred to court</li> </ul>  |
| <b>Training</b>   | Operation of training programme | <ul style="list-style-type: none"> <li>➤ Number of local committee members trained</li> <li>➤ Number of affected population trained in Project-related</li> <li>➤ Training courses</li> </ul>   |
| <b>Management</b> | Staffing                        | <ul style="list-style-type: none"> <li>➤ Number of implementing agencies by function</li> <li>➤ Number of ministry officials available by function</li> <li>➤ Number of office and field equipment, by type</li> </ul>  |
|                   | Procedures in operation         | <ul style="list-style-type: none"> <li>➤ Census and asset verification/quantification procedures in place</li> <li>➤ Effectiveness of compensation delivery system</li> <li>➤ Number of land transfers effected</li> <li>➤ Co-ordination between local community structures, TCN and officials</li> </ul> |

## 11.4 Internal and External Monitoring

### 11.4.1 Internal Monitoring

The TCN- PIUs will perform periodic monitoring of all resettlement activities in the Unit's portfolio. The TCN-PIU will consult and coordinate with the appropriate MDAs (e.g. State Ministry of Agriculture and Ministry of Land and Survey.) on social monitoring.

For those areas with minor resettlement, the TCN-PIU will report at least quarterly on the: implementation schedule, delivery and usage of any resettlement compensation, relocation of PAPs and their households, extent of community involvement and efficiency of resettlement agencies in fulfilling their obligations.

In the areas where a resettlement plan is required because of land acquisition or significant numbers of displaced persons, the TCN-PIU, will provide a quarterly progress report on the various resettlement activities. The report will provide detailed explanation of resettlement progress, fund allocation, and issues and problems arising, as well as solutions devised, during implementation. In addition, the report which shall be in a tabular format will have comparisons on the following:

- *No. of sub-projects requiring preparation of a RAP;*
- *No. of households, and number of individuals (women, men and children) physically or*

*economically displaced by each sub-project;*

- *Length of time from sub-project identification to payment of compensation to PAPs;*

- *Timing of compensation in relation to commencement of physical works;*
- *Amounts of compensation paid to each PAP household (if in cash), or the nature of compensation (if in kind);*
- *No. of people raising grievances in relation to each sub-project;*
- *No. of unresolved grievances.*

#### **11.4.2 External Monitoring**

For major resettlement, the State Project Implementation Units (SPIUs) will engage an independent firm or organization to conduct periodic external assessments of resettlement progress. The State agencies will develop a detailed monitoring work plan for the terms of reference, based on the resettlement plan submitted to and approved by the TCN. The various State Agencies will select a firm with extensive experience in social survey and resettlement monitoring for this work. The SPIUs will review and approve the questionnaires and inventory forms developed by the consultant, as well as the research methods, analytic techniques, and reporting formats proposed by the consultant.

The aim of this independent monitoring is to provide verification of key concerns in resettlement, such as compliance with resettlement policies, implementation progress, the extent of effective consultation and participation of local populations, and the direction and extent of changes of income and livelihood among displaced persons. Careful attention to monitoring matters such as these will help ensure equitable benefits for every displaced person.

#### **11.5 Monitoring and Evaluation Indicators**

A number of objectively verifiable indicators shall be used to monitor the impacts of the compensation and resettlement activities. These indicators will be targeted at quantitatively measuring the physical and socio-economic status of the PAPs, to determine and guide improvement in their social well-being. The establishment of appropriate indicators in the RAP is essential since what is measured is what will be considered important. Indicators will be created for affected people as a whole, for key stakeholder groups, and for special categories of affected groups such as women headed households, disable persons, marginalized persons etc.

The monitoring indicators to be used for this RAP are developed to respond to specific site conditions.

1. *Input indicators include the resources in terms of people, equipment and materials that go into the RP. Examples of input indicators in the RAP include: the sources and amounts*



*of funding for various RP activities; and the establishment of the Land Acquisition Team.*

2. **Output** indicators concern the activities and services, which are produced with the inputs.

Examples of output indicators in the RP include a database for tracking individual plot compensation; and the payment of compensation for loss of land or assets.

2. **Process** indicators represent the change in the quality and quantity of access and coverage of the activities and services. Examples of process indicators in this RAP include: the creation of grievance mechanisms; the establishment of stakeholder channels so that they can participate in RAP implementation; and, information dissemination activities.

Table 11.2 outlines indicators to monitor and evaluate the implementation of resettlement and compensation plans.

**Table 11.2: Resettlement and Compensation Performance Measurements Indicators**

| <b>Monitoring Indicators</b>  | <b>Evaluation Indicators</b>  |
|---|---|
| 1. Outstanding Compensation or Resettlement Contracts not completed before next agricultural season   | 1. Outstanding individual compensation or resettlement contracts  |
| 2. Communities unable to set village-level compensation after two years   | 2. Outstanding village compensation contracts   |
| 3. Grievances recognized as legitimate out of all complaints lodged.  | 3. All legitimate grievances rectified  |
| 4. Pre-project production and income (year before land used) versus present production and income of resettlers, off-farm-income trainees, and users of improved mining or agricultural techniques. | 4. Affected individuals and/or households compensated or resettled in first year who have maintained their previous standard of living at final evaluation. |
| 5. Pre-project production versus present production (crop for crop, land for land)  | 5. Equal or improved production household   |
| 6. Pre-project income of vulnerable individuals identified versus present income of vulnerable groups.  | 6. Higher cost project income for vulnerable individuals  |

## APPENDICES

### Appendix 1: LAGOS AND OGUN STATE TRANSMISSION LINE PROJECT

#### Socio-Economic Inventory Instrument for Project Affected Persons (PAPS)

##### PREFACE SECTION

|                                |  |
|--------------------------------|--|
| Date of Interview              |  |
| Time of Interview              |  |
| Name of Interviewer/Enumerator |  |
| GPS of the location            |  |
| Language of communication      |  |

##### SECTION A. IDENTIFICATION

|                              |   |               |                    |            |                    |
|------------------------------|---|---------------|--------------------|------------|--------------------|
| 1                            | Attach Passport or Camera No of PAP Photo |               |                    |            |                    |
| 2a                           | Name of PAP                               |               |                    |            |                    |
| 2b                           | Phone No of PAP                           |               |                    |            |                    |
| 3                            | Name of Next of kin                       |               |                    |            |                    |
| 4                            | Gender (Tick)                             | Male          | Female             |            |                    |
| 5                            | Age                                       |               |                    |            |                    |
| 6                            | Marital status (Tick)                     | Married       | Single             | Widow(wer) | Separated/Divorced |
| 7                            | Religion                                  | Christian     | Muslim             | Others     |                    |
| 8                            | Are you the household head (Tick)         | Yes           | No                 |            |                    |
| 9                            | Contact/House Address                     |               |                    |            |                    |
| 10                           | Phone No                                  |               |                    |            |                    |
| 11                           | Highest level of Education                | Non Education | Primary            | Secondary  | Tertiary           |
| <b>LIVELIHOOD INDICATORS</b> |   |               |                    |            |                    |
| 12                           | Main Occupation                           |               | Support occupation |            |                    |
| 13                           | Income/Week                               |               | Income/Month       |            |                    |

|    |  |                                 |            |           |           |                     |                            |
|----|--|---------------------------------|------------|-----------|-----------|---------------------|----------------------------|
| 14 | Is PAP from this community?              |                                 |            |           |           |                     |                            |
| 15 | How long has PAP lived in this community |                                 |            |           |           |                     |                            |
| 16 | Number of wives (for a man PAP)          |                                 |            |           |           |                     |                            |
| 17 | Number of children in the household      |                                 |            |           |           |                     |                            |
| 18 | No of people living in the household     |                                 |            |           |           |                     |                            |
| 19 | Other Household Members                  | Options (Tick the applicable)   |            |           |           |                     |                            |
|    |  | Surname                         | First Name | Gender    | Age       | Relationship to /HH | Present Educational Status |
|    | Wife / Husband                           |                                 |            |           |           |                     |                            |
|    | Member 1                                 |                                 |            |           |           |                     |                            |
|    | Member 2                                 |                                 |            |           |           |                     |                            |
|    | Member 3                                 |                                 |            |           |           |                     |                            |
|    | Member 4                                 |                                 |            |           |           |                     |                            |
|    | Member 5                                 |                                 |            |           |           |                     |                            |
|    | Member 6                                 |                                 |            |           |           |                     |                            |
|    | Member 7                                 |                                 |            |           |           |                     |                            |
|    | Member 8                                 |                                 |            |           |           |                     |                            |
| 20 | <b>HOUSEHOLD VULNERABILITY STATUS</b>    |                                 |            |           |           |                     |                            |
|    | FHH with under aged children             | Aged Person (65+) on low income |            | No of PDP | No of MDP | No of CHH           |                            |

**Key**

FHH: Female headed household  
PDP: Physically disadvantaged person  
MDP: Mentally disadvantaged person  
CHH: Child headed household

**SECTIONB: FOR AFFECTED STRUCTURES/ECONOMIC TREES /CROPS/FARMS**

21) Identity of Affected Asset/Structure **(Tick all the applicable)**

(a.) Barren Land..... (b) Farm land ...(c) House.....(d)Fence.....

(e) Shop.....(f) Economic tree (g) Shrine....(h) Tomb, (i) others, **Please clearly state)** .....

22) Movability status of affected item

a) Moveable .... B) Immoveable

23) Describe the nature of Impact on the item:

(a) Impact will be temporal (b) Impact will be permanent

24) What is the ownership status of the affected item?

a) PAP owns the item (b) PAP is a tenant c) PAP has lease right, (d) PAP is a squatter

**LAND**

25) Type of Right PAP has over affected land:

a) Right of Occupancy (R of O), b) Certificate of Occupancy, (C) Owned by Inheritance,(d) Others..... **(Please clearly state)**

26) Does PAP own another land elsewhere? (a) Yes..... (b) No.....

27) State the Size of the affected land/farm in square meter.....

28). What is the use of this land/farm?

(a) Fallow land (b) crop farming, (c) Livestock, (d)Residential House (e) Commercial house/shop, (f) Others.....(explain)

**CROP/ECONOMIC TREE**

29) State the type of crops/economic tree in the farm/ land and the number count of each:

Perennial Crops: Name of crop(s) and number count of each.....

.....

Annual crops: Name of crop(s) and number count.....

.....

Trees: Name of Trees and Number count of each type:.....

.....

**Structure/House:**

30) What type (s)of roofing materials were used for the affected structure?(a)grass... (b) Corrugated iron sheets(c) Aluminum (d) metal coated roofing sheet

31). What is the material of the floor and wall of the Affected Structure? **(Please Tick One)**  
a.) Cement..... (b) Mud ...(c) Tiles..... (d) Wood..... (e) others, (Please state) .....

32). How many rooms are in the Affected House?.....

33). Who owns the affected structure or house? **(Please Tick One)**

(a) Personal..... (b) Landlord.....(c) Company.....(d) Local Govt.....(e) family (f) State Govt..... (g)Federal Govt.....(h) Others(Please Specify).....

34). If rented, how much do you pay annually?.....

35) Where do you intend to move to if this house is demolished?.....

**SECTION C: FOR BUSINESS PREMISES LOSS OF MANHOOR**

- 36) What type of business would be affected?
- 37) What is your average daily income /sale?.....
- 38). How many days in the week do you operate your business? .....
- 39). How many staff/workers has the business employed? .....
- 40) What implication will relocating have on your business?  
 (i).....  
 (ii).....  
 (iii).....
- 41) How do you think this impact can be minimized?  
 (i).....  
 (ii).....

**Appendix 2: Harmonize Rate for Compensation in South Western Nigeria**

**SOUTH-WEST GEO-POLITICAL ZONE**

**HARMONISED COMPENSATION RATES FOR ECONOMIC TREES AND CROPS IN SOUTH-WEST GEO-POLITICAL ZONE**

| S/NO | ECONOMIC TREES               | A<br>100% | B<br>70%  | C<br>30%  |
|------|------------------------------|-----------|-----------|-----------|
| 1.   | Cocoa                        | 1,200.00  | 840       | 360       |
| 2.   | Oil Palm                     | 2,200.00  | 1,540     | 660       |
| 3.   | Kola nut Tree                | 2,000.00  | 1,400     | 600       |
| 4.   | Rubber                       | 500.00    | 350       | 150       |
| 5.   | Avocado Pear                 | 900.00    | 630       | 270       |
| 6.   | Local Pear                   | 900.00    | 630       | 270       |
| 7.   | Guava                        | 500.00    | 350       | 150       |
| 8.   | Cashew                       | 700.00    | 490       | 210       |
| 9.   | Bread fruit                  | 300.00    | 210       | 90        |
| 10.  | Mango                        | 800.00    | 560       | 240       |
| 11.  | Citrus Orange                | 1,000.00  | 700       | 300       |
| 12.  | Coconut                      | 1,000.00  | 700       | 300       |
| 13.  | Pawpaw                       | 200.00    | 140       | 60        |
| 14.  | Grape Fruit                  | 500.00    | 350       | 150       |
| 15.  | Coffee                       | 500.00    | 350       | 150       |
| 16.  | Banana                       | 250.00    | 175       | 75        |
| 17.  | Plantain                     | 500.00    | 350       | 150       |
| 18.  | Maize                        | 20,000/ha | 1,400/ha  | 6000/ha   |
| 19.  | Cassava                      | 50.00     | 35        | 15        |
| 20.  | Guinea Corn                  | 10.00     | 7         | 3         |
| 21.  | Tobacco                      | 15,000/ha | 10,500/ha | 4,500/ha  |
| 22.  | Yam                          | 100/stand | 70/stand  | 30/stand  |
| 23.  | Cocoyam                      | 30.00     | 21        | 9         |
| 24.  | Tomatoes                     | 50.00     | 35        | 15        |
| 25.  | Walnut                       | 500.00    | 350       | 150       |
| 26.  | Pineapple                    | 100.00    | 70        | 30        |
| 27.  | Soft wood                    | 1,500.00  | 1,050     | 450       |
| 28.  | Hard wood                    | 3,500.00  | 2,450     | 1,050     |
| 29.  | Alligator Paper              | 2,500/ha  | 1,750/ha  | 750/ha    |
| 30.  | Pepper                       | 75.00     | 52.5      | 22.5      |
| 31.  | Mellon                       | 50.00     | 35        | 15        |
| 32.  | Garden Egg                   | 75.00     | 52.5      | 22.5      |
| 33.  | Vegetable, Onion and Cabbage | 50.00     | 35        | 15        |
| 34.  | Cotton                       | 50.00     | 35        | 15        |
| 35.  | Groundnut                    | 50.00     | 35        | 15        |
| 36.  | Beans                        | 75.00     | 52.5      | 22.5      |
| 37.  | Beniseed                     | 100.00    | 70        | 30        |
| 38.  | Potatoes                     | 50.00     | 35        | 15        |
| 39.  | Rice                         | 50,000/ha | 35,000/ha | 15,000/ha |
| 40.  | Raffia Palm                  | 1,000.00  | 700       | 300       |
| 41.  | Iyere                        | 100.00    | 70        | 30        |
| 42.  | Okro                         | 20.00     | 14        | 6         |
| 43.  | Bamboo                       | 100.00    | 70        | 30        |

RESOLUTION OF THE NATIONAL TECHNICAL DEVELOPMENT FORUM (NTDF) ON LAND ADMINISTRATION

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Appendix 3: Compensation Budget for PAPs (Details in the Valuation Report)

|   |                       |
|---|-----------------------|
| C. Crops  | 386,027,143.00        |
| D. Structures   | 201,817,797.00        |
| <b>Sub-Total</b>  | <b>587,844,940.00</b> |
| C. Support to vulnerable groups (2.0% of A+B)   | 11,201,182.83         |
| H. Security, bank charges, stamp duty and other logistic for compensation payment (2.5%) for crops      | 9,650,679.58          |
| I. Security, bank charges, stamp duty and other logistics for compensation payment (2.5%) for structure | 5,045,445.93          |
| J. Demolition and salvage of structures (5%) of B   | 10,090,889.85         |
| K. Contingency (5%) of A+ B   | 29,392,247.00         |
| H. Livelihood restoration & Training for PAPs   | 13,777,454.87         |
| <b>Sub –Total</b>   | <b>79,157,898.05</b>  |
| <b>TOTAL AMOUNT</b>   | <b>667,002,838.05</b> |

CLAIMANT'S ANALYSES FOR STRUCTURE AND ECONOMIC TREE/CROPS

| S/N | STATE | LGA     | COMMUNITY   | AMOUNT     |                     |
|-----|-------|---------|-------------|------------|---------------------|
|     |       |         |             | STRUCTURE  | ECONOMIC TREE/CROPS |
| 1.  | OGUN  | EWEKORO | EJIO        | 80,844,655 | 12,021,140          |
| 2.  |       |         | ABESE       | 25,755,500 | 14,321,322          |
| 3.  |       |         | SODERU      | 14,364,973 | 6,587,650           |
| 4.  |       |         | SEPETI      | 650,000    | 13,368,060          |
| 5.  |       |         | AYEYE       | 100,000    | 1,113,000           |
| 6.  |       |         | ADUBIARO    | 190,720    | 4,953,660           |
| 7.  |       |         | BAASE       | 1,015,931  | 1,816,000           |
| 8.  |       |         | AKINBORE    | 2,686,880  | 7,241,300           |
| 9.  |       |         | IFADA       | 1,150,000  | 3,121,700           |
| 10. |       |         | ONIKOKO     | 8,831,820  | 5,402,700           |
| 11. |       |         | OLUKE       | 3,619,400  | 19,475,900          |
| 12. |       |         | SOWUNMI     | 4,056,883  | 3,730,101           |
| 13. |       |         | OGUNMOLA    | -          | 116,240             |
| 14. |       |         | ABEREMETA   | 1,746,368  | 5,967,500           |
| 15. |       |         | MOLAJA      | 967,193    | 9,867,600           |
| 16. |       |         | OREKE       | 2,647,965  | 3,053,590           |
| 17. |       |         | ELEGBATA    | 1,320,440  | 1,968,700           |
| 18. |       |         | APENA       | 348,169    | 112,000             |
| 19. |       |         | JITADU      | 381,440    | 613,500             |
| 20. |       |         | ELEYELE     | 300,000    | 14,664,150          |
| 21. |       |         | ILAO        | 200,000    | 3,590,000           |
| 22. |       |         | ITORI ALASE | 225,000    | 2,064,150           |
| 23. |       |         | AKE         | 911208     | 2,520,150           |
| 24. |       |         | OGIDI       | -          | 666,800             |
| 25. |       |         | AKAKUN      | -          | 3,632,400           |
| 26. |       |         | ONIBOTUJE   | -          | 1,732,300           |
| 27. |       |         | PANKERE     | 100,000    | 3,337,580           |
| 28. |       |         | GBANGBA     | 150,000    | 1,468,500           |
| 29. |       |         | AJADE       | 300,000    | 4,632,070           |
| 30. |       |         | OBOLONTI    | 1,593,856  | 22,954,850          |
| 31. |       |         | IJUMO       | 750,000    | 21,347,500          |
| 32. | OGUN  | IFO     | OLORUNSOGO  | 7,055,770  | 2,721,340           |
| 33. |       |         | ITA-ALAJI   | 14,055,155 | 4,287,420           |
| 34. |       |         | FENOPA      | 13,505,880 | 5,589,105           |
| 35. |       |         | LERIN       | 477,098    | 2,469,750           |

|     |      |          |              |                    |                    |
|-----|------|----------|--------------|--------------------|--------------------|
| 36. |      |          | IKEREKU      | 456,130            | 1,403,250          |
| 37. |      |          | OBASA        | 410,064            | 1,371,750          |
| 38. |      |          | LOWOFELA     | 264,520            | 3,961,950          |
| 39. |      |          | MOSE         | 241,520            | 2,770,850          |
| 40. |      |          | AJEGUNLE     | 2,031,900          | 599,600            |
| 41. | OGUN |          | ODANA        | -                  | 1,178,750          |
| 42. |      | OBAFEMI- | INUDANE      | 381,500            | 1,021,300          |
| 43. |      | OWODE    | OPANIGANGAN  | 367,812            | 6,133,650          |
| 44. |      |          | IREGUN       | 150,000            | 14,338,150         |
| 45. |      |          | AGOYON       | -                  | 6,874,900          |
| 46. |      |          | LUKOSI       | 1,289,380          | 6,588,000          |
| 47. |      |          | IJEMO        | 1,571,350          | 2,134,700          |
| 48. |      |          | AGBOKE       | 50,000             | 1,736,300          |
| 49. |      |          | TOOLU        | 1,596,165          | 2,568,050          |
| 60. |      |          | AWADO        | 50,000             | 171,000            |
| 51. |      |          | BAMUKUN      | 50,000             | 16,806,300         |
| 52. |      |          | IJEUN        | 100,000            | 11,254,890         |
| 53. |      |          | OTOTO        | -                  | 19,761,600         |
| 54. |      |          | MORISA-OKO   | -                  | 1,184,500          |
| 55. |      |          | OKWURI       | -                  | 2,576,000          |
| 56. |      |          | IJEMOKO      | 50,000             | 484,900            |
| 57. |      |          | ISOTA        | -                  | 5,622,500          |
| 58. |      |          | KEREBE       | -                  | 3,563,150          |
| 59. |      |          | LISA         | -                  | 2830550            |
| 60. |      |          | ODOFIN       | 200,000            | 21,853,800         |
| 61. |      |          | OWODE        | 164,033            | 1,830,200          |
| 62. |      |          | OYA          | 50,000             | 10,566,200         |
| 63. |      |          | AGBANGBA     | -                  | 10,663,575         |
| 64. |      |          | OLUWO        | 50,000             | 1,447,150          |
| 65. |      |          | IKIJA        | 172,130            | 2,881,650          |
| 66. |      |          | IKIJA- OLOSE | 1,668,989          | 3,552,600          |
| 67. |      |          | OTGBOLA      | 150,000            | 3,765,650          |
|     |      |          | <b>TOTAL</b> | <b>201,817,797</b> | <b>386,027,143</b> |

TOTAL NUMBER OF CLAIMANT FOR STRUCTURES = **788**

TOTAL NUMBER OF CLAIMANTS FOR CROPS = **2133**

#### Appendix 4: Attendance List

個人情報保護のため非公開

## **7. Lot 2 RAP Report**

LAGOS AND OGUN STATES TRANSMISSION LINES AND ASSOCIATED  
SUBSTATION PROJECTS (LOT 2)



**RESETTLEMENT ACTION PLAN (RAP)**

**FINAL DRAFT REPORT**

*Submitted to*



**TRANSMISSION COMPANY OF NIGERIA (TCN)**

*Prepared by*

**SEEMS NIGERIA LIMITED**

**APRIL, 2019**

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## LIST OF ABBREVIATIONS AND ACRONYMS

|         |  |
|---------|--|
| CBO     | Community Based Organisation                       |
| CLO     | Community Liaison Officer                          |
| CRE     | Chemistry, Resettlement & Environment              |
| DC      | Dual Current                                       |
| ESIA    | Environmental and Social Impact Assessment         |
| EPC     | Engineering, Procurement, and Construction         |
| FGD     | Focus Group Discussion                             |
| FGN     | Federal Government of Nigeria                      |
| FMENV   | Federal Ministry of Environment                    |
| GGDs    | General Group Discussions                          |
| IDI     | In-Depth Interview                                 |
| IFC     | International Finance Corporation                  |
| Km      | Kilometre  |
| KV      | Kilo Volts   |
| LGA     | Local Government Area                              |
| M&E     | Monitoring and Evaluation                          |
| NEGIP   | Nigeria Electricity and Power Improvement Project  |
| NEPA    | National Electric Power Authority                  |
| NERC    | Nigerian Electric Regulatory Commission            |
| NGO     | Non-Governmental Organization                      |
| NPC     | National Population Commission                     |
| OP      | Operational Policy                                 |
| PAP/PAH | Project Affect Persons/Project Affected Households |
| PC      | PAPs' Committee                                    |
| PHCN    | Power Holding Company of Nigeria                   |
| PIU     | Project Implementation Unit                        |
| PS      | Performance Standard                               |
| TCN     | Transmission Company of Nigeria                    |
| PIU     | Project Implementation Unit                        |
| PSS     | Performance Standard 5                             |
| RAP     | Resettlement Action Plan                           |
| RIC     | Resettlement Implementation Committee              |
| RoW     | Right-of-Way                                       |
| RU      | Resettlement Unit                                  |
| SEEMS   | Scientific Energy and Environmental                |
| TRC     | Traditional Ruling Councils                        |
| WB      | World Bank   |

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The active participation of Project Team in the RAP study right from the inception, supervision and review of the preliminary documents is hereby acknowledged.

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**Project Proponent: Transmission Company of Nigeria, Abuja**

## DEFINITIONS

**Community:** a group of individuals broader than households, who identify themselves as a common unit due to recognized social, religious, economic and traditional government ties or shared locality.

**Compensation:** payment in cash or in kind for an asset or resource acquired or affected by the Project.

**Cut-off-Date:** the date of completion of inventory of losses during the preparation of the RAP.

**Displaced Persons** means all the people affected by a project through land acquisition, relocation, or loss of incomes and includes any person, household, firms, or public or private institutions who as a result of a project would have their;

- (i) Standard of living adversely affected;
- (ii) Right, title or interest in all or any part of a house, land (including residential, commercial, agricultural, plantations, forest and grazing land) or any other moveable or fixed assets acquired or possessed, in full or in part, permanently or temporarily adversely affected; or
- (iii) Business, occupation, place of work, residence, habitat or access to forest or community resources adversely affected, with or without displacement.

**Economic Displacement:** a loss of productive assets or usage rights or livelihood capacities because such assets / rights / capacities are located in the project area.

**Entitlement:** the compensation offered by RAP, including: financial compensation; the right to participate in livelihood enhancement programs; housing sites and infrastructure; transport and temporary housing allowance; and, other short-term provisions required to move from one site to another.

**Household:** a group of persons living together who share the same cooking and eating facilities and form a basic socio-economic and decision-making unit. One or more households often occupy a homestead.

**Income Restoration** means the measures required to ensure that PAPs have the resources to at least restore, if not improve, their livelihoods.

**Involuntary Resettlement:** resettlement without the informed consent of the displaced persons or if they give their consent without having the power to refuse resettlement.

**Land acquisition** means the process whereby a person or household is involuntarily alienated from all or part of the land s/he owns or possesses, to the ownership and possession of a project for public purposes, in return for fair compensation.

**Physical Displacement:** a loss of residential structures and related non-residential structures and physical assets because such structures / assets are located in the project area.

**Project-Affected Person (PAP):** any person who, as a result of the project, loses the right to own, use or otherwise benefit from a built structure, land (residential, agricultural, or pasture), annual or perennial crops and trees, or any other fixed or moveable asset, either in full or in part, permanently or temporarily.

**Rehabilitation:** the restoration of the PAPs resource capacity to continue with productive activities or lifestyles at a level higher or at least equal to that before the project.

**Relocation:** a compensation process through which physically displaced households are provided with a one-time lump-sum compensation payment for their existing residential structures and move from the area.

**Resettlement:** a compensation process through which physically displaced households are provided with replacement plots and residential structures at one of two designated resettlement villages in the district. Resettlement includes initiatives to restore and improve the living standards of those being resettled.

**Resettlement Action Plan (RAP):** documented procedures and the actions a project proponent will take to mitigate adverse effects, compensate losses, and provide development benefits to persons and communities affected by a project.

**Resettlement Assistance:** support provided to people who are physically displaced by a project. This may include transportation, food, shelter, and social services that are provided to affected people during their resettlement. Assistance may also include cash allowances that compensate affected people for the inconvenience associated with resettlement and defray the expenses of a transition to a new locale, such as moving expenses and lost work days.

**Replacement Cost:** the amount of cash compensation and/or assistance suffices to replace lost assets and cover transaction costs, without taking into account depreciation or salvage value.

**Resettlement Policy Framework:** A resettlement policy framework is required for projects with subprojects or multiple components that cannot be identified before project approval. This instrument may also be appropriate where there are valid reasons for delaying the implementation of the resettlement, provided that the implementing party provides an appropriate and concrete commitment for its future implementation. The policy framework should be consistent with the principles and objectives of OP 4.12 of the World Bank.

**Vulnerable:** people who by virtue of gender, ethnicity, age, physical or mental disability, economic disadvantages, or social status may be more adversely affected by resettlement than others and who may be limited in their ability to claim or take advantage of resettlement assistance and related development benefits.

## EXECUTIVE SUMMARY

### INTRODUCTION

Nigeria government has recently realized that power supply capacity is overwhelmingly insufficient. As a countermeasure of serious power shortage, Transmission Company of Nigeria (TCN) planned a project geared to achieving transmission capacity of 20,000 MW by 2020 in accordance with growth of generation capacity. In line with the Transmission Lines network capacity development of achieving the transmission capacity of 20,000 MW by 2020, Lagos and Ogun States are targeted. This Transmission lines project in Lagos and Ogun States are to be financed through a loan (Japanese ODA loan) from Japan International Cooperation Agency (JICA). The Transmission Company of Nigeria (TCN) is the implementing agency and owners of the project when completed.

This Resettlement Action Plan (RAP) provides a detailed overview of the Project's resettlement process. It has been developed to ensure that affected persons are properly identified and are duly resettled or compensated in compliance with local, national, and international requirements. The objective of the RAP is to reduce the negative impacts of the proposed project on the PAPs by ensuring that their states after project implementation remain unchanged or improved. This RAP therefore defines the resettlement and compensation necessary as a result of implementing the Transmission Line project, in accordance with the World Bank's Involuntary Resettlement Policy and relevant sections of the Operations Manual, along with the Laws of Nigeria as well as TCN's Policy.

This report presents the outcomes of the RAP framework on the final corridor route including the proposed substations. It consists of twelve main chapters including:

- Chapter 1- Introduction; were the project background and objectives of the RAP are presented;
- Chapter 2 - Project description; which present the review of the corridor alternatives and description of the selected corridor;
- Chapter 3 - Institutional and legal framework related to land acquisition and PAP compensation;
- Chapter 4 - Consultation activities with the description of PAP's and other stakeholder concerns and comments;
- Chapter 5 - Existing social conditions of the communities and households affected by the project;
- Chapter 6 - Potential social impacts;
- Chapter 7 - Valuation and compensation measures;
- Chapter 8 - Income and livelihood restoration strategies;
- Chapter 9 - Institutional arrangements for RAP implementation;
- Chapter 10 - Monitoring, reviews and evaluation of RAP implementation;
- Chapter 11 - Grievances Mechanisms;
- Chapter 12 - RAP implementation and schedule.

## 2. PROJECT DESCRIPTION

### 2.1 Line Route and Corridor Alternatives

The entire project consists of about 203km high voltage transmission lines and 5 high voltage substations. In addition to the three substations assigned to SEEMS Limited (Lot 2), the length of the selected transmission lines corridor covered by SEEMS is about 63.97 km including the following:

1. Ogijo (Likosi/ Dejuwogbo) – Arigbajo (Ejio) D/C Transmission Line (48.74 km)
2. Ogijo – Existing Ikorodu/Shagamu 132 kV 2x D/C Transmission Line (132kV Quad Line) (2.41 km)
3. 132kV D/C Transmission Line from Ogijo – Redeem (Abule Oba) (7.83 km)
4. MFM (Makogi) – Existing Benin (Omotosho)/Ikeja West 330kV 2 x D/C Transmission Line (4.99 km)

Part of the civil work under the project is expected to affect people who have properties that fall within the proposed RoW. So, in line with TCN's policy for high voltage transmission lines, and due to environmental and socioeconomic considerations, some transmission line routes have been designed to avoid sensitive environment and residential areas and settlements. This informs the choice of the alternatives on which this report is based upon. The choice of the alternative routes was based on some criteria including technical (topography, watercourses, soils, access, poorly drained and floodable sectors, airports, power line and road crossings, number of angles, etc.), socioeconomic (number of settlements affected and their population, permanent agriculture, well-established schools, military grounds, etc.) and environmental reasons (vegetation, protected areas, main watercourses, birds and mammals migratory corridors, fauna reproduction areas, etc.).

In view of these, the choice of appropriate line routes ensures that no populated areas will be impacted. Eighty percent of the entire ROW length is farmlands, bush fallows, swamp and secondary forests.

### 2.2 Environmental Considerations

The line routes and the substation sites were carefully selected by considering sensitive ecosystems along the proposed PTL route and to avoid built-up areas as much as possible. The transmission line is designed in compliance with international standards regarding audible noise, electric and magnetic fields, corona, as well as interference with radio and television signal. In addition, practical mitigation measures have been proffered for the identified environmental impacts of the proposed Transmission Lines and Substations project.

## 3. INSTITUTIONAL AND LEGAL FRAMEWORKS

### 3.1 Legal and Regulatory Framework underlying the study

The study was undertaken in compliance with national and international regulations. The national legal frameworks for this RAP include:

- i. The Nigeria Land Use Act of 1978, reviewed under Cap 202 of 1990. The legislation

- stipulates the rules for land acquisition and resettlement in Nigeria.
- ii. Resettlement Policy Framework for Nigeria Electricity and Power Improvement Project (NEGIP)
- iii. Nigerian Electricity Regulatory Commission (NERC) Draft Regulation Acquisition of Land and Access Rights for Power Projects in Nigeria
- iv. Electricity Supply Regulations of 1966 and
- v. The Electricity Power Sector Reform Act, 2005.
- vi. World Bank Safeguard Policies: For the World Bank, the relevant framework is the operational policy on Involuntary Resettlement (OP 4.12) adopted in 2001. The policy addresses land acquisition and involuntary resettlement issues. The differences between the Land Use Act and the Bank's OP 4.12 mostly concern rehabilitation measures. Where there are gaps between the Land Use Act and OP 4.12, in implementing this RAP, the Bank's policy will be upheld.

## 4.0 CONSULTATIONS

### 4.1 Meetings at National and State Levels

The purposes of series of meetings held were to introduce the project to the relevant stakeholders and gather their feedback and opinion about the project. The stakeholders expressed their concerns about the project, which were duly recorded. They also advised on the best way to approach the community members. The following meetings were held:

#### 4.1.1 Consultation with Project Proponent and Ogun State Team

- i. Project Kick-off Meeting at Governor's Office, Oke-Mosan, Abeokuta was held on May 3, 2017, between project proponent's team (TCN) and the Consultants.
- ii. Another Technical meeting was held on May 11, 2017.

#### 4.1.2 Meetings with Council Chairmen, Traditional Rulers, Community Leaders and Indigenes of Affected Communities December 18 and December 22, 2018

During the reconnaissance visit of December 17, 2007, communities within 5km radius from the project site that will potentially be affected by the proposed project were identified and appointments for consultative meeting were made with the traditional rulers of each community.

During the subsequent field work that commenced on December 18, 2018, consultative meetings through FGDs, In-depth Interviews and questionnaire survey were conducted at various times at the Palaces of the traditional rulers and Local Government Headquarters between SEEMS Socio-economic Team, TCN, and Representatives Ogun State Government, leaders, different social groups and youth leaders of each community. At the meetings, the socio-economic benefits and environmental implications of the proposed project, and the need for and objectives of an environmental impact assessment were explained. The support

and participation of the communities were sought.

#### 4.1.3 Meetings with Regulators and other stakeholders

Meetings were held at different occasions before, during and after the field work with the under listed stakeholders to discuss details of the proposed project, solicit their suggestions on the project and request for relevant information from respective organizations especially on population estimates, environmental bye laws of Ogun State, Maps, etc:

- Federal Ministry of Environment, Abuja
- Ogun State team (comprising Ogun State Environmental Protection Agency, Ogun State Ministry of Lands and Survey, Governor's Representative etc.)
- Community based and Non-Governmental Organizations
- TCN

Most of the stakeholders consulted concur with the proposed development in view of the fact that the proposed power interconnection project will improve power supplies, stabilize the quality of the electricity and provide diverse source of power in the region. Some stakeholders also expressed their concerns regarding impacts on wildlife corridors and local biodiversity, impact on soil stability in erosion-prone areas.

#### 4.2 Consultation with the Communities

Community meetings were organized with the help of the local leadership. These consultations were carried out at different levels. The consultants held meeting with leaders of the affected communities at their respective Local government headquarters where they were provided with the details about the project and the upcoming activities. The community leaders therefore mobilized members of their communities for public consultations. At the community meetings, members of each community were informed about the background and objectives of the project and the ongoing and proposed activities of the. The consultant used the occasions to solicit for the cooperation all affected communities; they were equally informed about the expected compensation, how the compensation will be done, who and what qualifies for compensation and expected timetable for other activities. The team also used the occasion of public meetings to take members of the communities through the community questionnaire, to which answers were provided through discussion and consensus. Following the presentations, the community was given time to ask questions, seek clarifications, raise opinions and make comments. Most of the issues/questions raised were answered or clarified with the exception of few technical questions pertaining to provision of electricity, given compensation to community leaders who may not be affected by the project and the construction of towers, etc. The community was assured that their concerns would be addressed accordingly. Concerns raised during the public meetings include but not limited to the following:

- Compensation
- Provision of basic infrastructures like health facilities, good road network, schools, and potable water supply, electricity supply
- Health and safety issues, especially during construction and as it relates to the substations
- Provision of employment
- Land ownership especially as it affects the original owners and the tenants
- Community benefits etc.

#### 4.3 Consultation of Project Affected Persons

As indicated in the study approach, a face-to-face interview was conducted with the head of household or any adult member of the household available at the time of the visit to fill the household questionnaire. Socioeconomic information was collected about household members, livelihood, occupation, income, land ownership, ethnicity, and length of stay in the community as well as principal and secondary structures. Their properties such as crops, land and trees were also enumerated. Their concerns about how the transmission line project could affect the households were also gathered. Few individuals residing in the affected communities but are not going to be affected by the project but residing in the area were also interviewed; these group serves as the control group. Only one of the three substations had people residing therein and this is Likosi/Dejuwogbo substation. The other two substations, MFM and Redeem substations are free and open land. The Likosi/Dejuwogbo substation land had already been acquired by TCN since 2008 though it has been encroached by some 462 property owners. Altogether a total number of 2,279 individuals were affected by the project. A total of 153 completed structures, 753 uncompleted structures, 1,218 with crops and economic trees, 24 tombs and 48 shrines will be affected by the proposed transmission lines ROW apart from few public facilities.

#### 5.0 DESCRIPTION OF THE PROJECT AFFECTED AREAS: CENSUS OF COMMUNITIES AND HOUSEHOLDS AFFECTED BY THE WAYLEAVE

##### 5.1 Socioeconomic Surveys and Property Registration

Field study was conducted to identify and characterize all assets and persons along the proposed project corridor. Prior to field study, adequate consultations were made to all stakeholders along the RoW as well as government and traditional institutions. Also, in order to meet the objectives of the study, the consultant adopted systematic, integrated, participatory and collaborative approaches in the preparation of this RAP. A baseline census survey was conducted in the affected project area. Information was gathered through document reviews, community consultations, questionnaire administrations, Focus Group Discussions (FGDs), General Group Discussions (GGDs), In-depth Interviews (IDI), key informant interviews with relevant stakeholders including traditional and political leaders, opinion leaders, as well as heads of relevant government agencies at both State and Local Government levels, and selected persons from the communities. Topographic survey conducted and the baseline census survey/enumeration and valuation exercise conducted by the consultant on the transmission line route, provided required positions (including resources of interest) and persons that will be affected by the proposed project. Non-participatory observation techniques and visual photography sessions were also utilized as complimentary data collection tools.

During consultation activities, a feedback mechanism to the TCN headquarters is usually in place to accommodate concerns raised by stakeholders that cannot be immediately addressed. In the course of consultations, previously raised concerns are either addressed or clarified.

A total of nine hundred and six (906) completed and uncompleted structures and one thousand, two hundred and eighteen (1218) tree/crop owners will be affected by the transmission line ROW. The number of individuals affected by the proposed project is influenced by the land ownership and structures in the four affected local government areas Ewekoro, Ifo, Obafemi Owode and Sagamu. On the whole seventy-seven communities will be



affected. Most of the landed properties are jointly owned by extended families or by inheritance.

Apart from the 48 shrines found in the coverage area, no other archaeological structures will be affected by the transmission lines. Results from baseline census survey/enumeration and valuation exercise as well as from the route topographic survey show that over 80% of the total land are either farmlands, forests or bush fallows, while most of the buildings (82 residential and 268 uncompleted buildings) affected by the project were in Likosi/Dejuwogbo substation. A total of two thousand, two hundred and seventy-nine (2,279) PAPs were identified across the four (4) LGAs and the seventy-seven (77) project affected communities; three hundred and sixty-seven (367) of these were from Ewekoro, one hundred and seventy one (171) in Ifo, seven hundred and eight (708) from Obafemi Owode and the largest number of affected persons one thousand and thirty three (1033) are from Sagamu. One account for the large number in Sagamu is due to the number of individuals that have encroached Likosi/Dejuwogbo substation (455). Generally, more of the identified affected PAPs (71%) were males. More than 70% of the PAPs were within the active age bracket of 15-49 years. Based on low infrastructural development of the project area, the quality of life of the PAPs could be described as poor. The level of education among the PAPs is generally low. More than 60% had secondary or lower levels of education and literacy level among the youth in all the LGAs is generally low. This pattern is similar in all the affected communities. Majority of the PAPs are Yorubas. From community interview, it was evident that the people living in the project area subscribe to two main religious beliefs, Christians and Muslim. The primary occupation of the PAPs is artisan (47%) with farming as secondary occupation for most of the PAPs (14%); even though a substantial number claimed to be engaged in industries (30%), these are mainly youth residing in the urban locations (e.g. those in Likosi/Dejuwogbo substation) and since there is no industry in the project area, it therefore means that this category of people work outside the project area. Farming is both tree cropping and subsistent with sugar cane, maize, rice, cassava, plantain and beans as the main crops. The main sources of water for domestic use are boreholes (76%) and pipe borne water (10%); another 9% rely on water from sunk well. Majority of the PAPs rely on the health facility at Ifo and Sagamu since virtually all affected communities have no health facility. Only 28% use public health facilities in these two major towns; 23% claimed they rely on traditional health clinic. Evidence from focus group discussions and in-depth interviews clearly showed that the Properties owned by most of the PAPs are of two types which are farmland and land acquired through inheritance, outright purchase, tenant/leasing or pledging.

### 5.2 Community or heritage buildings and sites in the wayleave

There are 989 different buildings (including 4 schools and 9 worship centres) located within the wayleave. The project area has no single community site.

### 5.3 Affected households' characteristics

A total of 153 households are impacted by the project and most of them are in Likosi/Dejuwogbo substation (82). As the survey showed, out of the 155 households, 152 were headed by males compared to just 3 households headed by females. With the exception of Likosi/Dejuwogbo and few other communities, most of the affected persons are not resident within the affected project area. Most of them acquired the properties by inheritance. Forty-seven percent (47%) of the respondents in the RoW are artisans and taking farming as secondary occupation where they grow subsistence and cash crops. Some 30% work with some industries located outside the project area.

### 5.4 Crops and Trees Affected by the Wayleave

More than half of the impacted households (54%) have a cultivated parcel or a farming area affected by the wayleave. A total of 1218 interviewed households were growing a crop or small trees in the wayleave.

### 6.0 IMPACT OF THE PROJECT ON THE HUMAN ENVIRONMENT

The following categories of affected people have been identified in the wayleave:

- 153 owners of plots with houses and/or a secondary structure;
- 753 have uncompleted buildings
- 1218 households have crops or economic trees;
- 81 residential bare land (undeveloped)
- 48 shrines
- 24 families will have to remove the tombs situated

A certain number of the above households are affected by multiple impacts

Owners of plots with houses or other structures in the wayleave will be affected by:

- Loss of land and houses in which they are living;
- Loss of other buildings and structures (fence, kitchen, shops etc);
- Productive time lost to participate in the evaluation of impacts and other administrative tasks.

With the exception of one crippled man in Ogunji, Mr Taiwo Enock Ayininuola who specifically requested to have his house replaced if possible, all other affected persons preferred to be compensated in cash so that they can have their building elsewhere and far away from the project area.

### 7.0 ASSETS VALUATION AND COMPENSATION

Asset valuation along the RoW of the proposed Transmission Line was conducted by experts to ascertain individuals whose properties or livelihoods will be directly or indirectly affected by the project activities.

Replacement Cost method of valuation was adopted in valuing the subject properties. This method was used in estimating the value of the property/structure and is based on the assumption that the capital value of an existing development can be equated to the cost of reinstating the development on the same plot using current cost of labour, material and other incidental costs.

Eligibility for compensation was in line with World Bank Operation Policy and guideline. PAPs will be entitled to various types of compensation and resettlement assistance that will in the worst scenario restore them to pre-project standards or conditions. Apart from residential buildings, crops and economic trees, and lands and development on the lands, compensation will also be given for three broad categories of losses, namely; loss of commercial land, loss of business premises (if any) and loss of income from affected businesses.

During field studies, all PAPs were provided with certificates for identification purposes. The provision of the certificates makes them eligible for compensation and/or resettlement.

In order to subject the report to constructive criticism, TCN will present this report to various stakeholders including: traditional leaders, NGOs/CBOs in the area, appropriate ministries and other governmental agencies. In addition, the report will be displayed at strategic public places including local government secretariat, government offices and selected libraries for review and possible comments. The comments will be incorporated in the final report.

When paying compensation, TCN will ensure that the living conditions of the PAPs are restored to the statuses that are in the worst case, similar to their pre-project status. The RAP implementation team will verify the authenticity of each PAP and ascertain that every certificate holder is correctly documented in the register before payments. Payments will be made according to locations and adequate information will be made available to all affected persons before payment. Such information will include.

- Dates and locations of payment
- List of eligible people
- Mode of payment
- Location of payment etc.

Payment to PAPs will be made by paying directly into the Bank Account of the project affected persons. In the event that any individual is absent during payment, the compensation committee will communicate a new date of payment to such PAP(s).

The RAP and Monitoring budget is summarized in the table below. This includes all costs involved in the execution of all RAP and monitoring activities. The total budget for RAP compensation is: **₦2,334,741,943.55k**.

**The cost of PIU formation and activities, contingencies, monitoring and inflation must be added to the figure given above to get the total cost of RAP and other activities.** The only RAP activities that are envisaged to last for a longer period are the monitoring and evaluation activities which are scheduled to be done once a year after completion of major RAP activities.

**Table 1: RAP and Monitoring Cost**

| RAP IMPLEMENTATION BUDGET SUMMARY |   |                         |
|-----------------------------------|---|-------------------------|
| S/No                              | Element   | Amount =N=              |
| 1                                 | Crops   | 396,993,628.50          |
| 2                                 | Structures  | 1,679,918,207.82        |
| 3                                 | Sub-total for structures and crops  | <b>2,076,911,836.32</b> |
|                                   | Support to vulnerable groups(Identified according to Valuation Matrix)                                      | 6,132,145.40            |
| 4                                 | Allow for Security, bank charges, stamp duty and other logistics, for compensation payment (2.5%) for crops | 9,924,840.71            |

|    |  |                         |
|----|--|-------------------------|
| 5  | Allow for Security, bank charges, stamp duty and other logistics, for compensation payment (2.5%) for structures | 41,997,955.20           |
| 6  | Allow for demolition and salvage of structures (5%)  | 83,995,910.39           |
| 7  | Allow 5% contingency for structures + crops)   | 103,845,591.82          |
| 8  | Livelihood restoration and Training support (1% of A & B)  | 11,933,663.71           |
| 9  | Sub Total  | 257,830,107.23          |
| 10 | Grand Total  | <b>2,334,741,943.55</b> |

## 7.2 Resettlement Budget and Implementation

Necessary budget provisions have been made for the proposed Transmission Lines to ensure that the mitigation commitments, including compensation and the monitoring programmes are fully implemented. Full supplementary assistance will be provided by TCN. All payments to project affected persons shall be made directly by TCN after the audit of eligible PAPs. In addition, an extra 10% of the total budget value will be added to take care of contingencies and possible inflations.

## 8.0 INCOME AND LIVELIHOOD RESTORATION STRATEGIES

The communities will be impacted negatively mainly through the displacement of community structures and through the effects on some of their land, crops and economic trees. Virtually all affect persons with the exception of a cripple man, have agreed to cash compensation. So, there will be cause to rebuild any house or for resettlement of any kind apart from cash compensation.

The affected persons have agreed to relocate their shrines, tombs and other public facilities (schools, churches and mosques) in the wayleave. There will be equitable distribution of the fund. Communities should receive their share according to the number of household affected and the length of the wayleave within them. The impact is thus minimal and temporary provided that households have enough time to prepare, are duly compensated and receive as much as possible fringe benefits like employment during construction. All necessary steps should be taken by TCN and the Project Implementation Unit (PIU) in charge of compensation to ensure that enough time for proper compensation and resettlement.

## 9.0 INSTITUTIONAL RESPONSIBILITIES FOR RESETTLEMENT

Various institutions will be involved in the implementation of this Resettlement Action Plan. The major groups that will be involved in the compensation/resettlement process are the Project Implementation Unit (PIU) and the Chemical, Resettlement and Environment (CR&E) Departments of TCN and a constituted PAPs Committee, comprising of key stakeholders including representatives of the Federal Ministry of Environment (FMEEnv).. This structure will take care of the implementation of the RAP, including the monitoring activities and implementation of the corporate social responsibility fund. A training program must be implemented as part of the PIU setting-up process to enhance awareness among key personnel involved with the supervision of compensation evaluation, procedures and implementation of others mitigation and compensation measures.

## 10.0 MONITORING AND EVALUATION

Monitoring and Evaluation (M&E) as part of the implementation process ensures the effectiveness of all land/asset acquisition and resettlement activities, in addition to measures designed to mitigate adverse social impacts. M&E procedures include internal track keeping and check systems as well as external independent monitoring. Three main components will be covered by the M&E, namely:

- Internal performance monitoring by TCN
- Impact monitoring commissioned to specialized firms (consultants); and
- RAP Completion Audit.

The monitoring reports will be prepared in accordance with World Bank guidelines. Progress will be reported for the following tasks:

- Internal monitoring;
- Expert monitoring;
- Completion audit and;
- Compensation

## 11.0 GRIEVANCE MECHANISMS

A Grievance Redress Committee will be set up by TCN to address complaints from RAP implementation. This committee will be directly under the TCN CR & E department with oversight by TCN-PIU. Its members will include legal and accounts representatives of TCN and PAP Committee, and the legal expert from TCN shall be the secretary. The traditional line of authority equally plays a significant role in the grievance redress mechanism by mediating between the PAPs, nominated family and community representatives and the grievance redress committee. All PAPs and impacted communities will be informed about the grievances procedure and their rights at the implementation stage of the RAP.

## 12.0 RAP IMPLEMENTATION SCHEDULE

The implementation schedule covers the period from the preparation of the RAP Report to the completion of the proposed project (up to when it is fully operational). The schedule defines the duration and timing of the key milestones and tasks. The major component tasks in the schedule include those highlighted in Table 12.3.

## CHAPTER ONE: INTRODUCTION

### 1.1 PROJECT BACKGROUND

#### 1.1.1 The Project

The Transmission Company of Nigeria (TCN) is one of the companies unbundled from the defunct Power Holding Company of Nigeria (PHCN), and the only one wholly owned by the Government. TCN is charged with the responsibility of transmitting electric power from the various power stations to the load centres across the country and beyond, ensuring efficient and cost-effective transmission, system operation, and improved service delivery. TCN is also responsible for the management of assets of the High Voltage Transmission System Operations, generation dispatch functions, as well as the development of the network through the construction of new transmission lines and substations for efficient transmission and system operations.

Nigeria has realized strong economic growth, until 2016 when the economy went into recession. However, stronger growth is projected for the future due the new anti-corruption posture of the Government as well as economic policies targeted at reducing capital flight. Meanwhile, power supply capacity is overwhelmingly insufficient. As a countermeasure of serious power shortage, Transmission Company of Nigeria (TCN) planned a project geared to achieving transmission capacity of 20,000 MW by 2020 in accordance with growth of generation capacity. Presently, the transmission lines to the largest demand centre of Lagos are in a bottleneck situation so the generating capacities being built across the country cannot be fully utilized. Moreover, there are no detour routes for use when equipment failure occurs and the system reliability is low.

The Lagos and Ogun States is targeted at improving power supply to Lagos and Ogun States, in line with the Transmission Lines network capacity development of achieving transmission capacity of 20,000 MW by 2020. This Transmission line project in Lagos and Ogun States ("Lagos and Ogun States Transmission Project" or "the entire project") is to be financed through a loan (Japanese ODA loan) from Japan International Cooperation Agency (JICA). The Transmission Company of Nigeria (TCN) is the implementing agency and owners of the project when completed. This entire project plans reinforcement of transmission capacity, improvement of credibility of electricity supply and reduced electricity loss by installing transmission systems in southwest area Nigeria. It contributes acceleration of economy and development of the communities.

The entire project consists of about 203km high voltage transmission lines and 5 high voltage substations. For the purpose of ESIA and RAP study, the entire project is divided into 3 sections, Lot1, Lot 2 and Lot 3. Transmission Company of Nigeria (TCN) has engaged SEEMS Limited to conduct Line Route Study, Environmental and Social Impact Assessment (ESIA), Environmental Management Plan (ESMP) and Resettlement Action Plan for Lot 2 of the project (hereinafter "the project" or "proposed project") consisting of the following components in Table 1.1.1 as described in the TOR;

**Table 1.1.1 Description of Proposed Transmission Line and Substation**

| Lot   | Description of Transmission Line   | Size / length  |
|-------|--|----------------|
| Lot 2 | Ogijo (Likosi/ Dejuwogbo) Substation   | 25.00 Hectares |
|       | Redeem Substation  | 9.62 Hectares  |
|       | MFM Substation   | 19.69 Hectares |
|       | Ogijo (Likosi/ Dejuwogbo) – Arigbajo (Ejio) D/C Transmission Line                  | 48.74 km       |
|       | Ogijo – Existing Ikorodu/Shagamu 132 kV 2x D/C Transmission Line (132kV Quad Line) | 2.41 km        |
|       | 132kV D/C Transmission Line from Ogijo – Redeem                                    | 7.83 km        |
|       | MFM – Existing Benin (Omosho)/Ikeja West 330kV 2 x D/C Transmission Line           | 4.99 km        |

Specifically, following studies shall be conducted.

- Carry out the Line Route Study (LRS), to determine the optimum route for the lines.
- Conduct the ESIA to identify and assess the potential environmental and social impacts and recommend appropriate mitigation strategies and prepare ESMP.
- Prepare out the Resettlement Action Plans (RAP), based on the international standards and principles presented in the Resettlement Policy Framework.

The project is financed through a loan from Japan International Cooperation Agency (JICA), as part of the development of power transmission infrastructure in the South-Western Region of Nigeria.

This type of project must undergo an environmental and social impact assessment as required by the EIA Act No. 86 of 1992. And in conformance with Nigerian legislations, JICA guidelines for environmental and social considerations, the World Bank environmental and social safeguard policies and International best practices, the project is subjected to a complete environmental study, along with RAP and an Environmental and Social Management Plan (ESMP).

**1.2 SCOPE AND OBJECTIVES OF THE RAP STUDY**

The objective of this RAP is to identify and reduce the negative impacts of the project on PAPs through compensation for assets that will be lost and thereby provide assistance to improve their livelihoods and standards of living or restore them to pre-displacement levels. This RAP was prepared in concordance with the guidelines of the government of Nigeria, as well as the policies and in conformity with World Bank requirement in the OP 4.12 and PS 5 on Involuntary Resettlement by ensuring that PAPs will not be improvised by the social impacts of the project and that the affected communities receive as much positive benefits as possible. The guidelines provided in this report will ensure that proper compensation and sufficient preparation time are given to affected communities and households. Compensation for loss of productive assets will be at the current market value, in order to assist PAPs to improve or sustain their pre-project living standards and income generating capacity. The ROW acquisition planning was carried out in a manner that will ensure minimal effect on occupied areas hence limiting the adverse impacts on persons in the project areas. The census survey conducted by TCN determined and documented those that will be affected by the proposed project's ROW and plans are currently being developed on the timely settlement of affected persons in order to ensure that the quality of life after the project is not less than it was prior to the project.

The contents of this report include the following:

- Description of Policies and Regulatory Framework (National and World Bank)
- Description of difference between Nigerian Land Use Act and World Bank Policy on Resettlement
- Institutional Arrangement
- Socio-economic Baseline of Project Area and Project Affected People
- Estimate of Impacts on PAPs and compensation/resettlement strategies
- Eligibility Criteria
- Methodology of Asset Valuation and Compensation
- Description of the Compensation Framework, Package and Agreement
- RAP Implementation and Accountability
- Grievance and Redress Procedure
- Evaluation and Monitoring Methodology

## CHAPTER TWO: PROJECT

### 2.1 NEED FOR THE PROJECT

Due to significant shortage of power supply capacity compared to demand, load allocation has been implemented nationwide in Nigeria. If all power stations currently being constructed under the National Integrated Power Project (NIPP) become operational, the installed generation capacity will become above 10,000 MW by the end of 2018 and it will be expected to increase greatly. The existing and proposed transmission line system in Nigeria is shown in Figure 2.1.1.

The transmission lines that run from the Niger Delta in the south to the north via the largest demand centre of Lagos are in a bottleneck situation so the generating capacity in the south cannot be fully utilized. Moreover, there are no detour routes for use when equipment accidents occur, and the system reliability is low. Furthermore, as was mentioned above, the capacity of generating equipment is expected to increase greatly in the coming years, however, because transmission capacity is unable to keep up with generating capacity, there is an urgent need to strengthen the transmission infrastructure. As a countermeasure of serious power shortage, Transmission Company of Nigeria (TCN) planned a project geared to achieving transmission capacity of 20,000 MW by 2020 in accordance with growth of generation capacity.

Nigeria has the largest population among African countries. After coming out of recession last year, the economy of the country is expected to grow steadily in the coming years. However, social infrastructure is far behind the economic development. In particular, electricity supply is extremely in short, being serious impediment to economic development.

Therefore, it is most urgent and essential to secure sufficient and stable supply of electricity as the platform for the economic development.

According to a report “preparatory survey for power transmission project in the Federal Republic of Nigeria” by JICA published in 2016, the implicit peak demand for the national grid is estimated at 11.0GW in 2014 and will increase to 16.4GW in 2020 and 23.6GW in 2025. The report also projected High Case with revised assumptions. Under the High Case projection, the implicit peak demand for the national grid will grow from 11.0GW in 2014 to 17.3GW in 2020 and 26.3GW in 2025. The electricity demand for the grid is projected to grow at annual 7.2% between 2014 and 2025 for the Base Case and 8.5% for the High Case.

Furthermore, according to the Lagos State Electricity Board, the electricity demand in the Lagos region is presently 1,250MW, however, the average supply capacity is 650MW, resulting in an absolutely short supply. The proposed Lagos and Ogun States Transmission Lines and Substations have been designed to expand supply electricity in the States. There is no adequate transmission line to meet up with demand of households, industries and other infrastructures in Ogun State as proposed and envisaged, hence there is need for the present proposed projects.

### 2.2 BENEFITS OF THE PROJECT

Energy is the raw material needed to fuel any country's economy growth. *“Energy is the golden thread that connects economic growth, increased social equity and a healthy environment. Sustainable development is not possible without sustainable energy.”* -UN Secretary-General Ban Ki-moon.

The benefits of this project for the people of Lagos and Ogun State in particular, and the economy of Nigeria in general are numerous. The following few are worth mentioning:

- Improved and more reliable electric power supply.
- Enhances productivity and efficiency in both public and private organizations
- It helps to develop and promote small, medium, and large-scale enterprises thereby creating direct and indirect employment opportunities.
- It helps to improve the security of lives and properties.
- General contribution to climate change through overall reduction of the used of personal power generating sets.
- General improvement of the standard of living for the populace.

### 2.3 THE PROPONENT: TRANSMISSION COMPANY OF NIGERIA (TCN)

Transmission Company of Nigeria (TCN), wholly owned by the Federal Government of Nigeria and having its headquarters at 14, Zambezi Crescent, Maitama, Abuja, is the project proponent. The company was incorporated in November 2005, emerging from the defunct National Electric Power Authority (NEPA) as a product of the merger of the Transmission and Operations sectors on April 1, 2004.

TCN has eight Transmission Regions and a National Control Centre, NCC. Each of these is headed by a General Manager (Transmission), who is responsible for the running and maintenance of transmission and transformation facilities in their areas of operation. The Transmission Regions are Lagos, Osogbo, Kaduna, Bauchi, Benin, Shiroro, Enugu and Port Harcourt and the National Control Centre (NCC) located at Osogbo. Being one of the 18 unbundled Business Units under the Power Holding Company of Nigeria (PHCN), TCN was issued a transmission license on 1st July 2006 by the Nigerian Electricity Regulatory Commission (NERC) to carry out electricity transmission, system operation and electricity trading which is ring fenced.

The mandate of TCN includes the following

- Management of assets of the High Voltage Transmission System Operations as well as generation dispatch functions.
- Operate as the provider of open access transmission service based on regulated transmission tariff and non-discriminatory system operations and economic dispatch services within a regulatory framework provided by the Nigerian Electricity

Regulatory Commission (NERC), the Grid Code and the Market Rules.

- Load forecasting and system expansion planning.
- Acquiring the necessary ancillary service for defined reliability and quality service standards.
- Managing the market settlement system.
- Development of the network through the construction of new transmission lines and substations for efficient Transmission and System operations, hence all stakeholders should observe the Grid Code, Distribution Code and Market rules.

TCN has a Health Safety and Environment (HSE) Department, headed by a General Manager. The department is responsible for environmental and social safeguards of the company’s activities and operations. The department also facilitates liaisons with communities as well as government agencies and local government departments to facilitate stakeholder consultations, as well as interfaces with the Federal Ministry of Environment for the approval of the ESIA.

## 2.4 PROJECT LOCATION

The entire project consists of about 203km high voltage transmission lines and 5 high voltage substations located in Lagos and Ogun State. The entire project is divided into three (3) Lots and the proposed project subject to this ESIA. The proposed line route for Lot 2 runs from Likosi/ Dejuwogbo and passes within the vicinity of Shimawa /Magboro, and Arigbajo (Ejio) in Ogun State. Figure 2.4.1 shows Ogun state location in the map of Nigeria. Specifically, it will pass through the local government areas listed In Table 2.4.1

**Table 2.4.1: Local Government Areas Affected by the Project**

| S/N | STATE | LGAs                                 |
|-----|-------|--------------------------------------|
| 1   | Ogun  | Ewekoro, Sagamu, Owode/Obafemi & Ifo |

Table 2.4.1 shows the description of proposed Transmission Lines with a total length of about 60.5 km and substations. Figures 2.4.2 – 2.4.4 show the route of Transmission Lines and substations.

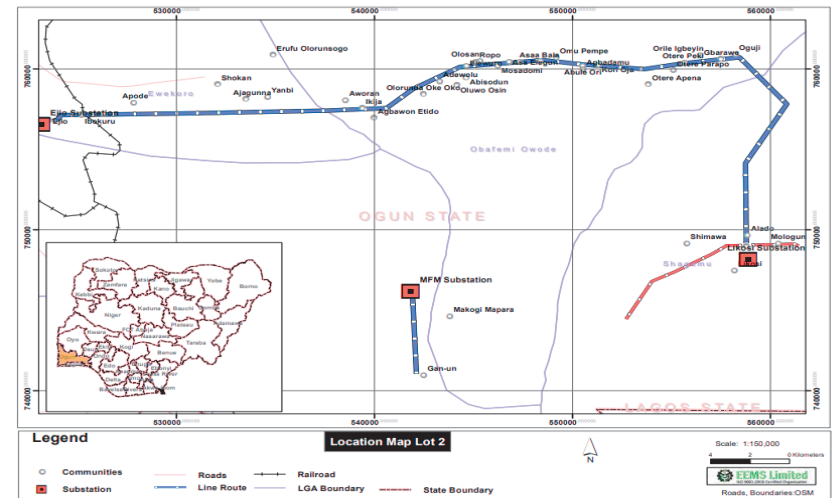


Figure 2.4.1: Location Map for the Proposed Projects in Nigeria –Lot 2

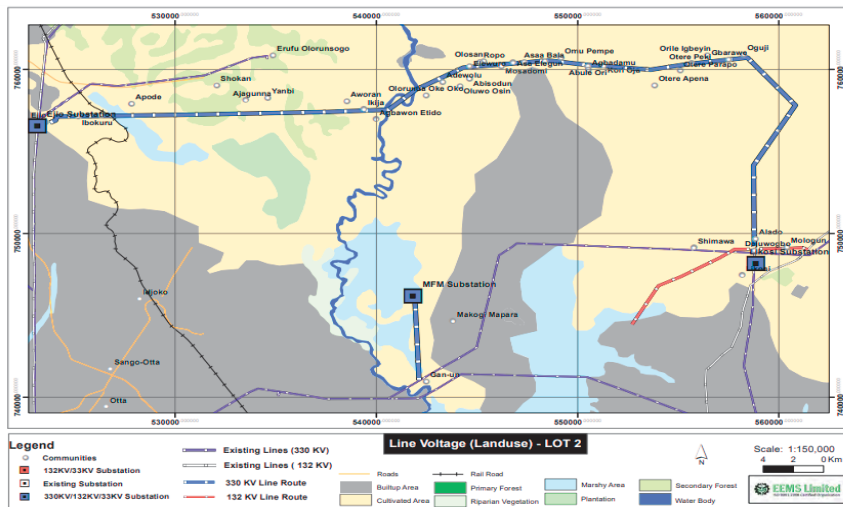


Figure 2.4.2: Location of Existing and Proposed Transmission Lines Components for the Projects- Lot 2

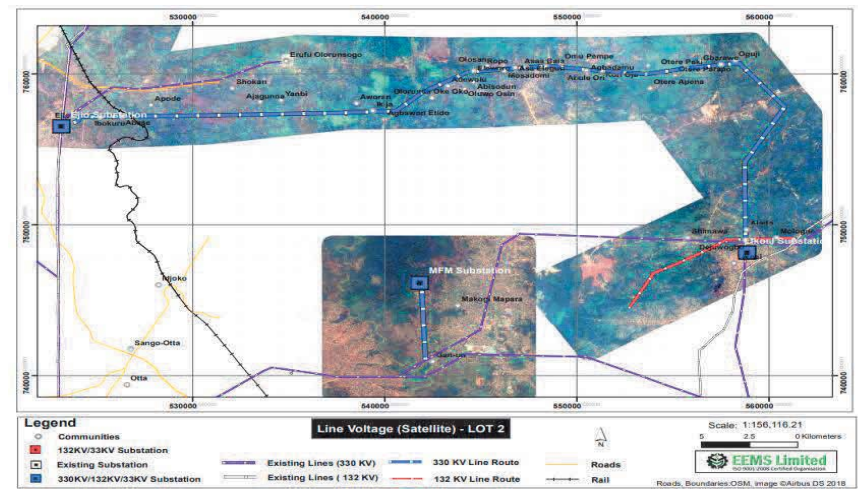


Figure 2.4.3: Satellite Imagery of Existing and Proposed Transmission Lines Components for the Projects- Lot 2

## 2.5 ENVISAGED SUSTAINABILITY

Some factors are important to consider to reaching project sustainability. They are related to practical aspects related to economic profitability, technical resources, and all, with an efficient management. With the growth in electricity demand that has occurred over the last decades, adequate and reliable energy supplies are important to economic development. Additional energy resources, including electricity generation and share, as well as infrastructure improvements, are important. Consequently, the investments which will be carried out should be useful primarily economically speaking, for the supply of the local load.

### 2.5.1 Technical Sustainability

The proposed project shall be technically viable because, it is professionally designed, and the technology employed is readily available. The proposed route selection has also considered the accessibility for maintenance works after commissioning.

### 2.5.2 Economic Sustainability

The proposed transmission line project shall be economically sustainable because the proponent is seeking to finance the project through a loan by JICA. Talks has reached advanced stage. Also, there is high demand of the power and the Return on Investment (ROI) is long term but surely high, to ensure effective pay back of the loan in line with loan agreement.

### 2.5.3 Environmental Sustainability

The line routes and the substation sites were carefully selected by considering sensitive ecosystems along the proposed PTL route and to avoid built-up areas as much as possible. In addition, practical mitigation measures have been proffered for the identified environmental impacts of the proposed Transmission Lines and Substations project. TCN is fully committed to comply with the relevant applicable national environmental laws, applicable international conventions and world bank environmental safeguard policies. Furthermore, TCN is also committed to implementing the ESMP developed to further guarantee the environmental sustainability. TCN has full department that handles environmental matters. The HSE department is headed by a General Manager who reports directly to the CEO. Significant number of ESIA's and environmental audits have been conducted in the past by TCN. Hence, they have the technical skills needed to manage the mitigations that are determined for the identified impacts of this project.

### 2.5.4 Social Sustainability

The project has secured its first social license – the host communities' acceptance of the proposed project their eagerness to see it succeed. The proposed transmission line project shall create job opportunities for unemployed indigenes and Nigerians.

In addition, TCN is committed to effective and continuous stakeholders' engagements and consultations and effective implementation of the RAP.

TCN is committed to comply with applicable national social laws, relevant international conventions and World Bank social safeguard policies. Furthermore, TCN has a Social Specialist as a member of the PIU, but will require training on World Bank involuntary resettlement policy as well as the new environmental and social management framework

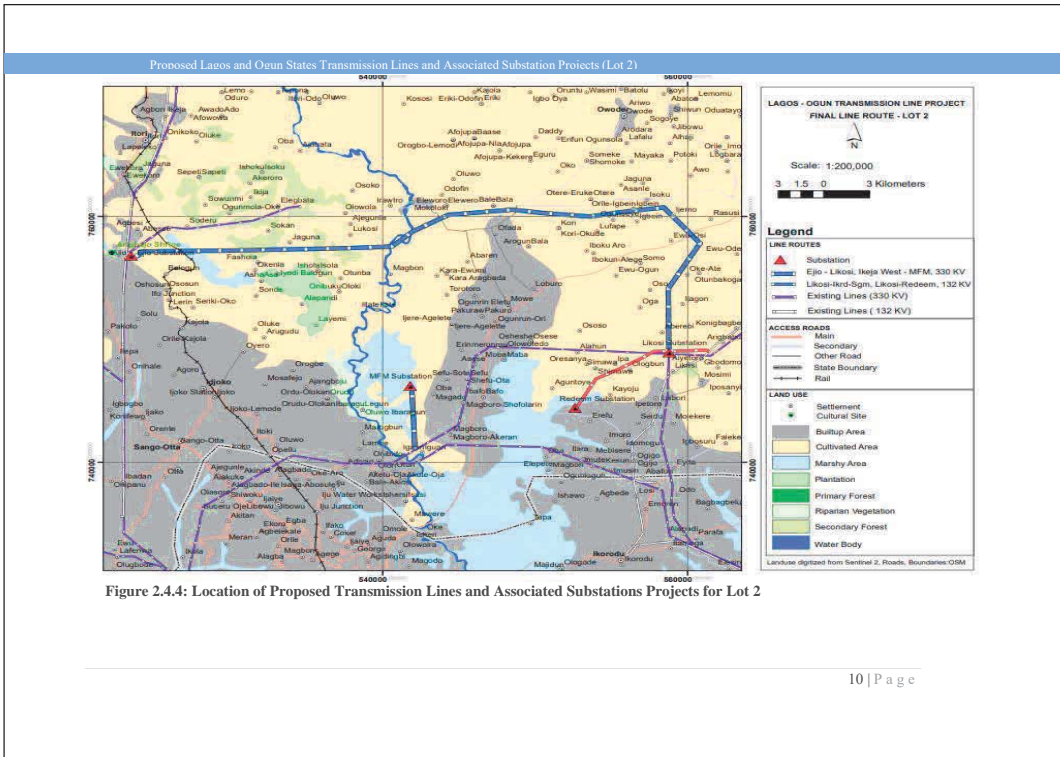


Figure 2.4.4: Location of Proposed Transmission Lines and Associated Substations Projects for Lot 2



## 2.6 PROJECT ALTERNATIVES

### 2.6.1 Project Options

#### Do-Nothing' Option

The first project option considered was the 'do-nothing' option. This option would result in the continuation of the shortage of electricity supply, which has also been inefficient, inadequate, and unreliable. The use of domestic and industrial generators to power homes, offices and industries will escalate. And this will result in increased gaseous emissions with its associated health effects as well as increased greenhouse gas effects. Furthermore, economic growth will be stifled. Therefore, this option was rejected.

#### Delayed Project Option

This would arise if a situation of civil unrest, or public opinion is against the development, or the socio-economic and cultural impacts of the project are not favourable, given available mitigation options. This would mean that all planning and development activities would be stalled until conditions are more favourable.

This option would therefore delay access to more reliable electricity and slow down investments in generation plants, since power evacuation is delayed. The use of domestic and industrial generators to power homes, offices and industries will also be prolonged. And this will result in increased gaseous emissions with its associated health effects as well as increased greenhouse gas effects. Therefore, this option was rejected.

#### Project Implementation Option

The third option considered was the execution of the proposed project as planned. This option was accepted because it will de-bottleneck the grid around the largest demand centre of Lagos and provide a more secure and reliable energy supply with all the benefits listed under Section 2.2.

### 2.6.2 Analyses of Alternatives

Design/ Technology Alternatives

#### (i) Substations

##### **Gas-insulated Substation (GIS)**

This technology is described in chapter 3 [section 3.10.1 (ii)]. It has the advantage of needing a little space, where land availability poses a challenge but much more expensive than the AIS.

##### **Air-insulated Substations (AIS)**

This technology is described in chapter 3 [section 3.10.1 (i)]. It has the advantage of being less expensive than the GIS although needing more space. This is the more economical alternative, where land is available.

### **Hybrid**

This technology combines the advantages of being less expensive than the GIS with needing less space than the AIS.

The option to be used for the project is the air insulated technology, because the size of land for the substations can contain it with land still available for future expansion.

#### **(ii) Lines**

##### **Number of Circuits Alternatives**

This presents the alternatives of using the single-, double-, or multi-circuit transmission lines. The single-circuit (SC) TL combines the immediate advantage of low construction cost with maintenance convenience, although it becomes more expensive on the long run, requiring more land take for corridors. This alternative was rejected entirely.

The multi-circuits (MC) TL requires the least space for corridor per unit power transmitted than the SC and DC TLs. It is the highest initial capital outlay, although eventually, the most economical. However, in the event of need for maintenance, power outage has farther reaching impacts on consumers than both SC and DC TLs.

The double-circuits TL minimizes land take per unit power transmitted than the SC, requires more initial cost than the SC but it is more economical, eventually.

##### **Towers Types (Tubular / Lattice) Alternatives**

There are two basic tower types, namely the tubular and the lattice steel towers. The choice of tower type was based on considerations of available corridor width and cost. The tubular towers are more compact than the lattice type, requiring shorter width but shorter spans and therefore more number of towers. Against this background, therefore, the lattice type will be used for the entire 330kV DC line.

##### **Underground versus overhead transmission Alternatives**

The underground transmission is very expensive and is often necessary where there is not enough land for the required corridor for the overhead tower infrastructure. It is also aesthetically wholesome and reduces environmental risks and impacts. On the other hand, the overhead transmission alternative is cheaper, easier to construct and maintain and equally sustainable when all identified impacts and risks are eliminated or minimized. Hence surface transmission was selected.

### 2.6.3 Site and Line Route Alternatives

The general characteristics of the line route considered are:

- short, to minimize cost and the impact on the environment,
- rectilinear, to minimize the angles and the footprint,
- accessible, near roads, to facilitate maintenance,
- surrounding towns and villages, to facilitate electrification, and
- bypassing towns and villages, to minimize the demolition of the built environment and relocation of populations.

The factors to avoid are:

- exclusion zones of airports and airfields
- soils with low load-bearing capacity, thus, far from wetlands and floodplains

- hills and ridges
- protected areas, forest reserves, classified forests, Ramsar sites and other sites, which aim to protect natural areas and species
- Physical cultural resources (PCR), archaeological, paleontological, historical, architectural, religious (including graveyards and burial sites) and aesthetic or other cultural significance.
- Bird migration corridors, feeding, rest areas and nesting grounds.

The Alternative Line Routes and location of substation

Transmission Line

**(i) Proposed 330kV Transmission line from Ejio – Likosi/Dejuwogbo (48.74km)**

The proposed JICA line route from Ejio to Likosi/Dejuwogbo was followed from AP1 at Ejio Substation up to AP3 across the river at Ejio. Between AP3 and AP4, the line crosses the NGC Gas Pipeline, Proposed railway line under construction and Existing railway line. The line crosses Ogun River between AP5 and AP6 to Okeoko Community through the swampy forest to avoid massive developing residential estates after the river at Ofada and Loburo town. The line crosses Ofada Road between AP9 and AP10 to pass across Omu Apempe, Ori, Otere Apena, Otere Parapo and Oguji to cross Lagos – Ibadan expressway beside Wichtech Roofing Industry thereby avoiding Makun City Residential and Industrial estates. The new option passes behind villages and areas with low developmental rates comprises of mainly farmlands, forests, poultries farms, etc. The length of the proposed best JICA line is 43.285km while the length of the new route is 48.74km

**(ii) Proposed 132kV 2 x DC Transmission line from Likosi/Dejuwogbo – Ikorodu/ Sagamu (2.41km)**

Due to the proposed re-arrangement and re-configuration of Likosi/Dejuwogbo Substation, the 132kV Transmission Lines are been moved Northward as against the previous arrangement in the JICA report. Due to this re-arrangement, the line was moved away from the previous position proposed by JICA to the proposed position eastward from Likosi/Dejuwogbo substation to join the existing Ikorodu/ Sagamu Transmission line immediately after Thames Valley College. The length of the proposed JICA line is 2.334km while the length of the new route is 2.41km.

**(iii) Proposed 132kV Transmission Line from Likosi/Dejuwogbo – Redeem (7.83km)**

Due to the proposed re-arrangement and re-configuration of Likosi/Dejuwogbo Substation, the 132kV Transmission Lines are been moved Northward as against the previous arrangement in the JICA report. Due to this rearrangement, the line was moved away from the previous position proposed by best JICA line to the proposed position westward from Likosi/Dejuwogbo substation at AP1. AP1 and AP2 are new angle points, North of the existing 330kV Ikeja West Transmission Line. The line will cross the existing 330kV Ikeja West Transmission line between AP2 and AP3 and crosses Likosi/Dejuwogbo – Shimawa road between AP 3 and AP4 along the Proposed JICA route. Due to the intersection of the Transmission line with the Redeem Christian Church of God (RCCG) proposed 3km x 3km Auditorium, a new substation site was proposed thereby changing the length and direction of the line from AP6 to AP7. The length of the transmission line route is 7.83 km.

**(ii) Proposed 330kV Transmission Line from Existing Ikeja West - MFM (4.99km)**

There is no deviation from JICA option. It passes through swampy forest with fewer developments. The length of the proposed best JICA line is 4.99 km.

The summary of alternative line routes is in Tables 2.5. 1 -2.5.4. Also, the recommended route maps are presented in Figures 2.5. 1 -2.5.4

Substation

Three (3) substations falls within the scope of Lot 2 project namely; Likosi/Dejuwogbo (formerly known as Ogijo) Substation, Redeem Substation and MFM substation. Ejio substation served as the main hub in the entire project where several transmission lines emanated from including Ejio – Likosi/Dejuwogbo Transmission Line.

During visitation to the communities affected by Ogijo substation site, it was learnt that the location of the substation site is not Ogijo but around Likosi/Dejuwogbo area. 25 hectares substation site is situated at Dejuwogbo and Alado communities with approximate 9.0 and 16.0 hectares belonging to Alado and Dejuwogbo respectively. During a stakeholders meeting, it was unanimously agreed that the substation should be named after the community that has the largest share of the land which is Dejuwogbo.

The Two (2) previous sites allocated for the Redeem substations were affected by the Oloparun resettlement site and the 3km x 3km new auditorium of the RCCG. The new substation site has been allocated Abule Oba which is being recommended for the substation.

The 20 hectares substation site situated within the Mountain Top University (MFM substation) at Makogi. The substation site was shifted Northward because of the new Land acquisition by the Mountain Top University while size is still intact.

**Table 2.6.1: Alternative Analysis 1 - Section between proposed Ejio – Likosi/Dejuwogbo 330kv Transmission Line Route**

|   |  | Route 1  | Route 2   | Route 3   |
|---|--|--|---|---|
| Description   |  | Straight route with the lowest construction cost.  | It avoids crossing an existing Ejio-Olorunsogo 330KV line. It avoids build-up areas and settlement to minimize land acquisition. It avoids Ofada town, OPIC residential/ industrial estate and crosses Lagos-Ibadan expressway into Likosi/Dejuwogbo substation where there are minimal built-up areas. | To reduce impact by land acquisition, it avoids settlements and built-up areas                    |
| Distance (km)   |  | 36.5   | 48.74   | 42.3  |
| Social Aspect   | Number of Buildings in Way Leave (Estimated) | 189  | 355<br>(Majority are under construction)  | >400  |
| Natural Aspect  | Access Road                                  | Some existing roads are present, but construction of access roads may be necessary in some areas. It goes through the Loburo town. | Some existing roads are present but upgrading of existing access roads may be necessary in some areas.  | Some existing roads are present, but construction of access roads may be necessary in some areas. |
|   | Land Use                                     | Commercial areas, congested residential areas, farmland, vegetation, river   | Farmlands, vegetation, settlements, river, swampy forest  | Farmlands, vegetation, settlements, river   |
|   | Impact on Natural Environment                | Some vegetation needs to be cleared. No difference from the other route.   | Some vegetation needs to be cleared. No difference from the other route.  | Some vegetation needs to be cleared. No difference from the other route.                          |
| Geographical Conditions (Topography, ground stability, etc) |  | None in particular   | Relatively flat terrain with gentle slopes in few areas.  | None in particular  |
| Natural Disaster Risk                                       |  | None   | None  | None  |

| Technical Aspect  | No difference from the other alternatives | Construction across river and major expressway. | No difference from the other alternatives |
|-------------------|---|---|---|
| Cost              | Δ   | o   | o   |
| Recommended Route |   | This option is being recommended                |   |

**Table 2.6.2: Alternative Analysis 2 - Section between proposed Likosi/Dejuwogbo – existing Ikorodu/ shagamu 132kv 2 x DC Transmission Line route**

|                |                                  | Route 1  | Route 2   | Route 3  |
|----------------|----------------------------------|--|---|--|
| Description    |                                  | Turning-in /out point is between Ikorodu Substation and Shagamu Substation. There are some shops and houses around the turning -in and -out point. | By moving Turning-in/out point 2.3km to north-east, it is possible to run within the way leave of the existing 330kV line. It also enables to connect straight at the starting and ending points. | About 700m length passes through a developing area after Likosi/Dejuwogbo substation towards Mologun and Gbepa community. The lands at the 2 communities are not developed and it connects Existing Ikorodu/ Shagamu 132kV TL after Thames Valley college. |
| Distance (km)  |                                  | 1.5  | 2.3   | 2.41   |
| Social Aspect  | Number of Buildings in Way Leave | 7  | 0   | 51   |
| Natural Aspect | Access Road                      | Some existing roads are present, but construction of access roads may be necessary in some areas.  | Some existing roads are present, but construction of access roads may be necessary in some areas.   | Many existing roads are present around Likosi/Dejuwogbo Substation and along the proposed Transmission line, Construction of access roads may not be necessary.  |
|                | Land Use                         | Vegetation, farmlands, some settlements  | Vegetation, farmlands   | Developing/ residential areas, farmlands and vegetation  |
|                | Impact on Natural                | Vegetation in way leave needs to be cleared.   | Since the way leave can be shared with the  | Some vegetation needs to be cleared and land   |

|  |   |   |  |  |
|--|---|---|--|--|
|  | Environment   | Since there is another transmission line in west, vegetation will be segmented. | existing line, impacts on vegetation by clearing or segmenting are lower than Route 1. | acquired.                              |
|  | Geographical Conditions (Topography, ground stability, etc) | None in particular  | None in particular   | None in particular                     |
|  | Natural Disaster Risk                                       | None  | None   | None                                   |
|  | Technical Aspect  | No difference from the other alternative.                                       | No difference from the other alternative.  | Construction of special terminal tower |
|  | Cost  | ⊙   | ○  | ○                                      |
|  | Recommended Route   |   |  | This option is being recommended       |

**Table 2.6.3: Alternative Analysis 3- Section between proposed Likosi/Dejuwogbo – Redeem 132kv DC Transmission Line route**

|                |                                  | Route 1   | Route 2   | Route 3   |
|----------------|----------------------------------|---|---|---|
| Description    |                                  | Straight route with the lowest construction cost  | It avoids settlements to minimize impacts by land acquisition.                                    | The route was redirected from the Likosi/Dejuwogbo substation to suit the proposed substation design. It crosses existing 330kV Ikeja west TL and follow path taken by Route 1 and terminate at the newly acquired substation site. |
| Distance (km)  |                                  | 10.1  | 10.3  | 7.83  |
| Social Aspect  | Number of Buildings in Way Leave | 7   | 6   | 157   |
| Natural Aspect | Access Road                      | Some existing roads are present, but construction of access roads may be necessary in some areas. | Some existing roads are present, but construction of access roads may be necessary in some areas. | Many existing roads are present around Likosi/Dejuwogbo Substation and along the proposed Transmission line, upgrading of existing roads may be necessary   |
|                | Land Use                         | Farmlands, vegetation, Settlements  | Farmlands, vegetation, Settlements  | Farmlands, vegetation, Settlements  |

|  |   |  |  |  |
|--|---|--|--|--|
|  | Impact on Natural Environment                               | Some vegetation needs to be cleared. No difference from the other route. | Some vegetation needs to be cleared. No difference from the other route. | Some vegetation needs to be cleared. No difference from the other route. |
|  | Geographical Conditions (Topography, ground stability, etc) | None in particular   | None in particular   | Undulating terrain, Valleys and gentle slopes                            |
|  | Natural Disaster Risk                                       | None   | None   | None   |
|  | Technical Aspect  | No difference from the other alternative(s)                              | No difference from the other alternative(s)                              | Crossing existing 330kV TL   |
|  | Cost  | ⊙  | ○  | ○  |
|  | Recommended Route   |  |  | This option is being recommended   |

**Table 2.6.4: Alternative Analysis 4 - Section between proposed existing Ikeja West – MFM 330kv DC Transmission Line route**

|                |                                  | Route 1   | Route 2  | Route 3  |
|----------------|----------------------------------|---|--|--|
| Description    |                                  | Straight route with the lowest construction cost                          | The starting point is the existing transmission line tower closest (same as Route 1) but avoiding a built-up area. | To minimize impacts by land acquisition, the starting point is set at the south of MFM substation so that the route can avoid built-up areas completely. |
| Distance (km)  |                                  | 2.7   | 3.4  | 4.99   |
| Social Aspect  | Number of Buildings in Way Leave | 162   | 116  | 50   |
| Natural Aspect | Access Road                      | Construction of access roads is not necessary due to many existing roads. | Some existing roads are present, but construction of access roads may be necessary in some areas.                  | Some existing roads are present but upgrading of existing access roads may be necessary in some areas.   |
|                | Land Use                         | Residence   | Residence, Vegetation  | Residential, Vegetation, farmlands, vacant Land  |
|                | Impact on Natural Environment    | None to be noted  | Vegetation will be cleared and segmented.  | Vegetation will be cleared and segmented.  |

|   |   |   |   |
|---|---|---|---|
| Geographical Conditions (Topography, ground stability, etc) | None in particular                        | None in particular                        | Low land                                  |
| Natural Disaster Risk                                       | None                                      | None                                      | None                                      |
| Technical Aspect  | No difference from the other alternatives | No difference from the other alternatives | No difference from the other alternatives |
| Cost  | ◎   | ○   | ○   |
| Recommended Route   |   |   | This option is being recommended          |



Figure 2.6.1: The recommended Option for Ejiro – Likosi/Dejuwo 330kV Transmission Line



Figure 2.6.2: The recommended Option for Likosi/Dejuwogbo – Ikorodu/ Sagamu 132kV 2 x DC Transmission Line

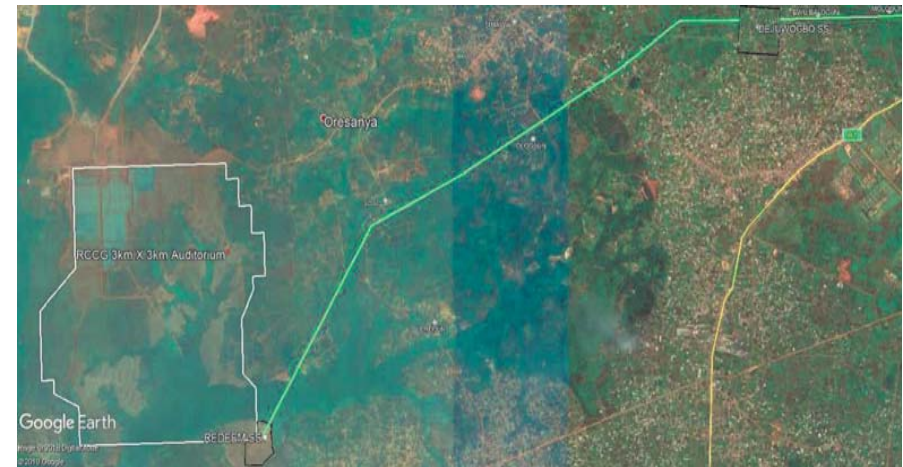


Figure 2.6.3: The recommended Option for Likosi/Dejuwogbo – Redeem 132kV Transmission Line



Figure 2.6.4: The recommended Option for Existing Ikeja West 330kV – MFM Substations

## 2.7 DESCRIPTION OF THE PROJECT COMPONENTS

### 2.7.1 Voltage Level and Number of Circuits

The proposed project, the construction of 63.97km, 330/132kV Double Circuit Transmission Line involves:

- Construction of Ogijo (Likosi/ Dejuwogbo) to Arigbajo (Ejio) 48.74km 330kV Double Circuit Transmission Line,
- Construction of 2.41km 132kV, 2-Double Circuits Transmission Line from Ogijo (Likosi/ Dejuwogbo) to the Existing Ikorodu/Shagamu 132 kV Transmission line,
- Construction of 7.83 km 132kV Double Circuit Transmission Line from Ogijo (Likosi/ Dejuwogbo) to Redeem (Abule Oba), Constuction of 4.99km 330kV Double Circuit Transmission from MFM(Makogi) to the Existing Benin (Omotosho)/Ikeja West 330kV Transmission Line,
- Construction of 330/132kV Substation with 2x300MVA 330/132kV and 2 x 100MVA 132/33kV Transformer capacities at Ogijo (Likosi/ Dejuwogbo),
- Construction of 2x60MVA, 132/33kV Substation at Redeem (Abule Oba),
- Construction of 132/33kV Distribution Substation with 2x150MVA, 330/132kV +and 2x60MVA 132/33kV Transformer capacities at MFM (Makogi).
- Development of land access (from nearby roads) to TLRoW to facilitate construction and maintenance
- Construction of incoming feeders and outgoing feeders which are connected to the existing transmission system

### 2.7.2 Phase Conductors

The line is designed for live line maintenance. As such, the power frequency and impulses do not only determine the geometry withstand clearances required, but also by live line maintenance approach and working distances. A minimum safe approach distance of 2,030mm for live bare hand work is required for 330/132kV line.

For low wind periods, the wind pressure used in calculating the swing angles is 0.1 kPa. For high wind periods, the wind pressure was calculated for a 200-year wind return period and converting the 3 second gust to a 5 minutes gust. The 5-minute guest wind will provide a satisfactory operational performance with a probability of exceeding the calculated swing angle of 1%.

### 2.7.3 Ground Wires

The underground transmission is very expensive and is often necessary where there is not enough land for the required corridor for the overhead tower infrastructure. It is also aesthetically wholesome and reduces environmental risks and impacts. On the other hand, the overhead transmission alternative is cheaper, easier to construct and maintain and equally sustainable when all identified impacts and risks are eliminated or minimized. Hence, surface transmission was selected.

### 2.7.4 Tower Types

There are two basic tower types, namely the tubular and the lattice steel towers. The choice of tower type was based on considerations of available corridor width and cost. The tubular

towers are more compact than the lattice type, requiring shorter width but shorter spans and therefore more number of towers. Against this background, therefore, the lattice type will be used for the entire 330kV DC line.

### 2.7.5 Foundations

Tower foundation shall mean the tower footing and footing and the supporting soil, which together resist the applied tower loads. Tower footings are the structural element (piles, grillages, pad and chimneys, etc.) that transmit the load to the soil. The soil types and soil engineering parameters shall be adequate and properly taken into account.

For this project, the determination of type and size of a tower foundation, soil details from geotechnical investigations shall be used and complemented with additional investigations where required. All foundations shall make adequate provision for horizontal shear forces at the ground line. The foundation types chosen for the proposed TL project shall be constructed using concrete and reinforcement as major materials. Due to the possibility of the corrosion of foundation materials by underground water, surface water and soil, the following shall be used: The foundation protection thickness shall be enlarged to over 50mm while the top of the foundation shall be minimum 500mm above ground level.

High strength concrete shall be used.

Antiseptic such as bitumen shall be applied on the area that shall have direct contact with the soil. Specific high-grade cement shall be used in the concrete mixture.

### Standard Foundations

Standard foundations for towers shall be concrete pad and chimney. The height of the chimney shall be determined according to expected buoyancy (e.g. floods, tidal water level changes). The use of displacement method for calculating bearing pressure in pad and chimney foundation, reducing the unit weight of concrete in account of excavated earth overburden shall not be accepted.

### Special Foundations

In areas of low soil bearing capacity, special foundations will be required for the set-up of TL towers. Special foundations comprise but are not restricted to: Pad and chimney with enlarged pad (soil bearing capacity!) Raft foundations (soil bearing capacity!)

Pile foundations,

Combined pile and raft foundations

For design of these foundations, special considerations shall be made concerning water levels, buoyancy, concrete quality, etc.

### Transmission Lines Design for Actual Conditions:

The design and foundation selection shall be done based on the actual ground conditions at each site, taking into account the differences in design methods applicable to granular and cohesive soils and considering the maximum and minimum ground water elevation at each site, whichever is critical, in the determination of the foundation and protective requirements. Initial identification of the soil type has been based on visual examination of the soils present throughout the length of the RoW. Soils have been identified as either granular or cohesive on the basis of the field identification procedures.

**Loading on Foundation:** The foundations are designed from the loads worked out from the tower design at the base of the tower and these loads are increased by 10% in case of suspension tower and 20% in case of tension tower. These loads are considered as working loads for the design of the foundation.

### 2.7.6 Clearing of Right-of-Way

Generally, the easement will be inspected in conjunction with the inspections of the structures. If necessary, vegetation control activities will be carried out. Two basic types of control will be employed:

**Hand clearing:** In sensitive areas or in areas too steep for mechanical control, hand clearing of re-growth is used. Only a portion of the re-growth is removed to keep the disturbance to a minimum. A team of up to 4 people could be used on this work; and

**Mechanical control:** Tractor driven brush cutting equipment capable of clearing small trees are commonly used to maintain access tracks and where heavy re-growth is occurring within the easement. A work team of up to 3 persons could be involved.

In any section of the transmission line the easement does not contain any vegetation, but buildings and other infrastructure instead, it will be important to govern or restrict further development that impinges on the safe electrical clearances required for the 132/330 kV easements.

National Security and Civil Defence Corps (NSCDC) have legal responsibility for safeguarding national assets such as power lines, railway lines, pipelines and other public utilities. Therefore, it is NSCDC's responsibility to prevent encroachment on transmission lines. However, TCN being the owner of these lines, shall facilitate and provide logistics support.

### 2.7.7 Access Road

Access to each structure location will be required for a crane, elevated platform, trucks transporting the materials and construction equipment, materials, and vehicles. Access will also be required to temporary sites needed for storing conductor drums, winching and braking equipment during the overhead earth wire stringing.

Apart from the existing community tracks (where they exist) which none in current condition will accommodate larger equipment necessary for the construction activities, several access tracks for the construction work will be require repair and existing ones upgraded. There are several specific locations where tracks and swamp crossings will require upgrading or access re-evaluated. These upgrades will be identified during detailed design and form part of the construction contractor's responsibility. Recommendations have been made where significant or important vegetation communities exist will be re-grown. These recommendations form part of the development project, as described in the ESMP.

The entire line route corridor has adequate existing roads and tracks that can used to access it. Hence, new tracks will be constructed only where necessary. Any new access road to be constructed upgraded will be limited to 5m, while tracks to be constructed under the line is



limited to 3m. These will be used during construction and maintained for maintenance purpose. However, final route of access road will be determined in consultation with the landowner, giving consideration to environmental impacts. Where new tracks are required, road plant may be used to construct the track and for final trimming and construction of drains.

There is no specific need for continuous access along the entire route of the transmission line, although continuous access generally provides the simplest and least extensive method of access to individual structures and the proposed easement area. Access tracks will be upgraded progressively as construction works progress.

Erosion and Sediment Control measures for all works will be implemented, in accordance with the respective regulatory standards. EPC contractors shall prepare an Erosion and Sediment Control Plan (ESCP) in accordance with regulatory standards and submit to FMEnv for approval prior to the commencement of works and maintain same during works. Measures may include installation of silt fences, straw bales, and drains. It is TCN's policy that the tracks be maintained in a condition suitable for the construction work until the completion of the works. The tracks are then maintained to ensure maintenance and inspection works can be undertaken during operation of the transmission line.

## 2.8 REQUIREMENTS

### 2.8.1 Construction

The construction program will have several discrete activities and these are described below. The specific pattern of construction activities will generally follow this sequence although some activities may be carried on concurrently.

#### Campsites / Logistics Bases

Campsites / logistics bases will be located at Likosi/ Dejuwogbo, Redeem (Abule Oba) and MFM (Makogi) substations. Material storage during the construction of the lines will be restricted within the acquired RoW. The campsites / logistics bases at these locations will be required only for storage and fabrication, while workers shall be accommodated in existing hotels around the area.

#### Foundation Construction and Erection

The construction of structure foundations generally involves boring or excavating a hole for each leg or pole, installing steel reinforcing and the stub leg, and then pouring concrete. All surplus soils from excavations and boring would be used in filling low lying areas of the access roads, provided that this soil is not polluted. Where the soils are contaminated, this should be reported to Ogun State Ministry for guidance on the most appropriate disposal depending on the nature and extent of contamination.

In poor ground conditions and for the heavier tension towers, more substantial foundations are required involving open excavation, the installation of formwork, pouring of concrete, and subsequent backfilling of the excavation. These foundations take longer to install and

will cause more disturbance than the construction of bored tower foundations. In steeper terrain, it may be necessary to create a level bench at some tower sites to provide a working area for construction crew and equipment.

The construction of tower and pole foundations will require a workforce of approximately eight (8) persons, an auger type borer or backhoe excavator and arrangements for supply of premixed concrete, by truck. The construction of foundations for a typical tower or pole might take up to three days, although the time could be a week or more where difficult foundation conditions are encountered. Foundations will be under construction at several sites at any one time.

At each new tower sites, the crane and drill rig will require a flat platform to work on. Although the new tower sites are generally flat, there may be a need for the construction of a level pad. The pad will need to be cut into the slope close to the foundation site and access for concrete trucks will be necessary along the access tracks to each structure.

Erosion and sediment control measures will be implemented, and the level area will be retained and vegetation cover rehabilitated following completion of construction works.

#### Tower Construction

For this project the lattice tower type shall be used. The conductors are vertically arranged, and the earthing conductors are above conductors. Towers of overhead power lines consist of tower body, earth wire peaks and cross-arms. The transmission voltage, the number of circuits, the height of the towers and other aspects determine the tower design and material, whereby galvanized steel is used. The towers dominate the aesthetic impact of an overhead line, govern the operational reliability. They need to withstand reliably the conductor forces and external loads.

#### Conductor and Earth Wire Stringing

Following erection of the new structures at either end of the line, stringing of the conductors and earth wires will occur. A process known as "tension stringing" is normally used. This ensures that the conductors remain above ground at all locations in each stringing section. This requires specialized truck mounted equipment. This process will be undertaken gradually along the line as construction progresses.

The process of stringing starts with a light wire, called the draw wire, being fed through "sheaves", or pulleys, supported from the ends of the insulators. Where possible, the draw wire will be run along the ground between structures and through the sheave attached to each structure. The draw wire is then tightened and pulled into the air. Where it is not possible to run the draw wire along the ground, because of terrain difficulties, water bodies, roads or disturbance to vegetation, a nylon draw wire will be fed between two structures using a hurdle and catch cradle arrangement to support the draw wire above ground. The nylon rope

will be held at tension above the ground and is "pulled through" the sheaves to draw the normal steel draw wire into the sheaves.

The draw wire will be attached to the end of the conductor and the conductor will be pulled through the sheaves. The conductors will be drawn from the drums and a braking machine applies tension to the conductor as it is pulled out. The tension keeps the conductor from touching the ground, or trees and other obstacles.

At the completion of the "pull", the tension in the conductors will be adjusted to ensure that correct ground clearance is obtained. The conductor will then be fixed in position at each structure and the sheaves recovered and moved along the line to be used again. Stringing requires specialized truck mounted equipment, known as the "winch" and the "brake", to pull out the conductor and to maintain and adjust the tension in the conductors. These two pieces of plant are normally positioned to allow up to 7 km of the transmission line to be strung in a single "pull". For this project the pull distance will be less due to shorter distances between tension structures and the need to minimize outage length. The conductor and earth wire are stored on reels, called "drums", approximately 2 m in diameter. Each drum holds about 3.5 km of conductor so several drums will be stored at each brake site. Plant required at each site includes the winch and/or brake equipment, trucks for delivery of conductor drums, and concrete anchor blocks. Winch and brake sites are normally located adjacent to tension towers but can also be in the centre of a span. Sites that are relatively level and flat will be required to allow the drums to be maneuvered easily and safely.

The stringing operations will involve approximately 15 to 20 persons, spread over the section being strung. It is expected that each section of line will take several months to string with the actual "pulling out" of the conductors taking only two days. The rest of the time will be spent on preparation and final tensioning in between outage periods.

The stringing and tensioning equipment is normally truck mounted and does not require any specific earthworks or establishment activities. However, the stringing and tensioning activities will involve truck and vehicle access along the section being strung which may result in some surface disturbance. No specific erosion or sedimentation controls will be required however any incidental soil disturbance will be rehabilitated on completion of the construction program.

**Substation Construction**

The chart for the substations is shown in Figure 2.6.1

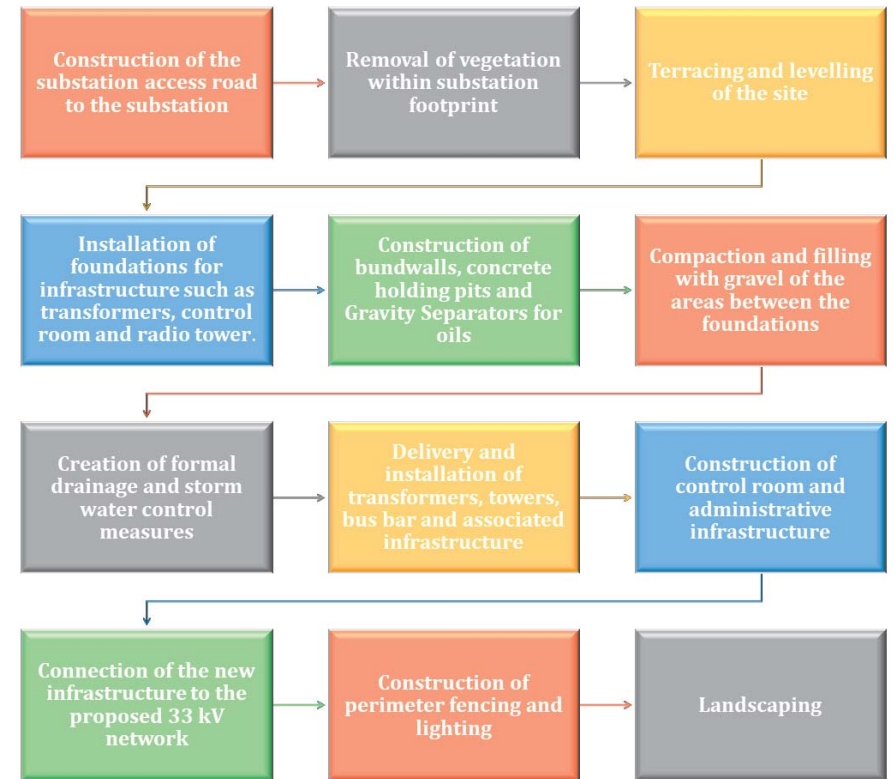
Construction activities for the substations will involve the following:

- Upgrading of the substation access road to Redeem substation
- Existing untarred road at Likosi/ Dejuwogbo and MFM substations will be upgraded.
- Removal of vegetation within substation footprint.

Terracing and levelling of the sites.

Installation of foundations for infrastructure such as transformers, control room and radio

tower: - The project area is made up of different types of soils and varying geological conditions which will require geotechnical studies. Excavations will be conducted to create holes for erecting or installing the pylons. After excavation, foundations will be constructed for supporting the pylons. The excavation and construction of the foundations shall involve the use of hand tools like crow bars, mixers, vibrators, trappers, etc. But in case of rocky areas compressors and drills will be used. The equipment to be used in project construction will require various forms of energy which will include manpower, charged battery or fossil fuel. The manual equipment to be used in the development project includes crow bars, spanners and ropes. About 75% of materials for the substation construction are expected to come from offshore locations while 25% will be sourced locally.



**Figure 2.8.1: Construction Activities of the Substations**

Fuel based equipment to be used will include mixer, vibrators, compressors, and drills. The construction of the foundations will involve masonry work and related activities. General masonry and related activities to be undertaken will include concrete mixing, construction of foundations, erection of steel tower and curing of fresh concrete surfaces. These activities

shall utilize labour from the neighbourhood to supplement some machinery works such as that by the concrete mixers; thus, creating employment for the local population.

- Construction of bunds and oil holding dams (for emergency holding of transformer oil in the event of a spill) and wall safety walls
- Compaction and filling with gravel of the areas between the foundations
- Creation of formal drainage and storm water control measures
- Delivery and installation of transformers, towers, bus bar and associated infrastructure
- Construction of control room and administrative infrastructure
- Connection of the new infrastructure to the proposed 33 kV network
- Construction of perimeter fencing and lighting
- Landscaping: - After successful completion of the project construction work, the project contractor will rehabilitate the project sites that had been subjected to clearing by planting indigenous plant species.

### Transportation

Transportation requirements during the construction period will vary per the work required at each tower site. For new structures, the vehicles likely to be used are as follows:

- Articulated truck for steel sections and transformers delivery from Lagos (Tin Can or Apapa port) where these offshore components of the required materials will be shipped through Ikorodu;
- Non-articulated flatbed truck;
- Concrete truck;
- Track or 4WD mounted drill rig;
- Crane;
- Bulldozer/grader/excavator/backhoe;
- 4WD vehicles;
- Elevated work platform; and
- Brake and winch truck

The nomination above for the main earthmoving equipment will vary between the structure sites and will likely be transported to several sites at different times. For example, some foundation sites will require an excavator for the foundation work while others will only need a backhoe. It is not anticipated that earthworks requiring the use of a dozer would be required.

Each site would require an elevated platform or similar for connection of the conductor pulleys. For the stringing operations, two heavier brake and winch trucks and one truck delivering conductor wire, earth wire, and temporary anchor blocks will need access to specific sites along the route.

The EPC contractor shall prepare a Traffic Management Plan (TMP), as a part of the CEMP. TMP is to focus on the construction phase of the project and in addition, must also include (but not be limited to including):

- The management of the delivery of equipment;
- Access to and from structure sites;
- Work methodologies for restringing across roadways;
- Arrangements for temporary road closures;
- Parking; and
- Any security access arrangements.

### Workforce and Hours of Operation

#### Workforce

The workforce engaged on the project will vary during the construction program and will be dependent on the specific activities underway. Labour requirements will generally be a maximum of 32 at each route, comprising approximately 10 on access track and foundation work, 10 on structure erection and 12 on stringing work, with several others engaged on miscellaneous other activities. As outlined above, it is anticipated that most activities will be undertaken gradually in accordance with the requirement to keep the existing line in service during peak demand periods.

#### Hours of Operation

Given the need to undertake most of the work in planned system outages, the construction program will include work outside normal construction hours and will include night time and weekend periods as required. All construction activities that are likely to generate noise shall not be undertaken during night time.

#### Regulatory Requirements

The contractors shall ensure compliance with the following laws and regulations:

- The Factories Act, 1987
- Wages Board and Industrial Council Act, 1974
- Workers' Compensation Act, 1987
- IFC Performance Standard 2: Labour and Working Conditions
- International Labour Organisations (ILO) requirements

These are elaborated in Section 1.4

#### Clean-Up and Final Inspection

The following steps will be taken to clean up the construction sites and conduct final inspection, preparatory to commissioning:

- On completion of works, the concrete shall be thoroughly cleaned.
- All packing and surplus materials from site and all rubbish and waste shall be removed as well as trees from transmission line right of way and access roads.
- Required burning permits shall be obtained, to comply with government regulations.
- There shall be no disposal of rubbish, waste or any debris in rivers and do not pile such materials in stream beds, river terraces, or any unauthorized place.
- Any irrigation ditches which had been temporarily blocked to facilitate the line construction shall be cleared and cleaned.
- All irrigation facilities shall be restored to the condition existing before arrival on site.

- Natural drainage in areas where temporary facilities have been made for construction purposes shall be restored.
- Any fences, gates, etc., which have been damaged during construction shall be restored.
- Access roads shall be restored to their original conditions.

Towers shall be inspected to ensure proper installation of all items including signs and accessories, hardware, dampers and spacer dampers, insulators and to ensure that bolts are tightened, no members and bolts are missing, conductors and overhead shield wires are properly sagged with specified clearances maintained, ground leads are removed and towers and foundations are installed within the specified tolerance. Inspection shall be carried out along the transmission line to ensure that rubbish and waste are disposed, fences are mended, holes and over-excavations are filled, drainage is restored, damages to property are made good and the transmission line right-of-way is reinstated.

### 2.8.2 Operation

The proposed Transmission Line maintenance will be the responsibility of TCN. The maintenance is described in the following sections.

#### Structure and Conductor Maintenance

Once the transmission line construction is completed, maintenance patrols will make periodic inspections of the structures, the easement and the conductor and line hardware, taking note of clearance conditions, damage to components or evidence of vandalism.

#### Easement Maintenance

As outlined in TCN Easement and Access Track Maintenance Policy maintenance of the transmission line easement is necessary to ensure that the safe electrical clearances are not infringed due to growth of vegetation.

Generally, the easement will be inspected in conjunction with the inspections of the structures. If necessary, vegetation control activities will be carried out. Two basic types of control will be employed:

**Hand clearing:** In sensitive areas or in areas too steep for mechanical control, hand clearing of re-growth is used. Only a portion of the re-growth is removed to keep the disturbance to a minimum. A team of up to 4 people could be used on this work; and

**Mechanical control:** Tractor driven brush cutting equipment capable of clearing small trees are commonly used to maintain access tracks and where heavy re-growth is occurring within the easement. A work team of up to 3 persons could be involved.

In any section of the transmission line the easement does not contain any vegetation, but buildings and other infrastructure instead, it will be important to govern or restrict further development that impinges on the safe electrical clearances required for the 132/330 kV easements.

National Security and Civil Defence Corps (NSCDC) have legal responsibility for safeguarding national assets such as power lines, railway lines, pipelines and other public

utilities. Therefore, it is NSCDC's responsibility to prevent encroachment on transmission lines. However, TCN being the owner of these lines, shall facilitate and provide logistics support.

#### Rehabilitation Program

Disturbed areas (e.g., construction pads, winch sites and tracks) that are not required for future use or access will be shaped and seeded in consultation with each landowner. Rehabilitation of work sites will be carried out as work proceeds and as soon as possible after the completion of work on each site. A rehabilitation plan shall be included in the project's ESMP.

Erosion control measures, in accordance with the Blue Book will be implemented at each work site during the work period and following the completion of work at the site, measures to restore the pre-existing ground condition will be implemented and are further discussed in Chapter 5.

Re-vegetation techniques such as loosening of ground compacted by construction equipment, improving soil quality of excavated material spread around structure sites, spreading of fertilizer and grass seeding will be implemented as required. Special re-vegetation techniques will be necessary if acid sulphate soils are encountered. These areas may also require follow up maintenance to ensure that vegetation cover is successful.

In some areas, specialized rehabilitation works will be required or otherwise agreed with the landowners. As such, the ESMP that will need to be developed on a site-by-site basis to reflect the prevailing conditions and the level of rehabilitation required. Farmlands for example may prefer to leave the disturbed area tilled but not sown as they will be returned to vegetable production. Other areas, which may involve tree clearing, will require replanting of trees in areas located outside the easement and the agreement of respective land owners.

These trees will be replaced at a ratio of four to one and planted within the riparian corridor outside the easement. This work will be undertaken in consultation with all affected Local Government Councils.

#### Project Decommissioning/ Closure

This is the last phase of this project. Decommissioning of the substations and Transmission Lines will be affected when the active life of the substation has expired. The project will involve removing the substation apparatus and reclaiming the land where necessary.

Equipment to be removed includes:

- The transformers;
- Associated substation equipment; and,
- The substation fence.

The aim is to return the disturbed site to equivalent land capability following the substation decommissioning. The guidelines outlined under FMEnv and NESREA's Environmental Protection Guidelines for Transmission Lines for the reclamation of decommissioned substation sites will be applied in for the substations. These include:

- Assessing soil conditions;
- Protecting the environment during the decommissioning activities; and,

- Ensuring the site is reclaimed to the pre-disturbance land capability and is compatible with current adjacent land use.

Generally, if a decision is made to decommission the lines and SS, the following steps will be taken towards the process in the two study areas:

- Dismantling of the towers and condition
- Dismantling of tower foundations
- Removal of all material from transmission line
- Dismantling and all material and equipment within the substations.
- Restoration of land to its original situation as much as possible

### PROJECT WASTES

A lot of wastes of different kinds are expected and generated during construction, decommissioning/dismantling, operation, and maintenance. Table 3.6.1 shows estimated quantity, sources, disposal method, place of disposal and the responsible party.

#### Waste Generation

Below is a list of envisaged project wastes and their potential sources:

- Leaves, branches, trunks, grasses from the clearing of the vegetation along ROW and Substation spaces.
- Kitchen wastes from human feeding and activities involving many workforces.
- Scrap metals – from cuttings, fittings, pylon member, nuts, bolts, and welding etc.
- Concrete waste – from foundations and plinths, including housing complex and control room construction.
- Nylons/Plastics – from human activities wrappings, water sachet, food etc.
- Oil spills from heavy duty machinery and equipment, transformers, breakers, and vehicle engines, either during normal run of old machines or maintenance work.
- Human wastes – from activities of personnel involved in the work or secondary business group.
- Operational activities – nylons, paper materials/office, human waste etc.

PCB is a toxic substance contained in certain transformer oil, which shall not be used in this project. Nevertheless, to control an accidental spill, provision shall be included in the project design for an API gravity oil separator as well as a bundwall or underground chamber as an integral part of transformer foundation is required to control PCB spillage.

SF 6 is an inert gas which possesses very high insulation resistance to high voltage and also acts as a very good medium for high voltage arc quenching. It is therefore deployed in high voltage switchgear operations

#### Waste Disposal

Waste disposal methods will include:

- Composting of biodegradables
- Selling metal, wood, and plastic scraps to buyers
- Reuse of materials e.g., packages, concrete, etc
- Dumping of remaining wastes at approved sites

Sewage from site camps will be vacuum-sucked into septic tanked trucks and taken to facilities approved by OGEPA. The EPC contractor shall contact these agencies during mobilisation stage to arrange the modalities.

Spent oils generated during transformer fillings, retrofitting and maintenance work will be stored in oil trench and oil sump at the substations and in line with requirements of the Basel Convention.

It is recommended to use mobile toilets at construction sites, and soak-a-way pits at camp sites.

**Table 2.8.1 Expected Type and Source(s) of Waste for the Proposed Transmission Line and Substations Project**

| Project Phase                 | Type of waste | Form of Waste                                       | Source of Waste                | Colour Code                              |
|-------------------------------|---------------|---|--------------------------------|--|
| Site preparation/<br>Clearing | Degradable    | Vegetation, kitchen waste                           | Camp, TLRoW                    | Green                                    |
| Construction                  | Degradable    | Kitchen waste                                       | Camp, TLRoW                    | Green                                    |
|                               | Mixed         | Metal scrap, wood, Nylon/plastics, spilled concrete | Camp, TLRoW                    | Brown /black                             |
|                               | Sewage        | Camp sites  | Personnel                      | Black                                    |
| Operation and<br>Maintenance  | Degradable    | Vegetation  | TLRoW                          | Green                                    |
|                               | Hazardous     | Spent oils  | Transformer                    | Brown/ black                             |
|                               |               | SF6 gas   | Transformer / circuit breakers | Colourless and odourless green house gas |

Source: Field Survey, 2017

#### Overview of emissions and wastes

##### Air emissions

Air emissions will be limited to fugitive dust and other emissions (e.g. from vehicle traffic, land clearing activities, and materials stockpiles) during the construction phase of the Project.

##### Noise emissions

During the construction phase, noise will be generated by heavy equipment's and truck traffic. During the operational phase, the corona of overhead transmission line conductors and high frequency currents of the transmission line may result in the creation of radio noise in the form of buzzing or humming. Typically, a transmission line RoW and conductor bundles are created to ensure radio reception at the outside limits remains normal. However, periods of rain sharply increase the streaming corona on conductors and may affect radio reception in residential areas near transmission lines.

**Electromagnetic fields (EMF)**

The power transmission through the proposed transmission line during operational phase will result in development of electromagnetic fields (EMF). Electric fields are produced by voltage and increase in strength as the voltage increases. Magnetic fields result from the flow of electric current and increase in strength as the current increases. Electric fields are shielded by materials that conduct electricity, and other materials, such as trees and building materials. Magnetic fields pass through most materials and are difficult to shield. Both electric and magnetic fields decrease rapidly with distance. It is expected that with the clearance requirements give in exposure will stay within the limits set by the International Commission on Non-Ionizing Radiation Protection (ICNIRP).

**Solid wastes**

Solid wastes will include sludge, food wastes, paper, batteries, glass, plastic, used parts, consumable items such as filters, packing materials, and other materials. A comprehensive waste management system will be in place that allows separation of waste streams to facilitate reuse or recycling. All hazardous materials, such as oily contained rags and filters, and batteries, shall be separated and stored separately.

To reduce waste, where possible the Project will require suppliers to provide consumable items in reusable containers or packaging. All wastes will be disposed of by waste registered contractors by Ogun State Environmental Protection Agency (OGEPA) who have been licensed by the appropriate authority.

**2.9 PROJECT COST AND SCHEDULE**

TCN is strongly committed to the completion of the proposed Lagos and Ogun States Transmission Lines and substations, which have estimated life span of 50 years, and every effort is geared towards actualizing this goal. The proposed project execution schedule is presented in Tables 2.9.1, 2.9.2 and 2.9.3 (Gantt Chart) and indicates construction commencement in Q1 2019 and commissioning scheduled for Q1, 2022.

The implementation schedule for the construction of the transmission lines and substations would follow the under-listed duration. It should be noted that some of the phases and activities will run concurrently to save time.

**Table 2.9.1: Implementation schedule for construction of Transmission lines**

| Transmission Lines                |   |                                  |
|-----------------------------------|---|----------------------------------|
| Phase I                           | Phase II  | Phase III                        |
| Pre-construction                  |   |                                  |
| Line Route Studies<br>ESIA<br>RAP | Engineering Procurement<br>and Construction (EPC)<br>Final Acceptance Test<br>(FAT) | Commissioning<br>Project closure |
| 12 months                         | 24 months   | 3 months                         |

**Table 2.9.2: Implementation schedule for construction of Substations**

| Substations       |                                |   |                                   |
|-------------------|--------------------------------|---|-----------------------------------|
| Phase I           | Phase II                       | Phase III   | Phase IV                          |
| Design & Approval | Procurement &<br>Manufacturing | Construction  | Communication,<br>Project closure |
| 6 months          | 12 months                      | 24 months (can run<br>concurrently with part<br>of phase 2) | 6 months                          |

Invariably, some percentage variation is allowed in the duration for contingencies. In that case, the average total duration for the entire project execution is put at 36 months. Construction works shall be scheduled at time crops have been harvested.

**Table 2.9.3: Proposed Project Implementation Schedule**

| ID | Task Mode | Task Name  | Duration | Start        | Finish       | Qtr 3 | 1st Half | 1st Half | 1st Half | 1st Half | 1st Half | 1st Half |
|----|-----------|--|----------|--------------|--------------|-------|----------|----------|----------|----------|----------|----------|
|    |           |  |          |              |              | Qtr 1 | Qtr 2    | Qtr 3    | Qtr 1    | Qtr 2    | Qtr 3    | Qtr 1    |
| 1  |           | Lagos and Ogun States Proposed Transmission and Substation Projects      | 51 mons  | Mon 04/01/16 | Fri 29/11/19 |       |          |          |          |          |          |          |
| 2  |           | <b>Feasibility studies</b>   | 12 mons  |              | Fri 02/12/14 |       |          |          |          |          |          |          |
| 3  |           | Line-route studies   | 4 mons   | Thu 15/09/11 |              |       |          |          |          |          |          |          |
| 4  |           | Environmental and Social Impact Assessment (EIA)                         | 9 mons   | Wed 08/06/16 | Tue 14/02/17 |       |          |          |          |          |          |          |
| 5  |           | Resettlement Action Plan (RAP)   | 9 mons   | Wed 08/06/16 | Tue 14/02/17 |       |          |          |          |          |          |          |
| 6  |           | Front End Engineering Design   | 12 mons  | Tue 05/01/16 | Mon 05/12/16 |       |          |          |          |          |          |          |
| 7  |           | EPC contract award Process   | 6 mons   | Tue 06/12/16 | Mon 22/05/17 |       |          |          |          |          |          |          |
| 8  |           | Mobilization   | 2 mons   | Thu 08/06/11 |              |       |          |          |          |          |          |          |
| 9  |           | Check survey of EPC contractor   | 1 mon    | Wed 09/08/17 | Tue 05/09/17 |       |          |          |          |          |          |          |
| 10 |           | Transmission line and substations detailed design                        | 2 mons   | Thu 07/09/17 | Mon 01/11/17 |       |          |          |          |          |          |          |
| 11 |           | Material production (tower members, conductor, insulator, line hardware) | 7 mons   | Mon 04/12/17 | Fri 15/06/18 |       |          |          |          |          |          |          |
| 12 |           | Material testing   | 4 mons   |              |              |       |          |          |          |          |          |          |

|                    |       |                       |       |                    |
|--------------------|-------|-----------------------|-------|--------------------|
| Task               | ————— | Inactive Summary      | ————— | External Tasks     |
| Split              | ..... | Manual Task           | ————— | External Milestone |
| Milestone          | *     | Duration-only         | ————— | Deadline           |
| Summary            | ————— | Manual Summary Rollup | ————— | Progress           |
| Project Summary    | ————— | Manual Summary        | ————— | Manual Progress    |
| Inactive Task      | ————— | Start-only            | ————— |                    |
| Inactive Milestone | ————— | Finish-only           | ————— |                    |

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| ID | Task Mode | Task Name   | Duration | Start        | Finish       | Qtr 3 | 1st Half | 1st Half | 1st Half | 1st Half | 1st Half | 1st Half |
|----|-----------|---|----------|--------------|--------------|-------|----------|----------|----------|----------|----------|----------|
|    |           |   |          |              |              | Qtr 1 | Qtr 2    | Qtr 3    | Qtr 1    | Qtr 2    | Qtr 3    | Qtr 1    |
| 13 |           | Material shipment                                       | 2 mons   |              | Fri 24/08/16 |       |          |          |          |          |          |          |
| 14 |           | Clear and grub site along transmission line corridor    | 1 mon    | Mon 08/01/18 | Fri 02/02/18 |       |          |          |          |          |          |          |
| 15 |           | Foundations for tower installation and substation works | 4 mons   | Thu 31/03/18 | Wed 20/06/18 |       |          |          |          |          |          |          |
| 16 |           | Tower erection and substation works                     | 8 mons   | Mon 30/07/18 | Fri 08/02/19 |       |          |          |          |          |          |          |
| 17 |           | Conductor stringing                                     | 6 mons   | Fri 15/02/19 |              |       |          |          |          |          |          |          |
| 18 |           | Commissioning and testing                               | 1 mon    |              |              |       |          |          |          |          |          |          |
| 19 |           | Reinstating and clean up                                | 1 mon    |              | Fri 15/11/16 |       |          |          |          |          |          |          |
| 20 |           | Demobilization  | 0.5 mon  |              | Fri 29/11/16 |       |          |          |          |          |          |          |
| 21 |           | Commissioning   | 1 day    |              |              |       |          |          |          |          |          |          |

|                    |       |                       |       |                    |
|--------------------|-------|-----------------------|-------|--------------------|
| Task               | ————— | Inactive Summary      | ————— | External Tasks     |
| Split              | ..... | Manual Task           | ————— | External Milestone |
| Milestone          | *     | Duration-only         | ————— | Deadline           |
| Summary            | ————— | Manual Summary Rollup | ————— | Progress           |
| Project Summary    | ————— | Manual Summary        | ————— | Manual Progress    |
| Inactive Task      | ————— | Start-only            | ————— |                    |
| Inactive Milestone | ————— | Finish-only           | ————— |                    |

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## 2.10 SOCIAL BASELINE AROUND THE PROJECT AREA

Social baseline data was gathered using a combination of desk-top studies and household surveys, Focus Group Discussions (‘FGDs’) and in-depth interviews with community leaders, affected persons, like community key stakeholders like youth, women and vulnerable members. Field study was conducted to identify and characterize all assets and persons along the proposed project corridor. Prior to field study, adequate consultations were made to all stakeholders along the RoW as well as government and traditional institutions. Also, in order to meet the objectives of the study, the consultants were adopted systematic, integrated, participatory and collaborative approaches in the preparation of this RAP. A baseline census survey was conducted in the affected project area. Information was gathered through document reviews, community consultations, questionnaire administrations, Focus Group Discussions (FGDs), in-depth interviews (IDI), key informant interviews with relevant stakeholders including traditional and political leaders, opinion leaders, as well as heads of relevant government agencies at both State and Local Government levels, and selected persons from the communities. Topographic survey was conducted and the baseline census survey/enumeration and valuation exercise were also being conducted by the consultants on the transmission line route. Non-participatory observation techniques and visual photography sessions were also being utilized as complimentary data collection tools.

The details of baseline outcome of study area are presented in Chapter 5.

## CHAPTER THREE: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

### 3.1 FRAMEWORK IN NIGERIA

Land use and ownership in Nigeria is governed by the Land Use Act of 1978. Prior to the promulgation of the Act, there was a multiplicity of land tenure systems in Nigeria with the Maliki Law system dominant in pre-colonial northern Nigeria until 1910 when an Ordinance conferred on the colonial governor control of all lands in that part of the country. In the rest of Nigeria, land was owned by extended families, lineages or whole communities with the head of the families or communities having custodial rights over land.

Under the differing land tenure systems existing before the Land Use Act, particularly in southern Nigeria, individuals typically only had a right to use communal or family land, either for a definite or an indefinite period. Such usufruct rights could not translate into personal ownership of the land.

The land tenure system in existence before the Land Use Act encouraged multiple sales of the same parcel of land to different people because of the absence of a titling system or public record of extant land holdings. It also made it difficult for foreign entities and governments to acquire land for public infrastructure projects, due to the customary reluctance of communities to cede ownership of land to non-natives.

With the promulgation of the Land Use Act, the ultimate title of all lands situated in Nigeria now vests in the Governor of each State, in trust and for the common benefit of all Nigerians (3). Ultimately, the Land Use Act was promulgated to support fair and equitable access to land, and to encourage its productive use through: (i) a system of registration of titles; (ii) placing a cap on tenure of rights over land; (iii) the issuance of paper titles (Certificates of Occupancy); and (iv) the institution of a regime of rents, fees and taxes. The policies and regulatory frameworks listed below guided the preparation of this RAP.

#### 3.1.1 Institutional Framework

In order to ensure the successful implementation of the RAP, an institutional framework has been developed with clearly defined roles and responsibilities. The design keeps all stakeholders in continuous contact through the project life. The institutional actor for resettlement and compensation includes project team, State Government, community leaders, NGOs, and PAPs. This framework elaborates the role of various stakeholders in the implementation and administration of the RAP. It further clarifies the role of PAPs and their responsibilities in the entire exercise. The major groups that will be involved in the compensation/resettlement process are the Project Implementation Unit (PIU) and the Chemical Resettlement and Environment (CR&E) Departments of TCN and a constituted PAPs Committee, comprising of key stakeholders including representatives of the Federal Ministry of Environment (FMENV), Ogun State Government team and the National Electricity Regulatory Commission (NERC), etc.



### 3.1.2 Legal and Regulatory Framework

One of the principles of the Resettlement Action Plan (RAP) is that resettlement planning should adhere to national policies and legislation, and international best practices. The legal framework of this RAP describes all laws, decrees, policies, and regulations relevant to the resettlement activities associated with the proposed project.

This section provides a brief overview of the Nigeria laws and provisions related to land use, planning, acquisition, management and tenure, and more specifically the legislations related with land expropriation or acquisition, land valuation and land replacement. It also provides the World Bank Policy on resettlement.

#### 3.1.2.1 National Policies

Some of the policies and laws related to resettlement social issues in Nigeria are:  
Environmental Impact Assessment Act (Decree 86) of 1992 – which requires that all projects be screened using the procedure stated in the Act to determine the kind of assessment to be carried out for the project.

Nigeria Land Use Act, 1978 (revised in 1990): The Land Use Act addresses all matters relating to land acquisition and resettlement. This Act vests all land on the Governor of each state to hold in trust for the general public. The Governor exercises control over all urban land while non-urban land is in the control of the Local Government Authority. According to this Act, statutory rights of occupancy are granted by the Governor and customary rights of occupancy are granted by the local government authority. Land administration is usually handled by the ministry of lands in the various states. Lands in the Federal Capital Territory are managed by the Federal Capital Development Authority (FCDA) but the Abuja Geographic Information System (AGIS) is the custodian of all land data in the FCT.

Based on the provisions of this Act the Governor can revoke statutory rights of occupancy in the interest of the general public. NEPA (PHCN) used to have power to acquire land for power projects but this power was lost to the reforms that brought about the implementation of the Power Sector Reform Act of 2005. TCN now has to acquire land like every other individual or organization as provided by law and adequate compensation now has to be paid where resettlement issues are involved. The RPF covers land acquisition in detail.

The Mineral Resources Act of 1990 requires that transmission line corridors not be established through Mineral and Natural Resource Areas, so as to protect their economic value.  
The Wild Animal Preservation Act of 1990 prohibits transmission line construction through areas formally designated as Wild Preservation Areas or national parks.  
The Federal Environmental Protection Agency 'Environmental Impact Assessment (EIA) Act' requires the assessment of impacts and provision of mitigations prior to project implementation

#### 3.1.2 National Laws

The Land Use Act Cap 202, 1990 Laws of the Federation of Nigeria is the key legislation that has direct relevance to the project. Relevant Sections of these laws as may relate to this Project with respect to land ownership and property rights, resettlement and compensation are

summarised in this section.

The Land Use Act is the applicable law regarding ownership, transfer, acquisition and all such dealings on Land. The provisions of the Act vest every Parcel of Land in every State of the Federation in the Executive Governor of the State. He holds such parcel of land in trust for the people and government of the State. The Act categorized the land in a state to urban and non-urban or local areas. The administration of the urban land is vested in the Governor, while the latter is vested in the Local Government Councils. At any rate, all land irrespective of the category belongs to the state while individuals only enjoy a right of occupancy as contained in the certificate of occupancy, or where the grants are “deemed”.

The concept of ownership of land as known in the western context is varied by the Act. The Governor administers the land for the common good and benefits of all Nigerians. The law makes it lawful for the Governor to grant statutory rights of occupancy for all purposes; grant easements appurtenant to statutory rights of occupancy and to demand rent. The Statutory rights of Occupancy are for a definite time (the limit is 99 years) and may be granted subject to the terms of any contract made between the state Governor and the holder.

The Local Government Councils may grant customary rights of Occupancy for agricultural (including grazing and ancillary activities), residential and other purposes. But the limit of such grant is 500 hectares for agricultural purpose and 5,000 for grazing except with the consent of the Governor. The local Government, under the Act is allowed to enter, use and occupy for public purposes any land within its jurisdiction that does not fall within an area compulsorily acquired by the Government of the Federation or of relevant State; or subject to any laws relating to minerals or mineral oils.

The State is required to establish an administrative system for the revocation of the rights of occupancy, and payment of compensation for the affected parties. So, the Land Use Act provides for the establishment of a Land Use and Allocation Committee in each State that determines disputes as to compensation payable for improvements on the land (Section 2 (2) (c).

In addition, each State is required to set up a Land Allocation Advisory Committee, to advise the Local Government on matters related to the management of land. The holder or occupier of such revoked land is to be entitled to the value of the unexhausted development as at the date of revocation (Section 6) (5). Where land subject to customary right of Occupancy and used for agricultural purposes is revoked under the Land Use Act, the local government can allocate alternative land for the same purpose (section 6) (6).

If Local Government refuses or neglects within a reasonable time to pay compensation to a holder or occupier, the Governor may proceed to effect assessment under section 29 and direct the Local Government to pay the amount of such compensation to the holder or occupier (Section 6) (7).

Where a right of occupancy is revoked on the ground either that the land is required by the Local, State or Federal Government for public purpose or for the extraction of building materials, the holder and the occupier shall be entitled to compensation for the value at the date of revocation of their unexhausted improvements. Unexhausted improvement has been defined by the Act as:

*“Anything of any quality permanently attached to the land directly resulting from the expenditure of capital or labour by any occupier or any person acting on his behalf and increasing the productive capacity the utility or the amenity thereof and includes buildings plantations of long-lived crops or trees, fencing walls, roads and irrigation or reclamation works, but does not include the result of ordinary cultivation other than growing produce”.*

Developed Land is also defined in the generous manner under Section 50(1) as follows:

*“Developed land means land where there exists any physical improvement in the nature of road development services, water, electricity, drainage, building, structure or such improvements that may enhance the value of the land for industrial, agricultural or residential purposes”.*

It follows from the foregoing that compensation is not payable on vacant land on which there exist no physical improvements resulting from the expenditure of capital or labour. The compensation payable is the estimated value of the unexhausted improvements at the date of revocation.

Payment of such compensation to the holder and the occupier as suggested by the Act is confusing. Does it refer to holder in physical occupation of the land or two different persons entitled to compensation perhaps in equal shares? The correct view appears to follow from the general tenor of the Act. First, the presumption is more likely to be the owner of such unexhausted improvements. Secondly, the provision of section 6(5) of the Act, which makes compensation payable to the holder and the occupier according to their respective interests, gives a pre-emptory directive as to who shall be entitled to what.

Again, the Act provides in section 30 that where there arises any dispute as to the amount of compensation calculated in accordance with the provisions of section 29, such dispute shall be referred to the appropriate Land Use and Allocation Committee. It is clear from section 47 (2) of the Act that no further appeal will lie from the decision of such a committee. If this is so, then the provision is not only retrospective but also conflicts with the fundamental principle of natural justice, which requires that a person shall not be a judge in his own cause. The Act must, in making this provision, have proceeded on the basis that the committee is a distinct body quite different from the Governor or the Local Government. It is submitted, however, that it will be difficult to persuade the public that this is so since the members of the committee are all appointees of the Governor.

Where a Right of Occupancy is revoked for public purposes within the state of the Federation; or on the ground of requirement of the land for the extraction of building materials, the quantum of compensation shall be as follows:

*In respect of the land, an amount equal to the rent, if any, paid by the occupier during the year in which the right of occupancy was revoked.*

*In respect of the building, installation or improvements therein, for the amount of the replacement cost of the building, installation or improvements to be assessed on the basis of prescribed method of assessment as determined by the appropriate officer less any depreciation, together with interest at the bank rate for delayed payment of compensation. With regards to reclamation works, the quantum of compensation is such cost as may be substantiated by documentary evidence and proof to the satisfaction of the appropriate officer.*

*In respect of crops on land, the quantum of compensation is an amount equal to the value as prescribed and determined by the appropriate officer.*

Where the right of occupancy revoked is in respect of a part of a larger portion of land, compensation shall be computed in respect of the whole land for an amount equal in rent, if any, paid by the occupier during the year in which the right of occupancy was revoked less a proportionate amount calculated in relation to the area not affected by the revocation; and any interest payable shall be assessed and computed in the like manner. Where there is any building installation or improvement or crops on the portion revoked, the quantum of compensation shall follow that outlined in paragraph (ii) above and any interest payable shall be computed in like manner.

### **Electricity Supply Regulations**

National Electric Power Authority - NEPA (now TCN) guidelines established a minimum horizontal distance between a building and overhead wires as:

7.5 meters for 11 kV wires (reportedly revised to 4.5 meters)

15 meters for 33 kV wires (reportedly revised to 7.5 meters)

30 meters for 132 kV wires, and

60 meters for 330 kV wire.

The safety requirement for electrical lines is set out in the Electricity Supply Regulations of 1996 made under sections 3 and 4 of the Electricity Act. Sections 60 and 61 of these regulations specify that power lines must be clear from buildings and other structures by specified distances as shown in Table 3.1.

**Table 3.1: Required Distances between Structures and Power Lines**

| <b>Line Voltage</b> | <b>Distance (Meters)</b> |
|---------------------|--------------------------|
| 330KV               | 6.0                      |
| 132KV               | 4.0                      |
| 33KV                | 3.0                      |
| 11KV and Under      | 2.4                      |

*Source: Sections 60, 61, S.I. 6 of 1966 Electricity Supply Regulations, Federal Republic of Nigeria Official Gazette, No. 17, Vol. 83, April 2, 1996. Lagos: Federal Government Press*

The transmission line has been designed to incorporate safe recommendations for distances to structures and settlements as well as human exposure. TCN took into consideration the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines for human exposure to electromagnetic fields as well as local electricity supply regulations in Nigeria.

### **National Electricity Regulatory Commission**

Section 96 of the Electric Power Sector Reform Act 2005 (Act No. 6 of 2005) empowers the National Electricity Regulatory Commission (NERC) to regulate the operations of the power sector. In a draft regulation on acquisition of land and access rights for power projects, the commission outlines the following general guidelines for acquiring land or rights of way:

The Commission shall discourage compulsory acquisition of land and encourage Licensees to enter into negotiations with PAPs for voluntary acquisition.

Compulsory acquisition in accordance with the provisions for the Land Use Act shall only be adopted and allowed where the PAP unreasonably withholds or refuses to give the Licensee Free Prior Informed Consent to acquire land voluntarily by negotiation, and the commission evaluates an application by the licensee, and makes declaration that the land is required by the licensee.

Prior to acquiring any land, the Licensee shall comply with applicable State or Federal laws and this regulation but may be exempted from complying with this regulation to any extent permitted by the commission, where voluntary acquisition is not feasible.

The Licensee, prior to acquisition, shall submit its project design to the Commission for review to ensure that Project impacts are reduced or minimized and the Commission may require a Licensee to explore all viable alternative project designs where the design would entail large scale adverse social and environmental impact.

To ensure that best practices are adopted, the Licensee shall as far as possible follow procedures consistent with the Regulation during all the phases of acquisition of Land.

PAPs shall be consulted and enabled by the Licensee to participate in the planning, implementation and monitoring of the acquisition and resettlement of displaced persons.

Where it is not feasible to obtain consent of the land owner the licensee shall:

Apply to the Commission in the form of Application for Acquisition of land  
Prepare a Resettlement Action Plan (RAP) where the design would entail large scale adverse social and environmental impact, which will contain measures to improve the livelihoods and standards of living of PAPs or at least restore them to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

The Commission shall issue the necessary declaration for compulsory acquisition of land in accordance with the Land Use Act upon being satisfied that:

The Licensees' best efforts to acquire land voluntarily by negotiation with PAPs have failed.

The Licensee has proven that the project cannot be sited on another property other than the one that is the subject matter of the application.

The application made by the licensee pursuant to bullet point 7 (1) (a) of the Regulation; and  
The RAP made pursuant to clause 7 (1) (b) of the Regulation which together with government measures will address the relevant standards of the Regulation.

#### **Law on Compensation for Land and Other Assets**

The Land Use Act makes it lawful for the Governor to revoke a right of occupancy for overriding public interest. For both statutory and customary rights of occupancy, public interest includes the requirement of land for mining purposes or transmission line or for any associated purposes. Any such revoked right of occupancy shall be entitled to compensation based on the provisions of the Land Use Act. However, no compensation shall be awarded with respect to unoccupied land as defined in the Land Use Act, except to the extent and circumstances specified in the Land Use Act (Section 20, Subsection 4).

By the provision of the Land Use Act as well as that of the NEPA Operational Decree No.24 of 1972, TCN as a federal agency, was also empowered to acquire land. Furthermore, since the

Land Use Act gives to the State the ownership of all land, compensation by TCN will be restricted to structures, installations, and improvements on the land, not the land itself. However, the act does require the State or Local Government to provide alternative land for affected people who will lose farmland and alternative residential plots for people who will lose their houses. TCN generally did this for hydropower resettlement programmes, but not for transmission line and sub-station projects, or for distribution projects. Alternative land was not provided to people who lost land for tower base construction, or who were relocated to clear the right of way. In some areas closer to towns and cities, additional cash compensation was paid, on a case by case basis, to people who lost building plots, other land, or houses to make way for substations. Alternative land was not provided.

#### **Land Registration / Land Ownership Law and Property Rights**

Each State government in Nigeria has laws requiring registration of interests in land. The Land Use Act provides for the establishment of a Land Use and Allocation Committee in each State that determines disputes as to the amount of compensation payable under this Act for improvements on land. This Committee also has the responsibility for advising the Governor on any matter connected with resettlement. In Ogun State, the Ministry of Lands and Survey is the main government agency in the State. The Ministry has a good knowledge of land ownership in the state, and also has its own estate surveyor that takes part in the assessment and determination of valuation.

The lands to be acquired in most of the communities are rural land. The provisions of the Land Use Act vests the administration of rural land in the hands of the Local Government Council; in reality, the community leadership and traditional authorities remain the custodians of rural land, and play a vital role in determining ownership and resolving disputes. It is for this purpose that it becomes needful to rely on the traditional authority in the affected communities, and to also seek out the local chiefs, and community leadership for assistance in identifying landowners as well as resolution of disputes.

#### **Land Acquisition, Resettlement / Re-location Laws**

In Nigeria, the legal framework for land acquisition and resettlement is formulated in the Land Act Use of 1978 (modified in 1990) that in most regards is in accord with the World Bank Group policy for resettlement. The key differences between the Land Use Act and the World Bank's OP 4.12 and PS 5 are related to rehabilitation measures, which are neither proscribed nor mandated in the Act.

The Land Use Act provides for the establishment of a Land Use and Allocation Committee in each State that has responsibility for advising the State Governor on any matter connected with resettlement. This Act provides an option of resettlement in case of revocation of right of occupancy in respect to any developed land on which a residential building has been erected. Under this Act, the Governor or Local Government may use official discretion to offer in lieu of compensation, resettlement in any other place or area by way of a reasonable alternative accommodation. While within the national and local legal system, the land-for-land arrangements are discretionary; TCN makes every effort to collaborate with State Governors and the Local Governments. This will allow the affected owners to decide whether they might want cash compensation or opt for alternative land with similar characteristics (plus sufficient compensation to replace the loss assets, such as homes, fish ponds/traps, tombs, etc.).

### 3.1.3 TCN Policy

TCN is the only successor company under PHCN. PHCN formerly called NEPA, used to be the sole electricity utility in Nigeria responsible for electric power generation, transmission and distribution. The change in name to PHCN was affected by the implementation of the Power Sector Reform Act (2005). This Act unbundled NEPA into six generating companies (GenCos), eleven distribution companies (DisCos) and one Transmission Company of Nigeria (TCN). These companies were initially government-owned parastatals but all except TCN have been privatized.

The transmission company of Nigeria is responsible for the transmission of electric power from the generating stations to the Discos through the national grid. This company is responsible for maintaining the national grid and wheeling energy to the distribution companies.

TCN has an environment department (ERSU-TCN) which was set up as part of the investments under NTDP. They are responsible for ensuring compliance with environmental regulations and TCN such as environmental assessment and management of projects sites health and safety.

**National Electricity Regulatory Commission (NERC):** The National Electricity Regulatory Commission was established by the implementation of the Power Sector Reform Act (2005). NERC, by this Act is charged with the responsibility of regulating the activities of the electric power sector. As part of its functions, the commission is to set rules and regulations and also enforce them. NERC also issues licenses and ensures compliance with market rules and other operating guidelines. The commission is headed by a chairman and is assisted by a vice-chairman together with other commissioners.

**The Electric Power Implementation Committee (EPIC):** This committee was established by the National Council on Privatization (NCP) to carry out the synchronization, coordination and monitoring of all activities leading to restructuring and privatization of the electric power sector. The duties of EPIC include: formulation of blueprints for the reformation of the electric power sector; formulation and review of policies aimed at entrenching a vibrant and transparent power sector; source for sustainable private sector involvement in the power sector; and supervise the activities of all government agencies involved in the activities leading to the final privatization of NEPA.

**National Electric Power Policy:** In March 2001 the Federal Government approved an Electric Power Policy put together by EPIC to serve as a guide for the power sector reform process. This policy divides the reform process into Transition stage (coming on stream of Project Implementation Plans (PIPs), Emergency Power Providers (EPPs), restructuring and unbundling of NEPA and privatization of selected DisCos), Medium Stage (post privatization of NEPA – energy trading between GenCos, TCN and DisCos) and Long Run (competitive market and competitive pricing of energy to ensure the sustainability of investments by private sector. All Generating, Transmission and Distribution companies are expected to be fully privately owned as time goes on).

## 3.2 INTERNATIONAL FUNDER POLICIES, PROCEDURES AND GUIDELINES

### 3.2.1 World Bank Safeguard Policy

The World Bank's Operational Policy 4.12 was updated in March 2007. The OP includes safeguards to address and mitigate impoverishment risks related to project development and involuntary resettlement.

World Bank OP 4.12 addresses direct economic and social impacts that both result from Bank-assisted investment projects and are caused by the involuntary taking of land (resulting in relocation or loss of shelter, loss of assets or access to assets and/or loss of income sources or means of livelihood) or the involuntary restriction of access to legally designated protected areas resulting in adverse impacts on the livelihoods.

#### The OP establishes three overall objectives:

Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs.

Where it is not feasible to avoid resettlement; resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programmes.

Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

The project proponent is responsible for preparing, implementing, and monitoring a resettlement plan (or a resettlement policy framework) that adequately documents the resettlement planning process and agreed procedures. Under OP 4.12, the implementation of resettlement activities is linked to the implementation of the investment component of the project to ensure that displacement or restriction of access does not occur before necessary measures for resettlement are in place. Specifically, the taking of land and related assets may take place only after compensation has been paid and, where applicable, resettlement sites and moving allowances have been provided to the displaced persons.

World Bank's OP 4.12 specifies that resettlement compensation<sup>1</sup> and assistance should be offered to all displaced persons regardless of the total number affected, the severity of impact, and whether or not they have legal title to the land.

This project will comply with the World Bank's Operational Policy 4.12 on involuntary resettlement and Performance Standard 5 on Land Acquisition and Involuntary Resettlement.

<sup>1</sup> Payment in cash or in kind for an asset or a resource that is acquired or affected by a project at the time the asset needs to be replaced.

Due to the high voltage capacity of the proposed transmission line, TCN's practice is to avoid built up areas in order to reduce public exposure. Avoidance of involuntary resettlement was therefore a key consideration in the selection of the transmission line RoW. The line routes were designed so as to cause the least possible displacement and/or disruption to the host population.

OP 4.12 aims to ensure that the following key principles of resettlement are in place:

The Project Affected Persons<sup>2</sup> (PAPs) are being offered choices including alternative relocation options that are technically and economically feasible to them and are culturally appropriate. Preferences are given to land-based resettlement strategies of the displaced people whose livelihoods are land-based and are indigenous (But, no indigenous person by the definition of the World Bank is present in the project areas). Such strategies must be compatible with their cultural preferences and should be prepared in consultations with them. The primary objective of consultations is to identify and promptly address the concerns of the PAPs regarding their rights and interests. This was accomplished through diverse forms of consultative forums that reached out to the various categories and groups of persons in the affected areas. SEEMS has carried out detailed consultations with identified stakeholders within the project area. Consultation activities covered the Ogun State Government, and the main Local Government Areas that will be affected by the project. After consultation and sensitisation programmes at the State and LGA levels, SEEMS also initiated and had consultations with traditional rulers, leaders of affected communities, and identified family heads/individuals that will be affected by the project.

When the impacts require physical relocation, the compensation measures must include: provision of assistance during relocation (moving allowance), residential housing or housing sites that are at least equivalent to the old site in terms of productive potential and location advantages.

Resettlement should include measures to ensure that the affected people are offered support for a reasonable transition period based on the estimate of time required to restore the original level of their livelihoods and standards of living. Affected persons shall be paid adequate compensation to move during the transition period.

The affected people should also be provided with development assistance for losses incurred. Presently, the information obtained from the enumeration and valuation exercise had being entered into a database to facilitate compensation/resettlement planning, implementation and monitoring. SEEMS Nigeria is responsible for developing the database and ensuring that all the identified persons, whose properties will be affected by the proposed project, are captured in the database. Efforts will be made to ensure that resettlement/compensation payments are properly computed and that the database is maintained accordingly.

Compensations in line with the JICA Guidelines and World Bank's OP 4.12/PS 5 as well as TCN's procedures will be made to owners of affected land, structures, shrines, farmlands and other properties before demolitions. TCN has in place a standard procedure for RoW acquisition, enumeration, evaluation, resettlement, and compensation activities. Particular attention should be

<sup>2</sup> Any person who, as a result of the implementation of a project, loses the right to own, use, or otherwise benefit from a built structure, land (residential, agricultural, or pasture), annual or perennial crops and trees, or any other fixed or moveable asset, either in full or in part, permanently or temporarily.

paid to the needs and concerns of the poor and vulnerable groups including peoples with disability, the landless, women, and children including the elderly, and ethnic minorities' compensation. Twelve (12) individuals with disabilities were identified during the survey. These physically challenged persons were impacted by the proposed RoW; their buildings which have reached completion levels are directly affected by the line routes. Two of these disabled are cripples while another two have sight problem. These four individuals will require special attention and should be given preference in the process of implementation, and appropriate action taken to protect their interest. One of them cripples, Mr Taiwo Enock Ayininuola, a 52 year old stock broker specifically requested for resettlement. He has four (4) bedroom bungalow and two (2) rooms self-contained at the back of the main building.



A cripple man: Mr Taiwo Enock Ayininuola.

Another vulnerable man affected by the project

Compensations must be made in cash or in-kind depending on the preferences made by the affected people. However, virtually all affected persons with the exception of one who has physical disability opted for compensation in cash rather than in kind. The compensation should be made promptly, in form of a single payment and shall be at a market value, which shall be considered as full replacement cost<sup>3</sup> for the lost assets.

In accordance with the Land Use Act, all lands belong to the Federal Government. Compensation shall be paid for revocation of rights of occupancy on lands and in the absence of that compensates only for improvements and assets on the land. The law is known by the affected communities. However, this project will comply with the World Bank OP.12 PS 5 and the affected persons will be duly compensated for the land.

<sup>3</sup> The rate of compensation for lost assets (with regard to land and structures) must be calculated at full replacement cost, that is, the market value of the assets plus transaction costs.

Steps were taken to ensure that every affected property and owner was identified, confirmed, and documented for due compensation. Based on the data collected so far from the baseline survey and valuation exercise, some rights of occupancy will be revoked in the areas. Some of the affected lands had crops and economic trees; some had completed and uncompleted structures that serve various purposes; there were shops, shrines and tombs in few of the affected areas. The affected persons enumerated and documented during the survey of the transmission line route have one or a couple of the listed assets which will form the basis for compensation.

A fair and equitable set of compensation options shall be utilized. Displaced persons shall be compensated for their losses at current market prices. Cash compensation for lost assets may be appropriate under the following circumstances:

Where the livelihoods are land based, but the land acquired by the project is a small fraction of the affected asset and the residual is economically viable.

Where there is a sufficient supply of land, housing and labour which can be used by the displaced person; and

Where the livelihoods are not land based

This RAP aims to promote participation of affected people in resettlement/compensation planning and implementation. Displaced persons shall be meaningfully consulted and provided opportunities to participate in planning and implementing resettlement or compensation programmes. They shall also be assisted in their efforts to improve their livelihoods and standards of living. In compliance with OP 4.12 and PS 5, their standard of living shall at least be restored, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of the project implementation, whichever is higher. Compensations will be paid based on the current market price for the assets that will be affected by the RoW and for properties in one of the substations at Likosi/ Dejuwogbo. This will be paid using enumeration and valuation data and will be completed prior to project commencement.

The budget for the RAP will be determined using the data acquired during the baseline census enumeration and valuation exercise of the affected communities. The compensation rates have been reviewed in line with current market prices for affected properties within the state. The budget will include 10% mark-up to cover the RAP administration and monitoring costs.

The budget is currently being finalized ahead of payment. TCN will ensure that resettlement/compensation costs are built into the overall project budget as up-front costs and also ensure that payment for resettlement/compensation of PAPs are completed before the proposed project activities commence.

The OP 4.12 indicates that compensation should be made to the following three categories of affected population:

Those who have formal rights to land, including customary and traditional rights recognized under the local laws

Those who do not have formal rights to land at the time the census began but have a claim to such lands or assets, and

Those who have no recognisable legal right or claim on land they are occupying.

In regard to public consultation and disclosure, the OP 4.12 indicates that:

The affected people should be identified and informed about their options and rights in regard to resettlement and should be given the opportunity to participate in planning, implementing, and monitoring of the relocation activities.

A census of the affected population and broad consultations in the affected communities should be undertaken in order to not only identify those to be affected, but also to discourage inflow of people not eligible for assistance.

Participants in the consultations must include community leaders, NGOs, CBOs and other interest groups active in the project area.

An independent monitoring and grievance procedure will be put in place for the successful implementation of the RAP. In addition to internal monitoring that will be provided by TCN, an independent team will be responsible for the external monitoring of the resettlement/compensation process. TCN management will engage and pay for the services of the independent monitoring team. Relevant resources such as transportation, access to the RAP strategies and programs, and to PAPs, among others, shall be provided by TCN. The independent monitoring team will be retained by TCN to periodically carry out external monitoring and evaluation of the implementation of the RAP process. The independent monitoring team will provide quarterly reports to TCN and the Project Affected Persons' Committee which comprises of the PAPs, the State Government and relevant stakeholders.

### 3.2.2 IFC Performance Standards for Investment

International Finance Corporation (IFC) Performance Standards on Social and Environmental Sustainability. The International Finance Corporation adopted new Performance Standards on Social and Environmental Sustainability in April 2006. The outcome-based Performance Standards (PS) updated existing IFC safeguard policies, strengthening social and environmental policy, and prescribing more comprehensive and integrated impact assessments. The IFC approved updated Performance Standards on Social and Environmental Sustainability in May 2011, effective January 2012.

Performance Standard 1, Social and Environmental Assessment and Management System, and Performance Standard 5, Land Acquisition and Involuntary Resettlement, are most directly relevant to this Resettlement Action Plan.

Performance Standard 1 structures the way in which environmental and social issues are to be handled and serves as the core around which the other Standards are framed.

Performance Standard 1 requires that affected communities be appropriately engaged on issues that could potentially affect them. Key requirements include:

- Ensuring free, prior and informed consultation and facilitating informed participation,
- Obtaining broad community support,
- Focusing on risks and adverse impacts, and proposed measures and actions to address these
- Undertaking consultation in an inclusive and culturally appropriate manner
- Tailoring the process to address the needs of disadvantaged or vulnerable groups.

The IFC's *Performance Standard 5: Land Acquisition and Involuntary Resettlement* recognizes that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land and has the following key objectives:

- To avoid, and when avoidance is not possible, minimize displacement by exploring alternative project designs
- To avoid forced eviction
- To anticipate and avoid, or where avoidance is not possible, minimize adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost (market value of the asset plus transaction costs) and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected
- To improve, or restore, the livelihoods and standards of living of displaced persons
- To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure (i.e. resettled to a site that they can legally occupy and where they are protected from the risk of eviction at resettlement sites).
- Requires that the project proponent identify, via a census, those persons who be displaced and establish a cut-off date to establish eligibility for compensation
- Requires project proponent to offer land-based compensation, where feasible, where livelihoods of displaced persons are land-based, or where land is collectively owned
- Suggests application of the Performance Standard in situations where displacement unrelated to land acquisition has occurred because of the adverse economic, social or environmental impacts of project activities
- Introduces the concept of negotiated settlements to avoid forcible removal of people
- Requires preparation of a Resettlement Action Plan, which demonstrates how displacement will be managed in accordance with the Performance Standard.
- Requires that standards for compensation be transparent and consistent within a project, and established with the participation of those impacted.

Involuntary resettlement in IFC PS 5 refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or means of livelihood) as a result of project-related land acquisition. Resettlement is considered involuntary when affected individuals or communities do not have the right to refuse land acquisition which results in displacement. Where it is unavoidable, appropriate measures to mitigate adverse impacts on displaced persons and host communities must be carefully planned and implemented.

Project proponents must, according to the Performance Standard, offer displaced persons and communities' compensation for loss of assets at full replacement cost and other assistance to help them improve or at least restore their standards of living or livelihoods.

Replacement value is defined as follows:

**Agricultural Land** - The market value of land of equal productive use or potential located in the vicinity of the affected land, plus the cost of preparation to levels similar to or better than those of the affected land, plus the cost of any registration and transfer taxes.

**Land in Urban Areas** - The market value of land of equal size and use, with similar or improved public infrastructure facilities and services preferably located in the vicinity of the affected land, plus the cost of any registration and transfer taxes.

**Household and Public Structures:** The cost of purchasing or building a new structure, with an area and quality similar to or better than those of the affected structure, or of repairing a partially affected structure, including labor and contractors' fees and any registration and transfer taxes.

In determining the replacement cost, depreciation of the asset and the value of salvage materials are not taken into account, nor is the value of benefits to be derived from the project deducted from the valuation of an affected asset.

Where national law or policy does not provide for compensation at full replacement cost, or where other gaps exist between national law or policy and the requirements with respect to displaced people, the Performance Standard advises that project proponents consider alternative measures to achieve outcomes consistent with the objectives of Performance Standard (e.g. supplementary allowances in cash or in kind).

In the case of physically displaced persons, the Performance Standard requires that project proponents offer the choice of replacement property of equal or higher value, equivalent or better characteristics and advantages of location, and security of tenure, or cash compensation at full replacement value where appropriate.

If land acquisition for the project causes loss of income or livelihood, regardless of whether or not the affected people are physically displaced, project proponents are required to: Promptly compensate economically displaced persons for loss of assets or access to assets at full replacement cost.

In cases where land acquisition affects commercial structures, compensate the affected business owner for the cost of re-establishing commercial activities elsewhere, for lost net income during the period of transition, and for the costs of the transfer and reinstallation of the plant, machinery or other equipment.

Provide replacement property (e.g., agricultural or commercial sites) of equal or greater value, or cash compensation at full replacement cost where appropriate, to persons with legal rights or claims to land which are recognized or recognizable under the national laws  
Compensate economically displaced persons who are without legally recognizable claims to land for lost assets (such as crops, irrigation infrastructure and other improvements made to the land) other than land, at full replacement cost.

Provide additional targeted assistance (e.g., credit facilities, training, or job opportunities) and opportunities to improve or at least restore their income-earning capacity, production levels, and

standards of living to economically displaced persons whose livelihoods or income levels are adversely affected.

Provide transitional support to economically displaced persons, as necessary, based on a reasonable estimate of the time required to restore their income-earning capacity, production levels, and standards of living.

### 3.2.3 JICA Guideline

As specified in the JICA Guidelines:

Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. When, after such an examination, avoidance is proved unfeasible, effective measures to minimize impact and to compensate for losses must be agreed upon with the people who will be affected.

People who must be resettled involuntarily and people whose means of livelihood will be hindered or lost must be sufficiently compensated and supported by project proponents etc. in a timely manner. Prior compensation, at full replacement cost, must be provided as much as possible. Host countries must make efforts to enable people affected by projects and to improve their standard of living, income opportunities, and production levels, or at least to restore these to pre-project levels. Measures to achieve this may include: providing land and monetary compensation for losses (to cover land and property losses), supporting means for an alternative sustainable livelihood, and providing the expenses necessary for the relocation and re-establishment of communities at resettlement sites.

Appropriate participation by affected people and their communities must be promoted in the planning, implementation, and monitoring of resettlement action plans and measures to prevent the loss of their means of livelihood. In addition, appropriate and accessible grievance mechanisms must be established for the affected people and their communities.

For projects that will result in large-scale involuntary resettlement, resettlement action plans must be prepared and made available to the public. In preparing a resettlement action plan, consultations must be held with the affected people and their communities based on sufficient information made available to them in advance. When consultations are held, explanations must be given in a form, manner, and language that are understandable to the affected people. It is desirable that the resettlement action plan include elements laid out in the World Bank Safeguard Policy, OP 4.12, Annex A.

The project is also in compliance with the JICA principles and guidelines for environmental and social considerations (2004). JICA recognizes a wide range of environmental and social issues must be addressed. For this reason, JICA asks stakeholders for their participation and incorporates their opinions into decision-making processes by ensuring meaningful participation of stakeholders in order to reach a consensus on any issue that might have arisen.

On Information disclosure, JICA encourages project proponents to disclose and present information about environmental and social considerations to local stakeholders. The information is disclosed well in advance when they have meetings with local stakeholders in cooperation with JICA.

JICA encourages consultation with local stakeholders. The project proponents are expected to engage in consultation with local stakeholders through means that induce broad public participation to a reasonable extent, in order to take into consideration, the environmental and social factors in a way that is most suitable to local situations, and in order to reach an appropriate consensus. In order to have meaningful meetings, JICA encourages project proponents to publicize in advance that they plan to consult with local stakeholders, with particular attention to directly affected people. It encourages project proponents to prepare minutes of their meetings after such consultations occur.

JICA respects the principles of internationally established human rights standards such as the International Convention on Human Rights and gives special attention to the human rights of vulnerable social groups including women, indigenous peoples, persons with disabilities, and minorities when implementing cooperation projects.

As specified in the JICA guidelines, there are certain laws/regulations and standards of reference which must be adhered to by project proponent. Among these are the following:

The project must meet the requirements for environmental and social considerations highlighted in the Guidelines by ensuring that projects comply with the laws or standards related to the environment and local communities as posited by the Federal, State and Local Governments of the host countries; JICA also ensure that the project conform to those governments' policies and plans on the environment and local communities.

JICA confirms that projects do not deviate significantly from the World Bank's Safeguard Policies and refers as a benchmark to the standards of international financial organizations; to internationally recognized standards, or international standards, treaties, and declarations, etc.; and to the good practices etc. of developed nations including Japan, when appropriate. When JICA recognizes that laws and regulations related to the environmental and social considerations of the project are significantly inferior to the aforementioned standards and good practices, JICA encourages project proponents etc., including local governments, to take more appropriate steps through a series of dialogues, in which JICA clarifies the background of and reasons for the inferior regulations and takes measures to mitigate the adverse impacts when necessary.

JICA takes note of the importance of good governance surrounding projects in order that measures for appropriate environmental and social considerations are implemented. JICA also discloses information with reference to the relevant laws of project proponents etc. and of the government of Japan.

## 3.3 GAP ANALYSIS

### 3.3.1 Comparison between Land Use Act and World Bank OP 4.12

The World Bank Operational Policy explicitly makes adequate provision for project affected persons who are either displaced or suffer other losses, as a result of projects, to be adequately catered for. Livelihoods of persons to be affected must be preserved, but in cases when this is inevitable, minimal displacements should occur. In instances where displacement is unavoidable, compensation should be paid to PAPs to help them to restore their social, economic and



environmental livelihoods.

The Land Use Act makes provision for compensation to be paid to only persons who have suffered any loss and can produce any form of title that is legal in the form of right of occupancy/ownership or legally binding tenancy agreement to the land in question. Whereas the law relating to land administration in Nigeria is wide and varied, entitlements for payment of compensation are essentially based on right of ownership. The Bank's OP4.12 is fundamentally different from this and states that affected persons are entitled to some form of compensation whether or not they have legal title if they occupy the land by a cut-off date.

Therefore, as this is a Bank funded project, the principles of World Bank OP 4.12 and JICA Guidelines are not negotiable and must be adhered to. As a result, all land to be acquired by for this project would be so acquired subject to the Laws of Nigeria and the Bank OP4.12. Where there are differences in the national law and World Bank Policies, the higher standard will apply. As noted in the Tables below, World Bank OP 4.12 and PS 5 will take precedence over national/state policies. Presented in Tables 3.2 and 3.3 are comparisons and contrasts between the International Best Practices and the Local legislations as affecting Project Displaced Persons.

**Table 3.2: Land Use Act and World Bank OP 4.12 on Compensation**

| Category of PAPs/ Type of Lost Assets | Nigerian Law  | World Banks' OP 4.12/IFC's PS  |
|---------------------------------------|---|--|
| Project Proponent                     | Explore all viable alternative project design to ensure minimization of impacts (i.e. NERC Act) | Land acquisition to consider avoidance on involuntary resettlement where feasible or minimize through project design                           |
| PAPs                                  | Same provision is made in the Environmental Impact Assessment (EIA) Act of FEPA                 | Where not feasible to avoid resettlement, project shall give displaced persons opportunity to share in project benefits                        |
| PAPs                                  | Same provision is made in the EIA Act   | Determination of eligibility for compensation through meaningful consultations with the affected persons and communities                       |
| Land Owners                           | Cash compensation based upon market value   | Recommends land-for-land compensation, or cash compensation at replacement cost  |
| Land Tenants                          | Entitled to compensation based on the rights they hold upon land                                | Entitled to some form of compensation subject to the legal recognition of their occupancy  |
| Owners of Permanent Buildings         | Cash compensation based on prevailing market value  | Entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, prior to displacement |
| Owners of "Non-permanent"             | Cash compensation based on market value.  | Entitled to in-kind compensation or cash compensation at full replacement cost   |

|           |  |
|-----------|--|
| Buildings | including labour and relocation expenses, prior to displacement. |
|-----------|--|

**Table 3.3: Gap analysis between World Bank OP 4.12/PS 5 and Local Legislations**

| Issues   | OP 4.12/PS 5   | GAP in Local Legislations  |
|--|--|--|
| Displaced Person's right to information  | Lender shall address impacts through information of PAPs of their rights on resettlement alternatives in addition to the provision of prompt and effective compensation at full replacement cost   | Gives provision for resettlement through cash compensation but government and not PAPs has the discretion in respect of alternatives   |
| PAPs Restoration Level   | Living standards, income opportunities, and production levels of project affected people should be improved or at least restored to their pre-project levels.  | This is not provided for in the local legislations   |
| Displacement/Restrictions of PAPs  | Ensure that displacement/restriction of PAPs does not occur before necessary measures for resettlement   | This is not well-defined in the local legislations   |
| Establishment of support system for socially vulnerable groups                           | Socially vulnerable groups tend to be exposed to environmental and social impacts. In addition, they have limited access to decision making processes. Thus, it is necessary to give appropriate consideration to them                   | There is no description about support to socially vulnerable groups.   |
| Grievance Redress of PAPs  | Lender must provide for appropriate access to grievance redress in RAP   | Some provisions are made for this in the local legislations but not as comprehensively done in the OP 4.12/PS 5  |
| Enhancement of public participation in planning and implementation of resettlement plans | Appropriate participation by the affected people and their communities should be promoted in planning, implementation and monitoring of involuntary resettlement plans and measures taken against the loss of their means of livelihood. | There is no description about participation of project affected people and communities in the preparation and implementation of measures, as well as in conducting monitoring. |
| Provision of an Accessible Draft RAP which conforms                                      | Requires the provision of a draft resettlement instrument which  | This is not provided for in the local legislations   |

|   |  |  |
|---|--|--|
| with OP 4.12/PS 5 to PAPs                                 | conforms to OP 4.12/PS 5 and making it available at a place accessible to the displaced persons and local NGOs in understandable language  |  |
| **Compensation for land acquisition with replacement Cost | Regarding environmental and social considerations, reference is made to regulations and good practices of international agencies. In this project, compensation will be done with replacement cost in according with OP4.12 of World Bank on Involuntary Resettlement.   | There is no description about replacement cost. Compensation amount is evaluated based on the market value at the time of the laws issued for land acquisition and resettlement for a specific project |
| Assistance to PAPs without recognizable legal right       | Requires the provision of resettlement assistance to those who have no recognizable legal right or claim to the land they are occupying  | This is not provided for in the local legislations   |
| Gender  | The consultation process must ensure that women's perspectives are obtained and that their interests are factored into all aspects of resettlement planning and implementation. Addressing livelihood impacts may require intra-household analysis in cases where women's and men's livelihoods are affected differently. Women's and men's preferences in terms of compensation mechanisms, such as compensation in kind rather than in cash, should be explored. | This is not provided for in the local legislations   |

Source: SEEMS Study Team

*\*\*Replacement cost does not mean a market value or governmental rate. Replacement cost include: i) market cost for materials to build a replacement structure with an area and quality similar or better than the project scope; ii) cost for transporting materials to a new site; iii) cost for labour and contractor fee; iv) cost for tax and registration. Depreciation of asset and value of salvage should not be taken into account in determining the replacement cost*

### 3.3.2 Requirements of World Bank OP 4.12 and PS 5 adopted by TCN for this RAP

For the implementation of the RAP in respect of this project, the following World Bank Operational Policy on Involuntary Resettlement and Performance Standard on Land Acquisition and Involuntary Resettlement will be adopted;

Necessary steps were taken to avoid/minimize the need for resettlement.

Resettlement/compensation measures were conceived and will be executed as development activities to provide sufficient resources to PAPs and opportunity to share in the project benefits. Affected persons, communities and local authorities are being meaningfully consulted and consultations will continue throughout the life cycle of the project.

Work may not commence on the PAP's properties until compensation has been made. Development assistance in addition to compensation measures, such as job opportunities will be made available to PAPs.

Particular attention will be paid to any vulnerable groups identified in the proposed project areas. Communities will be given opportunities to participate in the planning, implementation and monitoring of resettlement/compensation.

RAP includes early screening, scoping of key issues, choice of resettlement/ compensation instrument and information required to prepare the resettlement component.

Having identified the need for involuntary resettlement in this project, SEEMS had carried out census, enumeration and valuation of assets to identify persons who will be affected by the project. This is to determine who will be eligible for assistance and discourage inflow of ineligible people for assistance.

Resettlement/compensation is linked to Project Implementation Plan in which the resettlement costs are included in the overall project budget and displaced PAPs will be compensated before they are affected by project activities.

TCN will adequately implement, monitor and evaluate this RAP. Provision is made for post compensation Grievance Redress.

This draft RAP conforms to World Bank OP 4.12 and PS 5 and JICA Guidelines and will be provided to the two bodies for assessment and approval. It will also be made available at a place that is accessible to displaced persons and NGOs in a readable form and in English language.

### 3.3.3 Project Compliance with World Bank Policy Objectives

Although the local legislation, including those regulating the right of way/set-backs belonging to the state does not require application of measures similar to those required by OP 4.12 to acquire land, TCN has fulfilled the requirements of the Involuntary Resettlement Policy as follows:

Census survey of all affected persons has been carried out with affected persons fully registered for appropriate compensations

Consultations were held with the relevant stakeholders.

Socioeconomic surveys of affected persons along the corridors has been conducted

Compensation methods have been agreed with the affected persons

TCN has agreed to set-up a RAP implementation team consisting of government agencies and representative of key stakeholders to participate in the resettlement and compensation of affected persons.

### 3.4 TRADITIONAL/POLITICAL GOVERNANCE AND COMMUNITY ORGANIZATION

The people have a well-defined hierarchical social structure with traditional leadership through kings, *Obas*, *Baale*/chiefs and elders. The Traditional Institution in the project affected area has four established “kingdoms” The *Elejio* of Ejio, *Ewusi* of Sagamu, *Olu* of Orile Igbeyin and *Oniro* of Oke Iro. The affected communities are under these paramount rulers. However, in each of the communities, there are traditional heads known as *Baale* who directly oversee each of the communities.

At the community level, the traditional authority structure hardly varies from one community to another with the traditional head (*Baale*) and chiefs jointly administering the political, economic and social affairs of the community. Authority in each community is at two levels. The first is the traditional ruling council composed of the village chiefs and headed by the village head (the *Baale*). The second level is the Community Development Association (CDA) comprising an elected Chairman and some executive members. The Community Development Association (CDA) mobilizes the different sections and interest groups in the Community for development purposes. The CDA reports to the Council of Elders. There is also a Youth Organization with elected Chairman and members.

Generally speaking, three broad groups are identifiable in each of the communities – male elders, youths and women. The role of male elders is traditional governance of the communities, while the youth leaders are usually at the bottom rungs of the ladder of authority, traditional roles including constituting a labour force in development projects, security of the community and to enforce law and order. Traditionally, there is a limit to the involvement of women in the political governance of these local settlements. Women play a subdued role in the communities, usually placed at the background. The community has a patriarchal familial arrangement.

## CHAPTER FOUR: CONSULTATION

### 4.1 STAKEHOLDER IDENTIFICATION AND METHOD OF PARTICIPATION

Stakeholders are all those with a stake in the outcome of a project who participate in decisions on planning and management of the proposed development. Stakeholders share information and knowledge and may contribute to project activities. Stakeholder involvement is essential in the RAP process. The detailed consultation with identified stakeholders within the project area was coordinated by SEEMS and TCN. Consultation activities covered the four Local Government Areas (Sagamu, Ifo, Ewekoro and Obafemi/Owode) and the communities that may be directly or indirectly affected by the project. After Consultation and sensitisation programmes at the State and LGA levels coordinated by TCN, SEEMS initiated a three-tier system of consultations. At the top of the tier were the traditional rulers of each identified LGAs, affected communities, as well as the identified family heads/individuals that will be affected by the project.

Consultations are major features of the socio-economic component of a RAP for any proposed project, which in this case incorporates all individuals and communities that may be directly or indirectly affected. Consultations were carried out to inform relevant stakeholders about the intentions and plans of the proposed project, the scope and the need for the community to own and safeguard the project as beneficiaries and stakeholders. Other objectives are to identify, address, and document the concerns and views of all stakeholders with a view to minimising potential conflicts that could arise during project implementation. The consultations for the Project were planned and carried out fully covering both the project EIA and RAP.

The following process guided the public consultations:

The Social safeguard team first identified the built- up areas, particularly, the areas with potentials for involuntary resettlement. Name of communities, the administrative organization and leadership structure were sought, and subsequently, a visit was made to the leaders and/or representatives of these communities. Public forum with stakeholders on the project matter

- Identification of PAPs and their social-economic baseline
- Inventory of PAPs and affected assets

#### 4.1.1 Notification to Stakeholders

Letters of introduction were written to key stakeholders including the concerned State Governments, relevant agencies and parastatals, Local Government Authority (LGA) and the heads of various communities that will directly or indirectly be affected by the projects as well as some other important key stakeholders, to secure permission to work in the respective LGAs and communities. The general public was also notified on the project through meetings and information delivered through their respective community leaders and representatives.

The established procedure for right of way acquisition is generally divided into four phases/steps. These steps are discussed in the following sub-sections.

**Step I: Notification / Sensitization**

Prior to the survey and administration of study questionnaires, TCN officials and the Project Consultants from SEEMS engaged all stakeholders in due consultations to inform and educate them on the purpose of the project and the possible associated impacts. During the consultations, the stakeholders were provided adequate information on the proposed project and the likely impacts as well as TCN's plan to ensure that the project does not impoverish them in any way. The stakeholders consulted included: State Government, representatives of the affected Local Government Areas, traditional rulers and leaders of the affected communities, youth leaders, etc. TCN shall also ensure that all stakeholders identified in this RAP report will be adequately notified before the commencement of resettlement and project execution. All properties affected by the proposed civil works have been valued and assessed according to laid down procedure. Owners of affected properties have been notified in several ways. These include one-on-one notification during the socio-economic survey, and also during consultation.

**Step II: Identification, Census, Enumeration and Valuation**

After the approval of the route survey and line profile by TCN, census, enumeration and valuation of properties along the RoW were commenced by SEEMS consultants.

Claimants are notified of the date of enumeration of their properties in specified areas. They are required to be present to identify their properties. During the enumeration, a thorough and comprehensive identification, census and assessment is carried out and a photograph of each claimant is taken in his/her property or premises. During this process, the representatives of the various communities shall witness and confirm every enumerated property and owner. This process ensures that rightful owners are documented and compensated for affected properties.

**Step III: Payment of Resettlement/Compensation**

Payment of compensation is based on the value of affected properties, also referred to as claims in the compensation schedule that will be approved for implementation (Appendix V). Payment will be made directly into the account of the owners of the property after consultations with affected parties as well as community head to properly identified real owners. Payment will be by e-payment. The claimant is expected to sign the TCN/TCN indemnity form 128 (Form IV of Appendix III) to confirm the collection of compensation payment. Payment exercise is usually witnessed by the community heads or their representatives. Pictures and videos may be used to visually document payment.

**Step IV: Post-Compensation Issues**

PAPs will be encouraged to direct all post-compensation grievances that may arise to TCN for investigation and verification through the Grievance Redress Committee. All complaints arising from enumeration and payment of compensation will be treated on their merit and properly documented. Work activities will not commence until resettlement/compensation payments have been made to all affected persons. The Engineering, Procurement and Construction (EPC) contractor will commence construction activity after the confirmation of payment of compensation by TCN Headquarters and the expiration of the notice to PAPs for removal of their valuables from acquired land.

**4.1.2 National and LGA Stakeholder Meetings**

The stakeholders consulted were very receptive and open in their discussions of issues pertaining to the project (see Plate 4.1). Virtually all of them put a lot of emphasis on compensation/resettlement issues and what would be impacts of the project on the environment. Majority of the stakeholders consulted expressed their enthusiasm about the project; they see it as one of the project that bring development and hoped that the power interconnection project will improve power supplies, stabilize the quality of the electricity and provide diverse source of power in the region, and further create employment for the generality and especially for the people in the affected States. The Chairmen of Local Government interacted with expressed their readiness to fully support the project and are prepared to encourage members of the LGA to cooperate with those that will be working on the project. However, some stakeholders are concerned that the proposed power interconnection may negatively affect their proposed projects in the areas. There are a number of estates and holdings along the line route (Carol, Aina Gold, Unilag, Mayflower, Platinum, Eminent, Gloryland, Cassavila, Yinka Property Mart, Green Spring, Unique, Ore Meta, Mercy, and Treasure Park Estates). Some of the estate owners expressed their displeasure and concern for their proposed projects like schools, Hotels, Housing Estate etc. the path of which the lines traversed. Some hunters along the route from Ibokuru to Asabala and from Kori Oja towards Orile Igbehin claimed that the project will affect local biodiversity particularly in wildlife. The proposed development would interfere with the natural habitat and could trigger soil erosions in highlands slopes particularly when crossing the rift valley at Ologbun Sofuyi and Oke Ate. Majority however believed that the intensity of damage potentially caused by the proposed development is going to be minor, given the nature of the project.



Carol: the Owner of Carol Estate

Plate 4.1.: Consultation with the owner of Carol Estate

Table 4.1: Stakeholder Engagement Activities to Date for the TCN Project

| Stakeholder Engagement  | Engagement Activity                             | Stakeholders  | Number of Participants | Venue  | Date/Time                                       | Specific Discussion Areas  |
|---|---|---|------------------------|--|---|--|
| <b>STAGE 1: SCOPING</b>   |   |   |                        |  |   |  |
| Government Agencies – Federal, State and Local Government Authority Regulatory Authorities.           | Meeting with State and Local Council Officials. | Federal Ministry of Environment, Abuja.                       | 6                      | Environment House, Abuja   | May 10, 2017<br>July 11, 2017                   | <input type="checkbox"/> Registration of the Project;<br><input type="checkbox"/> Scope of data collection and ToR approval;<br><input type="checkbox"/> Issues concerning site visitation; EIA process and scope of the EIA;<br><input type="checkbox"/> Approval for one season waiver; and<br><input type="checkbox"/> Approval for the substation and the lines. |
|   |   | Ogun States   | 35                     | Governor's office Secretariat  | May 3, 2017<br>Every last Thursday of the Month |  |
|   |   | Sagamu, Ewekoro, Owode Obafemi & Ifo LGA                      | 7                      | Each Secretariat   | November 19 -30<br>January 10, 2018             |  |
| <b>STAGE 2: Line Route survey/ESIA/RAP Studies</b>  |   |   |                        |  |   |  |
| Baseline Data Collection: Community Engagement, engagement with local groups and traditional leaders. | Meeting with Traditional Rulers and Youths.     | The head and chiefs of host communities.                      | 129                    | Each Affected Community  | December 18 -23, 2017                           | <input type="checkbox"/> Formal presentation of the project;<br><input type="checkbox"/> Discussion of community concern; and<br><input type="checkbox"/> The need for a grievance   |
| Government Agencies – Federal, State and Local Government Authority Regulatory Authorities.           | Meeting with Local Government Officials.        | Sagamu South; Sagamu West and Ofada/Mokoloki LCDAs and others | 155                    | Sagamu South LCDA Secretariat, Ejo Town Hall and Ofada/Mokoloki LCDA Secretariat | December 15-16, 2017                            | <input type="checkbox"/> Engagement with affected communities;<br><input type="checkbox"/> Potential positive impacts (provision of electricity and employment of opportunities for local people; and<br><input type="checkbox"/> Community<br><input type="checkbox"/> Issues pertaining to appropriate location of the   |
|   |   | Federal Ministry of Environment,                              | 18                     | Redemption Camp  | July 11, 2017                                   |  |

|                                 |  |   |    |                          |                   |   |
|---------------------------------|--|---|----|--------------------------|-------------------|---|
|                                 |  | Abuja.<br>Transmission Company of Nigeria, Abuja. | 10 | Redemption Camp          | December 20, 2017 | <input type="checkbox"/> Engagement with Redcem Officials to take decision on the appropriate substation location   |
| Non-Governmental Agency (NGO) – |  | Nigerian Conservation Foundation (NCF)            | 12 | NCF Office, Lekki, Lagos | March 7, 2018     | <input type="checkbox"/> Discussion on potential impacts of proposed projects on biodiversity<br><br><input type="checkbox"/> NCF shows their interest for the collaboration of TCN's project if there is any opportunity |

**4.1.2.1 Community Perception and Concerns**

As indicated in the ESIA, development projects usually generate impacts on their host communities which may be positive or negative, real or perceived and may affect the people’s receptiveness of the development project and relationship with the project proponents. When asked if the proposed project development would have any effect on them, the respondents perceived greater benefits from the transmission line and substations since it is intended to bring development. They based their expectations on the benefits the inhabitants had derived from previous projects in the area. For instance, some of the respondents mentioned what they have benefitted from the existing industries such as: the provision of pipe borne water, lockup shops, construction of earth road and culverts, provision of electricity and electric transformer, Primary Health Centre, and boreholes to some communities in the area. Some of them perceived the project to lead to increase in business activities most especially during construction; they hope to benefit from the influx of workers. Some believe that the project will bring employment opportunities to the youth and some hope to be involved by supplying sand and blocks for construction. However, a few, who appear very enlightened, raised issues regarding air pollution, noise and biodiversity displacement. They pleaded with the socio-economic team to ensure that adequate mitigation measures are put in place to forestall all negative impacts to the community. The team allayed their fears on the level of pollutants and promised an environmentally friendly project. On biodiversity displacement, the team assured them that wildlife will change location.

**Table 4.2: Issues and Concerns Raised by Stakeholders and Responses during meetings**

| Topic                 | Concerns and Comments   | Stakeholders having made the comment / recommendatio | Actions to Address Concerns  |
|-----------------------|---|--|--|
| Social Infrastructure | There is a general concern regarding the provision of basic social infrastructure and amenities such as health facilities, schools, and potable water supply. These facilities are grossly inadequate in the affected communities | Affected Communities Leader                          | The participants were informed that the project will attract development to the communities. |

|                   |   |  |  |
|-------------------|---|--|--|
| Health and Safety | <input type="checkbox"/> Concern on the likely problem for the neighbouring communities and the fear that the project would not generate additional problems like vibration, noise, EMF and gaseous emission;<br><input type="checkbox"/> Concern on health hazard and EMF effect; and<br><input type="checkbox"/> Hoped that the substations would be built in line with the highest safety standards and would create the minimum disruption to communities | Affected Communities (Community Leader, Women Leader Youth Leader) | The interests and concerns of the community will be put into consideration.<br><br>Their project will be executed with the highest standard and in a way that their safety and health will not be jeopardized. |
|-------------------|---|--|--|

| Topic       | Concerns and Comments  | Stakeholders having made the comment / recommendatio               | Actions to Address Concerns  |
|-------------|--|--|--|
| Electricity | <input type="checkbox"/> Non-availability of power to aid artisanship, thereby affecting quality of life.<br><input type="checkbox"/> Where available, power supply has been irregular | Affected Communities (Community Leader, Women Leader Youth Leader) | The participants were informed that the transmission line will evacuate power to the substations which will in turn step it down before it is distributed through the national grid where it will get to the populace and enhance the quality of life. |

|                              |  |  |   |
|------------------------------|--|--|---|
| Compensation for lost assets | The issue of fair and adequate compensation was raised in virtually all communities especially for those whose occupation will be affected by the TL RoW | Local Government Chairmen/Affected Communities (Community Leader, Women Leader Youth Leader) | The stakeholders were informed that the project already has in place a RoW acquisition process which includes enumeration, valuation and compensation. They were informed that this process will be followed with community survey to ensure that all affected persons are identified and included in the compensation program. They were also assured that compensation payment will be in line with current market prices. In addition, a grievance redress mechanism will be developed and communicated to all affected parties in |
|------------------------------|--|--|---|

| Topic      | Concerns and Comments  | Stakeholders having made the comment / recommendation  | Actions to Address Concerns  |
|------------|--|--|--|
|            |  |  | case there are issues  |
| Employment | <ul style="list-style-type: none"> <li><input type="checkbox"/> Requested that some of their indigenes who are qualified are given special consideration in employment so as to forestall a situation whereby their folks can only be labourers; and</li> <li><input type="checkbox"/> Appeal for employment of their youths in order to give empower them economically</li> </ul> | Local Government Chairmen/Affected Communities (Community Leader, Women Leader Youth Leader) | The participants were informed that a Community Relations and Engagement Plan will be developed prior to project commencement that will cover all terms and modalities of engagement to ensure that affected communities are equitably represented |

**4.1.3 Community Meetings**

Several meetings were held in the affected communities (most especially in Likosi, Dejuwogbo, and Alado where many individuals had encroached on TCN already acquired land), to create awareness and ensure that everybody concerned is aware or was informed about the project. The team ensured that women attended and participated to the meetings. The meetings were designed to inform the communities about the project and its potential associated impacts. The affected communities were sensitized regarding their right to be compensated and items to be compensated for including land, crops, and/or houses. Those present in each of the meetings were given opportunity to ask questions, raise their concerns and provide. Interviews were also conducted with heads and some selected leaders of these communities using already prepared community questionnaire (Appendix I) to obtain detailed information regarding the community, likely properties to be affected, their preference concerning benefits from the proposed project, indigenous trees and areas of environmental importance located in the communities.

**4.1.4 Consultation of Project Affected Persons**

Project affected persons (PAPs) include all persons whose land will be crossed by the proposed transmission line and those that will lose some other properties like structure, seasonal crops, business premises etc. The enumerators walked through the proposed wayleave and, with the help of community representatives, identified the landowners or property owner. A face-to-face

interview was then conducted with the head of household or another adult member of the household available at the time of the visit to fill the household questionnaire. Socioeconomic information was collected about household members, livelihood, income and production, land ownership, livestock, crops, trees, as well as structures. Concerns raised about the wayleave and how the transmission line project could affect the households were also gathered. Results from the household survey are presented in Chapter 5. A total of 158 people completed the household survey, including 2279 individuals that will be affected by the project. This control group is formed of people that will not be affected by the project but who are living in the same area.

## CHAPTER FIVE: SOCIO-ECONOMIC BASELINE OF THE PROJECT AREA AND PROJECT AFFECTED PERSONS

### 5.1 PREAMBLE

The socio-economic assessment studies were aimed at examining the socioeconomic conditions of the PAPs. This will be relevant for measuring and monitoring the progress of this RAP implementation.

### 5.2 DEMOGRAPHICS OF AFFECTED PEOPLE

The study intends to identify and document the demographic data of the project communities such as population, literacy level, occupation, dependency level, housing and social amenities. These data will be useful not only in establishing the importance of the resettlement of the affected persons but equally in quantifying the environmental and social impacts of the planned works which will help determine the management plans for the said project. More importantly, the baseline data will be useful for monitoring and evaluating the post implementation condition of the community and by implication the success of the project.

**Table 5.1: Project Affected Households**

| Lot2 | LGA           | No of communities | Estimated length of RoW across LGA's (km) | No of PAPS  | Total Amount            |
|------|---------------|-------------------|---|-------------|-------------------------|
|      | Ewekoro       | 3                 | 11.72                                     | 367         | 86,382,438.50           |
|      | Ifo           | 12                | 3.21                                      | 171         | 65,240,620.00           |
|      | Obafemi Owode | 32                | 24.78                                     | 708         | 730,727,341.92          |
|      | Sagamu        | 30                | 24.25                                     | 1033        | 1,194,561,435.90        |
|      | <b>Total</b>  | <b>77</b>         | <b>63.96</b>                              | <b>2279</b> | <b>2,076,911,836.32</b> |

Source: SEEMS, 2018



**Table 5.2: Summary of Distribution of Properties in Communities by LGA**

| LGA           | Residential Houses | Uncompleted Houses | Land      | Crogs/Trees/ economic | Tomb      | Shrines   | Factory/Shop | Total       |
|---------------|--------------------|--------------------|-----------|-----------------------|-----------|-----------|--------------|-------------|
| Ewekoro       | 3                  | 69                 | 0         | 276                   | 8         | 11        | 0            | 367         |
| Ifo           | 0                  | 2                  | 0         | 157                   | 0         | 12        | 0            | 171         |
| Obafemi Owode | 35                 | 241                | 81        | 335                   | 3         | 18        | 0            | 713         |
| Sagamu        | 120                | 453                | 0         | 450                   | 13        | 7         | 2            | 1045        |
| <b>Total</b>  | <b>158</b>         | <b>765</b>         | <b>81</b> | <b>1218</b>           | <b>24</b> | <b>48</b> | <b>2</b>     | <b>2296</b> |

**5.2.1 Age and Sex Structure****Table 5.3: Population Data of the Affected Local Government AREA (as at 2006)**

| Lot 2 | State | LGA           | Male             | Female           | Total    |
|-------|-------|---------------|------------------|------------------|----------|
|       | Ogun  | Obafemi Owode | 118, 574 (50.4%) | 116, 497 (49.6%) | 235, 071 |
|       |       | Ifo           | 269, 206 (49.9%) | 269, 964 (50.1%) | 539, 170 |
|       |       | Ewekoro       | 28, 212 (51.2%)  | 26, 881 (48.8%)  | 55, 093  |
|       |       | Sagamu        | 126, 855 (49.6%) | 129, 030 (50.4)  | 255, 885 |

Data Source: NPC, 2006

**Table 5.4: Population Data in Project Affected Households**

| Lot 2 | State | LGAs          | Age              | Population | Percentage |
|-------|-------|---------------|------------------|------------|------------|
|       |       | Obafemi Owode | 0 – 14 years     | 76         | 36         |
|       |       |               | 15 – 44 years    | 79         | 37         |
|       |       |               | 45– 64 years     | 53         | 25         |
|       |       |               | 65 years above   | 6          | 3          |
|       |       |               | <b>Sub-Total</b> | <b>214</b> | <b>100</b> |
|       |       | Ifo           | 0 – 14 years     | 5          | 39         |
|       |       |               | 15 – 44 years    | 3          | 23         |

|      |         |                  |            |            |
|------|---------|------------------|------------|------------|
| Ogun |         | 45– 64 years     | 5          | 39         |
|      |         | 65 years above   | 0          | 0          |
|      |         | <b>Sub-Total</b> | <b>13</b>  | <b>100</b> |
|      | Ewekoro | 0 – 14 years     | 34         | 30         |
|      |         | 15 – 44 years    | 54         | 48         |
|      |         | 45– 64 years     | 18         | 16         |
|      |         | 65 years above   | 6          | 6          |
|      |         | <b>Sub-Total</b> | <b>112</b> | <b>100</b> |
|      | Sagamu  | 0 – 14 years     | 214        | 37         |
|      |         | 15 – 44 years    | 230        | 39         |
|      |         | 45– 64 years     | 139        | 24         |
|      |         | 65 years above   | 4          | 7          |
|      |         | <b>Sub-Total</b> | <b>587</b> | <b>100</b> |
|      |         | Grand Total      | 926        |            |

Data Source: SEEMS, 2018

**Table 5.5: Population Data in Project Affected Area (For Household Heads)**

| Lot 2 | State | LGAs          | Age              | Population | Percentage |
|-------|-------|---------------|------------------|------------|------------|
|       | Ogun  | Obafemi Owode | 15 – 34 years    | 5          | 14.7       |
|       |       |               | 35 – 49 years    | 21         | 61.8       |
|       |       |               | 50 – 64 years    | 7          | 20.6       |
|       |       |               | 65 years above   | 1          | 2.9        |
|       |       |               | <b>Sub-Total</b> | <b>34</b>  |            |
|       |       | Ifo           | 15 – 34 years    | 0          | 0.0        |
|       |       |               | 35 – 49 years    | 1          | 33.3       |
|       |       |               | 50 – 64 years    | 2          | 66.7       |
|       |       |               | 65 years above   | 0          | 0.0        |
|       |       |               | <b>Sub-Total</b> | <b>3</b>   |            |
|       |       | Ewekoro       | 15 – 34 years    | 4          | 23.5       |
|       |       |               | 35 – 49 years    | 6          | 35.3       |
|       |       |               | 50 – 64 years    | 5          | 29.4       |
|       |       |               | 65 years above   | 2          | 11.8       |
|       |       |               | <b>Sub-Total</b> | <b>17</b>  |            |
|       |       | Sagamu        | 15 – 34 years    | 7          | 6.7        |
|       |       |               | 35 – 49 years    | 69         | 66.3       |
|       |       |               | 50 – 64 years    | 20         | 19.2       |
|       |       |               | 65 years above   | 8          | 7.7        |
|       |       |               | <b>Sub-Total</b> | <b>104</b> |            |
|       |       | Grand Total   | 158              |            |            |

Data Source: SEEMS, 2018

It was gathered from the field survey that majority of the Household heads are males (97%) with only 5 (3%) of the households headed by females. This implies that vulnerability concerns concerning household heads on the basis of sex composition may not apply as there is very small proportion of female headed households.

**Household (on Residential and Encroacher)****Table 5.6: Project Affected Households**

| Lot 2        | Local Government Areas (LGAs) | Gender of Heads of Households |        | Total (Project Affected Households) |
|--------------|-------------------------------|-------------------------------|--------|-------------------------------------|
|              |                               | Male                          | Female |                                     |
|              | Obafemi Owode                 | 34                            | 0      | 34                                  |
|              | Ifo                           | 3                             | 0      | 3                                   |
|              | Ewekoro                       | 17                            | 0      | 17                                  |
|              | Sagamu                        | 99                            | 5      | 104                                 |
| <b>Total</b> |                               | 153 (97%)                     | 5 (3%) | 158 (100)                           |

Data Source: SEEMS, 2018

Affected household heads are predominantly married people (almost 99%). However, in Sagamu LGA, there is one household headed by a man who is still single and there is another woman in the divorced/separated category serving as the head of her household. The significance of this result is that majorly of household heads are men who are the breadwinners and help mates in their respective households.

**Table 5.7: Marital Status of Heads of Households**

| Lot 2        | LGA           | Marital Status |                |          |                     | Total          |
|--------------|---------------|----------------|----------------|----------|---------------------|----------------|
|              |               | Single         | Married        | Widowed  | Divorced / Separate |                |
|              | Obafemi Owode | -              | 100            | -        | -                   | 100            |
|              | Ifo           | -              | 100            | -        | -                   | 100            |
|              | Ewekoro       | -              | 100            | -        | -                   | 100            |
|              | Sagamu        | 1              | 98             | -        | 1                   | 100            |
| <b>Total</b> |               | <b>(0.6%)</b>  | <b>(98.8%)</b> | <b>-</b> | <b>(0.6%)</b>       | <b>(100.0)</b> |

Data Source: SEEMS, 2018

The survey shows that most of the PAPs (45%) run large households (between 3-10) (Table 5.8). Forty-six percent of the PAPs have between 6-10 children and another 45% have between 3-6 children while barely 3.2% have families of 1-2 members. This goes to show that the level of dependent on the Head of Household will be much and there will be a heavy burden on the family if involuntary displacement occurs.

**Table 5.8: Household Size in the Project Area**

| Lot 2        | LGA           | Household Size |                |                 |               |          | Total              |
|--------------|---------------|----------------|----------------|-----------------|---------------|----------|--------------------|
|              |               | 1 – 2          | 3 – 5          | 6 – 10          | 11 - 15       | >15      |                    |
|              | Obafemi Owode | 0              | 41             | 47              | 12            | 0        | 100                |
|              | Ifo           | 0              | 67             | 33              | 0             | 0        | 100                |
|              | Ewekoro       | 0              | 35             | 59              | 6             | 0        | 100                |
|              | Sagamu        | 5              | 47             | 44              | 4             | 0        | 100                |
| <b>Total</b> |               | <b>5 (3%)</b>  | <b>71(45%)</b> | <b>73 (46%)</b> | <b>9 (6%)</b> | <b>-</b> | <b>158 (100.0)</b> |

Data Source: SEEMS, 2018

### 5.3 EDUCATION AND LITERACY

Literacy and educational characteristics are basic indices of human development. Evidence from field survey as well as focus group discussions and in-depth interview indicate that education and literacy rates are low among the population in the affected communities however, with the exception of Sagamu LGA where almost 50% had secondary education and another 40% attained tertiary level of education (Table 5.9).

Majority of the inhabitants of other Local Government Areas did not go beyond secondary school. Generally, as much as 30% of the household members in Obafemi Owode LGA had primary or no formal education. As shown in Table 5.10, literacy level is generally low for youth and female members of the project area; the gender differences are wide enough to stimulate measures to reverse the pattern. Also, the youth of the various communities should be assisted and encouraged to pursue education.

**Table 5.9: Educational Status in the Project Area**

| Lot 2        | Local Government Areas (LGAs) | Educational Status  |                 |                 |                 | Total            |
|--------------|-------------------------------|---------------------|-----------------|-----------------|-----------------|------------------|
|              |                               | No formal Education | Primary         | Secondary       | Tertiary        |                  |
|              | Obafemi Owode                 | 5                   | 29              | 32              | 32              | 100              |
|              | Ifo                           | 0                   | 33              | 0               | 67              | 100              |
|              | Ewekoro                       | 0                   | 18              | 41              | 41              | 100              |
|              | Sagamu                        | 1                   | 11              | 49              | 39              | 100              |
| <b>Total</b> |                               | <b>3 (2%)</b>       | <b>25 (16%)</b> | <b>69 (44%)</b> | <b>61 (39%)</b> | <b>158 (100)</b> |

Data Source: SEEMS, 2018

### 5.4 ECONOMICS

#### 5.4.1 Occupation and Industry

Majority of inhabitants of the affected communities are artisans (Table 5.10). Other subsidiary occupations are industry, trading, and farming. For most of the people, farming is their secondary occupation. Women are mainly involved in trading as their primary occupation while farming is regarded as their secondary occupation. Farming which is the secondary occupation of majority of people in the affected communities is both tree cropping and subsistent with maize, rice, cassava, plantain and sugarcane as the main crops. The economic cropping found in the area includes kolanut, sugarcane, and oil palm (growing wild). A few of the inhabitants are hunters, with hunting carried out at subsistence level as well as for recreation. Evidence from focus group discussions indicates that the level of unemployment (for salaried jobs which the people especially the youths prefer) is high. One of the challenges faced by communities affected by the project is lack of alternative economic activities such as employment. As indicated above and presented in Table 5.10, most of the communities regarded agriculture as secondary occupation. The only LGA where a significant proportion of members regard farming or hunting as one of their main occupation is Ifo. Also because of the presence of some industries in the State many of which are situated in Ewekoro LGA (though not in the affected communities within the LGA), many of the youths leave their area to work in these industries. This is the case with most of the youths from Ewekoro LGA who have moved out of their communities to secure employment in Lafarge and some other industries within the State. However, it is expected that some jobs will be available during the construction of the transmission line for the local population to be employed, mainly as casual labourers. However, the employment opportunities will be temporary and the community will only benefit during construction phase.

**Table 5.10: Occupation in the Project**

| Area | State | Local Government Areas (LGAs) | Occupation (%)  |          |                  |           |           | Total      |
|------|-------|-------------------------------|-----------------|----------|------------------|-----------|-----------|------------|
|      |       |                               | Farming/Hunting | Trading  | Teaching/Nursing | Industry  | Artisan   |            |
|      | Ogun  | Obafemi Owode                 | 12              | 6        | 3                | 15        | 64        | 100        |
|      |       | Ifo                           | 33              | 0        | 0                | 33        | 34        | 100        |
|      |       | Ewekoro                       | 6               | 6        | 6                | 53        | 29        | 100        |
|      |       | Sagamu                        | 3               | 17       | 1                | 18        | 61        | 100        |
|      |       |                               | <b>14</b>       | <b>7</b> | <b>3</b>         | <b>30</b> | <b>47</b> | <b>100</b> |

Data Source: SEEMS, 2018

#### 5.4.2 Personal Income

The income level of majority of the people in the area is low because most of them are artisans or working as labour in companies around their vicinity. Also, evidence from FGDs shows that a significant proportion of the youths are not gainfully employed and are not in any form of school for career development. Most of the aged are poor, except those whose children are in the city, who send money home. Some of the women are successful traders while some are house wives. There is dominance of the informal sector jobs (farming, trading artisanship, etc) which accounts for more than 90% of the employment and thus explains the low income levels of the inhabitants of the area as the sector is characterized by low productivity and income. There is need to address this problem of low level of income to avoid a restive environment in the future; hence the need for CSR policy objective.

Even though the household that will be impacted by the project have a significant diverse annual income with most of them having an income that is above ₦60,000, but those with this relatively high income are mainly those with multiple economic activities such as agriculture and business and are mainly in urban areas or close to urban areas (Table 5.11). It is evident from the outlook of most of the affected communities that majority of those in the rural locations have low income derived mainly from farming and artisanship. The impacts of the project on the sources of livelihood of many of the households may have adverse impacts on their income sustenance and standard of living, especially with the low rate of saving culture in the less developed countries.

**\*\*Table 5.11: Perception on Economic Scenario of Project Area**

| Lot 2 | State | Local Government Areas (LGAs) | Estimated Monthly Income (%) |               |               |         | Savings (%) |       |            |               |         |
|-------|-------|-------------------------------|------------------------------|---------------|---------------|---------|-------------|-------|------------|---------------|---------|
|       |       |                               | <20,000                      | 20,000-39,000 | 40,000-59,000 | 60,000+ | No savings  | <5000 | 5000-10000 | 10,001-20,000 | 20,000+ |
|       | Ogun  | Obafemi Owode                 | 2                            | 24            | 24            | 50      | 0           | 3     | 6          | 18            | 73      |
|       |       | Ifo                           | 0                            | 0             | 0             | 100     | 0           | 0     | 0          | 33            | 67      |
|       |       | Ewekoro                       | 6                            | 0             | 24            | 70      | 0           | 6     | 0          | 0             | 94      |
|       |       | Sagamu                        | 6                            | 8             | 16            | 70      | 3           | 0     | 1          | 12            | 84      |

Data Source: SEEMS, 2018

**\*\*Because of the current value of Naira (Nigeria currency), the income range as suggested in the template may not be appropriate.**

#### 5.4.2 Monthly Family Expenditure Pattern

Table 5.12: Monthly Expenditure Pattern per Family

| Lot 2                                | State | LGA           | Necessities |            |               |              |           | Rent (%) | Transportation (%) | Water and others (%) |
|--------------------------------------|-------|---------------|-------------|------------|---------------|--------------|-----------|----------|--------------------|----------------------|
|                                      |       |               | Food (%)    | Health (%) | Education (%) | Clothing (%) |           |          |                    |                      |
|                                      | Ogun  | Obafemi Owode | 48          | 5          | 9             | 10           | 12        | 4        | 9                  | 3                    |
|                                      |       | Ifo           | 40          | 8          | 11            | 17           | 10        | 6        | 6                  | 2                    |
|                                      |       | Ewekoro       | 49          | 5          | 8             | 15           | 11        | 4        | 5                  | 3                    |
|                                      |       | Sagamu        | 33          | 6          | 10            | 19           | 13        | 5        | 8                  | 6                    |
| <b>Project Affected Area Average</b> |       |               | <b>34</b>   | <b>6</b>   | <b>10</b>     | <b>15</b>    | <b>12</b> | <b>5</b> | <b>7</b>           | <b>4</b>             |

Data Source: SEEMS, 2018

#### 5.5 EMPLOYMENT/UNEMPLOYMENT

The project may not likely lead to any loss of employment. Rather, through the engagement of both skilled and unskilled persons in the communities, during the construction of transmission line RoW, employment and contract opportunities will be created, which will enhance standard of living. Findings from the study show that majority of those affected by the proposed project are artisans. Others affected include traders and farmers.

#### 5.6 LAND OWNERSHIP/LAND USE

The properties owned by the respondents in the communities are of two main types. These are farmlands and land. Evidence from In-depth interviews showed that the common patterns of land ownership in the community are through inheritance, outright purchase, tenant/lease and family. With the exception of lands that have been sold to some individuals, land in the project area is joint property of the extended family system, leading to fragmentation and small sizes of non-contiguous farm holdings.

Table 5.13: Land Ownership/Land Use

| S/N   | LGA           | Private Land |             |            |            | Community own land |             |            | State/LGA own |             |             |            |
|-------|---------------|--------------|-------------|------------|------------|--------------------|-------------|------------|---------------|-------------|-------------|------------|
|       |               | Residential  | Agriculture | Commercial | Industrial | Residential        | Agriculture | Commercial | Industrial    | Residential | Agriculture | Commercial |
| 1     | Obafemi Owode | 372          | 335         | 1          | 0          | 0                  | 0           | 0          | 0             | 0           | 0           | 0          |
| 2     | Ifo           | 14           | 157         | 0          | 0          | 0                  | 0           | 0          | 0             | 0           | 0           | 0          |
| 3     | Ewekoro       | 91           | 276         | 0          | 0          | 0                  | 0           | 0          | 0             | 0           | 0           | 0          |
| 4     | Sagamu        | 582          | 450         | 1          | 0          | 0                  | 0           | 0          | 0             | 0           | 0           | 0          |
| Total |               | 1059         | 1218        | 2          | 0          | 0                  | 0           | 0          | 0             | 0           | 0           | 0          |

Source: SEEMS, 2018

Lands are transferred down the family line through inheritance. In similar manner, community or family lands are also passed on from one generation to another down the family line. Lands can be purchased or leased. Sometimes, conditions are attached to land acquisition (especially leased or pledged land). For example, length of lease of land could be for a single or several planting seasons depending on the agreement reached between the original owner and the acquiring party. In cases where there are economic trees like Kolanut on pledged or leased land, the condition could forbid the temporary owner from harvesting the produce. In that case, the original owner retains the right to harvest the economic trees though the new owner is responsible for planting and harvesting of other food crops. For individually owned lands, owners reserve the right to sell or lease as they choose. However, for family lands, family members are not authorized to sell or lease part or all of such lands without the full consent and agreement of all family members. Every family member is entitled to the family land.

In Ogun State, it is a common practice to have the family lands to be shared in small proportions in order to ensure that each family member retains a portion as a right. The portions assigned to individuals are clearly demarcated so that each member is fully aware of the boundaries of his/her portion.

With proximity the State to Lagos, communities nowadays attach great value to land in their locality. Because of industrial activities and the presence of a number of industries in the State, every land owners now wish to be accorded necessary recognition and to be duly compensated for their land irrespective of the size. One peculiar feature of the State is that women retain full rights of land tenure apart from outright purchases. Family lands are shared with female members notwithstanding their marital status. The children of these female members are also entitled to the lands after the demise of their mothers.

### 5.7 BUILDING PATTERNS/HOUSING STRUCTURE/ASSETS

In the course of going round the affected communities, it could be deduced that settlements in the affected communities exhibit nucleated (clustered) settlement patterns. With the exception of Likosi, Ganun and Simawa, all buildings and structures that will be affected by the project are located in rural settings. Most of the buildings affected by the project are made from cement brick and with corrugated iron or zinc roofing (Plates 5.1-5.7). Some of the uncompleted buildings are already habited, even though they have only been completed to certain stage. The uncompleted buildings and some of the graves along the RoW are made of cement while the shrines are made of mud, woods, and straw. Some of the completed buildings were at foundation level, some at DPC level, some have been constructed up to window Cill and lintel level, some other were at roof level.



Plates 5.1 – 5.7: Typical Structures in the Project Affected Area

### 5.8 FIELDS AND CROPS AFFECTED BY THE WAYLEAVE

Virtually all affected communities are located in areas where significant portions of lands are entirely used for agriculture where crops such as cassava, maize, plantain, sugarcane, kolanut, oil palm etc. are mainly grown. All of the impacted households have cultivated parcel or farming area affected by the wayleave. A total of 1218 households were growing crops and economic trees in the wayleave (Table 5.14). Cassava is the most common food crops in the affected communities especially in Likosi/Dejuwogbo, Omu Pempe, Oluwo Oshin, Abisodun, Adewolu, and Otere Apena etc. Sugarcane is a popular cash crop in Asa Bala, Asa Elegun and Abese while Kolanut is a common crop grown in Sagamu area.

**Table 5.14: Summary of Distribution of Assets (except for building) in LGAs**

| S/N | LGA           | Asset |                     |                      |                      |                     |
|-----|---------------|-------|---------------------|----------------------|----------------------|---------------------|
|     |               | Fence | Fish/Pond           | Trees                | Crops                | Tomb                |
| 1   | Obafemi Owode |       | 1,250,000.0         | 28,081,425.00        | 37,234,494.50        | 150,000.00          |
| 2   | Ifo           |       | 0                   | 3,113,730.00         | 17,041,155.00        |                     |
| 3   | Ewekoro       |       | 0                   | 2,399,935.00         | 15,684,094.00        | 400,000.00          |
| 4   | Sagamu        |       | 0                   | 8,198,555.00         | 19,918,040.00        | 650,000.00          |
|     | <b>Total</b>  |       | <b>1,250,000.00</b> | <b>41,793,645.00</b> | <b>89,877,783.50</b> | <b>1,200,000.00</b> |

Source: SEEMS, 2018

**Table 5.15: Summary of Distribution of Public Properties in Communities**

| S/N | LGA           | Asset         |           |          |               |                 |
|-----|---------------|---------------|-----------|----------|---------------|-----------------|
|     |               | Cemetery/Tomb | Shrine    | School   | Church/Mosque | Public Facility |
| 1   | Obafemi Owode | 3             | 17        | 0        | 2             | 1               |
| 2   | Ifo           | 0             | 13        | 1        | 0             | 0               |
| 3   | Ewekoro       | 8             | 11        | 0        | 1             | 0               |
| 4   | Sagamu        | 13            | 7         | 3        | 6             | 2               |
|     | <b>Total</b>  | <b>24</b>     | <b>48</b> | <b>4</b> | <b>9</b>      | <b>3</b>        |

Source: SEEMS, 2018

## 5.9 POVERTY AND INEQUALITY

Poverty could be considered in absolute terms, as falling below some fixed minimum consumption level, or could be in relative terms to mean inability to afford what average people have. Poverty is the lack of essential items such as food, clothing, shelter and safe drinking water, all of which determine the quality of life. It may also include the lack of access to

opportunities such as education and employment which aid the escape from poverty and/or allow one to enjoy the respect of fellow citizens. Inequality commonly referred to as relative poverty is defined as unequal distribution of income/expenditure across the entire population. Based on low infrastructural development which is described below, the quality of life of the people in most of the project area can be described as poor. For instance, majority of the residents of the affected areas cannot be sustained by their monthly incomes which is often less than ₦60,000 in a month. These income levels as given by the respondents were subjective. Evidence from in-depth interviews with community leaders clearly showed that many of the inhabitants may not be earning as much as they have indicated. Many of them opined that their response would influence the compensation that would be paid on their properties. Evidence from the survey showed that a substantial number of residents in the project area could not access adequate food for a functional life. In view of this, many of them depend on secondary occupations like farming and hunting for sustenance and for additional means of income generation.

Therefore, considering the competing household needs as regards this income levels, the majority of the PAPs could be termed as being poor hence the need to consider cushioning mechanisms to avoid destabilizing such households further. A general improvement in the quality of the lifestyle of the people is therefore expected from the enhancement of the infrastructures and economic activities that will be associated with these development interventions.

## 5.10 INFRASTRUCTURAL BASE

The quality and quantity of available basic infrastructure including water supply, educational, health, markets, electricity, and transport facilities have been used as indicators of the level of development and quality of life. Based on low infrastructural development, the quality of life of the people in the affected communities can be described as poor. A general improvement in the quality of the lifestyle of the people is therefore expected from the enhancement of the infrastructures and economic activities that will be associated with these development interventions.

### 5.10.1 Market Facilities

The project will not affect any of the markets. Aside from Sagamu, which will not be affected by the project, there is no other functional market in any of the affected communities. The inhabitants of the area carry their goods to Mowe, Ifo, Sagamu and Abeokuta which are far from their communities. In the alternatives many of the inhabitants also patronize local shops and kiosks located all over some of the communities. They also purchase whatever they need from these markets.

### 5.10.2 Access Road/Public Transportation

Most of the communities are connected to the main trunk roads (Ifo-Abeokuta express and Lagos-Ibadan express) by a network of roads, although many of the roads are in a state of disrepair. These roads which are dilapidated are currently begging for the attention of the State and Local Governments; even the roads leading to the headquarters of LGAs which these

communities belong to are in bad shape. Transportation is majorly by commercial motor vehicles and motorized cycles. Porterage on heads or shoulders is also a common activity, especially by the female gender.

### 5.10.3 Electricity Supply

Some of the communities (Ejio, Likosi, Dejuwogbo, Alado Sagamu, Simawa, Makogi, Soso, and Ganun etc.) are connected to national grid; although electricity supply to these communities was reported to be irregular and unreliable. Most of the affected communities are not supplied with electricity; those Majority of the households use kerosene for lighting, while fuel wood is used for cooking inhabitants. Very few of the houses in communities with electricity, have refrigeration and washing machines in their houses.

### 5.10.4 Educational Facilities

With the exception of few communities (Ejio, Likosi, Ewu Lisa, Ganun, Simawa, Sagamu) Primary schools are not easily accessed within a 1–5 km radius of settlements. Secondary schools are not so easily accessed. This may be one of the reasons for the low educational level of most of the inhabitants of the area. Majority of the Secondary school-age children attend schools at Sagamu, Ifo, Abeokuta or one of the neighbouring communities outside the project area. The project area has not benefitted from the free and free and compulsory education of Ogun State government. The proposed project will not be affecting any the schools in the areas.

### 5.10.5 Postal/Telecommunication Facilities

Members of the affected communities are benefitting from the services of the major GSM telecommunication providers (MTN, Airtel, Globacom, and Etisalat); though the coverage is not as effective as the main cities. But with few exceptions, most of these communities are connected to at least one of these service providers. The capital cities and other major towns in the study areas are fully covered by one or the other of these networks. It is therefore quite easy to communicate socially and also carry out business transaction within any part of the State. None of the communities including the major ones has postal services in their vicinity. So the project will not affect any telecommunication or postal services in the areas.

### 5.10.6 Health Facilities

With the exception of the Primary Health Care Centre at Likosi and Sagamu General Hospital, there is no medical clinic or pharmacy in the Project area. Residents are required to use the public health centre or private clinics in Likosi, or in cases of more specialized treatment, Sagamu General Hospital.

#### *Disease Prevalence*

Evidence from the quantitative data showed that malaria is the commonest disease suffered in the project area followed by Cough and Diarrhoea in that order. Malaria is the number one cause of morbidity in sub-Saharan Africa, and the project area is devoid of potable water, thus the high rate of water-borne diseases.

Most of the affected persons consider themselves as ‘very healthy’ (51%) and another 18% believe that they are ‘healthy’. However, the people’s idea of health may be limited to ‘physical well-being’ and not being admitted in the hospital for medical treatment. This may not be so if health were to be considered as the state of physical, mental and social well-being and not merely absence of sicknesses or diseases. This however cannot be taken as the true health status of the community since most of them rarely go to hospitals except when they are very sick. Evidence from the focus group discussions revealed that the health seeking behaviour of most communities is poor. Data from the health survey also revealed that for their medical attention, about 28% of the respondents use public health facilities; about 23% would use Traditional Health Clinics while another 17% would use patient medicine stores. Attendance of Antenatal care clinic is equally poor; only very few mothers attend antenatal clinics prior to the delivery of the last baby. They rely on local herbs. Evidence from health surveys indicates that majority of the inhabitants rely on traditional medicine (herbs) for their health needs. From the survey, it was found that visits to health centres and hospitals for treatment become essential only as the last resort for majority when it becomes absolutely necessary (when the use of herbs proves ineffective and when the sickness is getting out of control). Many of the inhabitants avoid health centres/hospitals because of waiting time, cost of treatment and the attitude of health workers among others. Many of them patronize Patent Medicine Stores and itinerant drug vendors in spite of the fact that that the efficacy of dispensed drugs cannot be ascertained.

### 5.10.7 Water Supply

Evidence from the survey and in-depth interviews showed that majority of residents of the project area do not have access to potable water supply. Most of the households in the affected communities have borehole which form forms the main source of water supply. The main sources of water for consumption and domestic use to some other households are pipe borne water and sunk wells. Very few rely on river or stream. None of the communities have access to government supplied potable water sources and there is nothing to indicate government readiness towards provision of portable water to the communities. Majority of the residents utilize private boreholes (often at a cost to them).

**Table 5.16: Drinking Water Sources in the Study Area**

| Lot 2        | State | Local Government Areas | Water Resources  |           |            |              |          |
|--------------|-------|------------------------|------------------|-----------|------------|--------------|----------|
|              |       |                        | Pipe Borne Water | Borehole  | Sunk Wells | River / Rain |          |
|              | Ogun  | Obafemi Owode          | 12               | 74        | 9          | 6            | -        |
|              |       | Ifo                    | -                | 100       | -          | -            | -        |
|              |       | Ewekoro                | 6                | 59        | 35         | -            | -        |
|              |       | Sagamu                 | 10               | 83        | 5          | 1            | 1        |
| <b>Total</b> |       |                        | <b>10</b>        | <b>76</b> | <b>9</b>   | <b>4</b>     | <b>1</b> |



## 5.11 SUMMARY OF PAPS

Table 5.17: Project Affected Structure

| Type of Primary Structure                   |                      | Number of Owner (HHs) | Number of Physically displaced persons | Number of Economically displaced persons | Number of owner (HHs)         | Number of Physically displaced persons | Number of Economically displaced persons |
|---|----------------------|-----------------------|--|--|-------------------------------|--|--|
|   |                      | Title holder          |  |  | Non-title holder (Encroacher) |  |  |
| Residential                                 | Occupied             | 73                    |  |  | 82                            | 82                                     |  |
|   | Unoccupied           | 563                   |  |  | 267                           | 267                                    |  |
| Residential tenant structure                |                      |                       | 37                                     |  | 0                             | 0                                      | 0  |
| Commercial Structure                        |                      | 1                     | 1                                      | 1  | 1                             | 1                                      | 1  |
| Public facility (tomb, shrine, school etc.) | Public and Religious | 56                    | 56                                     |  | 16                            | 16                                     |  |
| <b>Total</b>                                |                      | 693                   | 693                                    | 1  | 366                           | 366                                    | 1  |

Source: SEEMS, 2018

Table 5.18: Project Affected Land

|                 | Land Use                | Number of owner (Project Affected Units) | Area Size (m <sup>2</sup> ) | Relocation Assistance Needed |
|-----------------|-------------------------|--|-----------------------------|------------------------------|
| Government Land | Residential Land        |  |                             | No                           |
|                 | Commercial Land         | 455                                      | 250,000.00                  |                              |
|                 | Agricultural Land       |  |                             |                              |
|                 | MFM                     |  | 199,900.00                  |                              |
|                 | Redeemed (Donated Land) |  | 96,200.00                   |                              |
|                 | <b>Sub-Total</b>        | 455                                      | 546,100.00                  |                              |
| Community Land  | Residential Land        | 689                                      | 795,859.89                  | Yes                          |
|                 | Commercial Land         | 4  | 3,136.14                    |                              |
|                 | Agricultural Land       | 1129                                     | 1,957,600.00                |                              |
|                 | Non-used Land           | 0  | 0.00                        |                              |
|                 | Others                  | 2  | 236.00                      |                              |
|                 |                         | <b>Sub-Total</b>                         | <b>1824</b>                 |                              |
|                 | <b>Grand Total</b>      | <b>2279</b>                              | <b>3,302,932.03</b>         |                              |

Source: SEEMS, 2018

Table 5.19: Project Affected Agricultural Land and Associated PAPS

|                           | Project Affected Units (Number of Agricultural Land) | Project Affected Persons (Number of Economically Affected Persons) |
|---------------------------|--|--|
| Government Land           | 285  | 285  |
| Community or Private Land | 933  | 933  |
| <b>Total</b>              | <b>1218</b>  | <b>1218</b>  |

Source: SEEMS, 2018

Table 5.20: Affected Trees and Crops

|             |       | Unit    |
|-------------|-------|---------|
| Agbalumo    | Stand | 24      |
| Apara       | Stand | 3       |
| Bamboo      | Stand | 7,916   |
| Banana      | Stand | 697     |
| Beans       | Stand | 300     |
| Bitter kola | Stand | 2       |
| Bitter leaf | Stand | 5       |
| Cashew      | Stand | 25      |
| Cassava     | Stand | 239,540 |
| Cherry      | Stand | 26      |
| Citrus      | Stand | 279     |
| Cocoa       | Stand | 396     |
| Coconut     | Stand | 44      |
| Cocoyam     | Stand | 5,450   |
| Date palm   | Stand | 88      |
| Ewe leaf    | Stand | 495     |
| Ewedu       | Stand | 1,000   |
| Eweran      | Ha    | 0.09    |
| Fruit       | Stand | 1       |
| Garden egg  | Stand | 600     |
| Guava       | Stand | 203     |
| Hard wood   | Stand | 12,886  |
| Idi         | Stand | 281     |
| Idin        | Stand | 637     |
| Idingo      | Stand | 129     |
| Kola nut    | Stand | 4,084   |
| Maize       | Ha    | 1       |
| Mango       | Stand | 91      |
| Moringa     | Stand | 14      |
| Oil palm    | Stand | 4,293   |
| Okro        | Stand | 5,800   |
| Orange      | Stand | 24      |

|             |       |        |
|-------------|-------|--------|
| Paw paw     | Stand | 567    |
| Pear        | Stand | 2      |
| Pepper      | Stand | 11,120 |
| Pineapple   | Stand | 3,464  |
| Plantain    | Stand | 9,436  |
| Raffia palm | Stand | 2,174  |
| Shea butter | Stand | 32     |
| Soft wood   | Stand | 15,196 |
| Sugarcane   | Stand | 34,200 |
| Tomato      | Stand | 555    |
| Vegetable   | Stand | 9,700  |
| Walnut      | Stand | 1      |
| Yam         | Stand | 900    |

Source: SEEMS, 2018

## CHAPTER SIX: IMPACT OF THE PROJECT ON HUMAN ENVIRONMENT

### 6.1 PREAMBLE

This type of projects usually generates either positive or negative impacts on their host communities, however, these impacts may be real or perceived and may affect the people's receptiveness of the development project and relationship with the project proponents. Generally, the attitude of the host communities towards the project seems to be positive as most of the key stakeholders engaged in in-depth and focus group discussions perceived greater benefits from the transmission line project since it is intended to enhance.

The following paragraphs summarize the impacts. The following main categories of affected people have been identified:

153 owners of plots with houses and/or a secondary structure in the wayleave  
 753 Uncompleted structures  
 81 Undeveloped lands  
 72 monuments (shrines and tombs)  
 1218 individuals have crops/economic trees along the route

A certain number of households are affected by multiple impacts.

Owners of plots with houses or other structures in the wayleave will be affected by:

- Loss of land and houses in which they are living;
- Loss of other buildings and structures (factory, workshop etc);
- Productive time lost to participate in the evaluation of impacts and other administrative tasks.

There are 153 buildings affected along the RoW; some community sites are also affected. In particular 48 shrines and 24 tombs will be affected. These communities opted for compensation for these properties.

Most of the affected land have been sold and cut to plots while there are developers that bought large expanse of land along the line routes. So apart from household and crop owners that will lose their properties, some of the estates' owners will equally lose part of their lands to the project. Within some of the Estates, some individuals who have bought land from these estate owners will also lose their buildings and some other properties. For instance, within Aina Gold Estate some number buildings owned by individuals will be lost.

## 6.2 IMPACT OF TRANSMISSION LINES AND SUBSTATIONS

### 6.2.1 General

This type of projects usually generates either positive or negative impacts on their host communities; these impacts may affect the people's receptiveness of the development project and relationship with the project proponents. This section therefore presents a detailed description of the Project impacts. The potential environmental impacts of the installation of the power transmission lines from Ejio to Likosi/ Dejuwogbo, Likosi/ Dejuwogbo to Redeem, and Likosi/ Dejuwogbo to Sagamu and substations were assessed using data collected from field investigations in January to February, 2018, consultations with government officials, review of relevant documents and consultation with various stakeholders as well as PAPs. There are two categories of residents in the project affected areas. These are the resident and non-resident households:

#### 6.2.1.1 Resident Households

As at the end of the census and socio-economic baseline study, the Project RoW was occupied by 989 full-time residents, residing in 153 households, all of whom will be physically displaced by project development. Most of the 153 resident households have ownership rights to a primary residential structure and land in the affected area. Some houses were occupied by separate tenant households as of the census time. Some resident households also have ownership rights to an area of agricultural land.

#### 6.2.1.2 Non-Resident Households

Two thousand, and Fifty-Four (2,054), additional families have ownership rights to structures and/or plots in the Project RoW but do not reside in the area. These households are classified as non-resident households. These non-resident landowners will be economically displaced by the Project and are therefore eligible for compensation.

The details of the affected communities are presented in Appendix IV while Appendix V provides the assets that will be affected in each of the communities.

### 6.2.2 Houses and Secondary Structures

In all, a total of 906 houses including 153 completed and 753 uncompleted (which are at various levels of completion) are located in the RoW. Likosi/ Dejuwogbo/Dejuwogbo substation alone has 366 structures (82) completed and 284 uncompleted) (Appendix II). Other two substations (Mountain of Fire and Redeem substations) are open land and no structure exists on them. Most of these houses are made from brick, and with corrugated iron or zinc roofing. These houses are classified as modern, traditional or a combination thereof depending on the construction materials used (concrete, thatch etc.). In total there are 153 households that have a house affected. Apart from house, there other structures that are impacted by the project. These include shops, block-making factory and some public facilities.

Public facilities located in the Project RoW Footprint are limited to the three (4) Primary school at Ewu Lisa, Ologbun Shofidiya, Ganun, and Likosi/Dejuwogbo; nine (9) worship centres (Mosques/Churches) in Ibokuru, Ori, Kori Oja, Ewu Lisa, Alado, Gbara, Simawa, Soso and Likosi/Dejuwogbo communities. The primary school and some of the churches and mosques used by residents are affected by RoW.

### 6.3 CUMULATIVE IMPACT

Some of the communities will experience cumulative impact from this project. Specifically, Likosi/ Dejuwogbo substation, Alado and some of the communities where the existing 132 kV transmission lines pass through are already associated with some impacts of loss of land (due to the construction of access roads) or restricted cultivation practices (tree cultivation in the wayleave). The new line will increase the size of the wayleave were these cultivation restrictions apply. However, the acquisition of Likosi/Dejuwogbo substation land and access roads already present in this substation will reduce the impacts in this portion of the project. For instance, there will no compensation for land in the substation; people will only be compensated for the structures and crops (which are mainly seasonal crops) in this substation. However, all other communities where the new transmission lines are passing through will be compensated for the loss of land, structures and crops as a result of this project

Apart from Likosi/ Dejuwogbo, the substation site, some other communities are already affected by the existing transmission lines but will again be affected by the new proposed transmission lines. One of the proposed power interconnection lines from Ejio to Likosi/ Dejuwogbo also traverses an area where there is a railway project but the survey team had found a way to by-pass this rail line to avoid the impact this would have had on the project.

## 6.4 ECONOMIC IMPACT OF CONSTRUCTION AND MAINTENANCE

### 6.4.1 Employment

Majority of residents of the affected communities and farmers and engaging in subsistence farming. One of the challenges faced by these communities affected by the project is lack of alternative economic activities such as employment in the formal sector or industry. It is expected that some jobs will be available during the construction of the transmission line for the local population to be employed, mainly as casual labourers. However, the employment opportunities will be temporary and the communities will only benefit during construction phase. A sizeable number of the affected communities have a lot of experienced workers that can be engaged during construction. These local artisans and entrepreneurs (where feasible) should be given opportunity to work with the construction company that will handle the project. Again, the project will attract a minimal positive impact on employment as only a few people are likely to be employed. It is therefore recommended that the community leaders should be encouraged by TCN and the contractor to form a project liaison group to assist them in distributing jobs to local communities.

It was observed that four PAPs who own shops/factory at Ori, Ewu Lisa, Simawa, and Likosi/Dejuwogbo within the project area might lose their major source of livelihood as these structures may be removed during the civil works. As the primary economic activity in the Project Footprint is agriculture, the impact on land-based livelihoods is high. However, the people mainly engage in subsistence farming. The major crops grown in the area cassava and

maize and the common cash crops are kolanut, sugarcane and oil palm.

#### 6.4.2 Infrastructure

In terms of infrastructure, the RoW is likely to affect schools, religious institutions and shrines. As the community survey showed, the following community infrastructures will be impacted and need to be relocated:

Three (4) Schools at Ewu Lisa, Ologbun Shofidiya, Gaun, and Likosi/Dejuwogbo

Three (3) Public Facilities at Ori, Alado and Likosi/Dejuwogbo

Forty-seven (48) Shrines

Twenty-two (24) Tombs at Ejio, Ibokuru, Ori, Likosi/Dejuwogbo

The impact of the project on these infrastructures will be significant bearing in mind the number of people that use them, most especially the Schools which is serving a number of communities around the area. Therefore, the public school affected by the project will be demolished and relocated to sites outside the proposed RoW. The communities have land outside the RoW to reconstruct these buildings, and the community leaders presented no objection to their displacement if proper valuation and compensation are provided before the commencement of project activities in the area.

#### 6.4.3 Estate

There are 32 Estates affected by the project RoW. These Estates developers purchased hectares of land from the original land owners. Virtually all of these Estate owners have title documents some of which were sighted by the survey team. Some of the Estates are already built up, some have building foundations own by individuals, some are busy with the development of the estate, while some have spent substantial amount of money on architectural design of the prospective projects the land was acquired for. Some Estate owners have sold substantial parts of their estates to individuals who have erected or are erecting structures therein. The Project RoW substantially affected these estates, their project design and some of the structures within. Therefore, these properties owners are due for compensation.

**Table 6.1: List of Estates Affected by the RoW**

| S/No. | Name of Organization                      | Community        | Remarks |
|-------|---|------------------|---------|
| 1     | Aina Gold Estate                          | Ibokuru          | Ewekoro |
| 2     | Da  | Eleworo          | Obafemi |
| 3     | Royal Life Estate                         | Olosan           | Obafemi |
| 4     | Unknown Estate                            | Asa Elegun       | Obafemi |
| 5     | National Directorate of Employment Estate | Asa Elegun       | Obafemi |
| 6     | Unilag Unique Estate                      | Asa Elegun       | Obafemi |
| 7     | Mercy Estate                              | Asa Elegun       | Obafemi |
| 8     | Mathew Ashimolowo Holdings                | Ori              | Obafemi |
| 9     | Yinka Property Mart Estate                | Otere Oba, Peki, | Obafemi |
| 10    | Mayflower Estate                          | Otere            | Obafemi |
| 11    | Ore Meta Estate                           | Orile Igbehin    | Obafemi |
| 12    | Ling Company Group                        | Ijemo –          | Shagamu |
| 13    | Caroline                                  | Makun            | Shagamu |
| 14    | Alabukun                                  | Oke Ate Ajebo    | Shagamu |

|    |  |              |         |
|----|--|--------------|---------|
| 15 | Cement                                 | Ogundipe     | Shagamu |
| 16 | Unkown Estate                          | Ewu Lisa     | Shagamu |
| 17 | Arishab Estate                         | Ewu Lisa     | Shagamu |
| 18 | Bashmoh Homes and Properties           | Aberebi      | Shagamu |
| 19 | Treasures Parks                        | Igbepa       | Shagamu |
| 20 | Treasures Parks                        | Ologbun      | Shagamu |
| 21 | Property Mart                          | Ologbun      | Shagamu |
| 22 | Mayfair Estate                         | Simawa       | Shagamu |
| 23 | Unnamed Estate                         | Simawa       | Shagamu |
| 24 | Lagos State inland Revenue Corporative | Simawa       | Shagamu |
| 25 | Unnamed Estate                         | Simawa       | Shagamu |
| 26 | Fayoff Estate                          | Gaun         | Ifo     |
| 27 | BKA Universal Estate                   | Gaun         | Ifo     |
| 28 | Eminent Estate                         | Gaun         | Ifo     |
| 29 | Glory Land Estate                      | Gaun         | Ifo     |
| 30 | Cassavilla Capital                     | Gaun (Igodo) | Ifo     |
| 31 | Green Spring Estate                    | Gaun (Igodo) | Ifo     |
| 32 | Platinum Estae                         | Makogi       | Ifo     |

#### 6.4.4 Community Sites

Evidence from socio-economic survey indicates that on the whole 77 community sites will be affected. The most important, numerically, are the 48 community shrines and 24 tombs that will be affected by the RoW. For these shrines, the compensation payment covers the cost of relocation and the associated ceremonies (undertaken by the community representative). The State Government and its representatives ensure that TCN pays the appropriate compensation to the right people and at the right time so that PAPs are able to carry out the required relocation activities. They also ensure that sufficient time, which is between 2 to 6 months, is provided for the PAPs to relocate their assets. Neither TCN nor the government representatives will participate in the ceremonies. However, ensuring the payment of the appropriate compensation and signing off the indemnity form confirms that each party has fulfilled their roles accordingly thereby allowing property owners to carry out their traditional rites without interference of strangers. In communities where there are sacred forests (for instance in Ibokuru), community administrators and elders must be consulted to obtain permission to cross-over those sites. There is no cemetery in any of the communities; but there are graves (tomb) in the frontage of some structures and some specific location within some of the communities. These sites are highly valued by the people and considered sacred and encroachment in such areas would attract serious resentment from the communities. Therefore, compensation should be paid for relocation of such sites.

#### 6.4.5 Loss of Economic Trees and Crops

Substantial hectares of land will be affected, essentially during construction. The number of households with trees, crops in the RoW is 1218 of the affected households.

As is the case in some other settings, experience has shown that in Nigeria, many farming activities have been found to be ongoing in already acquired land or RoW which is considered TCN land. Experience shows that in various parts of the country people do cultivate, mainly seasonal crops along the RoW. It is therefore recommended that TCN may allow PAPs to pursue those activities that have no impact to the pillars and insure security of the PAP. The farming households can thus continue with their farming activities in the RoW after construction.

In the construction period crops will have to be destroyed or delayed in the wayleave area. It is difficult to assess the exact impact on the annual harvest since the exact period and duration of construction in each locality are not known. For this reason, compensation of a year of harvesting of the area under cultivation in the wayleave should be given to all the households. In addition, crops that may be removed from land to be temporarily used for construction purposes (camp, access road) will also have to be compensated on the same base (cash equivalent to the value and quantity of crops). The exact amount is not evaluated since at this stage the exact location of camps and others facilities are not known. The contractor will be asked to plan its work and facilities in a way to minimized construction impacts.

#### 6.5 IMPACTS ON GENDER

Generally, the project will affect all the property owners in the affected areas but it will affect each gender differently. The project will mostly affect the farmers, majority of whom are men. Most of the household heads are men and farming activities in the area are carried out by men. Women are mostly involved in domestic work, though there are few women that also engage in farming activity. The land lost due to the project and subsequent loss of crops (annual and perennial) will affect these men more than women. With the exception of the property owners who are not resident in the area, majority of the men rarely go out of the area to look for work elsewhere. They engage in farming activity within their vicinity and they use whatever they can get from their faming activity to maintain their family. Though there are very few female headed households, this notwithstanding, these few women head of households could still be assisted to reduce the impact on their livelihood. During construction and to a lesser degree during the maintenance and decommissioning operations, women will benefit from opportunities to provide goods and services to the workers and as well engage in cooking and cleaning services.

#### 6.6 IMPACTS ON VULNERABLE GROUPS

Among affected PAPs are vulnerable groups who cannot meet their basic needs and who require special treatment or consideration. They will need support during and after relocation so that they can maintain or improve their pre-project living conditions.

There are four physically challenged persons (two cripples and two with sight problem) were identified. No mentally disabled persons were identified as part of the PAPs.

The objective of income restoration measures for the vulnerable persons is to ensure that they are reasonably assisted to overcome potential economic shock from the project and maintain the

quality of life not less than their pre-project state because; they are at higher risk than others based on their vulnerability disadvantage. These physically changed persons' structures are affected by the transmission line. Specially, one of the cripples requested for resettlement rather than compensation. The fear of not been able to put up another structure in the area and that because his wife is also physically challenged (being crippled), they may not have the energy to supervise such project again couple with the fear of land grabbers (popularly called 'Omo Onile') The kind/cash assistance for vulnerable group and PAPs in general shall be administered by TCN through the resettlement committee or through NGOs in consultation with the PAPs. To ensure that income restoration measures are effective all the articulated resettlement measures will be carried out prior to the project implementation. The income restoration plan (skill acquisition, assistance) to vulnerable PAPs shall be funded through the amount to be set aside for administration within the resettlement budget. This fund will be set aside by the TCN through its counterpart responsibility to project's due diligence and shall preferably be operated/administered by the resettlement committee/NGO to be appointed and supervised by the PMU during RAP implementation.

From the socioeconomic survey, it is estimated that only 3.2% impacted households in the communities crossed by the wayleave were headed by a woman. Culturally, among the major ethnic group in the area, women rarely own land; but in the course of conducting the socioeconomic survey, a significant number of women showed up as owners of landed properties in the area. These properties were portions assigned to them from family land inherited which have been shared among the siblings. This has however not affected the norm of non-involvement of women in community decision making among the ethnic groups.

## 6.7 IMPACT ON MINORITY GROUPS

Most of the affected communities are homogenous with regard to ethnicity; mainly Yoruba of Ogun extraction. There are no specific marginalized or stigmatized minority or indigenous people in the area that need special attention because of their status.

## CHAPTER SEVEN: VALUATION AND COMPENSATION

### 7.1 PREAMBLE

Land taking typically entails compensation for land, houses, business and other structures on that land, as well as other assistance in order to mitigate the adverse consequences that affect people and communities when they give up property for public good. The form of resettlement agreeable to the PAPs for both the permanent properties and temporary structures affected by the project is monetary compensation.

The Nigerian Electricity Regulatory Commission (Acquisition of Land and Access Rights for Electricity Projects) Regulations, 2012 has carried out a great reform on the Nigerian Land Use Act of 1978 as regard acquisitions and payment of compensations on landed property for overriding public interests such as to conform with the World Bank OP 4.12 and IFC PS 5. The relevant sections of these regulations as regard the fair right of the PAPs were taken into consideration.

Majority of the affected communities and LGAs were largely agrarian; however, few of the communities (Dejuwogbo, Likosi/ Dejuwogbo, and Ejio) are currently experiencing sub-urban development. This has had an adverse effect on the value of landed property in the area. The improved status of some of the affected Local Government Areas because of their proximity to Lagos State has had a spilling effect on some of the communities, with property market maintaining an upward trend. The market analysis of recent sales of land in the neighbourhood shows that land ripped for house development which almost cost nothing before now worth ₦500.00 and ₦1200.00 per metre square while agriculture land sell for between ₦350.00 and ₦500.00 per metre square.

Current market values will be utilized for compensation of resources that will be affected by the project. The rates are uniform for the same asset types and sizes. The uniformity in rates were established to eliminate persons or groups feeling under or overpaid in comparison to others. These rates will be used for the compensation of the identified properties on the RoW and Likosi/ Dejuwogbo Substation. TCN will provide indemnity forms as shown in Form IV of for each property that is being compensated for.

TCN valuation and payment of compensation procedure utilizes prevailing market prices as compensation rates for all affected assets/properties as at the time of enumeration and valuation, to meet the World Bank's OP 4.12/PS 5. Methods for valuation and payment of compensation for different categories of losses due to RoW acquisition for the transmission line and substations are briefly discussed below:

#### *Replacement Cost Method*

In valuing the subject properties, we have considered the Replacement Cost method of valuation. By Replacement Cost method, we imply estimating the cost of putting up the structure in its present state using current cost of construction. This method was used in estimating the value of the property/structure and is based on the assumption that the capital value of an existing development can be equated to the cost of reinstating the development on the same plot using current cost of labour, material and other incidental costs. The resultant figure is then added to an open fair market value of land in order to arrive at total value of compensation. In other words,

the estimated value will comprise of the cost of the property as if new. For permanent structures that will be displaced or removed permanently due to the project such as residential houses, walls/fences, etc., the compensation was structured to cover the replacement cost discussed above. It also covered the disturbance, loss, and other contingences that may be incurred in the course of movement. Agreements have been reached between TCN, the State Government, and the owners of affected structures that they will receive compensation and given adequate time to relocate their structures. This resulted to the 6 months relocation period for residential structures as against the 2 months for temporary structures only.

For crops and economic trees, reliance has been placed on the Federal Government harmonized rates for the Southwest Geopolitical zone for the Crops/Economic Trees (a copy is hereby attached for your scrutiny and information).

The rates were determined at market price of products/assets. The compensation payment was structured to cover the total yield. A percentage of outgoings such as labour, transportation, and market prices, were factored in to determine the net loss in annual income. The gestation period for assets like trees, crops, and fishes, were determined for the planting or reproduction of each at a premium market rate of return for agricultural investments, compounded per annum over the gestation period of each tree/crop, and multiplied by the net income loss. The market cost of seedlings was also determined and added to the total loss. The determined value was multiplied by the number of project affected crops/tree for each of the claimant.

For shrines and tombs, the compensation payment covers the cost of relocation and the associated ceremonies, which is undertaken by already identified property owners to be compensated. The State Government and its representatives ensure that TCN pays the appropriate compensation to the right people and at the right time so that PAPs are enabled to carry out the required relocation activities. They also ensure that sufficient time, which is between 2 to 6 months, is provided for the PAPs to relocate their assets. Neither TCN nor the government representatives will participate in the ceremonies. However, ensuring the payment of the appropriate compensation and signing off the indemnity form confirms that each party has fulfilled their roles accordingly thereby allowing property owners to carry out their traditional rites without the interference of strangers.

The total compensation payable for the PAPs along the Transmission Line is in the sum of ₦2,076,911,836.32 (Two Billion, Seventy-Six Million, Nine Hundred and Eleven Thousand, Eight Hundred and Thirty-Six Naira and Thirty-Two Kobo) only. The breakdown of the figure amongst the various communities is as shown in the Appendix V.

## 7.2 COMPENSATION FOR LAND

In line with the World Bank's OP 4.12//PS 5 requirement, the compensation for the losses has been designed to ensure that the quality of life for affected persons will be restored to a minimum of pre-project status. After construction, farming can be resumed. However, for safety reasons, TCN does not allow the planting of economic trees on the RoW.

The Land Use Act makes it lawful for the Governor to revoke a right of occupancy for overriding public interest. For both statutory and customary rights of occupancy, public interest

includes the requirement of land for mining purposes or transmission line or for any associated purposes. Any such revoked right of occupancy shall be entitled to compensation based on the provisions of the Land Use Act. However, no compensation shall be awarded with respect to unoccupied land as defined in the Land Use Act, except to the extent and circumstances specified in the Land Use Act (Section 20, Subsection 4).

### Compensation for the Substations' land

The three substations covered in this report are Likosi/ Dejuwogbo (25.00 Ha), Redeem (9.62 Ha) and Mountain of Fire (MFM) (19.99 Ha) substations. One of the substations, Redeem substation was donated to the project. From available information, Likosi/ Dejuwogbo substation land had already been acquired by TCN since 2008 but was not put to use. This gives room for some development on the land by people who encroached on the land. Some of the encroachers had put structures on the land and some have been using the land for farming and some other activities. Under World Bank OP 4.12, lack of legal title is no bar in extending assistance and support to those affected by the project development. Land in the two substations donated to the project will not be compensated for but compensation will be paid for the structures, crops (which are not seasonal) and other properties existing within Likosi/ Dejuwogbo substation. Compensation will be restricted to structures, installations, and improvements on the land, not the land itself. However, owners of seasonal crops (mainly cassava) on this land should be allowed to harvest their crops before the commencement of the project so as to avoid unnecessary compensation costs. Based on the current market value, the total replacement cost of the structures in Likosi/ Dejuwogbo substation is =N=662,042,328.30 (Six Hundred and Sixty-Two Million, Forty Two Thousand, and Three Hundred and Twenty-Eight Naira and Thirty Kobo) only (Appendix V).

The land for Abule Oba (Redeem) Substation is planned to be donated by a Christian group, Redeem, on a voluntary basis. Reportedly, the agreement on the voluntary land donation has been concluded between TCN and Redeem. In case that a land is donated on a voluntary basis without payment of full compensation, Environment & Social Framework for IPF Operations issued by the World Bank need to be considered. The Guidance Notes providing guidance for the borrower on the application of the Environmental and Social Standards, ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement, stated in footnote 10.

Six provisions on voluntary land donation described in the World Bank Guidance Notes, ESS5, and results being addressed to the provisions by TCN are summarized below:

- (a) ESS5 suggests that the potential donor or donors shall have been appropriately informed and consulted about the project and the choices available to them. As TCN stated, TCN started consultation with the landowner, Redeem, and sharing the project plan since April 2017.
- (b) ESS5 suggests potential donors are aware that refusal is an option, and have confirmed in writing their willingness to proceed with the donation. According to the agreement concluded between TCN and Redeem, Redeem expressed their intention to donate the land on a voluntary basis without compensation in writing;
- (c) ESS5 suggests that the amount of land being donated is minor and will not reduce the donor's remaining land area below that required to maintain the donor's livelihood at current levels. It was confirmed that Redeem owns approximately 1,000 ha of land and agreed to donate 9.8 ha of land to TCN, which means Redeem still have enough area of vacant land for future use;
- (d) ESS5 suggests that no household relocation is involved, and it was confirmed that no resettlement will be caused for the land;
- (e) ESS5 suggests that the donor is expected to benefit directly from the project. It was confirmed

that Redeem's facilities will be able to connect to the national grid directly and access to more reliable power source instead of Redeem's in-house power generation, once this project is completed; and

(f) ESS5 suggests that donation can only occur with the consent of individuals using or occupying the land for community or collective land, however, it was confirmed that the land is vacant and not used.

### 7.3 COMPENSATIONS FOR HOUSES

In all, a total of 153 residential structures, 753 uncompleted structures, 1218 crops and economic trees, 24 tombs, and 48 shrines, 4 schools, 9 worship centres (churches/mosque), 81 undeveloped land and 2 business facilities will be affected and thereby compensated for, by the proposed project. No archaeological structures, medical centres will be affected by the transmission line.

As shown in Table 7.1 the total replacement cost of the houses is ₦1,679,918,207.82 (One Billion Six Hundred and Seventy-Nine Million, Nine Hundred and Eighteen Thousand, Two Hundred and Seven Naira and Eighty-Two kobo) only.

**Table 7.1: Compensation for Some Affected assets including Structures**

| S/N | ITEM DESCRIPTION | COMPENSATION ASSESSED VALUE FOR STRUCTURE LOCAL GOVERNMENT AREA |              |                |                  | Total Assessed Value (₦) |
|-----|------------------|---|--------------|----------------|------------------|--------------------------|
|     |                  | Ew eko  | Ifo (₦)      | Obafemi Owode  | Sagamu (₦)       |                          |
| 1   | Church/Mosque    | 357,700.00  | 0.00         | 8,602,000.00   | 30,679,675.00    | 39,639,375.00            |
| 2   | Shrine           | 2,200,000.00  | 2,400,000.00 | 3,480,000.00   | 1,500,000.00     | 9,580,000.00             |
| 3   | School           | 0.00  | 2,159,400.00 | 0.00           | 5,878,200.00     | 8,037,600.00             |
| 4   | Tomb             | 400,000.00  | 0.00         | 150,000.00     | 650,000.00       | 1,200,000.00             |
| 5   | Public Facility  | 0.00  | 0.00         | 500,000.00     | 5,728,900.00     | 6,228,900.00             |
| 6   | Factory          | 0.00  | 0.00         | 301,950.00     | 15,938,460.00    | 16,240,410.00            |
| 7   | Building         | 38,481,911.50   | 319,535.00   | 417,045,972.50 | 962,332,102.30   | 1,418,179,521.30         |
| 8   | Land             | 4,378,798.00  | 16,200.00    | 127,678,099.92 | 48,739,303.60    | 200,872,401.52           |
| 9   | Total For        | 45,818,409.50   | 4,895,135.00 | 557,758,022.42 | 1,071,446,640.90 | 1,679,918,207.82         |

Source: SEEMS, 2018



#### 7.4 COMPENSATION FOR PUBLIC INFRASTRUCTURE

Few public buildings (mainly Schools, Churches and Mosques), are located along the right-of way and very close to the substations and will be affected by the project. These public buildings like churches or mosques whose symbolic value can be important and which several communities will hesitate to move will be compensated for. The replacement cost of the public buildings has been included in the calculation of the project. It should be noted that for most affected public structures, the owners would prefer in-kind compensation.

**Table 7.2: Compensation Assessed Value for Public Facility**

| COMPENSATION ASSESSED VALUE FOR PUBLIC FACILITY |                 |             |         |                |              |                          |
|---|-----------------|-------------|---------|----------------|--------------|--------------------------|
| S/N   | ITEM DESCRIPTIO |             |         |                |              | Total Assessed Value (₦) |
|   |                 | Ewekoro (₦) | Ifo (₦) | Obafemi Owoode | Sagamu (₦)   |                          |
| 1   | Public Facility | 0           | 0       | 500,000.00     | 5,728,900.00 | 6,228,900.00             |

#### 7.5 COMPENSATION FOR AGRICULTURAL PRODUCTION

The total area required by the project is estimated at 331 hectares. TCN will compensate for loss of land, economic trees and crop, structures, etc. and thus acquire a right-of-way for safety reasons; households and communities will not be allowed to use the way leave for agricultural operations (crops, grazing). No construction will be allowed along the right of way and within the substations. The compensation costs for the harvest lost during the construction works will vary depending if affected people had time to make harvest or not. The compensations for crop losses will be calculated during project implementation on the basis of its commercial value in addition to the restoration cost of crops.

**Table 7.3: Compensation Cost for Loss of Annual Crops, Economic Trees, Well/Boreholes and Lands**

| S/No. | Local Govt.    | Annual crops  | Ponds and well/boreholes | Economic Trees | Land Relocation Allowance =N= | Total Assessed Value (₦) |
|-------|----------------|---------------|--------------------------|----------------|-------------------------------|--------------------------|
| 1     | Ewekoro        | 2,399,935.00  | 0                        | 15,684,094.00  | 22,480,000.00                 | 40,564,029.00            |
| 2     | Ifo            | 3,113,730.00  | 0                        | 17,041,155.00  | 42,350,000.00                 | 62,504,885.00            |
|       |                |               |                          |                |                               | 0.00                     |
| 3     | Obafemi Owoode | 28,081,425.00 | 1,250,000.00             | 37,234,494.50  | 104,244,000.00                | 170,809,919.50           |
|       |                |               |                          |                |                               | 0.00                     |
| 4     | Sagamu         | 8,198,555.00  | 0                        | 19,918,040.00  | 94,998,200.00                 | 123,114,795.00           |
|       |                |               |                          |                |                               | 0.00                     |
|       | Total          | 41,793,645.00 | 1,250,000.00             | 89,877,783.50  | 264,072,200.00                | 396,993,628.50           |

#### 7.6 COMPENSATION FOR TREES

Even though there very few hard wood in the project affected area, but a lot of affected families have areas with some other economic trees which include kola nut trees, cocoa and palm trees and some other trees that are used for construction and firewood. Also common in the areas are fruit trees like Cashew, Orange and cocoa etc. These trees are available in most of the affected communities. For instance, Sagamu Local Government area is reputable as an area where Kola nut trees thrive very well. These are some other medicinal trees like baobab, acacia that have multiple uses to the communities. These trees will have to be uprooted and cannot be replaced because of the project. The loss generated by the complete deforestation of the line routes and substations will have a significant impact on the households. The compensation for the loss is a complex procedure since the compensation given to each tree is depending on its size. Evaluation of the number of trees for each of the PAPs was carried out by specialist from Ogun State Ministry of Agriculture and the cost for each of the communities has been estimated.

The total cost is estimated at ₦89, 877,783.50 (Eighty-Nine Million, Eight Hundred and Seventy-Seven Thousand Seven Hundred and Eighty-rtly-Three Naira and Fifty Kobo) only (APPENDIX V).

#### 7.7 COMPENSATION FOR LOSS OF TURNOVER

Business premises including logistics base, warehouses, open shops or other facilities were identified along the proposed RoW during the route topographical survey and enumeration and valuation exercise. Because most of the affected areas are rural and considering the difficulties of relocating the businesses into areas which may not be easily accessible to those patronizing them, it is evident that these businesses will lose some income. Therefore, the businesses and trade income losses will be evaluated individually. A cost equivalent to six months of turnover will be established as a basis for compensation.

## CHAPTER EIGHT: INCOME AND LIVELIHOOD RESTORATION STRATEGIES

The Transmission Company of Nigeria (TCN) is encouraged to use the guidelines below and involve the affected communities, local leaders, NGOs and other stakeholders to gather opinions in order to assess livelihood restoration procedures.

The World Bank (WB)'s OP, 4.12 paragraph (6c), states the following:

*“Displaced persons should be offered support after displacement, for a transition period, based on a reasonable estimate of the time likely to be needed to restore their livelihood and standards of living; and provided with development assistance, such as land preparation, credit facilities, training, in addition to the compensation they receive.”*

Additionally, WB OP 4.12, paragraph (2c), requires that displaced individuals be given assistance for their efforts to improve their living standards or to at least restore them to the highest standard between pre-displacement or standards prevailing prior to the beginning of the project implementation.

In an effort to define income and develop livelihood restoration strategies, TCN should involve participation for purposes of fostering ownership at an early stage. Assistance will be especially critical to the individual that is to be relocated far away, due to reconstruction costs that may be otherwise avoided.

It is recommended that TCN hire a consultant or partner with an NGO to coordinate the restoration programme.

### 8.1 COMMUNITIES WITHIN THE TRANSMISSION LINE'S ROW

As discussed in chapter 7 of this report, it is recommended to inform the PAPs of the project at least 3 months before the start of the construction.

In all cases, PAPs shall be advised to construct new structures at locations near the previous ones within the affected community to reduce disruption of community life, established spatial organization and services.

Also worthy of mentioning is the fact that many communities along the ROW have experienced workers that can be hired during the construction phase. Local experienced workers and entrepreneurs with necessary experience and capacity should be given priority work opportunities, if applicable. Also, as suggested through consultations, the general contractor

should liaise with village chiefs to maximise local hiring as well as the purchase of relevant local materials and services.

### 8.2 INCOME RESTORATION AND IMPROVEMENT

Different restoration packages will be required for each of the various categories of PAPs and will depend on the type and magnitude of loss suffered, the vulnerability level of the PAPs' household, the indicated preferences associated to their family characteristics and other relevant circumstances.

#### 8.2.1 Land base

As stated in chapter 7 of this report, the households that will lose a piece of land will receive sufficient compensation to be able to buy a new land, off-set loss of crops and rehabilitate the land to similar production level.

Further investigations paired with experience on similar projects indicate that in most cases it would be difficult and cumbersome for the TCN to find and propose replacement land for different reasons (risk of speculation, administrative burden, PAP lack of trust, etc.). It is thus preferable to pay cash compensation to the PAPs to provide them with an opportunity to purchase new land and condition it themselves and continue farming.

However, to limit impoverishment risk, adequate compensation level and implementation conditions are essential. The conditions discussed in chapters 7, 9 and 10 needs to be given to PAPs and are summarized below:

- Sufficient time to find and evaluate their option and possible replacement land and organize the resettlement;
- Support for all legal aspects of the transaction;
- All “transaction costs” such as registration fees, transfer taxes, or customary tributes are to be compensated;
- Adequate control of PAPs' use of compensations by project authorities through different mechanisms like progressive verification of land purchase should be taken.

PAPs whose crops are to be negatively impacted by the project should be provided seedlings and seeds for their gardens and crops on their replacement land.

Furthermore, compensation should cover cost of improvement (fertilized, tilled, weeded, fenced, etc.) to reach the productive condition of the original plot. Affected households will be paid by the project to do this work as much as possible, by themselves.

Additionally, technical assistance will be provided for at least a two-year period to help the impacted households improve their situation. As discussed in chapter 9 Project Implementation Unit is encouraged to engage the services of an experienced Agronomist who will also ensure coordination with governmental agricultural departments for the coordination and efficiency of

the work. This specialist will assess concerns, needs and the most relevant aspects of livelihood improvement with PAPs and local administration as well as it will propose improvement and support activities.

This help could include the following:

- Practical training courses on improved agricultural techniques;
- Improved crop varieties;
- Fertilization;
- Small scale irrigation;
- Animal traction and related equipment;
- Post-harvest grain conservation;
- Agroforestry, other relevant techniques.

#### 8.2.2 Trees

Trees will be destroyed during the construction of the transmission line since no trees taller than 4 meters are being kept in the wayleave. Compensation to households will be allocated according to the prescribed rates up to replace these trees. The PIU specialist will help the affected households to plant trees to restore their source of income and livelihoods.

#### 8.2.3 Structures

In a limited number of cases, houses and other structures that are located in the wayleave will have to be displaced. In that case and during the survey campaign, the PAPs indicated that with adequate compensation they would not have problem obtaining an available land to relocate their houses to.

Those buildings should therefore be rebuilt on new land where the risk of spatial disruption of household activities is the lowest. All necessary steps will be taken by the TCN and the PIU or consultants in charge of compensation to make sure that the PAPs find a suitable land for reconstruction and enough time for reconstruction and proper compensation is paid.

Reconstruction is to be done on parcels adjacent to the piece of land being displaced, where possible.

Each of these household will receive additional compensation to cover the following expenses:

- A moving allocation to pay for moving their goods and belongings;
- An income support for of the household to mitigate the inconvenience and time constraints related to the resettlement.
- Cost land administration, taxes and other charges associated with land acquisition.

#### 8.2.4 Vulnerable Groups

A special focus must be given to the livelihood improvement of vulnerable groups prior to the construction of the project. Vulnerable groups include low income families, women, child (under 18 years heading a household) or handicap headed households.

Vulnerable households will be consulted at the onset of the operation to evaluate their concerns and needs. Special help that could be provided include, among others:

- Support to open bank account;
- Help for administrative transactions (land titling);
- Relocation logistics and other support for the physically resettled households such as :
  - Transport assistance;
  - Reconstruction advice (on materials, type of structures, etc.) to ensure the quality of construction;
- Psychological support (information, counseling, discussion);
- Special transitional funds specific to vulnerable households.

Members of affected households should also benefit from the proposed training programs. Household members within vulnerable households are to be given priority for the allocation of project related employment and other benefits.

Given the current place of females in rural communities, when cash compensations is the only acceptable option, the following possible mitigation measures should also be examined and implemented when feasible:

- Awareness programs on issues directed towards authorities, local administrators and communities;
- Assistance of the PIU to inform and assist vulnerable people and groups;
- Seeking full consent of females in the households and explaining to them the proposed compensation options;
- Payment of large amounts of cash compensation (larger than N 200,000) through carefully distributed instalments (it can be over several months) to mitigate the potential for cash misuse;
- Careful monitoring.

#### 8.2.5 Non-Financial Components

##### Employment and Other Benefits

Priority should be given to all able bodied members of resettled households during the labour recruitment process. This applies to the following employment and contract opportunities : clearing of the corridor; portorage for movement of construction materials to transmission pylon development and other sites, construction of access roads and construction camps, reconstruction of community buildings and houses, provision of services and goods to the workers; administration of the compensation program, monitoring activities, etc.

Furthermore, all the affected households and communities should be given all the wood that is cut on their parcel for their own use or sale. The materials salvaged from the affected structures should also be left to the affected households and communities.

All goods and services (sand, cement, food, etc.) should be bought locally when possible. This applies to all contractors and specific provisions to that effect must be included in the construction Terms of Reference.

## CHAPTER NINE: RAP IMPLEMENTATION AND ACCOUNTABILITY

### 9.1 GENENRAL

The implementation schedule for this RAP covers the periods from the preparation of the RAP to the conclusion of the proposed project, the time that the transmission line construction phase and when the project becomes fully operational. The Implementation schedule defines the duration and timing of the key milestones and tasks.

It is important to note that the implementation of the project will be broken down into phases. This will start with the notification of the PAPs before their displacement and conclude with compensation and their resettlement (if it involves resettlement). PAPs will be compensated in accordance with this RAP and the resettlement policy framework that had been prepared prior to the commencement of any activity.

The schedule for the implementation of activities must be agreed to between the Resettlement Committee and the PAPs. These include the target dates for start and completion of all compensations before civil works for the proposed project starts.

The timing mechanism of these measures would ensure that no individual affected would be displaced (economically or physically) due to civil works activity before compensation is paid and resettlement sites with adequate facilities (if necessary) are prepared and provided to the individual or community affected. The major components of the schedule include:

- Consultation and Disclosure
- Preparation of RAP
- Final Investment Decision
- Consultations with the PAPs on the resettlement / compensation procedures
- Notification of PAPs prior to the activities that will affect them
- RoW acquisition, Compensation and/or Supplementary assistance
- Commencement of project operations
- Monitoring and evaluation, including baseline update
- Implementation of Community Development programme.

The implementation of RAP is a critical aspect of the entire project and will require a properly constituted structure for the administration of the same.

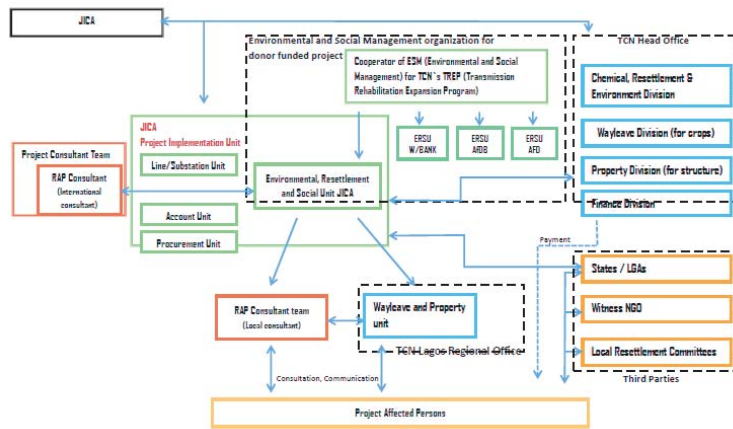


Figure 9.1: RAP Implementation Organization Chart

Source: TCN JICA PIU (2018)

## 9.2 INSTITUTIONAL FRAMEWORK

In order to ensure the successful implementation of the RAP, an institutional framework has been developed with clearly defined roles and responsibilities (Table 9.1). The framework will be the interface for all stakeholders involved in RAP implementation, allowing for continuous contact throughout the project life between the project team, State Government, community leaders, NGOs and PAPs. This framework elaborates the role of various stakeholders in the implementation and administration of the RAP. It further clarifies the role of PAPs and their responsibilities in the entire exercise.

As presented in Table 9.1, the major groups that will be involved in the compensation/resettlement process are the Project Implementation Unit (PIU) Wayleave and the Chemical Resettlement and Environment (CR&E) Departments of TCN and a constituted PAPs Committee, comprising of key stakeholders including representatives of the Federal Ministry of Environment (FMEnv), Federal Ministry of Power etc.

The roles and responsibilities of the institutions regarding Resettlement Implementation and Grievance redress are summarised in Table 9.1 below:

Table 9.1: Institutional Arrangement and Responsibilities for RAP

| S/No | Stakeholders/Institutions   | Responsibilities  |
|------|---|---|
| 1.   | Transmission Company of Nigeria (TCN) Project Implementation Unit (PIU) | <ul style="list-style-type: none"> <li>Establishment of Resettlement Implementation Committee (RIC)</li> <li>Ensuring that the project conforms to World Bank safeguard policies, including implementation of the Resettlement Action Plan (RAP), as required</li> <li>Co-ordinate all policies, programmes and actions of all related agencies in the states.</li> <li>Engaging the services of contractors and consultants to carry out preparation and implementation of RAP and subsequent engaging the service of external monitors for the RAP implementation</li> <li>Approval of payments to consultants for RAP activities carried out under the project</li> <li>Cooperate through a Steering Committee that provides guidance to the technical aspects of all project activities</li> <li>Internal monitoring and evaluation of RAP activities</li> <li>Maintain and manage all funds effectively and efficiently for the sub-projects</li> <li>Preparation of a detailed and well documented reports on RAP implementation</li> <li>Submission of Reports to TCN and World Bank for review</li> </ul> |

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|    |  |   |
|----|--|---|
| 2. | World Bank   | <p>Overall responsibility of ensuring that the OP 4.12 is complied with in the RAP</p> <p>Responsible for the final review, clearance and approval of the RAP</p> <p>Conduct regular supervision throughout the project implementation and monitor the progress of the project construction</p> <p>Recommend additional measures for strengthening the management framework and implementation performance</p>  |
| 3. | TCN Wayleave, Chemical, Resettlement and Environment (CR&E) Department | <p>Oversee compensation and resettlement activities of the project.</p> <p>Liaise with the TCN Way-Leave/RoW department on RoW acquisition process.</p> <p>Verify the compensation rates/budget and schedule as used in RAP to ensure proper implementation and provide recommendations to Project Implementation Unit for improvement/approval.</p> <p>Internal monitoring and evaluation of RAP activities.</p> <p>In co-ordination with TCN-PIU and PAPs Committee, organise meetings with PAPs and communal authorities, to disseminate copies of Resettlement Information Booklet (RIB) and entitlement forms.</p> |
|    |  | <p>Document the complaints and grievances raised by complainants and ensure timely solution by responsible institutions in line with the project approved RAP.</p> <p>Organize seminars to disseminate the RAP report to relevant stakeholders, communities, etc.</p> <p>Assist local people in overcoming the difficulties during the implementation period</p> <p>Perform other functions as is required by the department in the TCN Organogram.</p>   |
| 4. | *Chemical, Resettlement and Environment (CR & E) Officers              | <p>Ensure that there are sufficient resources (time, money and people) to supervise the implementation of compensation</p> <p>Ensure that any changes during implementation process that have significant environmental or social impact are communicated to the AGM TCN CR &amp; E in time and advice on actions to be taken and costs involved</p> <p>Ensure that the PIU is sufficiently informed on monitoring results</p>  |

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|    |   |  |
|----|---|--|
| 5. | **Resettlement Implementation Committee (RIC) | <p>Liase with Wayleave and CR &amp; E to ensure the successful implementation of RAP in the respective communities</p> <p>Responsible for guiding compensation and resettlement activities in project areas</p> <p>Form a survey team to carry out Detailed Measurement Survey (DMS) for affected PAPs and assets; finalize DMS and Entitlement forms for each PAPs</p> <p>Checking the unit prices of compensation as used in Resettlement Plans, offers suggestions for adjusting the unit prices in conformation with market prices/replacement costs (if required) to Project Implementation Unit for approval</p> <p>In co-ordination with TCN/Consultant, organize meetings with PAPs communal authorities, disseminate copies of Resettlement Information Booklet (RIB) and entitlement forms</p> <p>Based on the policy and proposed process/mechanism in RAP, the RIC prepare the detailed implementation plan and together with TCN/Consultant pay entitlements to PAPs and implement other activities in a timely manner</p> <p>Settling the complaints and grievances raised by complainants and suggest solutions for the outstanding issues to responsible institutions for improvement of the RAP implementation.</p> <p>Organize seminars to disseminate the RAP report to relevant stakeholders, communities, etc.</p> <p>Assisting local people in overcoming the difficulties during the implementation period.</p> |
| 6. | Contractor                                    | <p>Ensure that there are sufficient resources (time, money and people) to manage the compensation/resettlement issues of the works.</p> <p>Be responsible for ensuring that all site staff, including sub-contractors and subcontracted activities comply with the project's RAP.</p> <p>Ensure that any changes during the implementation process that may have significant social-economic impact on PAPs are communicated to the Supervising Engineer in time and manage them accordingly.</p> <p>Ensure that the RAP Monitoring and Evaluation Officer is sufficiently informed of contractor's monitoring results.</p> <p>Organise meetings on weekly or bi-monthly basis.</p>  |
| 7. | Project Affected Persons (PAPs)               | <p>Giving their own opinions and/or support on alternative project designs during focus group discussions</p> <p>Support Community-based development projects</p> <p>Participating in all phases of RAP preparation and implementation</p>   |
| 8. | Community Based NGO/Trade Union               | <p>Assist in resolving grievances of PAPs</p> <p>Ensures that social values are not interfered with</p> <p>Ensure community participation in mobilizing and sensitizing community members etc.</p> <p>Oversee the development needs of the entire community</p> <p>Oversee and coordinate/feedback on the consultation process of the project</p>  |

|    |          |  |
|----|----------|--|
| 9. | TCN/JICA | Provide funds for the implementation of the RAP and the proposed Project<br>Support development and approval of the Resettlement Action Plan to meet The World Bank requirements.<br>Resettlement/compensation of project affected persons to ensure that it is in line with the approved processes<br>Establishment of the grievance and monitoring mechanisms for the successful implementation of the RAP and for relevant improvements where necessary |
|----|----------|--|

*\*Officials who will serve in the unit will receive capacity enhancement training prior to the commencement of the civil works to enable them to deliver the resettlement and rehabilitation components effectively over time. Training will cover the following:*

*Understanding the Policy Guidelines  
Understanding the Implementation Schedule activities  
Understanding of the Land Acquisition Act and its procedure  
RAP implementation, monitoring and reporting  
Understanding the economic rehabilitation schemes*

*\*\*To ensure a broad representation with the intent of minimizing any conflict, it is recommended that the Resettlement Implementation Committee (RIC) members be drawn from amongst the following:*

*Representative of Ogun State Ministry of Land and Survey / State Surveyor General  
Representative of the FMENV and relevant Ogun State team  
The LGAs Valuers  
Representative of traditional Ruling Councils (TRC) from affected LGAs  
Two representatives of identified Non-Governmental Organisation (NGOs)/CBOs, local interest and civil groups  
A representative of the EPC contractor  
One each Officer from Wayleave and CR&E department of TCN  
The PC shall have a Chairperson and a Secretary appointed or elected by its members.*

### 9.2.1 TCN Project Implementation Unit

Based on previous experiences and in compliance with the approved process, the following are the responsibilities of TCN – PIU in the implementation of the proposed project and the RAP:

- Ensure that the project conforms to World Bank safeguard policies, including implementation of the RAP, as required.
- Ensure that initial baseline data is collected for the purposes of monitoring and evaluation report as per the indicators provided by the RAP.
- Engage the services of contractors and consultants to carry out preparation and implementation of RAP and subsequent engagement of the service of external monitors for the RAP implementation.
- Approval of payments to consultants for RAP activities carried out under the project.
- Preparation of quarterly and annual progress reports on RAP implementation.
- Ensure participation of the affected people in the planning of their resettlement and post resettlement circumstances.
- Accept financial responsibility for payment of compensation and other designated resettlement related costs.

- Ensure appropriate identification, enumeration, valuation, documentation, and compensation/resettlement of affected properties.
- Pay the affected people compensation to the appropriate amounts and ensure they are given sufficient notice to relocate
- Ensure monitoring and evaluation of the PAPs and the undertaking of appropriate remedial action to deal with grievances and to ensure that income restoration are satisfactorily implemented.

The PIU Coordinator must rely on a team of professionals and support staff able to conduct all relevant and important tasks. It is recommended that each PIU have:

**Support staff:** secretarial services, drivers, security and legal personnel, general accountants;  
**Survey, Identification & Valuation Team:** surveyors, valuers, “option disclosure and agreement” officers;  
**Cash compensation:** compensation officers, accountant, security officer;  
**Database management:** database officers;  
**Livelihood restoration and community forest:** agronomist/agro-foresters;  
**Assistance to vulnerable people and displaced households:** social workers;  
**LRS community project:** community mobilisation specialists / sociologists; technicians or engineers on ad-hoc basis providing technical advices for projects.

### 9.2.2 TCN Chemical Resettlement and Environment (CR&E)

In compliance with the approved process, the TCN Chemical, Resettlement and Environment (CR&E) department will deal with issues relating to the successful resettlement of PAPs. This will include the following:

Oversee compensation and resettlement activities of the project.  
Verify the compensation rates/budget and schedule as used in RAP to ensure proper implementation and provide recommendations to Project Implementation Unit for improvement/approval.

Internal monitoring and evaluation of RAP activities:

- In co-ordination with TCN-PIU and PAPs Committee, organise meetings with PAPs and communal authorities, to disseminate copies of Resettlement Information Booklet (RIB) and entitlement forms.
- Document the complaints and grievances raised by complainants and ensure timely solution by responsible institutions in line with the project approved RAP.
- Organize seminars to disseminate the RAP report to relevant stakeholders, communities, etc.
- Assist local people in overcoming the difficulties during the implementation period
- Perform other functions as is required by the department in the TCN Organogram.

CR&E Officers for the project are responsible for:  
Ensuring that there are sufficient resources (time, money and people) to supervise the environmental issues of the works.

Ensuring changes during implementation process that have significant environmental or social impact are communicated to the AGM TCN CR&E in time and advice on actions to be taken and

costs involved.

Ensuring that the PIU is sufficiently informed via AGM CR&E on monitoring results. Officials who will serve in the unit will receive capacity enhancement training prior to the commencement of the civil works to enable them to deliver the resettlement and rehabilitation components effectively over time. Training will cover the following:

- Understanding the Policy Guidelines
- Understanding the Implementation Schedule activities
- Understanding of the Land Acquisition Act and its procedure
- RAP implementation, monitoring and reporting
- Understanding the economic rehabilitation schemes

**9.2.3 PAPs Committee**

Under the guidance and coordination of the TCN CR&E department, the Project Affected Persons Committee (PC) will be formed one month prior to the payment of the compensation. This committee will act as a voice to the PAPs as well as other key stakeholders in the project.

The committee will be responsible for the following:

Liaise with CR&E to ensure the successful implementation of RAP in the respective LGAs.

Public Awareness: Facilitate extensive consultation with the affected people so that they can air their concerns, interests and grievances.

Compensation: Ratify compensation rates/payments and also serve as dispute resolution body to negotiate and solve any problem that may arise relating to resettlement process. If it is unable to resolve any such problems, it will channel them through the appropriate grievance procedures laid out in this RAP.

Monitoring and Evaluation (M&E): Helps to monitor the implementation of RAP

Logistics: Involves exploring all mechanisms by which RAP can be implemented.

Employment, Training and Counselling as approved by the PIU via CR&E: Involves employment protocol in the project (if any) for those who cannot find alternative employment.

The committee will also counsel the PAPs both socially and economically.

Members of the committee will be drawn from the following:

Representative of Ogun State Ministry of Land and Survey / State Surveyor General

Representative of the FMEnv and relevant Ogun State team

Representative of Federal Ministry of Power

Four LGA Valuers

One representative from each of the four LGAs traditional Ruling Councils (TRC)

Two representatives of identified Non-Governmental Organisation (NGOs)/CBOs, local interest and civil groups

A representative of the EPC contractor

One representative Officer from the Wayleave, CR&E departments of TCN

The PC shall have a Chairperson and a Secretary appointed or elected by its members. The chairperson shall be from the local area.

**9.2.4 Contractor**

The roles of the contractor in the implementation of RAP are to:

Ensure that there are sufficient resources (time, money and people) to manage the compensation/resettlement issues of the works.

Be responsible for ensuring that all site staff, including sub-contractors and subcontracted activities comply with the project’s RAP.

Ensure that any changes during the implementation process that may have a significant social-economic impact on PAPs are communicated to the Supervising Engineer in time and manage them accordingly.

Ensure that the RAP Monitoring and Evaluation Officer is sufficiently informed of contractor’s monitoring results.

Organise meetings on weekly or bi-monthly basis.

**9.2.5 Project Affected Persons**

The project affected persons will also be expected to:

Support Community- based developmental projects

Be actively involved in the work of the PAPs Committee.



**Table 9.2: Tasks for RAP implementation and responsibility for each Task**

| Task  | PIU (ESMP and RAP) | TCN Head office                                 |                                |                  | Regional office staff (RAP) |                            |  | Consultant team (the team can participate after consultant selection process completed) |                         | others  |
|---|--------------------|---|--------------------------------|------------------|-----------------------------|----------------------------|--|---|-------------------------|---------|
|   |                    | Chemical, Resettlement and Environment Division | Wayleave and Property Division | Environment unit | OHS unit                    | Wayleave And property unit | International consultant (Compensation and Resettlement Manager) | Local consultant  | State, Witness NGO, LRC |         |
| Location  | Abuja              | Abuja   | Abuja                          | Lagos            |                             |                            |  |   |                         |         |
| # of staff assigned (plan)  | 2                  | 1-2   | 2                              | 1                | 0                           | 1                          | 1  | 3-6 or more   |                         |         |
| Engagement with PAPs  |                    |   |                                |                  |                             |                            |  |   |                         |         |
| - Informed Consent, Consultation to all PAPs (and communities) and agreement with PAPs regarding the entitlement matrix | X                  |   |                                |                  |                             | x                          | x  | X   |                         | (LRC)   |
| - Supporting to PAPs (e.g. opening bank account, supports for vulnerable groups)  | X                  |   |                                |                  |                             | support                    | x  | x   |                         |         |
| - Signing on agreement with all PAPs  | X                  |   |                                |                  |                             | Support                    | x  | x   |                         |         |
| Establishment of organization   |                    |   |                                |                  |                             |                            |  |   |                         |         |
| - PIU (and consultant group?)   |                    |   |                                |                  |                             |                            |  |   |                         |         |
| - Local resettlement committee(s) in each communities   | x                  |   |                                |                  |                             | x                          |  | x   |                         | LRC     |
| Administrative activity   |                    |   |                                |                  |                             |                            |  |   |                         |         |
| - Identification of land, structures and assets   | x                  |   |                                |                  |                             | x                          | x  | x   |                         | Witness |

| Task  | PIU (ESMP and RAP) | TCN Head office                                 |                                    |                  | Regional office staff (RAP) |                            |  | Consultant team (the team can participate after consultant selection process completed) |                         | others                                    |
|---|--------------------|---|------------------------------------|------------------|-----------------------------|----------------------------|--|---|-------------------------|---|
|   |                    | Chemical, Resettlement and Environment Division | Wayleave and Property Division     | Environment unit | OHS unit                    | Wayleave And property unit | International consultant (Compensation and Resettlement Manager) | Local consultant  | State, Witness NGO, LRC |   |
| Location  | Abuja              | Abuja   | Abuja                              | Lagos            |                             |                            |  |   |                         |   |
| # of staff assigned (plan)  | 2                  | 1-2   | 2                                  | 1                | 0                           | 1                          | 1  | 3-6 or more   |                         |   |
| (variations from original RAP is expected due to arraignment of Line route) |                    |   |                                    |                  |                             |                            |  |   |                         | NGO                                       |
| - Compensation evaluation (re-evaluation to finalize)                       | x                  |   | x                                  |                  |                             |                            |  |   |                         | State (Land bureau etc.)                  |
| - Entitlement document review for qualification of compensation             |                    |   | X (visited sites and met all PAPs) |                  |                             |                            | x  | x   |                         |   |
| - Financial approval for payment to PAPs                                    |                    |   |                                    |                  |                             |                            |  |   |                         | TCN management including MD, finance, TSP |
| - Payment (transfer to bank account)  | x                  |   |                                    |                  |                             |                            |  |   |                         | TCN finance team will pay                 |
| - Payment (direct by check)   | x                  |   |                                    |                  |                             |                            | x  | x   | x                       |   |
| - Data base management  | x                  |   |                                    |                  |                             |                            | x  | x   |                         |   |
| - Communication with PAPs   |                    |   |                                    |                  |                             |                            | X  | x   | x                       | (LRC)                                     |

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| Task   | PIU (ESMP and RAP)                          | TCN Head office                                 |                                | Regional office staff (RAP) |          |                            | Consultant team (the team can participate after consultant selection process completed) |                      | others   |
|--|---|---|--------------------------------|-----------------------------|----------|----------------------------|---|----------------------|--|
|  |   | Chemical, Resettlement and Environment Division | Wayleave and Property Division | Environment unit            | OHS unit | Wayleave And property unit | International consultant (Compensation and Resettlement Manager)                        | Local consultant     |  |
| Location   | Abuja                                       | Abuja   | Abuja                          | Lagos                       |          |                            |   |                      |  |
| # of staff assigned (plan)   | 2   | 1-2   | 2                              | 1                           | 0        | 1                          | 1   | 3-6 or more          |  |
| - Physical resettlement assistance when needed                       | x   |   |                                |                             |          | x                          | x   | x                    | (NGO, LRC)   |
| Monitoring   |   |   |                                |                             |          |                            |   |                      |  |
| - Check the progress of compensation, relocation and RoC acquisition | X   |   |                                |                             |          | x                          | x   | X weekly and monthly |  |
| - External monitoring  |   |   |                                |                             |          |                            |   |                      | X, JICA  |
| - Reporting at least every quarter to JICA                           | x (based on monthly report from consultant) |   |                                |                             |          |                            | x   |                      |  |
| - RAP completion audit   | X   |   |                                |                             |          |                            |   |                      | Witness NGO, JICA  |
| Certificate of Occupancy issuance                                    |   |   |                                |                             |          |                            |   |                      | State (land bureau) (payment document review or site audit, not specified) |
| - confirmation of completion of compensation                         |   |   |                                |                             |          |                            |   |                      | State  |
| - land title (CoO) issuance  |   |   |                                |                             |          |                            |   |                      |  |
| Grievance Management   |   |   |                                |                             |          |                            |   |                      |  |

Proposed Lagos and Ogun States Transmission Lines and Associated Substations Project (Lot 2)

| Task   | PIU (ESMP and RAP)                           | TCN Head office                                 |                                | Regional office staff (RAP) |          |                            | Consultant team (the team can participate after consultant selection process completed) |                       | others           |
|--|--|---|--------------------------------|-----------------------------|----------|----------------------------|---|-----------------------|------------------|
|  |  | Chemical, Resettlement and Environment Division | Wayleave and Property Division | Environment unit            | OHS unit | Wayleave And property unit | International consultant (Compensation and Resettlement Manager)                        | Local consultant      |                  |
| Location   | Abuja  | Abuja   | Abuja                          | Lagos                       |          |                            |   |                       |                  |
| # of staff assigned (plan)   | 2  | 1-2   | 2                              | 1                           | 0        | 1                          | 1   | 3-6 or more           |                  |
| - Identification   | X (reported from consultant or LRC directly) |   |                                |                             |          |                            |   | X (reported from LRC) | LRC              |
| - Solution   | X  |   |                                |                             |          |                            |   | X                     |                  |
| - Reporting  | X  |   |                                |                             |          |                            |   |                       | LRC              |
| - Livelihood restoration   |  |   |                                |                             |          |                            |   |                       |                  |
| - Training   |  |   |                                |                             |          |                            | x   | x                     | NGO              |
| - Restoration assistance (technical support, material support, etc.) | x  |   |                                |                             |          |                            | x   | x                     | NGO, contractors |

### 9.3 COMMUNITY CONSULTATION

The RAP undertook a broad-based participation/consultation of the relevant stakeholders, especially the project affected persons. The essence was to ensure a broad-based partnership for achieving harmonious working relationship for implementing and monitoring the project with successful outcomes.

Consultations with the project affected communities and persons will be on-going throughout the life span of the project. This has been enshrined in guiding principle 2 of the World Bank Group on involuntary resettlement adopted in the preparation of this RAP.

Stakeholders for the purpose of this project are defined as all those people and institutions that have an interest in the successful planning and execution of the project. This includes those positively and negatively affected by the project. The key stakeholders identified include leaders in the communities, individuals who own properties that will be directly or indirectly affected and business owners, special interest groups such as NGOs/CBOs, etc.

Public consultation and participation are essential because they afford PAPs the opportunity to contribute to both the design and implementation of the project activities and reduce the likelihood for conflicts between and among PAPs and the Project Implementation. For the project to be successfully meaningful, effective and close consultation with local communities was seen as a pre-requisite. In particular, attention was paid to public consultation with the project affected individuals.

The consultation process ensured that all those identified as stakeholders, especially the project affected persons were consulted. One-on-one meeting was used during the survey of the socio-economic activities along the RoW. Stakeholders meeting were held in the affected communities. Amongst the persons met during the consultations are the community heads, Local Government Chairmen of affected LGAs, community representatives and leaders of some important community Association and Youth leaders among others.

At the meeting the overview of the proposed project and appreciation of RAP and other related instruments were presented. Furthermore, the challenges that could impede the implementation of the project and the support needed from all parties to ensure effective project and successful implementation were also discussed. Some of the discussed issues are:

- Environmental and Social Impact Assessment of the Project.
- Mechanisms for asset valuation.
- Mode of compensation.
- Extent of compensation i.e. who are entitled for compensation and why.
- Location of payment of compensation

### 9.4 COMPENSATION OF PAPS

In line with the World Bank operational policy on involuntary resettlement (OP 4.12), TCN will

ensure that the conditions of the PAPs are restored to the status that is in the worst case similar to the pre-project status. To ensure that the interests of displaced persons are fully protected in accordance with both the Land Use Act and World Bank OP 4.12 PS 5, TCN will adopt the following basic resettlement principles and guidelines:

Affected persons are defined as those who stand to lose land and/or assets where they conduct their business and earn income;

All affected persons are equally eligible for compensation and rehabilitation assistance, irrespective of land ownership status, to ensure that those affected by the project shall be at least as well off, if not better off than they would have been without the project;

The compensation packages shall reflect replacement costs for all losses where appropriate;

Compensation and resettlement will be satisfactorily completed before the commencement of civil works;

Affected persons will be systematically informed and consulted about the project;

The consultative process shall include not only those affected, but also the local governments, community leaders, youths, NGOs/CBOs etc.;

List of all PAPs has been documented in the PAP register for each affected Community. This Register will be used during payment of compensations by TCN. Compensation to PAPs shall be made before mobilisation of EPC contractor. This will be done at a location designated by the respective village heads or any other place considered appropriate by both TCN/and community leadership. Payment is scheduled to commence immediately after the approval of the RAP and concluded before mobilization of EPC Contractor to site. The payments to all the communities are planned to run back-to-back across the affected communities. The schedule and strategy of compensation, which is currently being developed by TCN, using data generated from the enumeration and valuation exercise, will be communicated to all the affected persons. Similar method of information dissemination used for earlier consultations and enumeration/valuation will be employed. Such information will include but limited to:

- Dates and locations of payment
- List of eligible people and amount
- Mode of payment
- Location of payment

Notifications and communications through heads of villages, towns, clans, and family heads down to the respective affected families, will be engaged to ensure proper dissemination of information. After compensation, between 2 (for temporary structures) and 6 months' (for residential structures) notice shall be given to the affected people before the construction exercise commences. This will enable them to salvage all that they deem valuable from the affected areas.

Vulnerable persons (widows and the aged) will be given priority during compensation. They will be given speedy attention prior to other PAPs. Payment will be made by crediting the account of the affected persons. The use of both modes of payment is adopted in order to easily accommodate literate PAPs (who could make bank transactions) and others who may not easily transact with the bank. In the event that an individual is absent during payment, the compensation committee will communicate a new date of payment to such PAP(s).

## CHAPTER TEN: MONITORING, REVIEW AND EVALUATION

### 10.1 GENERAL

Monitoring and Evaluation (M and E) procedures for the RAP have been designed to monitor the effectiveness of all the resettlement activities, including the physical progress of its resettlement and rehabilitation activities, the disbursement of compensation, the effectiveness of public consultation and participation activities and the sustainability of the project's livelihood restoration and development efforts. Monitoring of the implementation of this RAP is planned to ensure the success of the project's resettlement/compensation process. It will be considered part of the proposed project management process. The objectives of resettlement monitoring will be to ensure that:

- actions and commitments described in the RAP are implemented;
- early identification of implementation challenges so they can be corrected in a timely manner;
- appropriate feedback is provided to stakeholders;
- eligible project affected people receive their full compensation prior to the project execution;
- RAP actions and compensation measures have helped the people who sought cash compensation in restoring their lost incomes and in sustaining/improving pre-project living standards;
- complaints and grievances lodged by project affected people are followed up and, where necessary, appropriate corrective actions are taken

The establishment of appropriate indicators in the RAP is essential since what is measured is what will be considered important. Indicators will be created for affected people as a whole, for key stakeholder groups, and for special categories of affected groups such as women, aged and children.

The Project's monitoring plan will have three key components; namely:

- (i) Internal performance monitoring by TCN
- (ii) Impact monitoring commissioned to specialized firms and
- (iii) External audits or RAP Completion Audit.

To effectively report on the effectiveness of RAP implementation and in keeping with World Bank requirements on involuntary resettlement, TCN will monitor the following key indicators:

- The timely disbursement of compensation
- Compensation disbursement to the correct parties
- Public consultation and grievance procedures in place and functioning; and
- The physical progress of resettlement and rehabilitation, where applicable.

### Box 1: RAP Monitoring Framework

Verify internal RAP implementation reports by a field check of the following:

- Payment of compensation including its levels and timing
- Settlement of land/resource access claims
- Provision of employment, its adequacy and income levels
- Adequacy of training and other developmental inputs
- Rehabilitation of vulnerable groups
- Infrastructure repair, relocation or replacement
- Enterprise relocation, compensation and its adequacy
- Transition allowances

Interview a random sample of affected people in open-ended discussion to assess their knowledge and concerns regarding the resettlement process, their entitlements and rehabilitation measures.

Observe public consultations with affected people at the community level.

Observe the function of the resettlement operation at all levels to assess its effectiveness and compliance with the RAP.

Check the type of grievance issues and the functioning of grievance redress mechanisms by reviewing the processing of appeals at all levels and interviewing aggrieved affected people.

Survey the standards of living of the affected people (and of an unaffected control group where feasible) before and after implementation of resettlement to assess whether the standards of living of the affected people have improved or been maintained.

Advise project management regarding necessary improvements in the implementation of the RAP, if any

*Adapted from the World Bank Resettlement Source Book*

**Table 10.1: RAP Monitoring Framework**

| Component Activity                     | Type of Information/Data Collected  | Source of Information/Data Collections Methods   | Responsibility for Data Collection, Analyses and Reporting                 | Frequency/Audience of Reporting                                |
|--|---|--|--|--|
| <b>Internal Performance Monitoring</b> | Measurement of input, process, output and outcome indicators against proposed timeline and budget, including compensation disbursement          | Quarterly narrative status and compensation disbursement reports   | TCN RAP team, including public relations representatives                   | Semi-annual or as required by TCN RAP management team and JICA |
| <b>Impact Monitoring</b>               | Tracking effectiveness of inputs against baseline indicators<br>Assessment of affected people's satisfaction with inputs, processes and outputs | Bi-annual quantitative and qualitative surveys. Regular public meetings and other consultation with project affected people. Review of grievance mechanism outputs | TCN RAP team, including public affairs representatives<br>Panel of Experts | Bi-annual  |
| <b>RAP Completion Audit</b>            | Evaluation of the implementation as stated by the RAP as well as  | Review of the RAP Report and RAP Implementation report.  | TCN RAP team, including public affairs                                     | Annual   |

|  |  |  |                                   |  |
|--|--|--|-----------------------------------|--|
|  | other notable areas of improvement suggested by impact monitoring over implementation period |  | representatives, Panel of Experts |  |
|--|--|--|-----------------------------------|--|

TCN’s monitoring will provide the RAP management team with feedback on RAP implementation and help ensure that adverse impacts on affected people are mitigated in a timely manner. RAP M & E activities will be adequately funded implemented by qualified specialists and integrated into the overall project management system.

The establishment of appropriate indicators for RAP implementation monitoring is very essential. Indicators will be created for affected persons as a whole, for key stakeholder groups, and for special categories of affected groups such as women. Performance monitoring as an internal management function will allow the Project to measure physical progress against milestones established in the RAP. Key performance indicators for monitoring as presented in Table 10.1 above are commonly divided into categories for World Bank/Externat funded Agency (JICA) financed activities:

**Input** indicators include the resources in terms of people, equipment and materials that go into the RAP. Examples of input indicators in the RAP are the sources and amounts of funding for various RAP activities.

**Output** indicators concern the activities and services, which are produced with the inputs. Examples of output indicators in the RAP include (i) a database for tracking individual compensation; and (ii) the payment of compensation for loss of assets.

**Process** indicators represent the change in the quality and quantity of access and coverage of the activities and services. Examples of process indicators in the RAP include: (i) The creation of grievance mechanisms (2) The establishment of stakeholder channels so that they can participate in RAP implementation; and (3) Information dissemination activities.

**Outcome** indicators include the delivery of compensation and other mitigation to avoid economic and physical displacement caused by the Project. They measure whether compensation is paid and received, whether the affected populations who preferred cash compensation to in-kind resettlement assistance offered to them was able to use compensation payment for sustained income.

Apart from performance monitoring, there will also be impact monitoring which gauges the effectiveness of the RAP and its implementation in meeting the needs of the affected communities. The purpose of impact monitoring is to provide the Project with an assessment of the effects of resettlement, to verify performance monitoring and to identify adjustments in the implementation of the RAP, as required.

In consultation with external and independent Panel of Professionals, TCN will commission social and economic impact monitoring studies. These studies shall include Federal Ministry of

Environment, Ogun State Government/Ministry of Land and Housing, Ogun State Ministry of Environment and other relevant Ministries in Ogun State. TCN RAP management team and the Panel shall review the outcome of studies. The results of impact studies as well as internal monitoring efforts shall be disclosed through the regular information outlets of TCN and JICA info-shop.

TCN will include the affected persons in all phases of impact monitoring, including the identification and measurement of baseline indicators. One baseline has already been established through the preliminary socio-economic studies of the population and area affected by the project. Impact monitoring will also review consultation and grievance mechanism outputs such as the types of grievances identified and the outcomes.

Finally, there will be external resettlement evaluations to be conducted by an independent third party to determine whether project efforts to restore or improve the living standards and livelihoods of the affected people have been properly conceived and executed. TCN shall commission an external party to undertake an evaluation of RAP’s physical inputs to ensure and assess whether the outcome of RAP complies with the involuntary resettlement policy of the World Bank. The completion audit shall be undertaken after RAP inputs. The audit shall verify that all physical inputs committed in the RAP have been delivered and all services provided. It shall evaluate whether the mitigation measures prescribed in the RAP have the desired effect. The completion audit should bring to closure TCN’s liability for resettlement.

The project will take advantage of internal and external monitoring to ensure successful implementation of the RAP. The charter for the monitoring will be developed by TCN and will guide the activities of the monitoring team from inception to completion of the programme. The charter will define the processes and strategies that will be engaged in order to ensure that the objectives of the RAP will be accomplished. The charter will also define means of checking and following up with complaints to ensure that they are receiving due and timely attention as defined in the grievance procedure. Findings from the monitoring will be used where necessary to enhance the RAP processes and ensure that implementation is as duly approved.

**10.2 INTERNAL MONITORING**

Implementation of the RAP will be supervised and monitored by Wayleave, Chemical Resettlement and Environment Department of TCN through its assigned officers. The key objective of this will be to determine the effectiveness of the RAP implementation programme with respect to the affected persons and the project schedule. This monitoring will engage continuous consultations and the grievance procedure to ensure that compensation payment and restoration of affected persons are done accordingly. Findings will be recorded in quarterly reports to be furnished to the TCN - PIU and relevant stakeholders.

**Responsibilities of the Monitoring and Evaluation Officer**

Verify that the baseline information of all PAPs, collected during the valuation of assets, and the provision of compensation, resettlement and other rehabilitation entitlements have been effected in accordance with the provisions of this policy framework and the respective inventory and

**RAP.**

Ensure that the RAP is implemented as approved.

Verify that funds for implementing the RAPs are provided to the respective authorities in a timely manner, in amounts sufficient for such purposes and that the funds are used in accordance with the provisions of the RAP.

Ensure the identification and signature/thumb print of PAPs before and during receipt of compensation entitlements.

Record all grievances and their resolution and ensure that complaints are addressed in a timely manner.

After one year of completion of expropriation and necessary assistance to the PAP has been fulfilled, there will be an impact evaluation to assess whether the PAPs have improved their living conditions in relation with the baseline socioeconomic status collected during the socioeconomic studies.

**10.3 INDEPENDENT MONITORING**

An independent unit comprising of members of TCN, the State Government as well as Local Government representatives will be set up to periodically carry out monitoring and evaluation of the implementation of the RAP. TCN will engage a third party of experts who will be responsible for the independent monitoring of the RAP process. Relevant resources such as transportation, access to the RAP strategies and programmes, and to PAPs, among others, shall be provided by TCN. The team will monitor the effectiveness of the implementation of the RAP via inspections and audits to ensure that implementation is in line with approved processes. The team will develop the strategies and schedules for its monitoring activities, which will include spot checks targeted at discovering lapses or effectiveness of the process being implemented. The independent monitoring team will be retained by the TCN to carry out external monitoring and evaluation of the implementation of the RAP and provide reports to TCN Management, the Project Affected Person's Committee which comprises of the PAPs, Ogun State Government and relevant stakeholders on the outcomes, challenges, and areas of improvement in order to enhance the implementation process. In addition to verifying the information furnished on the internal supervision and monitoring reports, the independent monitoring team will visit a sample of 10% of the PAPs in each relevant community, six months after the RAP has been implemented to:

- Determine whether the procedures for PAPs participation and delivery of compensation and other rehabilitation entitlements have been done in accordance with the RAP.
- Assess if the RAP objective or enhancement or at least restoration of living standards and income levels of PAPs have been met.
- Gather qualitative indications of the social and economic impacts of project implementation on the PAPs.
- Recommend modification in the implementation procedures of the RAP, as the case may be, to achieve the principles and objectives of this policy framework.

Using existing baseline information as well as data compiled from the identification and enumeration/valuation programme, the Monitoring and Evaluation (M&E) advisors will be in position to note changes that may have occurred before and after resettlement.

One of the baseline indicators that are pertinent to this study is the income statistics. This implies that the average annual family income within the communities should not fall below an agreed upon factor in the first 18 months after compensation/resettlement. Data should indicate that the socio-economic situation of the affected people is stable after one year. If, after a year, the situation of PAPs are found to be deteriorating (unemployment, increasing poverty, etc.), further interventions may be considered.

**10.4 METHODOLOGY FOR MONITORING**

Monitoring will commence at the early stage of the project. Besides the charter comprising of the details of the monitoring strategy will be developed by the team, the approaches and methods used would require regular dialogue and surveys of the affected communities. The dialogue will provide a forum for affected parties to air any grievances or complaints that may arise. The survey will provide a more objective form of progress measurement to complement the more subjective consultations/dialogue. Findings from the monitoring as well as post-resettlement/compensation monitoring results shall be subject to review by representatives of the affected communities through the PAP Committee and TCN Wayleave and CR&E Department. The Monitoring Team will write its reports at the end of each visit and submit them to the TCN Project Manager and the PAPs' Committee (PC).

The World Bank OP 4.12, states that particular attention should be paid to the needs and concerns of the poor and vulnerable groups including the landless, women, and children including the elderly, ethnic minorities, and indigenous compensation. Therefore, during the whole monitoring process, the identified vulnerable households and individuals should be monitored to ensure that they are adequately taken care of and are benefitting from the income restoration and improvement special measures intended for them and are receiving in an appropriate manner the compensations they are entitled to. Some of the monitoring indicators for the vulnerable households and individuals include the following:

- ✓ Number of vulnerable households and individuals affected by project activities;
- ✓ Number of vulnerable households and individuals physically displaced as a result of project activities;
- ✓ Number of vulnerable households and individuals economically displaced (crop, shops and activities affected, etc.) as a result of project activities;
- ✓ Grievances and complaints by vulnerable households and individuals;
- ✓ Amounts of compensation paid for each category of lost assets (structures, land, crops, others) and other benefits obtained by vulnerable households and individuals;
- ✓ Affected vulnerable PAPs and households economic and livelihood situation (revenue, health and social status, well-being).

## CHAPTER ELEVEN: GRIEVANCE REDRESS MECHANISMS

### 11.1 GENERAL

The objectives of the grievance and appeals procedure are to respond to the complaints of the project affected persons (PAP) in a timely and transparent manner, maintain trust with the stakeholders and also to ensure that a plan is in place for effective management of complaints and concerns for the successful implementation of the RAP. Possibilities of grievances and disputes could arise as a result of ownership disputes, valuation of properties, compensation to identified owners, attitude of contractors and workers, and problems related to the time and manner of payment of compensation among others. So apart from maintaining an effective grievance mechanism to facilitate an effective and sensitive resettlement process, there is also a need to avoid delays that may arise through community disaffection with project execution.

In view of the above, grievance procedure has been designed to be simple and easy to follow by the PAPs and stakeholders. The grievance redress mechanism shall take into cognisance the line of reporting based on traditional tiers of authority, which is the established line of conflict redress amongst people along the route. It takes advantage of the existing and familiar traditional line of authority whereby complainants have free and direct access to the family leaders in order to express their concerns. The procedure will be communicated to all stakeholders, especially the PAPs for their use if need be. The procedures will also be documented and adhered to during RAP implementation, while the roles and responsibilities of those involved will be communicated to Stakeholders.

### 11.2 STEPS FOR SUBMITTING GRIEVANCES

A Grievance Redress Committee will be set up by TCN to address complaints from RAP implementation. This committee will be directly under the TCN CR&E department with oversight by TCN-PIU. Its members will include legal and accounts representatives of TCN and PAP Committee, and the legal expert from TCN shall be the secretary. The traditional line of authority equally plays a significant role in the grievance redress mechanism by mediating between the PAPs, nominated family and community representatives and the grievance redress committee.

Complaints, which may be oral or written can be made or forwarded to the Grievance Redress Committee through the Community Liaison Officer (CLO). The Grievance Redress committee will provide ample opportunities to redress complaints informally, in addition to the existing formal administrative and legal procedures. There shall be regular meeting between the community heads and the community liaison officer to ensure prompt and due attention. The liaison officer will utilize the local languages where necessary to ensure effective communication between PAPs, the project, and the Grievance Redress Committee. The functions of the Grievance Redress Committee are to:

- Provide support to PAPs on problems arising from loss of private properties and livelihood (if any).

- Record the grievance of the PAPs, categorize and prioritize the grievances that need to be resolved by the committee, and
- Report to the aggrieved parties about the developments regarding their grievances and the decision of the project authorities.

The committee will provide ample opportunity to redress complaints informally, in addition to the existing formal administrative and legal procedures. Grievance procedure shall take advantage of the existing and familiar traditional line of authority whereby complainants have free and direct access to the family heads in order to express their concerns. This procedure will also provide a mechanism to mediate conflict and cut down on lengthy litigation, which often delays such infrastructural projects. It will also provide people who might have objections or concerns about their assistance, a public forum to raise their objections and through conflict resolution, address these issues adequately. The procedure will be communicated to all stakeholders, especially the PAPs for their use if need be. It will also be documented and adhered to during RAP implementation, while the roles and responsibilities of those involved will be communicated to Stakeholders.

#### 11.2.1 Stage One: Community Level

At the first stage, PAPs will register their complaints through their extended family head via nuclear family head to the Community head. The community head shall present grievances to the grievance redress committee which will have to provide a written response to the PAPs through the extended family head, within fifteen calendar days of receiving the complaint.

At the community levels, a series of customary avenues exists to deal with dispute resolutions. Those avenues should be employed, when and where it is relevant as a “court of first appeal”. Such customary avenues should provide a first culturally and amicable grievance procedure that will facilitate formal and/or informal grievance resolution for grievances such as:

- PAPs not listed or missed out of register
- Wrongly recorded personal or community details;
- Losses not identified correctly
- Wrongly recorded assets including land details and/or affected acreage;
- Change of recipient due to recent death or disability;
- Recent change of asset ownership;
- Dispute over ownership
- Wrong computation of compensation;
- Inadequate assistance;
- Delay in disbursement of assistance and improper distribution of assistance.

At the community level, grievance committees to be known as Site Committee should be established with the following members:

- Traditional leader or head of the Community
- Community Development Secretary (CDS)
- Elected representative of the community at the LG
- representatives of the PAPs (1 female and 1 male)
- Affected local government Land Officer

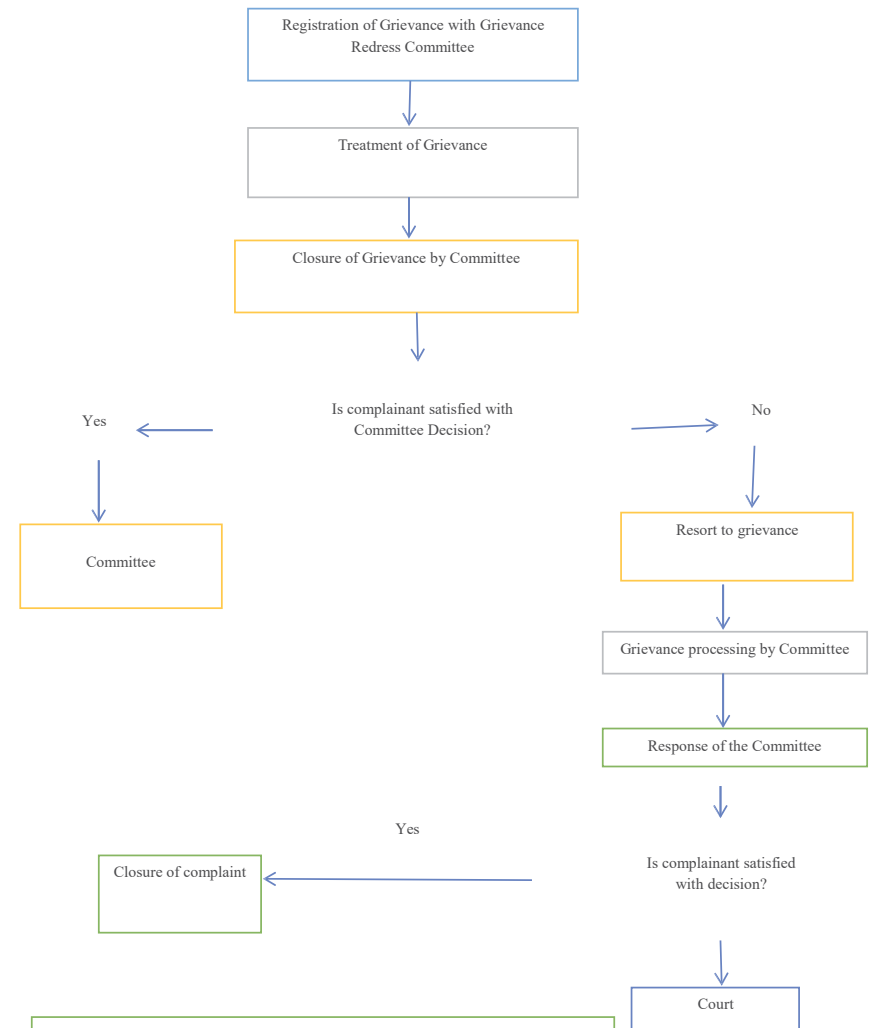
One officer of the Survey, Identification & Valuation Team of the PIU. PAPA's complaints should first be lodged verbally or in writing through this process. It is expected that the community/village committees will deal with the grievances they receive within three days of receipt of the complaint. If the complaint cannot be resolved at this level, or if the plaintiff is not satisfied with the settlement proposed, the plaintiff should then be referred to the second stage which is the local government level. As the first order of call in resolving grievances, the Site Committee members will deal with any grievance that comes up. This will ensure equal treatment across cases and elimination of nuisance claims and satisfy legitimate claimants at low cost.

**11.2.2 Stage Two: LGA Level**

If the PAPA's are not satisfied with the decision of the Site Committee, the Local Government Desk Officer, who liaises with the Site committee members and the Grievance Committee as well as the PIU will try and resolve the grievance. If this fails, the local government Resettlement Action Plan Committee (LGAPC) will step in. This committee presided over by the LGA Chairman will comprise of the PAPA's representative, affected communities (represented by their leaders), elected representative of the community at the Local Government level, affected local government Land Officer and representative of PIU officer in charge of grievances. Grievances that could not be resolved at this stage should then be referred to the third stage.

**11.2.3 Stage Three: State Level**

If the PAPA's are not satisfied with the decision at the second level, the case may be submitted for consideration of the TCN-PIU. If the complainant remains dissatisfied and a satisfactory resolution cannot be reached, the complainant has the option to pursue appropriate recourse via judicial processes.



**Figure 11.1: Flow Chart for Grievance Redress Steps**



**Table 11.2: A Typical Reporting Format for Grievance Redress**

| Community Project<br>&<br>Name of<br>Complainant | Type of Grievance   |  |   |  |       | Grievance resolution |               |         |                                  |
|--|---|--|---|--|-------|----------------------|---------------|---------|----------------------------------|
|  | Affected, but<br>not informed<br>about impacts<br>and options | Compensation<br>awarded is<br>inadequate | Compensation<br>not paid before<br>asset<br>acquisition | Resettlement<br>benefits awarded<br>are not provided | Other | Date of<br>complaint | Date resolved | Pending | Case<br>referred to<br>the Court |
| <b>Community Project 1</b>                       |   |  |   |  |       |                      |               |         |                                  |
| Complainant A                                    |   |  |   |  |       |                      |               |         |                                  |
| Complainant B                                    |   |  |   |  |       |                      |               |         |                                  |
| Complainant C                                    |   |  |   |  |       |                      |               |         |                                  |
| <b>Community Project 2</b>                       |   |  |   |  |       |                      |               |         |                                  |
| Complainant D                                    |   |  |   |  |       |                      |               |         |                                  |
| Complainant E                                    |   |  |   |  |       |                      |               |         |                                  |
| <b>TOTAL</b>                                     |   |  |   |  |       |                      |               |         |                                  |

### 11.3 FOLLOW-UP ACTIVITIES

Follow-up activities on grievance mechanisms should follow these steps:

- Ensure constant consultation with project affected people on ways to improve on grievance mechanism.
- Document the complaint and regularly report back to PAPs on any actions taken in resolving the grievance.
- Publicize either through public meetings, or written pamphlets or any media any complaint that has been successfully resolved.
- Once the complaint is resolved, in a timely manner, check the status of complaints, track progress, measure effectiveness, and timely report to concerned parties.
- Document lessons learned throughout the process of handling grievances as this can help in ensuring continual improvement of the future operations.
- The process of redressing grievances will start by registration of each grievance with the Grievance Redress Committee who will register and then forward it to the appropriate committee.
- Grievances will be discussed at the TCN-PIU monthly meetings and the resolution of the meeting communicated to the parties concerned through the community liaison officer.

## CHAPTER TWELVE: RAP IMPLEMENTATION BUDGET AND SCHEDULE

### 12.1 RAP AND LIVELIHOOD RESTORATION STRATEGY (LRS) BUDGET

The RAP, Livelihood Restoration Strategies (LRS) implementation and monitoring budget is summarized in **Table 12.1 below**. This includes all costs involved in the execution of all RAP and LRS activities. The total budget is:

**Table 12.1: RAP, Livelihood Restoration Strategies and Monitoring Cost**

| RAP IMPLEMENTATION BUDGET SUMMARY |  |                         |
|-----------------------------------|--|-------------------------|
| S/No                              | Element  | Amount =N=              |
| 1                                 | Crops  | 396,993,628.50          |
| 2                                 | Structures   | 1,679,918,207.82        |
| 3                                 | Sub-total for structures and crops   | <b>2,076,911,836.32</b> |
|                                   | Support to vulnerable groups(Identified according to Valuation Matrix)   | 6,132,145.40            |
| 4                                 | Allow for Security, bank charges, stamp duty and other logistics, for compensation payment (2.5%) for crops      | 9,924,840.71            |
| 5                                 | Allow for Security, bank charges, stamp duty and other logistics, for compensation payment (2.5%) for structures | 41,997,955.20           |
| 6                                 | Allow for demolition and salvage of structures (5%)  | 83,995,910.39           |
| 7                                 | Allow 5% contingency for structures + crops)   | 103,845,591.82          |
| 8                                 | Livelihood restoration and Training support (1% of A & B)  | 11,933,663.71           |
| 9                                 | Sub Total  | 257,830,107.23          |
| 10                                | Grand Total  | <b>2,334,741,943.55</b> |

### 12.2 SCHEDULE

The implementation schedule for this RAP covers the periods from the preparation of the RAP to the conclusion of the proposed project, the time that the transmission line construction phase and when the project becomes fully operational. The Implementation schedule defines the duration and timing of the key milestones and tasks.

It is important to note that the implementation of the project will be broken down into phases. This will start with the notification of the PAPs before their displacement and conclude with compensation and their resettlement (if it involves resettlement). PAPs will be compensated in

accordance with this RAP and the resettlement policy framework that had been prepared prior to the commencement of any activity.

The schedule for the implementation of activities must be agreed to between the Resettlement Committee and the PAPs. These include the target dates for start and completion of all compensations before civil works for the proposed project starts. The RAP has to be completed and PAPs adequately compensated before operation in the designated ROW of the project.

The timing mechanism of these measures would ensure that no individual affected would be displaced (economically or physically) due to civil works activity before compensation is paid and resettlement sites with adequate facilities (if necessary) are prepared and provided to the individual or community affected.

However, the timeline is only indicative since the external factors not envisaged at this period such as delay in reviewing and addressing comments and other administrative and operational matters may cause a delay in the project time line. TCN has in place a schedule for the transmission line project. The RAP schedule will ensure the implementation of the following key activities:

- Consultation, Sensitization and Disclosure
- Route Topographical Survey
- Socio-economic baseline survey
- Preparation of the RAP
- Final Investment Decision (FID) and continued consultations with affected people
- Right of Way acquisition (RoW)
- Notification
- Baseline Census Survey/Enumeration/valuation
- Resettlement/compensation of affected persons
- Post-compensation monitoring
- TCN Confirmation of resettlement/compensation
- EPC Contractor Mobilisation / Construction
- Reinstatement of land at the completion of construction of each section of the project
- Commencement of project operations, and
- Monitoring and evaluation, including baseline update.

Table 12.2 summarizes the implementation schedule of the Resettlement Action Plan by phase, responsibilities and completion time for the construction and rehabilitation project

**Table 12.2: Timetable for Resettlement Action Plan**

| Road Project Cycle  | Phase                               | Activities  | Date | Responsibility   |
|---------------------|-------------------------------------|---|------|--|
| PLANNING            | Scoping and Screening               | Initial site visits and consultation<br>Identification of Resettlement and Social Issues<br>Application of safeguard policies<br>Categorization<br>Action plan<br>Screening Report<br>JICA No-Objection |      | Consultant;<br>Supervision by TCN-PIU                    |
| DESIGN              | Preparation of RAP and consultation | Draft RAP<br>Constructions<br>JICA No-Objection   |      | Consultant;<br>Supervision by TCN-PIU                    |
|                     | Disclosure                          | Disclosure of RAP locally and to World Bank Info Shop   |      | TCN-PIU<br>World Bank                                    |
|                     | Finalization and Incorporation      | Final version of RAP<br>Incorporation of RAP into contract documents<br>JICA No-Objection   |      | Consultant;<br>Supervision by TCN-PIU                    |
| EXECUTION           | Implementation and monitoring       | Implementation<br>Monitoring and reporting on environmental and social mitigation measures<br>Monitoring and reporting of Resettlement and livelihood issues  |      | Contractors;<br>Supervision by TCN-PIU and the community |
| POST-IMPLEMENTATION | Operation and maintenance           | Maintenance<br>Monitoring and reporting of Resettlement and social livelihood issues  |      | Contractors;<br>Supervision by TCN-PIU and the community |

**Table 12.3: RAP Implementation and Follow-up Schedule**

| S/N | Activity                                   | Responsibility       | Implementation Period |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-----|--|----------------------|-----------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|
|     |  |                      |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1   | Preparation of RAP Report                  | Consultants/TCN      |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2   | Establish institutional framework          | TCN                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3   | Establish grievance mechanism              | TCN                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4   | Community consultation and engagement      | TCN/Consultants      |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5   | PAPs Notification                          | TCN                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6   | Space acquisition and Compensation payment | TCN/State Government |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7   | Commencement of project operations         | TCN                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 8   | Monitoring and evaluation                  | TCN/NGO/CBO          |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |

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## **APPENDICES**

**APPENDIX I: SURVEY INSTRUMENTS**

**FORM CODE: TCN/PPC/S/.....**

**INSPECTION SHEET ON  
STRUCTURE**

- 1) PROJECT NAME:  
.....
- 2) DATE OF INSPECTION: .....
- 3) NAME OF PROJECT AFFECTED PERSON:  
.....
- 4) PAP IDENTIFICATION NO.:  
.....
- 5) LOCAL GOVERNMENT AREA: .....
- 6) LOCATION/COMMUNITY: .....
- 7) COORDINATES:  
.....
- 8) TYPE OF PROPERTY/ STRUCTURE [BUILDING/ DEITY/ SEPULCHRE] .....
- 9) PROPERTY DESCRIPTION:  
.....
- 10) CONSTRUCTION DETAILS:
  - WALL:  
.....
  - WINDOW:  
.....
  - DOOR:  
.....
  - FLOOR:  
.....
  - CEILING:  
.....
  - ROOF:  
.....
  - TOILET:  
.....

WALL FENCE:  
.....

- 11) CONDITION: .....
- 12) TYPE OF USE: (a) Residential... (b) Commercial... (c) School... (d) Church or Mosque... (e) Shrine... (f) Hospital... (g) Others (specify).....
- 13) TYPE OF FLOOR: (a) Earth/Mud.... (b) Concrete... (c) Tiles... (d) Others (specify)...
- 14) TYPE OF ROOF: (a) Thatch... (b) Tin... (c) Tin with Ceiling... (d) No Roof.....
- 15) ACCOMMODATION (No. of Rooms).....
- 16) TITLE:  
.....
- 17) MEASUREMENT: (LENGTH X BREADTH)  
.....
- 18) DO YOU WANT TO BE COMPENSATED (CASH PAYMENT) .....(1) OR RESETTLED .....(2)
- 19) PICTURE OF PAP AND STRUCTURE (TO BE TAKEN TOGETHER)

- 20) NAME OF ASSESSING OFFICER: .....
- 21) SIGNATURE OF ASSESSING OFFICER: .....
- 22) OWNER/CLAIMANT.....
- 23) COMMUNITY REPRESENTATIVE.....
- 24) OGUN STATE GOVERNMENT REPRESENTATIVE.....
- 25) ESTATE SURVEYOR.....

**FORM CODE: TCN/PPC/C/.....**

**INSPECTION SHEET ON FARM CROPS/ECONOMIC TREES**

- 1) PROJECT NAME: .....
- 2) DATE OF INSPECTION: .....
- 3) NAME OF PROJECT AFFECTED PERSON: .....
- 4) PAP IDENTIFICATION NO.: .....
- 5) LOCAL GOVERNMENT AREA: .....
- 6) LOCATION/COMMUNITY: .....
- 7) COORDINATES: .....
- 8) TYPE OF FARM/ECONOMIC TREES.....

| S/No. | Crop Types | Tenure | Qty | Area Covered (m <sup>2</sup> ) | Seedling | Immature | Matured |
|-------|------------|--------|-----|--------------------------------|----------|----------|---------|
|       |            |        |     |                                |          |          |         |
|       |            |        |     |                                |          |          |         |
|       |            |        |     |                                |          |          |         |
|       |            |        |     |                                |          |          |         |

- 9) CONDITION: .....
- 10) TITLE: .....
- 11) DO YOU WANT TO BE COMPENSATED (CASH PAYMENT)....(1) OR RESETTLED.....(2)
- 12) PICTURE OF PAP AND FARM/ECONOMIC TREES (TO BE TAKEN TOGETHER)

- 13) NAME OF ASSESSING OFFICER: .....

- 14) SIGNATURE OF ASSESSING OFFICER: .....
- 15) OWNER/CLAIMANT.....
- 16) COMMUNITY REPRESENTATIVE.....
- 17) OGUN STATE GOVERNMENT REPRESENTATIVE.....
- 18) ESTATE SURVEYOR.....

**LAGOS AND OGUN STATE PROPOSED TRANSMISSION LINES AND ASSOCIATED SUBSTATION PROJECTS (LOT2) QUESTIONNAIRE  
AND IN-DEPTH INTERVIEW GUIDE**

**HOUSEHOLD INFORMATION**

PROJECT NAME: ..... NAME OF  
PROJECT AFFECTED PERSON: .....

|       |                |       |
|-------|----------------|-------|
| PAP   | IDENTIFICATION | NO.:  |
| ..... | .....          | ..... |
| LOCAL | GOVERNMENT     | AREA: |
| ..... | .....          | ..... |

LOCATION/COMMUNITY: ..... COORDINATES:  
.....





|    |                                 |  |
|----|---------------------------------|--|
| 14 | Household Expenditure per Month | i. Food.....1<br>ii. Clothing.....2<br>iii. Fuel.....3<br>iv. Education.....4<br>v. Health.....5<br>vi. Others (specify).....6 |
| 15 | Religion                        | Christianity<br>Islam<br>Traditional   |

|    |  |  |
|----|--|--|
| 16 | Household Structure and Assets                                 | <p><b>TYPE OF STRUCTURE</b></p> i. Mud and Wattle Thatch.....1<br>ii. Mud and Wattle Zinc.....2<br>iii. Earth Block/Thatch.....3<br>iv. Earth Block/Zinc.....4<br>v. Cement Block/Zinc.....5<br>vi. Cement Block/Asbestos.....6<br>vii. Timber Wall/Thatch.....7<br>viii. Timber Wall/Zinc.....8 |
|    |  | <p><b>WATER</b></p> i. Pipe Borne 1<br>ii. Borehole 2<br>iii. Sunk well 3<br>iv. Stream/River 4<br>v. Rain 5   |
|    |  | <p><b>ENERGY SOURCE</b></p> i. Electricity 1<br>ii. Generator 2<br>iii. Kerosene 3<br>iv. Charcoal 4<br>v. Gas Cooker 5  |
|    |  | <p><b>TOILETS/BATH TYPE</b></p> i. Water system 1<br>ii. Pit Latrine 2<br>i) Bush/Open Dug pit 3   |
|    |  | <p><b>OTHER ASSETS</b></p> i. Car/Bus 1<br>ii. Motorcycle 2<br>iii. Bicycle 3<br>iv. Fan 4<br>v. Others (specify) 5  |
| 17 | How solid waste disposed off?                                  | i. Burning.....1<br>ii. Burying.....2<br>iii. Dumping.....3<br>iv. Dump in Running/Stagnant water.....4  |
| 18 | What are the common diseases and pest found in this community? |  |

|    |   |  |
|----|---|--|
| 19 | Disability or long-term illness that you are currently suffering from | Dumbness<br>Deafness<br>Blindness<br>Crippled<br>Other (specify) |
|----|---|--|

QUESTIONNAIRE NO.: .....  
 PROJECT NAME: .....  
 NAME OF PROJECT AFFECTED PERSON: .....  
 PAP IDENTIFICATION NO.: .....  
 LOCAL GOVERNMENT AREA: .....  
 COMMUNITY: .....  
 DATE OF INTERVIEW: ..... INTERVIEWER'S NAME: .....

**COMMUNITY INFORMATION**

|    |  |  |
|----|--|--|
| 1  | Composition of the community (None, ¼, ½, ¾, All)  | RELIGION<br>i. Christian.....1<br>ii. Muslim.....2<br>iii. Traditional Religion.....3<br>STATUS<br>i. Better off.....1<br>ii. Poor.....2<br>GENDER<br>i. Male.....1<br>ii. Female.....2<br>MIGRATION STATUS<br>i. Indigenes.....1<br>ii. Migrants.....2<br>ETHNICITY<br>i. Major ethnic group.....1<br>ii. Minor ethnic groups.....2 |
| 2  | Name the major traditional gods of your community and shrines  |  |
| 3  | Name the major cultural festivals in this community  |  |
| 4  | How many cultural sites of importance do you have in this community?   |  |
| 5  | What categories of people are common in this community?  | Landlords.....1<br>Tenants.....2   |
| 6  | What proportion of this community would you consider to be poor? e.g. ½; 1/3; ¼ etc                          |  |
| 7  | What do you think are the reasons for poverty in this community?   |  |
| 8  | How is the general health status of people in this community?  | i. Good.....1<br>ii. Just Fair.....2<br>iii. Poor.....3  |
| 9  | What are the common diseases affecting people here?  |  |
| 10 | Are there reasons for particular health problems here?   |  |
| 11 | What has been done by the community/government to reduce the presence of above mentioned diseases and pests? |  |

|    |  |  |
|----|--|--|
| 12 | i. How would you characterize this community in terms of cooperation and social harmony?<br>ii. Do people work together or are there cases of fighting between groups within the community?<br>iii. What are the likely causes of such conflicts, there have been any? |  |
| 13 | In case of conflict between groups within the community, how are such problems resolved?   |  |
| 14 | Have there been any recent cases of conflict with groups outside the community? YES.....;<br>NO.....<br>If Yes, what were the causes?  |  |

15. Which of the following activities are practiced in this community? Indicate if women, men or both are engaged in each activity. Also indicate if each activity is declining or not.

|  | Gender (M/F/B) | Tick if activity is threatened or declining | If threatened, give reasons |
|--|----------------|---|-----------------------------|
| Crop farming                                   |                |   |                             |
| Trading  |                |   |                             |
| Livestock rearing                              |                |   |                             |
| Fishing  |                |   |                             |
| Hunting  |                |   |                             |
| Food processing                                |                |   |                             |
| Carpentry, Fashion Designing, Shoe Making etc. |                |   |                             |
| Crafts   |                |   |                             |
| Food selling/Snacks                            |                |   |                             |
| Hired Labourer                                 |                |   |                             |
| Others   |                |   |                             |

\*M = Males only engage in this activity; F =females only; B = both males and females engage in this activity

- Over the last 1-5 years, have there been any changes in these activities?
- Which activities have improved and which has remained the same?
- List the major crops grown in this community.
- List 2 important income-generating activities in this community
- How far from human habitation are of the TCN facilities in your community?
- Do TCN officials ever come to discuss their activities with your community? If yes, what do they discuss?
- How would you characterize the relationship between TCN and your community?
- Have there been cases of electricity related problems in this community? Yes.....(1) No.....(2) I don't know.....(3)

**APPENDIX II: RAP PREPARATION METHODOLOGY**

| S/N | Task                                    | Activity   |
|-----|---|--|
| 1   | Literature and Policy/Legal Review      | Receipt of the corridor design from RSDT for the corridor  |
|     |   | Obtain and review maps covering the project corridor to better understand the project route.   |
|     |   | Develop data gathering Instrument and Checklist in preparation for detailed field survey   |
|     |   | Commence definitive field investigation  |
| 2   | Consultations                           | Continual Consultation w   |
| 3   | Field Investigation and Data Collection | <u>Field Investigation:</u>  |
|     |   | Socioeconomic Survey of activities on the corridor   |
|     |   | Census and of Affected properties and Businesses   |
|     |   | Census of the project corridor in relation to number of various features identified trees affected, , affected structures, displaced persons, infrastructural facilities affected etc. |
|     |   | Valuation  |
|     |   | Data Entry   |
|     |   | Field data quality check will be carried out on return from the field to ensure consistency and elimination of errors before data entry commences.                                     |
| 4   | Analysis of Social Data                 | Data entry and processing  |
|     |   | Assess data from the field instrument against the checklist.   |
|     |   | Evaluate the impact of the project on the environment  |
|     |   | Calculation of compensation rates/values   |
| 5   | RAP preparation                         | Findings and Recommendations from analysis   |
|     |   | Identification of impacts  |
|     |   | Design mitigation and management plans<br>Development of RAP Implementation process and Schedule   |

**APPENDIX III: TCN FORM 128 – INDEMNITY**

Whereas the Transmission Company of Nigeria (TCN) paid to me \_\_\_\_\_  
 the sum of \_\_\_\_\_  
 ₦ \_\_\_\_\_ by way of compensation in full and complete satisfaction and discharge of  
 the claim made by me in respect of damages caused by the said Power  
 Holding Company of Nigeria and crops at \_\_\_\_\_ the receipt of which sum  
 I hereby acknowledge.

Now, I hereby undertake that all times hereafter well and sufficiently indemnify and keep indemnified the said  
 Transmission Company of Nigeria against all claims made by any person or persons whatsoever in respect of  
 the damage to the said property for which I have received the said compensation and against all liability in  
 respect thereof and against all actions, suits proceedings, demands, cost and expenses whatsoever which may  
 be taken or made against or be incurred or become payable the said Transmission Company of Nigeria (TCN)  
 in respect thereof.

Dated this \_\_\_\_\_ day of \_\_\_\_\_ 20

\_\_\_\_\_  
 Signature or mark

To: The Transmission Company of Nigeria (TCN)  
 I certify that I have read over and interpreted the above correctly in the Yoruba/Hausa/Ibo  
 \_\_\_\_\_ language to \_\_\_\_\_ of \_\_\_\_\_  
 \_\_\_\_\_ who appeared to understand the same fully

\_\_\_\_\_  
 Signature of interpreter

No fee or reward has been or is to be charged or taken for writing and completing the foregoing on behalf of  
 \_\_\_\_\_  
 (Name of person granting indemnity)

One number of copy of the foregoing has been written or completed by me.

\_\_\_\_\_  
 Name of writer

TCN FORM 128

**APPENDIX IV: COMMUNITIES IN THE PROJECT AREA**

| S/N | Section       | LGA/State           | LCDA     | Community                       |                  |
|-----|---------------|---------------------|----------|---------------------------------|------------------|
| 1   | Ejio – Likosi | Ewekoro, Ogun State |          | Ejio                            |                  |
| 2   |               |                     |          | Abese                           |                  |
| 3   |               |                     |          | Ibokuru                         |                  |
| 4   |               | Ifo                 |          |                                 | Apode            |
| 5   |               |                     |          |                                 | Mose Ejiogbe     |
| 6   |               |                     |          |                                 | Moro             |
| 7   |               |                     |          |                                 | Oloko            |
| 8   |               |                     |          |                                 | Igbo Aare        |
| 9   |               |                     |          |                                 | Iyedi Balogun    |
| 10  |               |                     |          |                                 | Jagunna          |
| 11  |               |                     |          |                                 | Odofin           |
| 12  |               |                     |          |                                 | Yanbi            |
| 13  |               |                     |          |                                 | Erifu Olorunsogo |
| 14  |               |                     |          |                                 | Luwani           |
| 15  |               |                     |          |                                 | Shodipo Agbawajo |
| 16  |               |                     |          |                                 | Gaun             |
| 17  |               |                     |          | MFM – Existing Benin (Omotosho) | Obafemi          |
| 18  |               | Lukosi Ode          |          |                                 |                  |
| 19  |               | Koole               |          |                                 |                  |
| 20  |               | Aworan              |          |                                 |                  |
| 21  |               | Ikija               |          |                                 |                  |
| 22  |               | Agbawon Etido       |          |                                 |                  |
| 23  |               |                     | Onibadan |                                 |                  |

|    |  |        |                   |
|----|--|--------|-------------------|
| 24 |  |        | Oniyan / Aiyetoro |
| 25 |  |        | Afidipan          |
| 26 |  |        | Oke Oko           |
| 27 |  |        | Adewolu           |
| 28 |  |        | Oluwo Oshin       |
| 29 |  |        | Abisodun          |
| 30 |  |        | Eleworo           |
| 31 |  |        | Lajioku           |
| 32 |  |        | Ropo              |
| 33 |  |        | Olosan            |
| 34 |  |        | Mosadomi          |
| 35 |  |        | Asa Elegun        |
| 36 |  |        | Asa Bala          |
| 37 |  |        | Omu Penpe         |
| 38 |  |        | Ori               |
| 39 |  |        | Kori Oja          |
| 40 |  |        | Otere Alase       |
| 41 |  |        | Otere Apena       |
| 42 |  |        | Olatilewa         |
| 43 |  |        | Otere Oba         |
| 44 |  |        | Otere Peki        |
| 45 |  |        | Orile Igbehin     |
| 46 |  |        | Gbarawe           |
| 47 |  |        | Ogunji            |
| 48 |  | Sagamu | Ijemo             |
| 49 |  |        | Isore             |
| 50 |  |        | Shofidiya         |

|    |                |  |                    |
|----|----------------|--|--------------------|
| 51 |                |  | Ogunkanra          |
| 52 |                |  | Onileowo           |
| 53 |                |  | Oshile             |
| 54 |                |  | Agbonmagbe         |
| 55 |                |  | Makun-Sagamu       |
| 56 |                |  | Lakaye             |
| 57 |                |  | Oke-Oko Onileowo   |
| 58 |                |  | Oke Ate Ajebo      |
| 59 |                |  | Ewu-Ogun           |
| 60 |                |  | Ogundipe           |
| 61 |                |  | Ewu-Lisa           |
| 62 |                |  | Erelu              |
| 63 |                |  | Aberebi            |
| 64 |                |  | Igbepa             |
| 65 |                |  | Alado              |
| 66 |                |  | Ewu-Balogun Sokoya |
| 67 | Ogijo-Existing |  | Mologun Onipeteye  |
| 68 | Ikorodu/Sagamu |  | Gbara              |
| 69 |                |  | Dejuwogbo          |
| 70 |                |  | Ologbun Ogunberu   |
| 71 |                |  | Ologbun Shofidiya  |
| 72 |                |  | Ologbun Maporo     |
| 73 |                |  | Simawa             |
| 74 |                |  | Soso               |
| 75 |                |  | Alaga Awolate      |
| 76 |                |  | Ranodu             |
| 77 |                |  | Likosi             |

**APPENDIX V: RAP IMPLEMENTATION BUDGET DETAILS**

## **8 . Lot 3 RAP Report**

# LAGOS AND OGUN STATES TRANSMISSION PROJECT

## RESETTLEMENT ACTION PLAN (RAP) Final Report



Project # 097.002.056  
April 2019, Final Report  
Version: v 3.0



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## PROJECT TEAM

### KEY EXPERTS

| NAME                     | QUALIFICATION | DESIGNATION/DISCIPLINE        |
|--------------------------|---------------|-------------------------------|
| Engr. Mamoud B. Abubakar | M.Eng         | Project Manager               |
| Dr Bassey Uzodinma       | DVM           | Quality Assurance             |
| Emmanuel Nwanjioi        | B.SC          | Estate Valuer                 |
| Prof. S.S. Adefila       | PhD           | Waste Management              |
| Engr Joseph Okafor       | B.Eng         | Electrical Engineer           |
| Dr. Joseph Ebigwai       | PhD           | Ecologist                     |
| Osahon, Nosa             | B.Sc          | Microbiologist                |
| Dr. Ujah, Terhide        | PhD           | Socio- Economic/Health Impact |
| Egbe, Alexander E        | M.Sc          | Botany                        |
| Mr. Onyia sunny          | M.Sc          | Air/Noise quality expert      |
| Mr Usman Balarabe        | M.Sc          | GIS Expert                    |
| Surv. Joseph Amaglo      | M.Sc          | Land Surveyor                 |

### SUPPORT TEAM

|                      |      |                                 |
|----------------------|------|---------------------------------|
| Olatayo Olasehinde   | B.Sc | Logistics/Field Coordinator     |
| Justina Ogbolu       | HND  | Accounts/Admin                  |
| Ikechukwu Umunna     | B.Sc | ICT                             |
| Tolulope Ogunleye    | B.Sc | Technical Support/Documentation |
| Danlami Kuje         | HND  | Valuer/ Enumeration             |
| Justine Shankodi     | HND  | Valuer/ Enumeration             |
| Okaku Abdullahi      | HND  | Valuer/ Enumeration             |
| Phillip Chukwuma     | BSc  | Enumeration officer             |
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## UNITS AND ACRONYMS

### Units

|                     |   |
|---------------------|---|
| °C                  | Degree centigrade                         |
| °F                  | Degree Fahrenheit                         |
| Cfm                 | Cubic feet per minute                     |
| Cfu/ml              | Colony forming unit per millilitre        |
| cm                  | Centimeters                               |
| DB                  | Decibels                                  |
| g                   | Grams                                     |
| GWh                 | Gigawatts-hour (109 watts × 3600 seconds) |
| kg                  | Kilogram                                  |
| kg/yr.              | Kilogram per year                         |
| km                  | Kilometers (1000 m)                       |
| kph                 | kilometer per hour                        |
| kV                  | Kilovolts (1000 volts)                    |
| kW                  | Kilowatt                                  |
| m                   | Meters                                    |
| m <sup>2</sup>      | Square meter                              |
| m <sup>3</sup> /hr. | Metre cubic per hour                      |
| mm                  | Millimeter                                |
| mm/sec              | Millimeter per seconds                    |
| mS/cm               | Micro Siemens per centimeter              |
| mV                  | Megavolts (106 volts)                     |
| mW                  | Megawatts (106 watts)                     |
| ppm                 | Parts per million                         |
| t                   | tonnes or tons                            |
| µg/L                | Microgram per litre                       |
| µS/cm               | Micro Siemens per centimeter              |

### Acronyms

|       |                                     |
|-------|-------------------------------------|
| %     | Percentage                          |
| (T)   | Threatened species                  |
| AAS   | Atomic Absorption Spectrometer      |
| Ag    | Silver                              |
| AIDS  | Acquired immune deficiency syndrome |
| AIDS  | Acquired immune deficiency syndrome |
| AIS   | Air Insulated Substation            |
| AIS   | Invasive species                    |
| ALARP | As Low As Reasonably Practicable    |
| AM    | Ante meridian                       |
| ANFO  | Ammonium Nitrate fuel Oil           |
| APHA  | American Public Health Association  |
| AQN   | Air Quality and Noise               |



|                 |   |
|-----------------|---|
| ARD             | Acid rock drainage  |
| ASTM            | American Standard and Testing Methods                     |
| ATR             | Africa Traditional Religion                               |
| Ba              | Barium  |
| BAP             | Biodiversity Action Plan                                  |
| BAT             | Best Available Technology                                 |
| BCG             | Bacillus Chalmette-Guerin                                 |
| BMI             | Body Mass Index   |
| BODs            | Biological Oxygen Demand                                  |
| BREF            | Best available technical Reference document               |
| Ca              | Calcium   |
| CAS             | Country Assistance Strategy                               |
| CBO             | Community Based Organization                              |
| CCP             | Cement Closure Plan                                       |
| Cd              | Cadmium   |
| CDF             | Community Development Fund                                |
| CDM             | Clean Development Mechanism                               |
| CEMPS           | Construction Environmental Management Plan                |
| CEO             | Chief Executive Officer                                   |
| CHMP            | Cultural heritage management plan                         |
| CHSP            | Community Health and Safety Plan                          |
| CITES           | Convention on International Trade in Endangered Species   |
| Cm              | Centimetres   |
| CMP             | Construction Management Plan                              |
| CNS             | Central nervous system                                    |
| CO              | Carbon monoxide   |
| CO <sub>2</sub> | Carbon dioxide  |
| COD             | Chemical Oxygen Demand                                    |
| CPKO            | Crude Palm Kennel Oil                                     |
| Cr              | Chromium  |
| CRE             | Chemical, Resettlement and Environment Unit of TCN        |
| CRM             | Compensation and Resettlement Manager                     |
| Cu              | Copper  |
| D               | Menhinick's Index (D).                                    |
| D               | Margalef's Richness Index (d)                             |
| DB              | Decibels  |
| DBH             | Diameter Breast Height                                    |
| DCS             | Distributed Control System                                |
| DD              | Data Deficient  |
| DNA             | Deoxyribonucleic Acid                                     |
| DO              | Dissolved Oxygen  |
| DPT             | Diphtheria pertussis tetanus                              |
| E               | EASTINGS of East (used in coordinate system)              |
| EBRD            | European Bank for Reconstruction and Development          |
| EC              | Electrical conductivity                                   |
| EEMS            | Engineering and Environmental Management Services Limited |



|                  |  |
|------------------|--|
| Ef               | Emission Factor  |
| EHS              | Environmental Health and Safety  |
| EIA              | Environmental Impact Assessment  |
| EIS              | Environmental Impact Statement   |
| EIS              | Environmental Impact Statement   |
| EMF              | Electromagnetic Field  |
| EMP              | Environmental Monitoring Plan  |
| EMPRITP          | Environmental Monitoring Programme and Resources Implementation And Training Program     |
| EMS              | Environmental Management System  |
| EN               | Endangered   |
| END              | Environmental Noise Directive  |
| EPA              | Environment Protection Act   |
| EPC              | Engineering, Procurement and Construction  |
| EPFI             | Equator Principle Financial Institution  |
| EPRP             | Emergency Preparedness and Response Plan   |
| ESAP             | Environmental and Social Assessment Procedures   |
| ESIA             | Environmental and Social Impact Assessment   |
| ESMP             | Environmental and social management plan   |
| ESPS             | Environmental and Social Policy Statement  |
| EU               | European Union   |
| FAS              | Ferrous Ammonium Sulphate  |
| Fe               | IRON   |
| FEPA             | Federal Environmental Protection Agency ( a defunct regulatory Agebcy replaced by FMENV) |
| FGDs             | Focus groups Discussions   |
| FGN              | Federal Government of Nigeria  |
| FLS              | FL Smidth  |
| FM               | Frequency modulation   |
| FMEA             | Failure Mode and Effects Analysis  |
| FMEnv            | Federal Ministry of Environment  |
| FMPW&H           | Federal Ministry of Power, Works and Housing   |
| FS               | Feasibility Study  |
| G                | Grams  |
| GDP              | Gross Domestic Product   |
| GHG              | Green House Gases  |
| GHS              | Globally Harmonized System   |
| GIIP             | Good Industry International Practice   |
| GIS              | Gas Insulated Substation   |
| GIT              | Gastro-intestinal Tract  |
| GM               | General Manager  |
| GPS              | Global Positioning System  |
| GWP              | global warming potential   |
| H <sub>2</sub> S | Hydrogen sulphide  |
| Ha               | Hectare  |
| ha               | Hectare  |
| HIV              | Human Immuno-deficiency virus  |
| HofH             | Head of Household  |



|                |   |
|----------------|---|
| HPLC           | High Performance Liquid Chromatograph                                       |
| HRRP           | Habitat removal and re-instatement plan                                     |
| Hs             | Shannon and Weiner diversity index  |
| HSD            | High speed diesel   |
| HSE            | Health, Environment and Safety  |
| i.e.           | That is   |
| IAA            | International Atomic Agency   |
| IAEA           | International Atomic Energy Agency  |
| ICCL           | International Cement Company Limited  |
| ICNIRP         | International Commission on Non-Ionizing Radiation Protection               |
| IEC            | Information Education and Communication                                     |
| IEEE           | Electrical and Electronic Engineers   |
| IFC            | International Finance Corporation   |
| IFC            | International Finance Corporation   |
| ILO            | International Labour Organisation   |
| IMCO           | Inter-governmental Maritime Consultative Organization                       |
| IPF            | Intergovernmental Panel in Forests  |
| IPIECA         | The international petroleum industry environmental conservation association |
| IPPC           | Integrated Pollution Prevention and Control                                 |
| IQ             | Intelligence quotient   |
| ISO            | International Organization for Standardization                              |
| ISQG           | International Quality Sediment Guidelines                                   |
| ISWMS          | Integrated Solid Waste Management Scheme                                    |
| ITCZ           | Inter-tropical convergence zone   |
| ITD            | Inter-tropical discontinuity  |
| IUCN           | International Union for Conservation of Nature                              |
| J              | Species Equitability  |
| JICA           | Japanese International Cooperation Agency                                   |
| K <sup>+</sup> | Potassium   |
| KBA            | Key Biodiversity Areas  |
| LAMENV         | Ogun State Ministry of Environment  |
| LASEPA         | Lagos State Environmental Protection Agency                                 |
| LAWMA          | Lagos State Waste Management Agency   |
| LC             | Least concerns  |
| LCD            | Liquid Crystal Detector   |
| LCDA           | Local Council Development Area  |
| LCP            | Large Combustion Plants   |
| LFN            | Laws of the Federation of Nigeria   |
| LGA            | Local Government Area   |
| LIDAR          | Light detection and ranging   |
| Log            | Logarithm   |
| LPFO           | Low Pour Fuel Oil   |
| LRC            | Local Resettlement Committee  |
| LSG            | Lagos State Government  |
| MC             | Mifor Consult   |
| MCC            | Manual classified Count   |



|                               |   |
|-------------------------------|---|
| MCTC                          | Manual Classified Turning Count   |
| MDAs                          | Ministries, Department and Agencies   |
| Mg                            | Magnesium   |
| MMA                           | Mathematical Method of multi-criteria Analysis  |
| MMSD                          | Ministry of Mines and Steel Development   |
| Mn                            | Manganese   |
| MOU                           | Memorandum of Understanding   |
| MSDSs                         | Material Safety Data Sheets   |
| mT                            | Tropical Maritime   |
| MTPA                          | Million Tonnes Per Annum  |
| N                             | NORTHINGS or North (used in coordinate system)  |
| N/A                           | Not Available   |
| NA                            | Not Available or Not Applicable   |
| NBS                           | The National Bureau of Statistics   |
| NCF                           | Nigerian Conservation Foundation  |
| NEEDS                         | National Economic Empowerment and Development Strategy  |
| NESREA                        | National Environmental Standards and Regulations Enforcement Agency   |
| NGN                           | Nigerian Naira  |
| NGO                           | Non-Governmental Organization   |
| NGOs                          | Non-Governmental Organizations  |
| NIMET                         | Nigerian Meteorological Agency  |
| NPC                           | National Population Commission  |
| NT                            | Not- Threatened   |
| NTDF                          | National Technical Forum on Land Administration   |
| ODA                           | Official Development Assistance   |
| OGEPA                         | Ogun State Environmental Protection Agency  |
| OGMENV                        | Ogun State Ministry of Environment  |
| OHS                           | Occupational Health and Safety Unit of TCN  |
| OHSAS                         | Occupational Health and Safety Assessment Series  |
| OP                            | Operational Procedures  |
| OPGW                          | Optical Ground Wire   |
| OPIC                          | Overseas Private Investment Corporation   |
| OSG                           | Ogun State Government   |
| PAG                           | Management of potentially acid generating   |
| PAH                           | Polycyclic aromatic hydrocarbons  |
| PAP                           | Project Affected People (the total population affected by the project, i.e. people living in households affected) |
| PCR                           | Physical Cultural Resources   |
| PH                            | Power of hydrogen (hydrogen ion)  |
| PHCN                          | Power Holding Company of Nigeria  |
| PIU                           | Project Implementation Unit   |
| PM                            | Post meridian   |
| PM                            | Particulate Matter  |
| PNS                           | Peripheral nervous system   |
| PO <sub>4</sub> <sup>2-</sup> | Phosphates  |
| PPE                           | Personal Protective Equipment   |





|                               |  |
|-------------------------------|--|
| PPE                           | Personal protective equipment                                |
| PSD                           | Particulate Size Distribution                                |
| PTDF                          | Petroleum Trust Development Fund                             |
| PVC                           | Polyvinyl chloride   |
| QA                            | Quality Assurance  |
| QC                            | Quality Check  |
| QHSE                          | Quality Health Safety and Environment                        |
| RAA                           | Registry of Affected Assets                                  |
| RAP                           | Resettlement Action Plan                                     |
| RBDPKO                        | Refined Bleached Deodorized Palm Kernel Oil                  |
| RBDPO                         | Refined Bleached Deodorized Palm Oil                         |
| REDD                          | Reducing Emissions from Deforestation and Forest Degradation |
| RL                            | Reduced Level  |
| ROW                           | Right of Way   |
| RP                            | Regeneration potential                                       |
| RTI                           | Respiratory Tract Infection                                  |
| SCADA                         | Supervisory Control and Data Acquisition                     |
| SDOS                          | Sustainable development organizational structure             |
| SDP                           | Sustainable Development Plan                                 |
| SEMA                          | State Emergency Management Agency                            |
| SEPA                          | State Environmental Protection Agency                        |
| SIA                           | Social Impact Assessment                                     |
| SMCL                          | Secondary Maximum Contaminant Level                          |
| SNCR                          | Selective Non-catalytic Reduction                            |
| SO <sub>2</sub>               | Sulphure dioxide   |
| SO <sub>4</sub> <sup>2-</sup> | Sulphates  |
| SoI                           | Sphere of influence  |
| SOPs                          | Standard Operating Procedures                                |
| SPL                           | Sound pressure level   |
| SPM                           | Suspended particulate matter                                 |
| SPO                           | Special Palm Oil   |
| SPSS                          | Statistical package for the social sciences                  |
| SQM                           | Square meter   |
| STDs                          | Sexually Transmitted Diseases                                |
| SUVs                          | Sport Utility Vehicles                                       |
| T                             | Turbidity  |
| TBA                           | Traditional Birth Attendants                                 |
| TC                            | Tropical Continental   |
| TC                            | Total Coli form  |
| TCN                           | Transmission Company of Nigeria                              |
| TDS                           | Total Dissolved Solids                                       |
| TFR                           | Total Fertility Rate   |
| THB                           | Total Heterotrophic Bacteria                                 |
| THC                           | Total hydrocarbon content                                    |
| THF                           | Total Heterotrophic Fungi                                    |



|        |  |
|--------|--|
| THUB   | Total Heterotrophic Utilizing Bacteria                           |
| THUF   | Total Heterotrophic Utilizing Fungi                              |
| TLV    | Threshold Limit Value  |
| TOC    | Total Organic Carbon   |
| TOR    | Terms of Reference   |
| ToR    | Terms of Reference   |
| TOR    | Terms of Reference   |
| TPM    | Total particulate matter   |
| TSC    | Time Species Count   |
| TSS    | Total Suspended Solid  |
| TT     | Tetanus toxoid   |
| UDHR   | Universal Declaration of Human Rights                            |
| UN     | United Nations   |
| UNCBD  | United Nations Convention on Biological Diversity                |
| UNDP   | United Nations Development Program                               |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| UNICEM | United Cement  |
| UNIDO  | United Nations Industrial Development Organization               |
| USD    | United States Dollar   |
| USDA   | United States Department of Agriculture                          |
| USEPA  | United States Environmental protection Agency                    |
| UV     | Ultra-Violet   |
| V      | Vanadium   |
| VOCs   | Volatile Organic Compounds                                       |
| VU     | Vulnerableness   |
| WB     | World Bank   |
| WCMC   | World conservation Monitoring Centre                             |
| WHO    | World Health Organizations                                       |
| WMF    | Waste Management Facility  |
| WPD    | Wayleave and Property Departments of TCN                         |
| WRC    | Watersheds Regulation Committee                                  |
| YF     | Yellow Fever   |
| Zn     | Zinc   |



## EXECUTIVE SUMMARY

### INTRODUCTION

#### Project Background

The Transmission Company of Nigeria (TCN) is one of the companies unbundled from the defunct Power Holding Company of Nigeria (PHCN), and the only one wholly owned by the Government. TCN is charged with the responsibility of transmitting electric power from the various power stations to the load centres across the country and beyond, ensuring efficient and cost-effective transmission, system operation, and improved service delivery. TCN is also responsible for the management of assets of the High Voltage Transmission System Operations, generation dispatch functions, as well as the development of the network through the construction of new transmission lines and substations for efficient transmission and system operations.

Nigeria has realized strong economic growth, until 2016 when the economy went into recession. However, stronger growth is projected for the future due the new anti-corruption posture of the Government as well as economic policies targeted at reducing capital flight. Meanwhile, power supply capacity is overwhelmingly insufficient. As a countermeasure of serious power shortage, Transmission Company of Nigeria (TCN) planned a project geared to achieving transmission capacity of 20,000 MW by 2020 in accordance with growth of generation capacity.

Presently, the transmission lines to the largest demand centre of Lagos are in a bottleneck situation so the generating capacities being built across the country cannot be fully utilized. Moreover, there are no detour routes for use when equipment failure occurs, and the system reliability is low.

The Lagos and Ogun States transmission project is targeted at improving power supply to Lagos and Ogun States, in line with the Transmission Lines network capacity development of achieving transmission capacity of 20,000 MW by 2020. This transmission line project in Lagos and Ogun States ("Lagos and Ogun States Transmission Project" or "the entire project") is to be financed through a loan (Japanese ODA loan) from Japan International Cooperation Agency (JICA). The Transmission Company of Nigeria (TCN) is the implementing agency and owners of the project when completed. This entire project plans reinforcement of transmission capacity, improvement of credibility of electricity supply and reduced electricity loss by installing transmission systems in southwest area Nigeria. It contributes acceleration of economy and development of the communities.

The entire project consists of about 207 km high voltage transmission lines and 6 high voltage substations. For the purpose of ESIA and RAP study, the project is divided into 3 sections, Lot1, Lot 2 and Lot 3. Transmission Company of Nigeria (TCN) has mandated the EEMS Limited to conduct Line Route Study, Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP) and Resettlement Action Plan for Lot 3 of the project (hereinafter "the project" or "proposed project") consisting of the following components;

- 330kV D/C Transmission Line from Ejio to Ajegunle -29.6 km.
- 132kv D/C Transmission Line from Ajegunle to Agbara -21.7 km.
- 132kv D/C Transmission Line from Ajegunle to Badagry – 36.2 km.
- New substation at Ejio (2x150MVA, 330/132kV + 2x60MVA 132/33kV)
- New substation at Ajegunle (2x150MVA, 330/132kV + 2x60MVA 132/33kV)



- New substation at Badagry (2x60MVA, 132/33kV).

Specifically, following studies were conducted.

- Line Route Study (LRS), to determine the optimum route for the lines.
- ESIA to identify and assess the potential environmental and social impacts and recommend appropriate mitigation strategies and prepare ESMP.
- This Resettlement Action Plans (RAP) prepared based on the international standards and principles presented in the Resettlement Policy Framework.

The project is financed through a loan from Japan International Cooperation Agency (JICA), as part of the development of power transmission infrastructure in the South-Western Region of Nigeria.

This type of project must undergo an environmental and social impact assessment as required by the EIA Act No. 86 of 1992. And also, resettlement action plan is needed as required by the Land Use Act and world bank operational policy -OP 4.12 as well as JICA guidelines for environmental and social considerations, the World Bank environmental and social safeguard policies and International.

#### Scope and Objectives

The policies of the JICA, World Bank, and the National Land Policies address involuntary resettlement. The RAP prepared for this project is consistent with the policies of the Government of Nigeria and that of JICA (adopted the World Bank Policy on Involuntary Resettlement -OP 4.12). The main objective of this RAP is to provide an agreed plan for the resettlement and compensation of Project Affected Persons (PAPs) affected by the proposed project, and this report presents the process for resettlement planning, elements of the compensation and eligibility program associated with the resettlement program as applied on people affected by the project. The draft was presented to Transmission Company of Nigeria (TCN), the PAPs and other stakeholders for comments. The information gathered will reduce concerns that may be raised by the PAPs, favouring their approval and their collaboration in project execution.

Specifically, the RAP was prepared in order to:

- Ensure that the land acquisition process comply with the requirements of Nigerian Laws and the World Bank policies;
- Raise awareness of the project and its consequences among the general public and particularly among those people who will be directly affected by the project;
- Establishing strategies to mitigate against adverse effects suffered by the PAPs including provision of channels and platforms for engagement and grievance resolution;
- Assess the potential extent of involuntary resettlement relating to the Project;
- Identify the possible impacts of such resettlement;
- Identify different categories of PAPs who will require some form of assistance, compensation, rehabilitation or relocation;
- Quantify different categories of PAPs who will require some form of assistance, compensation, rehabilitation or relocation;
- Provide guidelines to stakeholders participating in the mitigation of adverse social impacts of the project; and



- Estimate the costs necessary for resettlement and compensation.

### Methodology

The preparation of the RAP commenced with review of the preliminary feasibility study report following reports about the project, prepared by JICA, and other relevant literature including the harmonised rates for compensation for South Western States, legal documents, World Bank and JICA guidelines, etc. Subsequently, the RAP study was conducted through;

- Consultations with a number of key stakeholders at the national, state and local levels (see Chapter 4).
- The presentation of the provisional line route to the TCN and other stakeholders including communities for comments;
- The development of a multi-criteria line route study conducted to reduce the potential impacts of the project including resettlement upfront (see the line route study report);
- The completion of a census of households, private and community assets and properties affected by the line route and substation sites (see Section 2.8 and Chapter 5);
- The completion of socioeconomic surveys of communities and households whose land will be crossed by the lines (see Section 2.8 and Chapter 5).
- Detailed enumeration of affected assets and valuation of same to establish comprehensive budget for effective RAP implementation (See Chapter 7).
- Presentation of preliminary RAP report to TCN and other stakeholders for comments.

The census and socioeconomic studies were conducted based on two (2) separate surveys. The first survey (December 2017) was meant to assess the affected households' assets and socioeconomic circumstances and the second survey assessed the community's characteristics and assets that would be affected by the project implementation. The data obtained at this stage is used as control group analyses (See Section 2.8). The second in January and February 2018 is the PAP census, which was analysed in Chapter 5.

The information gathering was undertaken using SnapSurvey Software on Android Tablets as well as Avenza Maps to aid navigation and identification of the line corridor clearance. The SnapSurvey software has data analyse capability and also ensure integrity of the data collected, because once survey is uploaded, it cannot be recalled or changed by the interviewer.

## DESCRIPTION OF THE PROJECT

### Project Justification

Lagos and Ogun States to a certain extent are industrial nerve centers of Nigeria. Hence, account for significant proportion of load demand from the national grid. The new power plants in the South normally transmits to the North through the areas of highest demand (Lagos). And presently the transmission system around the area has limited capacity as a result they constitute bottlenecks. Hence, the need to expand the network to improve stability and reliability.

The sustainability of the project has been considered on three premises – technical, economic, and environmental and social. Technically, the technologies, materials, equipment and personnel are available. On the economic premise, the funds for its execution are available and the project output is



awaiting uptake by the consumers through Ikeja, Eko and Ibadan DISCOs in return for tariff payments. Environmental and social sustainability stem from the complete acceptance of the project by host communities, the careful identification and mitigation of project negative impacts and TCN's commitment to the implementation of all developed project's management plans.

### Project Location

The line routes, which is a linear project crosses three LGAs in Ogun State (Ewekoro, Ifo and Ado Odo/Ota) and one LGA in Lagos State, which is Badagry LGA. The three substations within the scope of Lot 3 are located at Ejio in Ewekoro LGA, Ajegunle in Ado Odo/Ota LGA and Badagry in Badagry LGA.

### The Line Routes

The right of way for 330kV line is 50m (25m either side of the center line), and 30m 132kV (15m on either side of the center line). Factors considered include space to accommodate the lattice tower (wire zone) and safety buffer zone to provide safe limits for electromagnetic radiation as well as tower collapse and also to comply with Nigerian Electricity Regulatory Commission (NERC) requirements. Structures for residential or commercial or any other purpose is not allowed but farming and grazing are tolerated, provided that the crops do not exceed 4 m in height. Hence, agricultural land is not compensated, only the crops lost temporary during construction phase is compensated.

The 330kV line from Ejio to Ajegunle is 29.6km while the 132kV from Ajegunle to Agbara and from Ajegunle to Badagry are 21.7km and 36.2km respectively. These two 132kV share a common boundary (multi-circuit towers) of 6.2km, which means the effective length of corridor required for 132kV line is 51.7km and 81.3km for both 330kV and 132kV.

**330kV DC line: Ejio to Ajegunle:** This transmission line is 330kV double circuit which connects between the Ejio S/S and Ajegunle S/S, with a length of 29.6km. It crosses the Lagos-Abeokuta Expressway (Trunk A5) at 6.853224°N, 3.192264°E, after about 2.3km from the Ejio substation. It also has a crossing point with the existing 330kV single circuit transmission line between Osogbo S/S and Ikeja West S/S after about 7km from Ejio substation. The existing single circuit transmission line is to be cut at the point of crossing. The Osogbo-Ikeja West line will be looped in and out of the Ejio substation. The transmission line from Ejio SS to the crossing point is four circuit; double circuit x 2 (consist of two circuit going to Ajegunle, two circuits from Osogbo-Ikeja West going in and out of Ejio).

**132kV DC line: Ajegunle to Existing Agbara Substation:** This transmission line is 132kV double circuit from the proposed Ajegunle Substation to the existing Agbara Substation, with a length of 21.7 km. This line shares common corridor with the Ajegunle to Badagry line for 6.2 km up to Iberese and reduced footprint. The areas around Ajegunle for up to 2km and 5km radius from Agbara substation is dense residential and industrial area. The Agbara line separated from the Badagry line at Igbere and passes through Egudu Adesina, Idayin, Idoluba before terminating at the existing Agbara substation located within the Agbara Industrial Layout.

**132kV DC line: Ajegunle to Badagry:** This transmission line is 132kV double circuit connecting the proposed Ajegunle substation to Badagry S/S, and it is 36.2km in length and share 6km common corridor (multi-circuit towers) with the Agbara line as mentioned earlier. Four circuit tower will be used to accommodate both the Ajegunle to Badagry and Ajegunle to Agbara lines for up to a distance of 6km. The key challenge for this line is to negotiate riverine residential communities and the swampy nature of the uninhabited areas from about 10km from the Badagry substation.



## The Substations

Three green field substations are within the scope of this RAP at Ejio, Ajegunle and Badagry, while the existing Agbara will require only an extension of the line bay and no additional land take will be required. The configuration of each of the substations as well as coordinates of location is shown below.

| Substation Name | Location                    | Location (UTM Zone: 31N)       | Size of land (ha) | Voltage class        | Incoming bay / Outgoing bay for transmission line   |
|-----------------|-----------------------------|--------------------------------|-------------------|----------------------|---|
| Ejio Substation | Ewekoro LGA/ Ogun State     | 523203.709mE<br>756989.301mN   | 25.3              | 330/<br>132/<br>33kV | Incoming bay from Olorunsogo PS: 330kV-DC line<br>Incoming bay from Osogbo S/S: 330kV-SC line<br>Incoming bay from Ikeja West S/S: 330kV-SC line<br>Outgoing to Ogijo S/S : 330kV-double circuit line<br>Outgoing to Ajegunle S/S : 330kV-DC line<br>Outgoing to New Abeokuta S/S : 132kV-DC line |
| Ajegunle S/S    | Ado Odo/Ota LGA, Ogun State | 507592.00 m E<br>735532.00 m N | 25.1              | 330/132/<br>33kV     | Incoming bay from Ejio S/S : 330kV-DC line<br>Incoming bay from Ikeja West S/S : 330kV-SC line<br>Outgoing bay to Sakete S/S : 330kV-SC line<br>Outgoing bay to Agbara S/S : 132kV-DC line<br>Outgoing bay to Badagry S/S : 132kV-DC line   |
| *Agbara S/S -   | Ado Odo/Ota LGA, Ogun       | 509275.967mE<br>718978.996mN   | 2.85              | 132/<br>33kV         | Incoming bay from Ejio S/S: 132kV-DC line   |
| Badagry S/S     | Badagry LGA, Lagos          | 484303.490mE<br>710894.910mN   | 19.6              | 132/33kV             | Incoming bay from Ajegunle SS : 132kV-DC line   |

\*No new land take is needed in existing Agbara Substation

## Other Project Components

Other components of the project include the following

- Earthing and Protection Systems
- Communication/Control System
- Campsites / Logistics Bases
- Access Track Repair / Upgrade / Construction

## POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

### The 1999 Constitution of the Federal Republic of Nigeria

Property ownership is guaranteed alongside other fundamental human rights like freedom of speech, association, and movement. Specifically, Sections 43 confers the right to acquire immovable property by citizens and Section 44 reserves government's power of eminent domain and prescribes how this power is to be exercised by the government.

Section 44 (1) provides that *"no moveable property or any interest in an immovable property shall be taken possession of compulsorily and no right over or interest in any such property shall be acquired compulsorily in any part of Nigeria except in the manner and for the purposes prescribed by a law that, among other things:*

*(a) requires the prompt payment of compensation therefore and*



*(b) gives to any person claiming such compensation a right of access for the determination of his interest in the property and the amount of compensation to a court of law or tribunal or body having jurisdiction in that part of Nigeria.*

This implies that non-compliance in respect to the manner (process), purposes recognised by law, and is met with promptitude in the payment of compensation and allowing claimant unfettered access to property being taken to ascertain claims and /or reserves affected persons to adjudicate on quantum of compensation would void an otherwise valid acquisition or resettlement. The basic land tenure law which is the Land Use Act Cap L5, LFN 2004 operationalizes the provisions of Section 44 of the Constitution.

### National Land Policy

All lands belong to the Government, which is held in trust on behalf of the people by the Governor of a State. The administration of urban land is directly under the control and management of the Governor; whereas non – urban land is under the control and management of the Local Government Area.

The Governor grants Statutory Rights of Occupancy to all lands. Local Government has the right to grant Customary Rights of Occupancy over non-urban lands. The Governor also have the power to revoke both Statutory and Customary rights to land for the overriding public interest.

In doing so, the Act requires that compensation be paid to the current holder or occupier with equal value. The Act also requires the State or Local Government to provide alternative land for affected people who will lose farmlands and alternative residential plots for people who will lose their houses in lieu of monetary compensation.

The legal basis for land acquisition and resettlement in Nigeria is the Land Use Act Cap L5, LFN 2004, According to the Act, all lands in Nigeria is vested in the Governor of each State, to be held in trust for the use and common benefit of all people. Lands are further classified into urban and rural (non-urban) for administrative purposes.

### National Social Protection Policy

The revised national policy on social protection was approved by the Federal Executive Council (FEC) in July 2017 to enhance social justice, equity and all-inclusive growth in the country. The framework seeks to achieve these using a transformative mechanism for mitigating poverty and unemployment in Nigeria. The social protection policy also includes the following schemes

- National Health Insurance Scheme (NHIS)
- National Pension Scheme
- National Primary Health Care (PHC)
- National Poverty Eradication Programme (NAPEP).

### National Gender Policy

The policy seeks to promote gender equality and eliminate discrimination based on gender, ethnicity, religious beliefs, etc. The key policy areas are focused around 5 critical areas:



- (i) Culture re-orientation and sensitisation to change gender perceptions and stereotypes;
- (ii) Promotion of women's human rights and in particular focusing on sexual and gender based violence (SGBV) and in supporting new legislations and legal rights of women;
- (iii) Promoting the empowerment of women and integrating gender within key sectors as highlighted within the NGP – (Agriculture/Rural Development; Environment/Natural Resource; Gender and HIV/AIDS; Health and Reproductive Health/Rights; Education/Training; Labour/Employment);
- (iv) Women's political participation and engendered governance including gender and conflict management and
- (v) Supporting institutional development including the use of ICT and building strategic partnerships, including identifying new partnerships with men's organisations, faith-based organisations and traditional institutions.

#### **Land Use Act CAP L5, LFN 2004 and Resettlement Procedures**

The Land Use Act Cap L5, Laws of the Federation of Nigeria 2004 is the key legislation that has direct relevance to this project. Relevant Sections of these laws as may relate to this project with respect to land ownership and property rights, resettlement and compensation are summarized in this section.

The Land Use Act is the applicable law regarding ownership, transfer, acquisition and all such dealings on Land. The provisions of the Act vest every Parcel of Land in every State of the Federation in the Executive Governor of the State. He holds such parcel of land in trust for the people and government of

The Governor administers the land for the common good and benefits of all Nigerians. The law makes it lawful for the Governor to grant statutory rights of occupancy for all purposes; grant easements appurtenant to statutory rights of occupancy and to demand rent. The Statutory rights of Occupancy are for a definite time (the limit is 99 years) and may be granted subject to the terms of any contract made between the state Governor and the Holder.

The Local Government Councils may grant Customary Rights of Occupancy for agricultural (including grazing and ancillary activities), residential and other purposes. But the limit of such grant is 500 hectares for agricultural purpose and 5,000 hectares for grazing except with the consent of the Governor. The LGA, under the Act is allowed to enter, uses and occupies for public purposes any land within its jurisdiction that does not fall within an area compulsorily acquired by the Government of the Federation or of relevant State; or subject to any laws relating to minerals or mineral oils.

The State is required to establish an administrative system with specific responsibilities including managing the revocation of the rights of occupancy, and payment of compensation for the affected parties. So, the Land Use Act provides for the establishment of a Land Use and Allocation Committee in each State that determines disputes as to compensation payable for improvements on the land. **(Section 2 (2) (c)).**

Where a Right of occupancy is revoked on the grounds either that the land is required by the Local, State or Federal Government for public good, the holder and the occupier shall be entitled to



#### **Electric Power Sector Reform No. 6, 2005**

This Act deals with acquisition of land and access right for electricity projects among other things. Section 77 of the Act empowers the Nigeria Electricity Regulatory Commission (NERC) to make a declaration that land is required by a license for purpose of generation or distribution of electricity. Section 77 (9) states: *"where the president issues a notice under sub-section 6, the Governor shall in accordance with the provisions of section 28(4) of the Land Use Act, revoke the existing right of occupancy respecting the land and grant a certificate of occupancy in favour of the concerned licensee in respect of the land identified by the commission in such notice.....who shall be entitled to claim compensation in accordance with the provisions of the Land Use Act"*.

#### **Institutional Framework**

This section gives highlights on relevant institutions through which planning, and implementation of the project will be affected. A number of institutions have been identified and will be involved in the overall implementation of this project. These include:

- The Federal Government of Nigeria (FGN);
- Federal Ministry of Power, Works & Housing (FMPWH)
  - ✓ Transmission Company of Nigeria (TCN)
  - ✓ JICA Project Implementation Unit (PIU)
  - ✓ Ikeja Electricity Distribution Company
  - ✓ Ibadan Electricity Distribution Company
  - ✓ Eko Electricity Distribution Company
- Federal Ministry of Environment
- Nigerian Electricity Regulatory Agency
- National Environmental Standards and Regulatory Enforcement Agency
- Lagos State Government
  - ✓ Bureau for Land Survey
  - ✓ Bureau for Physical Planning
  - ✓ State Ministry of Environment
- Ogun State Government
  - Bureau for Land Survey
  - Bureau for Physical Planning
  - ✓ Ogun State Ministry of Environment;
- Local Government Authorities (LGAs) :
  - Ewekoro LGA
  - Ifo LGA
  - Ado Odo/Ota LGA
  - Badagry LGA
- The Customary Chiefs District Councils and Village Heads



**International LAWS, Procedures and Guidelines**

**World Bank Safeguard Policy (OP 4.12):** Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood<sup>1</sup>) as a result of project-related land acquisition<sup>2</sup> and/or restrictions on land use. The policy has the following objectives;

- Minimize displacement
- Treat resettlement as a development program
- Provide affected people with opportunities for participation
- Assist displaced persons in their efforts to improve their incomes and standards of living, or at least to restore them
- Assist displaced people regardless of legality of tenure
- Pay compensation for affected assets at replacement cost
- Assistance to people referred to as special groups -women and children, very poor people, chronically ill or disabled, etc.

**IFC Performance Standards for Investment:** The IFC Performance Standards are directed towards clients, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities.

**JICA Guideline for Environmental and Social Considerations** The objectives of the guidelines are to encourage Project proponents etc. to have appropriate consideration for environmental and social impacts, as well as to ensure that JICA’s support for and examination of environmental and social considerations are conducted accordingly. The guidelines outline JICA’s responsibilities and procedures, along with its requirements for project proponents etc., in order to facilitate the achievement of these objectives. In doing so, JICA endeavors to ensure transparency, predictability, and accountability in its support for and examination of environmental and social considerations.

**STAKEHOLDER CONSULTATIONS**

The consultation process was designed and implemented in order to facilitate the informed participation of the project affected persons (PAPs), communities and other stakeholders affected by or with interest in the project. The consultations were conducted at three stages, scoping, presentation of the line route and finally presentation of the preliminary results of ESIA and RAP. These meetings took place in May/Jun 2017, Oct./Nov. 2017 and Feb. 2018 respectively.

The following stakeholder groups participated in the consultation process

- Concerned agencies and organisations at State and National levels;
- State-level (Ogun and Lagos) agencies;
- LGA-level agencies
- Customary authorities in communities affected by the line; -Obas, Ba’ales and Village Heads crossed by the line route.



- Industrial and commercial actors affected by the line, including relevant TCN departments, and JICA.
- Security agencies, national civil security and defence corps, department of security service, and the Nigerian Police

**First Stage Consultations**

The first consultation stage took the combined format of individual semi-structured interviews with community members and customary chiefs as well as group meetings with institutional stakeholders (organisations at national, state and LGA level).

The following results were achieved from the consultations:

- The communities understood the objectives and requirements of the project and pledged support and cooperation;
- The relevant agencies are aware of the project and the ESIA process (team, objectives and schedules);
- The requirements of Ogun State and Lagos State Laws and Regulations relevant to the project were highlighted by the agencies and understood by TCN and its consultants;
- The main stakeholders’ concerns and expectations were documented and have been considered for inclusion in the scope of the studies;
- A preliminary list of stakeholders was completed and the orientations of the Stakeholder Engagement Framework was enhanced;
- The Ogun State Governor established a committee to provide support for the project, while Lagos State Governor provided a high ranking cabinet member (Commissioner for Energy) to coordinate Lagos State support for the project.

**Second Stages of Consultation**

The second stage of stakeholder information and consultation to present the preliminary line route, as well as methodology and approach for ESIA and RAP study. At the same obtain feedback to refine the approach and the methodology and include concerns expressed in the study. About 30 communities known to have been affected by the line route at that time were consulted, in addition to the institutional stakeholders mentioned earlier.

**Third Stage Consultation**

The preliminary results of the ESIA and RAP was presented to Ogun and Lagos State team as well with representatives of the affected people. The reports were also shared with The Nigerian Conservation Foundation (NCF) an NGO dedicated to nature conservation and sustainable development in Nigeria.

Comments received were mainly observed errors in addressing some communities, and NCF requested for the inclusion of avian collision management plan in the ESMP.

**SOCIO-ECONOMIC BASELINE OF THE PROJECT-AFFECTED PERSONS**

Summary of the areas affected by the project are as follows;

| Local Government Areas (LGAs) | Number of Affected Communities | Estimated Length of ROW across LGAs (km) | Baseline Census Dates    |
|-------------------------------|--------------------------------|--|--------------------------|
| Ewekoro                       | 9                              | 15                                       | 16/01/2018 to 22/01/2018 |



|              |           |             |                          |
|--------------|-----------|-------------|--------------------------|
| Ifo          | 17        | 11.5        | 23-01-18                 |
| Ado-Odo/Ota  | 49        | 50          | 24/01/2018 to 10/02/2018 |
| Badagry      | 7         | 11          | 11/02/2018 to 15/02/2018 |
| <b>TOTAL</b> | <b>82</b> | <b>87.5</b> |                          |

### Demographics of affected people

**Age and Sex Structure:** According to projections by the national population commission, the population of the affected LGAs in 2016 are as follows, with 51% mal and 49% female.

| LGA             | TOTAL POPULATION | AFFECETD     | % OF TOTAL POPULATION AFFECTED |
|-----------------|------------------|--------------|--------------------------------|
| Ewekoro LGA     | 76,600           | 953          | 1.2%                           |
| Ifo LGA         | 750,000          | 539          | 0.1%                           |
| Ado-Odo/Ota LGA | 733,400          | 1920         | 0.3%                           |
| Badagry LGA     | 327,400          | 66           | 0.02%                          |
| <b>TOTAL</b>    | <b>1,887,400</b> | <b>3,478</b> | <b>0.2%</b>                    |

**Households Affected:** The total number affected by the is 3,478 with Ado Odo LGA having the highest with 1,920 and Badagry LGA the least with 66 households. Female heads of households constitute 12.7% of the total households. These figures include those economically or physically affected or both.

**Marital Status of Heads of Households:** overall 21.2% of the heads of households are single, 63% married, while 8% and 7.8% are widowed and divorced/separated respectively.

**Household Sizes:** These are number of people living in the household, which has 3 to 5 people having the highest frequency of 54.3% followed by 6 to 10 with 29.1%. others are 1 to 2 people (6.3%), 11 to 15 people (6.1%) and the hoses with more than 15 people constitutes the lowest (4.2%).

**Dependency Rate:** The total dependency ratio is the proportion of the population not in the work-force who are 'dependent' on those of working-age. Ado-Odo/Ota LGA has the highest dependency rate of 87.65% and If LGA have the lowest with 83%, while Ewekoro and Badagry LGA have 85.24% and 85.16% respectively. The national average for Nigeria 88.2% as reported by national bureau of statistics for the year 2015.

**Education and Literacy:** UNESCO defines literate person as one who can with understanding both read and write a short simple statement on his(her) everyday life in any language. Literacy rates are quite high in the project area ranging from 92.8% to 98.7% among men and 85.9% to 92.5% among women. Ogun and Lagos State average are 98.2% (men), 88.1% (women) and 99.4% (men), 99.3% (women) respectively.

### Income and Livelihoods of Household

Income analyses of households from all sources show that, farming attracts the highest proportion of the respondents up to 72.2% and 71.8% in Ifo and Ado-Odo/Ota respectively practice farming and generate substantial income from it 87.3% and 78.3%. The people of Badagry practice farming the least but practice hunting or fishing the highest.



The people that are living in the abject poverty line (on less than N10,00/month equivalent to less than USD 1/day) has highest proportion in Badagry LGA (19.7%), while Ewekoro has the lowest (15.7%).

**Educational Facilities:** Field survey, information from questionnaires, and responses from respondents during FGD's revealed the presence of over 755 primary schools, 181 secondary schools and 1 tertiary institution in the project area. In addition, Ado-Odo/Ota LGA accounts for about 35% of these schools. About 90% of these schools are privately owned with high tuition fees that many of the households cannot afford. Most of the communities in the study area, especially in Ifo, Badagry and Ewekoro LGAs only have access to government owned secondary schools. The pupils in these communities often walk distances of 3 – 4 km to bigger communities such as Atan, Badagry, Bandu and Agbara to access government owned secondary schools.

**Potable Water Supply:** About 62.2% of communities in Ado-Odo/Ota LGA have access to water supply as against about 59.5% in Ewekoro, 50.6% in Ifo and 53.2% in Badagry LGA. Most of the water schemes in the area are privately owned boreholes and wells. Some communities in Ijegemo and Sowole depend almost exclusively on water sourced from rivers and streams

**Electricity:** Forty – one communities representing about 62% are linked to the national grid line for electricity supply. The breakdown indicated that all ten communities within the RoW in Badagry LGA are connected to the national grid as against 25 (53%) within the Ado-Odo/Ota Local LG that is connected to the national grid. In Ewekoro LGA, Eji community is connected while Sojuolu is not connected. Five (5) of the 9 communities in Ifo LGA are connected.

**Health Facilities:** The health facilities in the area comprise of nine (9) Primary Health Centres (PHC) and fifty-eight (58) hospitals. The grossly inadequate health facilities provide both out-patient and in-patient services. The ratio of public to private hospitals in the project area is about 3:2.

**Household Facilities:** The household facilities surveyed include power generators, televisions, cars/trucks, refrigerators, etc. TV and radio are the most common facility among households in the project area, where almost all households have them with 95.6% to 100% of the household reported to have used them.

**Transport Facilities:** The project area is traversed by several roads, amongst which are:

- The Lagos – Abeokuta Express Way
- Sango-Idi-Iroko Road
- The Sokoto road in Egbele Village
- Ado road
- The Coker – Atan Road
- Smaller feeder roads linking the major roads with the impacted communities, and
- Unpaved roads connecting small villages and settlements.

Apart from the tarred Lagos-Abeokuta express way and the Sokoto road, the Atan to Ado road, others are either partially tarred or not tarred



## Housing Types

Field survey was conducted to identify quality of housing used by the PAPs. The materials used in construction surveyed

**House Roofing Materials:** Results on the roofing materials survey showed corrugated sheets has the highest percentage of 30.4% followed by asbestos (27.2%) with Bamboo/reed having the lowest (2.2%).

**House Walling Materials:** Results of survey of house walling materials show concrete block with the highest usage (56%), followed by mud bricks (15.2%). Others are ordinary mud (5.7%), wood (4.2% and thatch (6%).

**House Flooring Material:** Five flooring materials were observed to be in use. While smooth cement (49.8%), ceramic tiles (19.5%) and sand (15%) are the most used flooring materials across all the communities and LGAs, the use of woods/planks and smoothen mud were observed more among households in Ifo and Badagry LGAs.

## IMPACT OF THE LINES AND THE SUBSTATIONS

The impacts of the project on the social, economic and livelihoods of the affected population were assessed using data collected from field surveys, relevant documents and consultations with various stakeholders and PAPs. Potential environmental and impacts are described in the ESIA report of the project.

The Lot 3 of the project require the construction 87.5km of electricity transmission lines, consisting of 29.6km of a 330kV line from Ejio to Ajegunle and 57.9km of 132kV from Ajegunle to Agbara and Ajegunle to Badagry. It also includes new substations at Ejio, Ajegunle and Badagry and expansion of the existing Agbara substation.

The construction, operations and maintenance activities of the ROW and transmission line will involve periodic access to the structures.

For the project affected households and communities, negative impacts occurring during the construction phase include:

- Dust, noise and exhaust gas emissions;
- Soil erosion and properties of affected land;
- Loss of arable land and crop damaged as a result of clearing the ROW of trees for mitigation measures and for temporary access, work areas and work camps;
- Degradation of water and soil quality resulting from an accidental spill of hydrocarbons and other material as well as disturbance and displacement of wildlife, which could be accentuated by poor waste management practices. The spill could occur from machinery and vehicles, in workplaces and in work camps;
- Disturbance and displacement of wildlife due to noise generated vehicular movement or from construction and maintenance activities;
- Conflicts or grievance related to resettlement of affected households;



- Potential perturbation of communities or households associated to the arrival of workers and conflict over the distribution of jobs and other economic activities related to line construction.

The main long-term impacts, at the tower and substation location, and clearance of the ROW are:

- Permanent loss of crop areas and tree plantation in the ROW;
- Prohibition of constructing any structure (houses, shed, etc.) in the ROW;
- Potential perturbation of communities or households associated with the arrival of workers and conflict over the distribution of jobs and other economic activities related to maintenance of ROW.

## Economic and Physical Impacts

**Structure:** Structures affected by the project are mainly residential houses with few commercial structures as well as public and religious structures. There are a total 1297 structures affected by the project. There are 324 residential structures that are occupied, with a population of 1,592 that will have to be relocated. 844 residential structures are either unoccupied, mostly under construction and will be affected only economically. There are 30 commercial structures, mostly small shops imbedded in the residential structures described. Also affected are 16 public and religious buildings.

**Farmlands:** There are 2,647 households that would loose their farmlands and one government land.

The owners of these structures and farms will be compensated to reconstruct their houses outside the ROW. However, this relocation will result in loss of time, income and disruption of the organization for the daily life of affected households. It would need to be mitigated.

As mentioned earlier, the consultations carried out as part of this preliminary assessment showed that many affected households are concerned about not receiving adequate and timely compensation for resettlement and loss of crops, trees or land. An adequate and timely compensation should therefore be given, and new houses of displaced households should be built before the beginning of construction or any other activities capable of disrupting the PAPs. Where properly managed, the envisaged impacts will be minimal.

## Cumulative Impacts

The following proposed and existing projects within 10 km square radius are expected to exert cumulative impacts. They are

- Ewekoro cement Plant Line 1- An operating 1.3million tonnes per annum clinker cement plant
- Ewekoro cement Plant Line 2–An Operating 2.7 million tonnes per annum clinker cement plant
- Abeokuta Independent Power Project (Energy Culture)- A 147 megawatt gas powered power plant with a 500m transmission line
- Olorunsogo Gas Fired Power Plants Phase I and II (333MW open cycle and 750MW- combined cycle respectively)
- 132kv transmission line – An existing transmission line linking Ota to Abeokuta.
- 330kv transmission line – An existing transmission line linking Olorunsogo Power Plant to Ikeja West





- 330kV single circuit linking Osogbo to Ikeja West
- 132 kV line from Ikeja West to Agbara and to Ojo

The following cumulative impacts were identified;

**Resettlement:** All the existing project mentioned involve resettlement. However, since the projects did not happen all at the same time, the communities were able adjust after each one. Furthermore, due to the urban and semi urban nature of the most of the affected area the sensitivity of the communities is very low.

**Air Quality and Noise:** Given the findings of impact assessment and distance of the Ewekoro cement plant (line 1 and 2) from the project area, it appears unlikely that the cumulative impact on noise and air quality will not be significant. Also, the cumulative impact of Olorunsogo Power Plant Phase I & II from the project area will be localized to immediate environment.

**Traffic:** The construction phase will require large amounts of material and equipment to be transported to the Project site. It is expected that the Abeokuta IPP and ongoing construction of railway line project will use similar transport routes (Lagos – Abeokuta express way) which will place pressure on the local road network especially during the construction phases of the projects.

Given the foregoing, there is increased potential for accidents and disruption to the road traffic network for local users associated with the increase in traffic movements from overlapping construction traffic. It is expected that the traffic management plan to be developed for the project will consider other traffic movements associated with the development of the project in view which will help to mitigate this impact. However, in overall consideration, this impact is considered to be **moderate** due to the high likelihood of accidents occurring.

**Economy, Employment and Skills:** The operation of the various considered projects earlier outlined is proposed to occur simultaneously with the project in view. As such, the economic, employment and skills development opportunities will be greater for all the projects combined than a single project.

It should be noted that expectations regarding economic development, employment and skills development will be high amongst stakeholders in the local community and as such, in the event that one project does not meet expectations, there is the potential for all projects within the area to be the target of this negative outcome.

Based on the above, the cumulative impacts of the various proposed industrial projects on the economy, employment opportunities and skills development within the communities is expected to be positive.

#### **Economic Impact of Construction and Maintenance**

Livelihoods of the affected households may be affected with the acquisition of their lands. Appropriate compensation will be provided to replace economic loss. This risk is quite low since firstly, despite the land use density, it is possible to find alternative plots including through family and village solidarity. About 3000 families will loose a piece of cropland or house. These will be compensated adequately. In this context, the risk of loss will be greatly reduced.

The most important economic benefit generated by the project is the improved availability and reliability of electricity supply to Lagos and Ogun States. This can increase access to electricity, which



can improve economic activities and added convenience to people's lives. The project could also generate jobs for the operation and maintenance of the power lines and substations.

#### **Impacts on Gender**

Project impacts on women will primarily be felt during the construction phase. They are related to the fact that women are primarily responsible for field work and crops' production.

Only 552 of the affected households are headed or represented by women (15.9%). The project is likely to increase the vulnerability of women, since consultations in the project area have shown that, in general, women do not own land although the land law is such that the land belongs to the family. This makes women's situation unfavorable since men control resources such as land and other important assets.

#### **Impacts on Vulnerable Groups**

As mentioned previously, women that are heads in about 16% of the impacted households. There are no head of households younger than 18 years old. Specific mitigation measures, such as prioritizing local people and businesses for job opportunities and procurement, participation of able members of these households to work on their land (cutting, trees, reconstruction, etc.), leaving them the use of cut trees, salvage material from displaced houses or other structures (houses, shelter, etc.), could help these economically vulnerable households increase their revenues.

Administrative burden of compensation procedures should be reduced to minimal especially for the vulnerable households giving them timely information, enhanced access that reduces their strain in the compensation process and ultimately minimize incidental costs to them.

There are no groups that could be described as indigenous or minority in the area.

#### **VALUATION AND COMPENSATION**

Valuation of assets and other forms of losses occasioned by the project was conducted by a qualified Estate Surveyors and Valuers to ascertain individuals whose properties or livelihoods will be directly or indirectly affected by the project activities.

A general principle adopted in the formulation of the compensation valuation is that lost income and assets will be valued at their full replacement cost such that the project affected populations should experience no net loss. This is in accordance with World Bank Operational Policy on involuntary resettlement -OP 4.12 as well as the Nigerian Land Use Act

#### **Eligibility Criteria**

The World Bank Resettlement Policy/Guidelines require compensation for the lost assets and replacement costs to both titled and non-titled landholders and resettlement assistance for lost income and livelihoods.

In this project, the absence of formal titles will not constitute a barrier to resettlement assistance and rehabilitation. Furthermore, the principles adopted herein contain special measures and assistance for vulnerable affected persons, such as female-headed households, physically challenged persons, and the poor.



The social impact of the project on the affected persons shall be minimized by using the following measures.

- Economic Rehabilitation
- Asset Based Compensation
- Cash Compensation
- Mitigating Risks of Impoverishment
- Consultation with Affected Populations, and
- Grievance Redress Mechanisms

**Notification:** Prior to the conduct of surveys and administration of study questionnaires, the PAPs were officially notified of the enumeration exercise. Furthermore, the RAP team engaged all stakeholders in several consultations meetings held in each affected community. These public consultations served as avenue to educate them on the purpose of the project and the possible associated impacts and their respective rights.

**Value of Land:** The land use Act does not provide for compensation for land, only for assets and improvements. However, World Bank OP 4.12 provides for land replacement, asset replacement as well as restoration of livelihoods. Therefore, there is no justification to make presentation on the value for lands which the PAPs currently occupy under the laws of Nigeria. Nevertheless, going by the principles of payment of compensation adequate enough and in such a way that PAPs are not left poorer or impoverished because of the project, TCN will give adequate assistance to the PAPs to enable them obtain another land to relocate the affected assets to as well for restoration of livelihoods.

#### Entitlement Matrix for Resettlement Activities

This provides a framework for entitlement for each category of impacts of the project. To determine the eligible person for compensation the Land use Act and the Criteria set by the World Bank contained in OP 4.12 of the WB Operational Manual were both considered, and the more stringent applied.

The RAP for the project is aligned with the World Bank Operational Policy (OP 4.12) which indicates best practices to restoration of livelihoods of people affected by the implementation of the project. Hence, where there are gaps between the Land Use Act (1978) and the World Bank Policy (OP 4.12), in regard to compensation of PAPs, the more stringent requirement will apply. This is ensure compliance with the OP 4.12 without going against the Land Use Act.

The principles adopted thus forms the basis for establishing eligibility and makes for the provision for all types of losses (land, structures, business / employment, and work day wages). All affected persons shall be compensated at full replacement costs.

**Cut-Off Date:** A comprehensive census of the PAPs and inventory of affected assets and property were conducted. Notice of entry was served on the communities as mentioned earlier. The notification also included the dates for census of PAPs and property enumeration in the communities. The date of commencement of the enumeration established the cut-off-date, which was 12<sup>th</sup> January 2018. Therefore, any improvements made by PAPs on their parcel or on structures shall not be eligible for compensation.



**Proof of Eligibility:** Various forms of evidence as proof of eligibility was considered and they cover the following:

- PAP with formal legal rights, documented in the form of land title registration certificates (certificate of occupancy or right of occupancy), leasehold indentures, tenancy agreements, rent receipts, building and planning permits, business operating licenses, and utility bills among others: unprocessed/unregistered formal legal documents will be established.
- PAP with no formal or recognized legal rights-criteria for establishing non-formal, undocumented or unrecognized claims to eligibility shall be established paying attention to each situation and its peculiarities. Alternative means of proof of eligibility will include;
- Affidavit signed by landlords and tenants;
- Witnessing or evidence by recognized traditional authority, customary heads, community elders, family heads and elders and the general community.

However only PAPs enumerated during the baseline survey shall be eligible for either the compensation or resettlement. Any new structures or additions to existing structures carried out after the cut-off date and their occupants will not be eligible for compensation or resettlement.

#### Basis for Valuation of Losses and budgets

Valuation of assets to be affected by the implementation of the project was conducted using a general principle adopted in the formulation of the compensation valuation which follows the World Bank's Policy that lost income and asset will be valued at their full replacement cost such that the PAPs should experience no net loss.

**PAPs Losing Structures:** The mechanism for compensating loss of residential structures will be:

a) PAPs with legal rights of land use:

- The cash compensation reflecting full replacement cost of the structures without depreciation or deduction for salvaged materials.
- The provision of replacement residential land (house site and garden) of equivalent size, satisfactory to the PAPs or in cash at the replacement cost.
- If the residential land and /or structure is only partially being affected by the project and the remaining residential land is not sufficient to rebuild the residential structure lost in accordance with the prevailing standards, then at the request of the PAPs, the entire residential land and structure will be acquired at full replacement cost, without depreciation.
- All relocated PAPs will be provided with transportation and subsistence allowances as specified in OP 4.12 Policy.
- Tenants who have leased a house for residential purposes will be provided with a cash grant of Six months rental fee at the prevailing market rate in the area and will be assisted in identifying alternative accommodation.
- Severely affected PAPs and vulnerable groups will receive feeding allowance for days for PAPs in a structure that is occupied as at the time of the survey.



- In case of partial impact on structures and where the remaining structures remain viable for continued use, PAPs will also be entitled to additional allowance for repair of remaining structure.
- business loss due to relocation, calculated based on the amount earnings lost during movement
- job losses to employees that may lose their jobs, due to relocation of business.
- Business premises registration cost (if required at new location).

**PAPs Losing Agricultural Land and Crops:** The mechanism for compensating loss of farm land includes:

- ✓ The provision of assistance to obtain alternative site of equal size within the same community;
- ✓ Cash compensation for lost of crops and/or economic tree at full market price of estimated produce. This is arrived at by employing the appropriate valuation methodology over the types of crops or acreage covered as well as the economic trees to be affected.
- ✓ PAPs will also be provided with compensation at full replacement cost, without deduction or depreciation for salvaged materials or any other fixed assets in part or in total by the project, such as tombs and water wells.

**Compensation for Trees:** Some of the households in the project area (along with the transmission route) have fruit trees. These trees will have to be cut and cannot be replanted in the area of the line. This will be a permanent loss over the years. Evaluation of the numbers of trees for each family has been done on the basis of the investigation results. These trees will be compensated at rates approved by Government for the region (i.e, the harmonised compensation rate for crops for South Western Region).

**Access Roads and Workers Camps:** The allowance required for workers to access roads to account for the damages or temporary impacts on land for which the owners must be compensated, shall be included in the EPC contract. Contractors shall include this in their quotations.

## INCOME AND LIVELIHOOD RESTORATION STRATEGIES

The Transmission Company of Nigeria (TCN) shall use the guidelines below and involve the affected communities, local leaders, NGOs and other stakeholders to gather opinions in order to assess livelihood restoration procedures.

The World Bank (WB)'s OP, 4.12 paragraph (6c), states the following:

*“Displaced persons should be offered support after displacement, for a transition period, based on a reasonable estimate of the time likely to be needed to restore their livelihood and standards of living; and provided with development assistance, such as land preparation, credit facilities, training, in addition to the compensation they receive.”*

Additionally, WB OP 4.12, paragraph (2c), requires that displaced individuals be given assistance for their efforts to improve their living standards or to at least restore them to the highest standard between pre-displacement or standards prevailing prior to the beginning of the project implementation.



In an effort to define income and develop livelihood restoration strategies, TCN should involve participation for purposes of fostering ownership at an early stage. Assistance will be especially critical to the individual that is to be relocated far away, due to reconstruction costs that may be otherwise avoided.

It is recommended to inform the PAPs of the project at least 3 months before the start of the construction. In all cases, PAPs shall be advised to construct new structures at locations near the previous ones within the affected community to reduce disruption of community life, established spatial organization and services.

Also worthy of mentioning is the fact that many communities along the ROW have experienced workers that can be hired during the construction phase. Local experienced workers and entrepreneurs with necessary experience and capacity should be given priority work opportunities, if applicable. Also, as suggested through consultations, the general contractor should liaise with village chiefs to maximise local hiring as well as the purchase of relevant local materials and services.

Different restoration packages will be required for each of the various categories of PAPs and will depend on the type and magnitude of loss suffered, the vulnerability level of the PAPs' household, the indicated preferences associated to their family characteristics and other relevant circumstances.

**Land base:** The households that will lose a piece of land will receive sufficient compensation to be able to buy a new land, off-set loss of crops and rehabilitate the land to similar production level.

Further investigations paired with experience on similar projects indicate that in most cases it would be difficult and cumbersome for the TCN to find and propose replacement land for different reasons (risk of speculation, administrative burden, PAP lack of trust, etc.). It is thus preferable to pay cash compensation to the PAPs to provide them with an opportunity to purchase new land and condition it themselves and continue farming. The PAPs also prefer cash payments.

However, to limit impoverishment risk, adequate compensation level and implementation conditions are essential. The measures include providing sufficient time for PAPs to find and evaluate their options, support for all legal aspects of the transaction and the “transaction costs”.

PAPs whose crops are to be negatively impacted by the project should be assisted to purchase seedlings and seeds, land improvement, etc

**Trees:** Trees will be destroyed during the construction of the transmission line since no trees taller than 4 meters are being kept in the wayleave. Compensation to households will be allocated according to the prescribed rates up to replace these trees. The PIU specialist will help the affected households to plant trees to restore their source of income and livelihoods.

**Structures:** In addition to cost of structure replacement and land, each affected household will receive additional compensation to cover the following expenses:

- A moving allocation to pay for moving their goods and belongings;
- An income support for of the household to mitigate the inconvenience and time constraints related to the resettlement.
- Cost of land administration, taxes and other charges associated with land acquisition, will be waived for the PAPs by the State Government.



**Vulnerable Groups:** A special focus must be given to the livelihood improvement of vulnerable groups prior to the construction of the project. Vulnerable groups include low income families, women, child (under 18 years heading a household) or handicap headed households.

Vulnerable households will be consulted at the onset of the operation to evaluate their concerns and needs. Special help that could be provided include, among others to open bank account, help for administrative transactions and relocation logistics support

**Non-Financial Components:** These include employment from the communities during construction, and allowed to take salvaged materials including demolished building materials, wood from vegetation clearance, etc.

## INSTITUTIONAL ARRANGEMENTS FOR RAP IMPLEMENTATION

### Actors involved and organisational structure

These include:

- The Federal Government of Nigeria (FGN);
- Federal Ministry of Power, Works and Housing (FMPW&H);
- Transmission Company of Nigeria (TCN);
- Federal Ministry of Environment (FMENV);
- Lagos and Ogun State Government responsible for;
  - Lands administration;
  - Physical Planning,
  - Agriculture
  - Women and Social Services
- Affected Local Government Authority (LGA):
- The Customary Chiefdoms, District Council and Village Chiefs.

### Procedures and Responsibilities

- TCN is responsible for the compensation and ensuring the RAP is implemented adequately.
- FGN provides sovereign guarantee for the loan
- The Minister of FMPW&H approves the compensation budget
- FMENV along with State Ministries of Environment are the regulatory agency for ESMP and certain aspects of RAP.
- Land Administration is responsible for land administration including ROW permit
- Ministry for Agriculture provides support for agricultural land rehabilitation
- Women and Social services Ministry provides social support toolbox to women and children on how to deal with relocation stress.



**Witness NGO:** To enhance transparency and trust from PAPs it is suggested that a witness NGO, recognized and credible in the project area, be hired, through a public proposal and selection process, by the PIU to provide independent advice and report on RAP implementation and management focusing on consultation activities, compensation and resettlement related activities and grievances management. This NGO could be a recognized and credible Human Right advocacy group or a NGO active in rural development.

This 'outside' look will ensure that proper procedures and stated compensation processes are followed, that PAP grievances are well taken care of, and that PAPs are treated with fairness.

### Stakeholder Engagement Program

To ensure the interests of the affected persons are fully entrenched in the RAP process and income restoration, an engagement program shall be developed at the onset of the RAP implementation process. These program goals are transparent information and meaningful participation of PAPs, representatives of affected and interested groups and of the various administrative and government departments all through the project.

This participation will be done through PIU, the LRC and a vigorous program of information and consultation of affected communities and PAPs. These information and consultation will concern compensation rules and procedures, livelihoods program, PAPs rights, grievance mechanisms, etc.

Many means should be used leaflets, community meetings with graphical display to help illiterate people, radio messages in local languages, recorded approval of the project by local authorities, etc.

### Grievance Mechanisms

During implementation of the project activities, it is possible that disputes/disagreements between the project developer and the PAPs will occur especially in terms of compensation, boundaries, ownership of crops or land, etc.

The practice of grievance arbitration over resettlement issues in Nigeria is conducted within the framework of the Land Use Act (LUA) of 1978, reviewed under Cap 202, 1990. Three stages have been identified in the grievance procedure in the following order:

1. An aggrieved person first report to the Baale or the RAP implementation Consultant, for the resolution of issues such as ownership tussle, management of deceased property, boundary issues, etc.
2. Customary mediation and
3. Judicial hearing

### MONITORING, REVIEW AND EVALUATION

The purpose of resettlement monitoring is to ensure that measures developed for compensating the losses were effective in restoring PAPs living standards and income levels. Monitoring will be implemented by the PIU.



During monitoring phase, the existing grievance mechanism will be regularly reviewed for improving and correspondingly, additional and more user friendly forms, which enable the field staff to forward complaints and demands of local people to the PIU.

Throughout the Project lifecycle, monitoring and evaluation activities will be reviewed; restructured or removed in case that the previously produced tools and forms are inefficient.

Monitoring and Evaluation (M&E) procedures establish the effectiveness of all land and asset acquisition and resettlement activities, in addition to the measures designed to mitigate adverse social impacts. The procedures include internal track keeping efforts as well as independent external monitoring.

The purpose of resettlement monitoring for the proposed Transmission Line Project will be to verify that:

- Actions and commitments described in the RAP are implemented;
- Eligible project affected people receive their full compensation prior to the start of the rehabilitation activities on the corridor;
- RAP actions and compensation measures have helped the people who sought cash compensation in restoring their lost incomes and in sustaining/improving pre-project living standards;
- Complaints and grievances lodged by project affected people are followed up and, where necessary, appropriate corrective actions are taken; and
- If necessary, changes in RAP procedure are made to improve delivery of entitlements to project affected people.

The World Bank operational policy (OP 4.12) states that the project sponsor (TCN) is responsible for adequate M&E of the activities set forth in the resettlement instrument.

Monitoring will provide both a warning system for the PIU and the project sponsor (TCN) and a channel for the affected persons to make known their needs and their reactions to resettlement execution.

PIU monitoring and evaluation activities and programs shall be adequately funded and staffed. PIU monitoring will be verified by the witness NGO to ensure complete and objective information.

The monitoring and evaluation framework consists of three elements:

- PIU monitoring;
- External monitoring undertaken by the Witness NGO; and
- Independent RAP Completion Audit.

Indicators have been established in order to measure RAP activities, results, objectives and goals. There are five categories of indicators for performance monitoring.

The first three (3) Internal Performance Monitoring are: *input, output and process indicators*.

They are mostly used for medium term measures to ensure that the RAP is relevant, effective and efficient.



The last two Impact monitoring are: *outcome and impact indicators*. They are mostly used for long term measures for assessing the results.

RAP monitoring and evaluation activities will be adequately funded, implemented by qualified specialists and integrated into the overall PIU budget and activities.

PIU monitoring and evaluation activities will be supplemented and verified by monitoring efforts of the witness NGO.

The establishment of appropriate indicators in the RAP is essential since what is measured is what will be considered important. Indicators will be created for affected people as a whole, for key stakeholder groups, and for special categories of affected groups such as women.

The most important indicators for the RAP in the near term concern outputs, processes and outcomes since they define whether the planned level of effort is being made and whether early implementation experience is being used to modify/redesign RAP features. Over the medium to long term, outcome and impact indicators are critical since they are the ultimate measure of the RAP's effectiveness in restoring people's livelihoods.

Monitoring indicators are defined, which may be reviewed or re-defined during the course of project in response to changes to project-related conditions. Consequently, implementation and mitigation measures may have to be adopted to incorporate these changes into the M&E plan.

### RAP IMPLEMENTATION BUDGET AND SCHEDULE

The budget was prepared based on the entitlement matrix in Table 7.2. the summary are as follows, while details are in Appendix 1.

| Element  | Amount (NGN)            |
|--|-------------------------|
| Crops  | 400,905,574.24          |
| Structures   | 2,146,630,564.12        |
| <b>Sub-total for structures and crops</b>  | <b>2,547,536,138.36</b> |
| Allow for Security, bank charges, stamp duty and other logistics, for compensation payment (2.5%) for crops      | 10,022,639.36           |
| Allow for Security, bank charges, stamp duty and other logistics, for compensation payment (2.5%) for structures | 53,665,764.10           |
| Support to vulnerable groups (Base on Entitlement matrix Table 7.2)  | 16,236,000.00           |
| Allow for demolition and salvage of structures (5%)  | 107,331,528.21          |
| Allow 5% contingency for structures and crops  | 127,376,806.92          |
| <b>Subtotal</b>  | <b>314,632,738.59</b>   |
| <b>Total</b>   | <b>2,862,168,876.95</b> |

### Schedule

The RAP implementation should be completed before land take over. It is envisaged that it can be completed within a period of one and a half year. These will include, hiring of implementation



consultant and NGO, establishing local resettlement committees in each LGA, engagement with PAPs, payments to and assistance to PAPs, grievance redress, monitoring and evaluation and livelihood restoration. It is important that all structures to be rebuilt and payments for compensation are completed before project construction is commenced. This can be done progressively so construction can start on one end.

## CHAPTER ONE

### 1.0 INTRODUCTION

#### 1.1 PROJECT BACKGROUND

The Transmission Company of Nigeria (TCN) is one of the companies unbundled from the defunct Power Holding Company of Nigeria (PHCN), and the only one wholly owned by the Government. TCN is charged with the responsibility of transmitting electric power from the various power stations to the load centres across the country and beyond, ensuring efficient and cost-effective transmission, system operation, and improved service delivery. TCN is also responsible for the management of assets of the High Voltage Transmission System Operations, generation dispatch functions, as well as the development of the network through the construction of new transmission lines and substations for efficient transmission and system operations.

Nigeria has realized strong economic growth, until 2016 when the economy went into recession. However, stronger growth is projected for the future due the new anti-corruption posture of the Government as well as economic policies targeted at reducing capital flight. Meanwhile, power supply capacity is overwhelmingly insufficient. As a countermeasure of serious power shortage, Transmission Company of Nigeria (TCN) planned a project geared to achieving transmission capacity of 20,000 MW by 2020 in accordance with growth of generation capacity.

Presently, the transmission lines to the largest demand centre of Lagos are in a bottleneck situation so the generating capacities being built across the country cannot be fully utilized. Moreover, there are no detour routes for use when equipment failure occurs and the system reliability is low.

The Lagos and Ogun States transmission project is targeted at improving power supply to Lagos and Ogun States, in line with the Transmission Lines network capacity development of achieving transmission capacity of 20,000 MW by 2020. This transmission line project in Lagos and Ogun States ("Lagos and Ogun States Transmission Project" or "the entire project") is to be financed through a loan (Japanese ODA loan) from Japan International Cooperation Agency (JICA). The Transmission Company of Nigeria (TCN) is the implementing agency and owners of the project when completed. This entire project plans reinforcement of transmission capacity, improvement of credibility of electricity supply and reduced electricity loss by installing transmission systems in southwest area Nigeria. It contributes acceleration of economy and development of the communities.

The entire project consists of about 207 km high voltage transmission lines and 6 high voltage substations. For the purpose of ESIA and RAP study, the entire project is divided into 3 sections, Lot1, Lot 2 and Lot 3. Transmission Company of Nigeria (TCN) has mandated the EEMS Limited to conduct Line Route Study, Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP) and Resettlement Action Plan for Lot 3 of the project (hereinafter "the project" or "proposed project") consisting of the following components;

- 330kV D/C Transmission Line from Ejio to Ajegunle -29.6 km.
- 132kv D/C Transmission Line from Ajegunle to Agbara -21.7 km.
- 132kv D/C Transmission Line from Ajegunle to Badagry – 36.2 km.
- New substation at Ejio (2x150MVA, 330/132kV + 2x60MVA 132/33kV)

- New substation at Ajegunle (2x150MVA, 330/132kV + 2x60MVA 132/33kV)

Specifically, following studies were conducted.

- Carry out the Line Route Study (LRS), to determine the optimum route for the lines.
- Conduct the ESIA to identify and assess the potential environmental and social impacts and recommend appropriate mitigation strategies and prepare ESMP.
- Prepare out the Resettlement Action Plans (RAP), based on the international standards and principles presented in the Resettlement Policy Framework.

The project is financed through a loan from Japan International Cooperation Agency (JICA), as part of the development of power transmission infrastructure in the South-Western Region of Nigeria.

This type of project must undergo an environmental and social impact assessment as required by the EIA Act No. 86 of 1992. And also resettlement action plan is needed as required by the Land Use Act and world bank operational policy -OP 4.12 as well as JICA guidelines for environmental and social considerations, the World Bank environmental and social safeguard policies and International.

## 1.2 PROJECT LOCATION

The project components in Lot 3 consists of about 87.5km high voltage transmission lines, including about 6 km common corridor for Ajegunle to Agbara and Ajegunle to Badagry lines and 3 high voltage substations. The line routes, which is a linear project crosses three LGAs of Ogun State (Ewekoro, Ifo and Ado Odo/Ota) and Badagry LGA of Lagos State. The three substations within the scope of Lot 3 are located at Ejo in Ewekoro LGA, Ajegunle in Ado Odo/Ota LGA and Badagry in Badagry LGA. Location Maps are in Figures 1.1 and 1.2, while Figure 1.3 contain show affected communities.

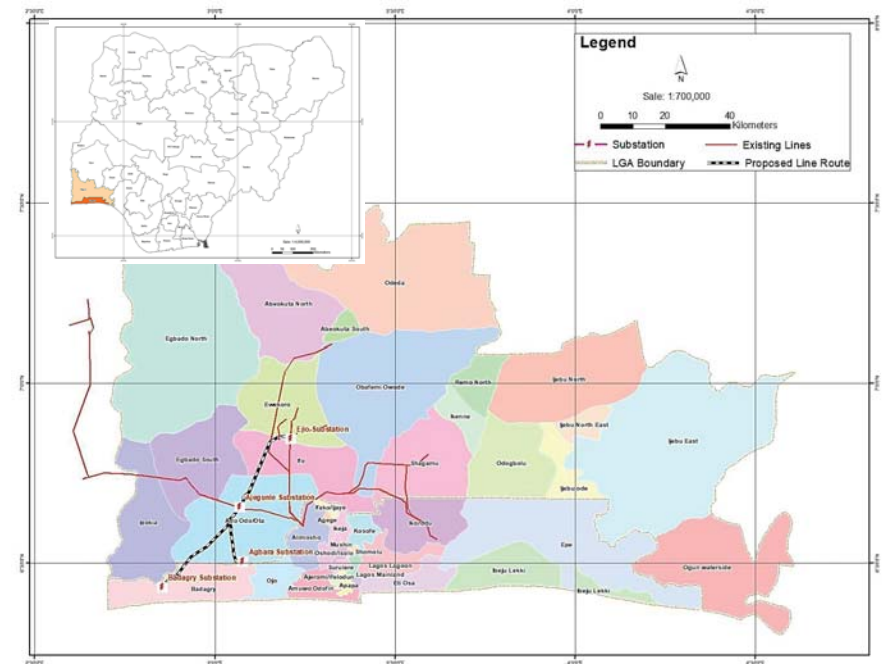


Figure 1.1 Lot3 Project Location in LGAs of Ogun and Lagos States, Nigeria

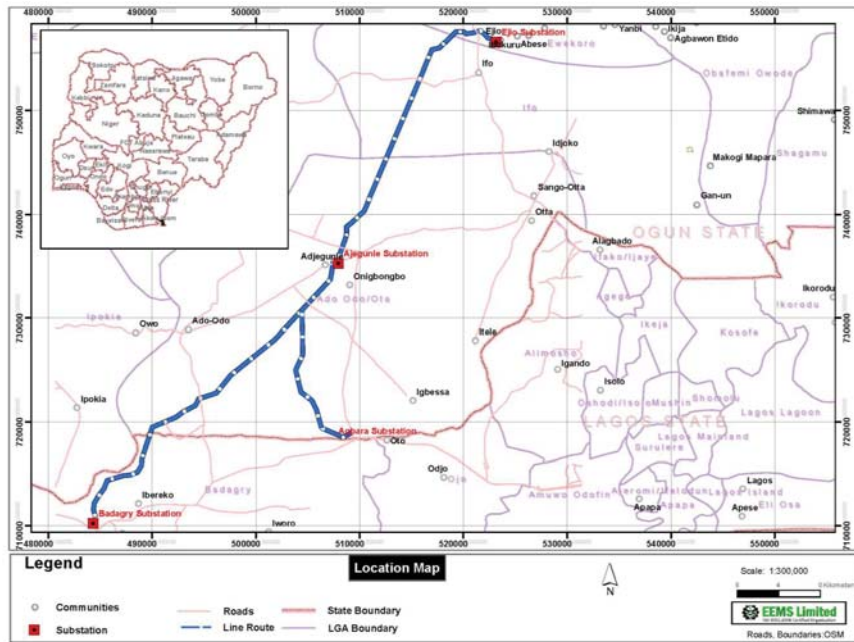


Figure 1.2 Specific Location of the Project (Lot3)

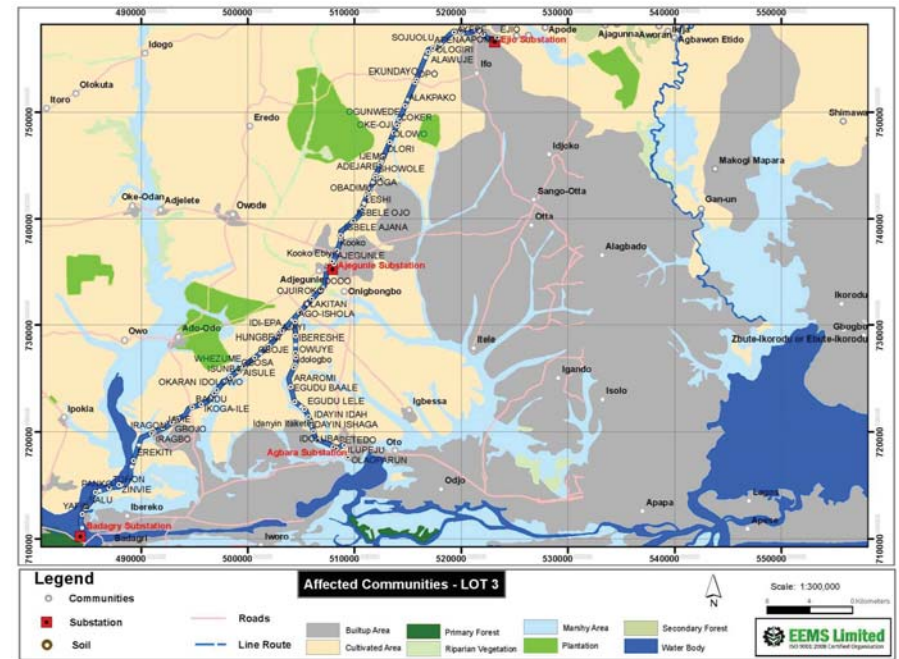


Figure 1.3 Communities Affected by the Project in Lot3

### 1.3 SCOPE AND OBJECTIVES OF THE RAP STUDIES

The policies of the JICA, World Bank, and the National Land Policies address involuntary resettlement. The RAP prepared for this project is consistent with the policies of the Government of Nigeria and that of JICA (adopted the World Bank Policy on Involuntary Resettlement -OP 4.12). These policies on involuntary resettlement cover both physical displacement and economic dislocation (loss of assets or access to assets that leads to loss of livelihood) because of land acquisition or restrictions on land use. Resettlement is involuntary when those affected cannot refuse, because expropriation could occur, even if those displaced willingly agree to compensation.

The main objective of this RAP is to provide an agreed plan for the resettlement and compensation of Project Affected Persons (PAPs) affected by the proposed project, and this report presents the process for resettlement planning, elements of the compensation and eligibility program associated with the resettlement program as applied on people affected by the project. The draft was presented to by the Transmission Company of Nigeria (TCN), the PAPs and other stakeholders for comments. The information gathered will reduce concerns that may be raised by the PAPs, favouring their approval and their collaboration in project execution.



Specifically, the RAP was prepared in order to:

- Ensure that the land acquisition process comply with the requirements of Nigerian Laws and the World Bank policies;
- Raise awareness of the project and its consequences among the general public and particularly among those people who will be directly affected by the project;
- Establishing strategies to mitigate against adverse effects suffered by the PAPs including provision of channels and platforms for engagement and grievance resolution;
- Assess the potential extent of involuntary resettlement relating to the Project;
- Identify the possible impacts of such resettlement;
- Identify different categories of PAPs who will require some form of assistance, compensation, rehabilitation or relocation;
- Quantify different categories of PAPs who will require some form of assistance, compensation, rehabilitation or relocation;
- Provide guidelines to stakeholders participating in the mitigation of adverse social impacts of the project; and
- Estimate the costs necessary for resettlement and compensation.

The thrust of this draft report includes: explanation of the RAP components and associated costs of compensation and assistance measures, organizational and institutional arrangements for the implementation of the RAP, eligibility criteria, and the planned grievance management mechanism. The actual number of households and the agricultural area that will be affected is also presented.

#### **1.4 METHODOLOGY**

The preparation of the RAP commenced with review of the preliminary feasibility study report following reports about the project, prepared by JICA, and other relevant literature including the harmonised rates for compensation for South Western States, legal documents, World Bank and JICA guidelines, etc.

Subsequently, the RAP study was conducted through;

- Consultations with a number of key stakeholders at the national, state and local levels (see Chapter 4).
- The presentation of the provisional line route to the TCN and other stakeholders including communities for comments;
- The development of a multi-criteria line route study conducted to reduce the potential impacts of the project including resettlement upfront (see the line route study report);
- The completion of a census of households, private and community assets and properties affected by the line route and substation sites (see Section 2.8 and Chapter 5).

- The completion of socioeconomic surveys of communities and households whose land are crossed by the lines (see Section 2.8 and Chapter 5). This survey covered all the households affected (100% coverage).
- Detailed enumeration of affected assets and valuation of same to establish comprehensive budget for effective RAP implementation (See Chapter 7).
- Presentation of preliminary RAP report to TCN and other stakeholders for comments.

The census and socioeconomic studies were conducted based on two (2) separate surveys. The first survey was meant to assess the affected households' assets and socioeconomic circumstances and the second survey assessed the community's characteristics and assets that would be affected by the project implementation.

The information gathering were undertaken using SnapSurvey Software on Android Tablets as well as Avenza Maps to aid navigation and identification of the line corridor clearance. The SnapSurvey output was subsequently exported to Microsoft excel worksheets and analysed.

The first household census and enumeration survey was undertaken in December, 2017 and the second in January and February, 2018.

## CHAPTER TWO

### 2.0 DESCRIPTION OF THE PROJECT

#### 2.1 PROJECT JUSTIFICATION

Lagos and Ogun States to a certain extent are industrial nerve centers of Nigeria. Hence, account for significant proportion of load demand from the national grid. The new power plants in the South normally transmits to the North through the areas of highest demand (Lagos). And presently the transmission system around the area has limited capacity as a result they constitute bottlenecks. Hence, the need to expand the network to improve stability and reliability.

The sustainability of the project has been considered on three premises – technical, economic, and environmental and social. Technically, the technologies, materials, equipment and personnel are available. On the economic premise, the funds for its execution are available and the project output is awaiting uptake by the consumers through Ikeja, Eko and Ibadan DISCOs in return for tariff payments. Environmental and social sustainability stem from the complete acceptance of the project by host communities, the careful identification and mitigation of project negative impacts and TCN's commitment to the implementation of all developed project's management plans.

#### 2.2 THE PROPONENT: TRANSMISSION COMPANY OF NIGERIA (TCN)

Transmission Company of Nigeria (TCN) is the project proponent. The company was incorporated in November 2005, emerging from the defunct National Electric Power Authority (NEPA) as a product of the merger of the Transmission and Operations sectors on April 1, 2004.

Being one of the 18 unbundled Business Units under the Power Holding Company of Nigeria (PHCN), TCN was issued a transmission license on 1st July, 2006 by the Nigerian Electricity Regulatory Commission (NERC) to carry out electricity transmission, system operation and electricity trading which is ring fenced.

The mandate of TCN includes the following

- i. Management of assets of the High Voltage Transmission System Operations as well as generation dispatch functions.
- ii. Operate as the provider of open access transmission service based on regulated transmission tariff and non-discriminatory system operations and economic dispatch services within a regulatory framework provided by the Nigerian Electricity Regulatory Commission (NERC), the Grid Code and the Market Rules.
- iii. Load forecasting and system expansion planning.
- iv. Acquiring the necessary ancillary service for defined reliability and quality service standards.
- v. Managing the market settlement system.
- vi. Development of the network through the construction of new transmission lines and substations for efficient Transmission and System operations, hence all stakeholders should observe the Grid Code, Distribution Code and Market rules.

TCN has a Health Safety and Environment (HSE) Department, headed by a General Manager. The department is responsible for environmental and social safeguards of the company's activities and operations. The department also facilitates liaisons with communities as well as government agencies

and local government departments to facilitate stakeholder consultations, as well as interfaces with the Federal Ministry of Environment for the approval of the ESIA.

### 2.3 DESCRIPTIONS OF THE LINE ROUTE

The description of the coordinates used in this report is based on the UTM WGS84 DATUM ZONE31. Furthermore, angle points and turning points are described in number of degrees it turns away from its rectilinear direction. Summary of the line route parameters is in Table 2.1. A 50m width clearance for 330kV line and 30m width of right of way for 132kV line projects is allowed for Nigeria standard. The 330kV line from Ejio to Ajegunle is 30km while the 132kV from Ajegunle to Agbara and from Ajegunle to Badagry are 21.7km and 36.5km respectively. These two 132kV share a common boundary (multi-circuit towers) of 6km, which means the total length of corridor required for 132kV line is 52.2km and 81.7km for 330kV and 132kV.

**TABLE 2.1 THE TRANSMISSION LINES AND LAND SIZE FOR SUBSTATIONS**

| LINE ROUTE           | VOLTAGE  | LENGTH (km) | ROW (m) | LAND AREA (ha) |
|----------------------|----------|-------------|---------|----------------|
| Ejio to Ajegunle     | 330kV DC | 29.6        | 50      | 148.0          |
| *Ajegunle to Agbara  | 132kV DC | 21.7        | 30      | 65.1           |
| *Ajegunle to Badagry | 132kV DC | 36.2        | 30      | 108.6          |
| <b>Total</b>         |          | <b>87.5</b> |         | <b>321.7</b>   |

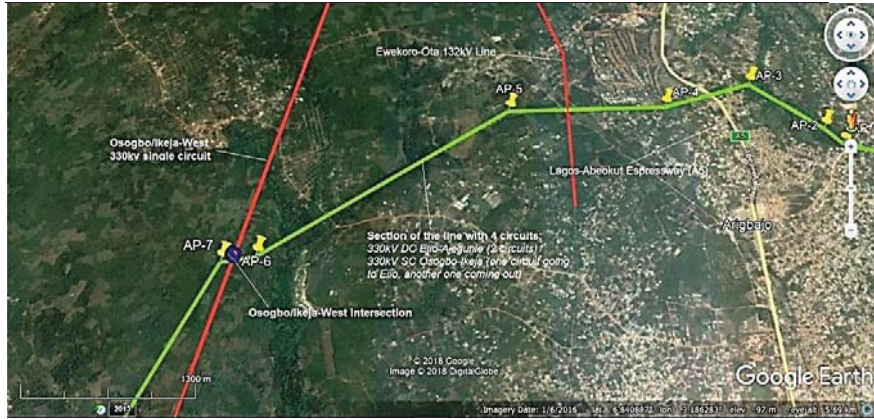
\*The 132kV lines utilizes 6.2km of common corridor, equivalent to 18.6 ha savings in land take. Hence, total footprint for lines reduces to 303.1 ha

#### 2.3.1 330kV DC line: Ejio to Ajegunle

This transmission line is 330kV double circuit which connects between the Ejio S/S and Ajegunle S/S, with a length of 29.6km. It commences from the Ejio substation at point (523223.522 mE, 756723.323) and move towards the East along a bearing of 285.5° for about one kilometre, where it took a right turn of 30.62° from its rectilinear direction, in order to avoid the densely populated Ejio Town. Furthermore, to avoid a Shrine in the Ejio Forest, an angle point of 15.34° to the left was introduced at point AP-002. About 700 m from this point another angle point of 65° to the left, to avoid crossing over a Mobil Petrol Station and the Lafarge Housing Estate.

This transmission line crosses the Lagos-Abeokuta Expressway (Trunk A5) at 6.853224°N, 3.192264°E, after about 2.3km from the Ejio substation. It also has a crossing point with the existing 330kV single circuit transmission line between Osogbo S/S and Ikeja West S/S after about 7km from Ejio substation. The existing single circuit transmission line is to be cut at the point of crossing. The Osogbo-Ikeja West line will be looped in and out of the Ejio substation. The transmission line from Ejio SS to the crossing point is four circuit; double circuit x 2 (consist of two circuit going to Ajegunle, two circuits from Osogbo-Ikeja West going in and out of Ejio). The crossing point is located at Latitude 6.838162° N, Longitude 3.154384° E and about 7km from the Ejio substation. The terminal tower at Ajegunle substation is 6.65854°N, 3.07254°E.

The altitude of Ejio (Ejio) S/S site is approximately 80m and the altitude of the distance of 5km westward is approximately 110m, transmission line is gradually upslope from Ejio S/S to the westward. The altitude of Ajegunle S/S is about 32m, the transmission line is gradually downslope by the Ajegunle SS. The route map is shown in Figure 2.4.



**Figure 2.4** Intersection Point with the Existing Osogbo-Ikeja West Line

**2.3.2 132kV DC line: Ajegunle to Existing Agbara Substation**

This transmission line is 132kV double circuit from the proposed Ajegunle Substation to the existing Agbara Substation, with a length of 21.7 km. This line shares common corridor with the Ajegunle to Badagry line for 6.2 km, where they separated at Iberese Village and reduces the footprint (See Figure 2.6). The areas around Ajegunle for up to 2km and 5km radius from Agbara substation is dense residential and industrial area (see Figure 2.6 and 2.7).



**Figure 2.5** The 132kV Lines Showing Multi-Circuit Sections



**Figure 2.6** Dense Residential Area Around Ajegunle Substation



**Figure 2.7** Dense Industrial Area of Agbara

**2.3.3 132kV DC line: Ajegunle to Badagry**

This transmission line is 132kV double circuit connecting the proposed Ajegunle substation to Badagry S/S, and it is 36.2km in length. It will also require an ROW of 30m width. As mentioned in Section 3.8.2, four circuit towers will be used to accommodate both the Ajegunle to Badagry and Ajegunle to Agbara lines up to Iberese Village, a distance of 6.2km. The key challenge for this line is to negotiate riverine residential communities and the swampy nature of the uninhabited areas from about 10km from the Badagry substation. Hence, the line was moved towards the swampy area in order to minimise impacts on human settlement as indicated by the green lines in Figures 2.7 and 2.8, instead of the yellow lines.

**SMALL COMMUNITY SETTLEMENTS vs SWAMP**



Figure 2.7a Small Community Settlements Vs Swamp (Erekiti)

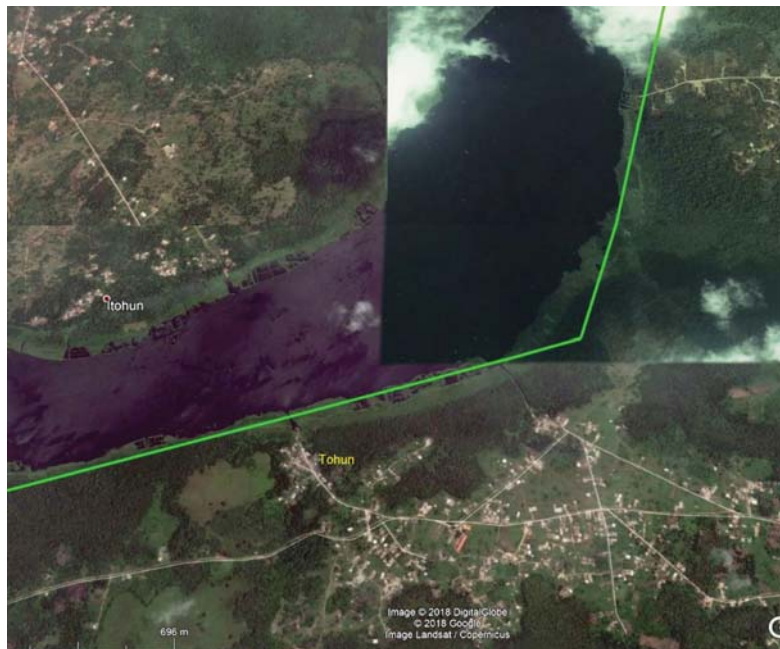
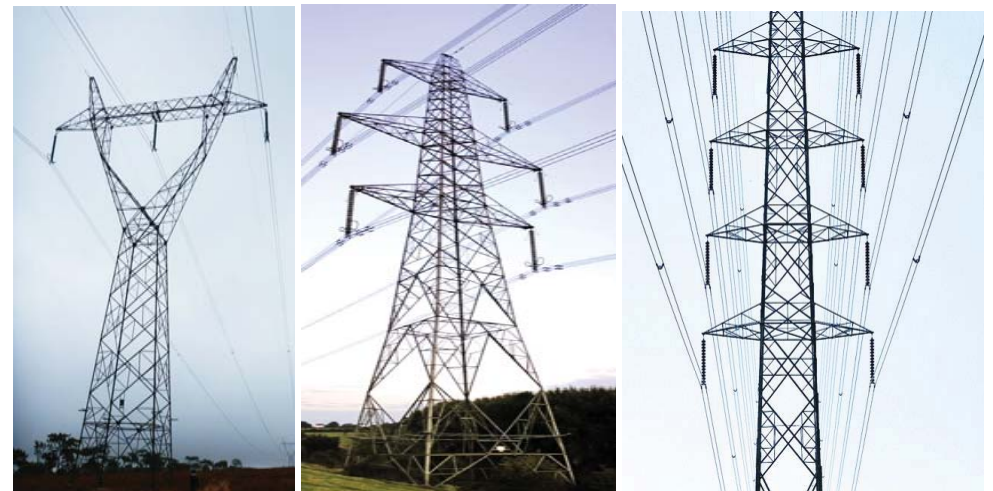


Figure 2.7b Small Community Settlements Vs Swamp (Tohun)



(a) Single Circuit (Not used in the Project)

(b) Double Circuit (used in all routes)

(c) Multi Circuit (used in common corridor Sections)

Figure 2.8 Types of Lattice Transmission Towers

## 2.4 DESCRIPTION OF THE SUBSTATIONS

### 2.4.1 General Descriptions

A substation is part of an electrical generation, transmission, and distribution system. Substations transform voltage from high to low, or the reverse, or perform as a buffer to provide continuous power to the consumers even if there is a shortfall of power from the source. Electric power may flow through several substations between generating plant and consumer, and its voltage may change in several steps. A substation may include transformers to change voltage levels between high transmission voltages and lower distribution voltages, or at the interconnection of two different transmission voltages.

Substations are normally outdoors and are enclosed by a wire fence. However, in residential or high density areas, the substation may be indoors and even housed inside a building to restrict the humming noise of the large transformers. The elements of a substation are shown in Figure 2.9.

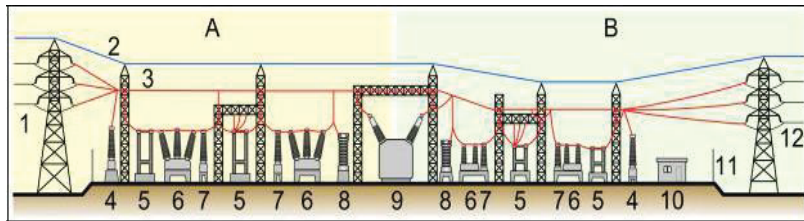


Figure 2.9 Elements of a substation

A: Primary power lines' side

B: Secondary power lines' side

1. Primary power lines 2. Shield wire 3. Overhead lines 4. Transformer for measurement of electric voltage 5. Disconnect switch 6. Circuit breaker 7. Current transformer 8. Lightning arrester 9. Main transformer 10. Control building 11. Security fence 12. Secondary power lines

For this project, all the substations will use Air Insulated Substations (AIS).

The AIS (see Figure 2.10) uses air as the primary dielectric from phase to phase, and phase to ground insulation. They have been in use for years before the introduction of Gas Insulated Substation (GIS). Most substations across all regions are AIS, which are in extensive use in areas where space, weather conditions, seismic occurrences, and environmental concerns are not an issue such as rural areas, and favourable offsite terrain. The indoor AIS version is only used in highly polluted areas, and saline conditions, as the air quality is compromised.



Figure 2.10 A Typical AIS Substation (with transformers zoomed in)

The AIS has the following features:

- The primary choice for areas with extensive space
- With quality design, the system is viable due to the low construction costs and cost of switchgear
- Less construction time, thereby more suited for expedited installations
- Easy maintenance as all the equipment is within view.
- It is easy to notice and attend to faults.

### 2.4.2 Configuration of the Substations

Three green field substations are within the scope of this RAP at Ejo, Ajegunle and Badagry, while the existing Agbara will require an extension of the line bay and no additional land take will be required. The configuration of each of the substations as well as coordinates of location is in Table 2.2 and the layout plans are in Figures 2.11 and 2.12.

TABLE 2.2 LOCATION AND CONFIGURATION OF SUBSTATIONS

| Substation Name | Location                    | Location (UTM Zone: 31N)     | Size of land (ha) | Voltage class        | Incoming bay / Outgoing bay for transmission line   |
|-----------------|-----------------------------|------------------------------|-------------------|----------------------|---|
| Ejo Substation  | Ewekoro LGA/ Ogun State     | 523203.709mE<br>756989.301mN | 25.3              | 330/<br>132/<br>33kV | Incoming bay from Olorunsogo PS: 330kV-DC line<br>Incoming bay from Osogbo S/S: 330kV-SC line<br>Incoming bay from Ikeja West S/S: 330kV-SC line<br>Outgoing to Ogijo S/S : 330kV-double circuit line<br>Outgoing to Ajegunle S/S : 330kV-DC line<br>Outgoing to New Abeokuta S/S : 132kV-DC line |
| Ajegunle S/S    | Ado Odo/Ota LGA, Ogun State | 507769.196mE<br>735269.385mN | 34.13             | 330/132/<br>33kV     | Incoming bay from Ejo S/S : 330kV-DC line<br>Incoming bay from Ikeja West S/S : 330kV-SC line<br>Outgoing bay to Sakete S/S : 330kV-SC line<br>Outgoing bay to Agbara S/S : 132kV-DC line<br>Outgoing bay to Badagry S/S : 132kV-DC line  |
| *Agbara S/S -   | Ado Odo/Ota LGA, Ogun       | 509275.967mE<br>718978.996mN | 2.85              | 132/<br>33kV         | Incoming bay from Ejo S/S: 132kV-DC line  |
| Badagry S/S     | Badagry LGA, Lagos          | 484303.490mE<br>710894.910mN | 19.6              | 132/33kV             | Incoming bay from Ajegunle SS : 132kV-DC line   |

\*No new land take is needed in existing Agbara Substation

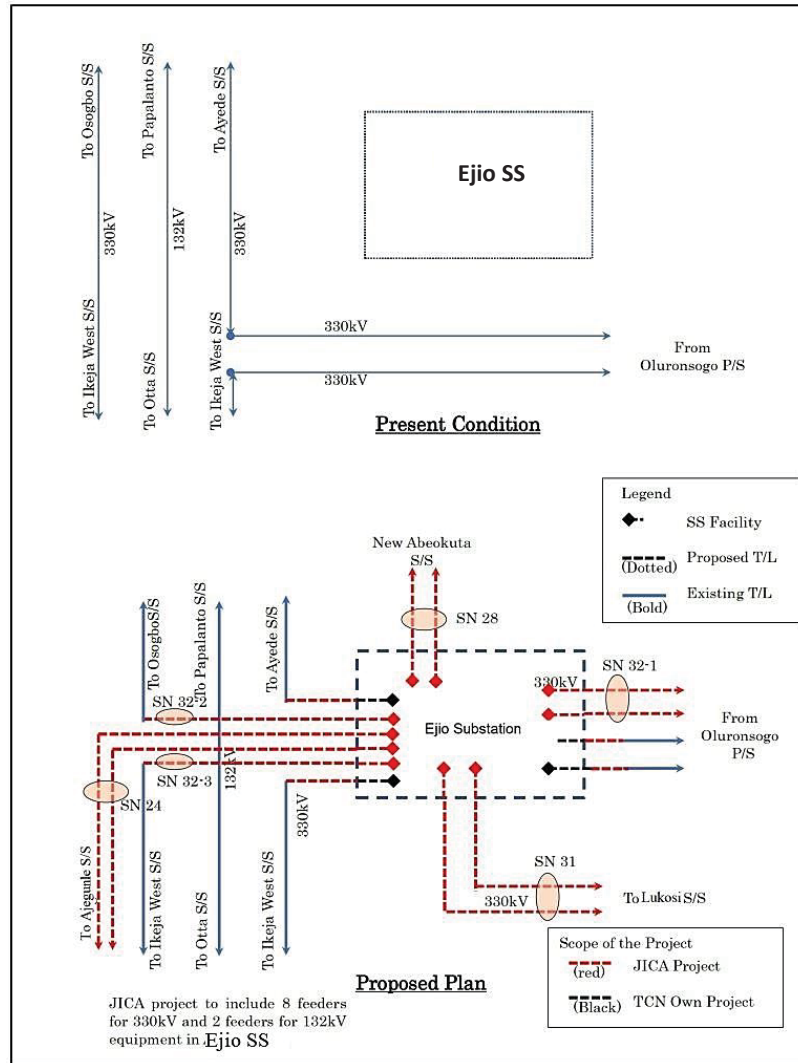


Figure 2.11 Layout Plan for Ejio Substation

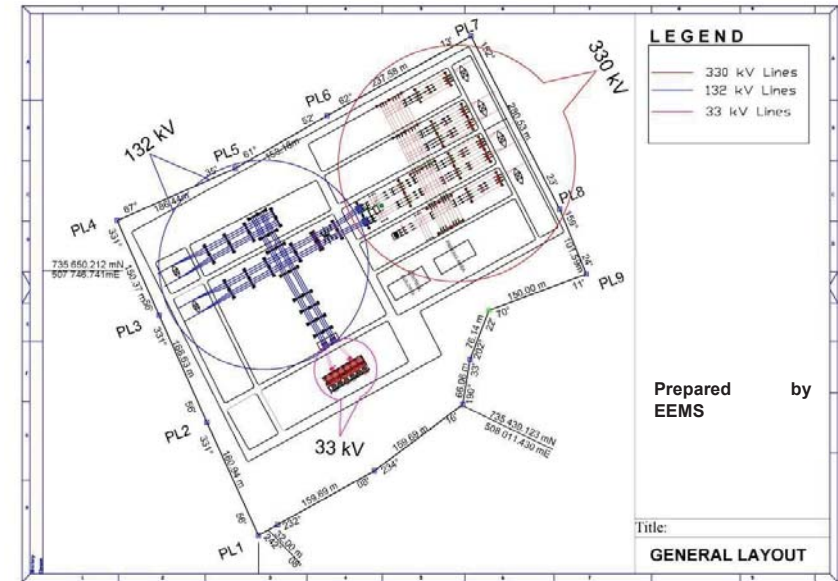


Figure 2.12 The Layout Plan for Ajegunle Substation

### 2.4.3 Functions of the Substations

The proposed substations are designed to function as follows:

- As voltage control mechanism through the transformers to step-up or step-down the system voltage as case might be, thereby lowering transmission losses.
- Correction of power factor in the circuits when the reactive loads are there to protect the generating plants and increase efficiency.
- For load shedding purposes on the distribution network there maintaining system balance.
- For the purposes of safety by switching and isolating the network during maintenance work, using circuit breakers and isolators including load demand sharing.
- Bus bar splitting for power distribution arrangement.

### 2.4.4 Substation Facilities

The spaces are meant to accommodate the following, in the minimum:

- All transformers of the following sizes and ratings.
  - a) Ejio (2x150MVA, 330/132kV + 2x60MVA 132/33kV)
  - b) Ajegunle (2x150MVA, 330/132kV + 2x60MVA 132/33kV)
  - c) Badagry (2x60MVA, 132/33kV).
  - d) Agbara (2x60MVA, 132/33kV).
- All breakers and isolators.

- All auxiliary transformers – Voltage, current, reactor, instrument etc.
- Line Bays as required.
- Cable trenches, oil sumps and drainage channels.
- Control room for system operations with offices, battery rooms, communication section, conveniences, clock rooms, parking slots, cable/junk yard etc.

The substations are highly earthed to take care of excessive current at fault condition. A robust environmental management system has been put in place to meet international standard and local environmental regulations.

In addition, the substations are to be graveled even after laying a nylon cover on the ground as a modern method to:

- Keep the weeds away from growth.
- Allow easy water run-off to drain channels.
- Improve the earthing system.
- Keep the environment clean and clear.

## 2.5 OTHER PROJECT COMPONENTS

### 2.5.1 Earthing and Protection Systems

Transmission line system protection has both electrical and mechanical aspects.

- For mechanical protection, Buchholz, high temperature, oil level relays including no-load time changer protection, and all will be incorporated.
- The electrical aspect on the other hand shall consist of numerical low impedance differential protection, high impedance restricted earth fault for each star connected transformer winding.

### 2.5.2 Communication/Control System

Radio communication between the technical crew in the Substation with the other Substations in the Transmission network, or between the control room officer and other field officers is considered very important for effective system operations. Hence highly sophisticated equipment shall be employed in this project.

### 2.5.3 Campsites / Logistics Bases

Campsites / logistics bases will be located at and adjacent to the substation locations at Ejio and Ajegunle as well as at Agbara Industrial Estate. No construction of residences will be needed for these base camps as there good hotels around the areas can accommodate workers close to all the worksites. However, storage facilities for equipment and materials will be needed.

### 2.5.4 Access Track Repair / Upgrade / Construction

Access to each structure location may be required for a crane, elevated platform, trucks transporting the materials and construction equipment, materials, and vehicles. Access will also be required to temporary sites needed for storing conductor drums, winching and braking equipment during the overhead earth wire stringing. Certain areas around Iragon, Erekiti, Tohun and Yafin may require access to tower location by boat. This may involve about 5 to 6 towers along the Ajegunle-Badagry line.

### 2.5.5 Workforce and Hours of Operation

Labour requirements for this project will generally be a maximum of 32, comprising approximately 10 on access track and foundation work, 10 on structure erection and 12 on stringing work, with a number of others engaged on miscellaneous other activities.

Due to the nature of activities to be undertaken, most of the construction program will include work that will be done at night time and weekend periods as required.

### 2.5.6 Operations and Maintenance of the Transmission Line

TCN shall be responsible for the maintenance of the proposed transmission line. The maintenance process shall include:

**Structure and Conductor Maintenance:** upon completion of the transmission line, maintenance patrols will make periodic inspections of the structures, the easement and the conductor as well as line hardware, taking particular note of clearance conditions, damage to components or evidence of vandalism.

**Easement Maintenance:** As outlined in TCN Easement and Access Track Maintenance Policy maintenance of the transmission line easement is necessary to ensure that the safe electrical clearances are not infringed due to growth of vegetation.

### Rehabilitation Program

Rehabilitation of work sites will be carried out as work proceeds and as soon as possible after the completion of work on each site. However, a rehabilitation plan shall be included in the project's ESMP.

### 2.5.7 Right of Way

The right of way for 330kV line is 50m (25m either side of the center line), and 30m 132kV (15m on either side of the center line). Factors considered include space to accommodate the lattice tower (wire zone) and safety buffer zone to provide safe limits for electromagnetic radiation as well as tower collapse and also to comply with Nigerian Electricity Regulatory Commission (NERC) requirements (see Figure 2.13). Structures for residential or commercial or any other purpose is not allowed but farming and grazing are tolerated, provided that the crops do not exceed 4 m in height. Hence, agricultural land is not compensated, only the crops lost temporary during construction phase is compensated.

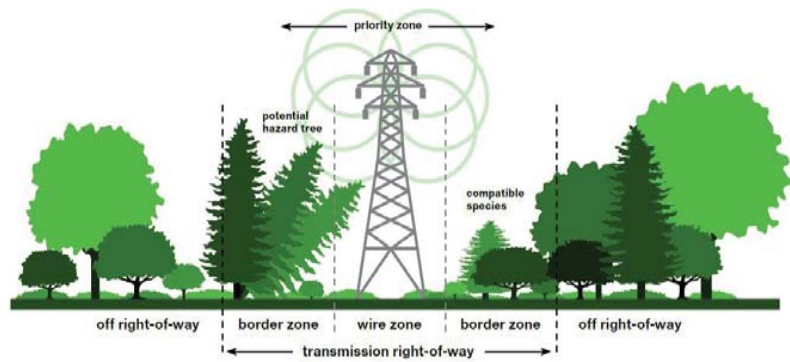


Figure 2.13 Transmission Right of Way

## 2.6 PROJECT COST AND SCHEDULE

### 2.6.1 Project Cost

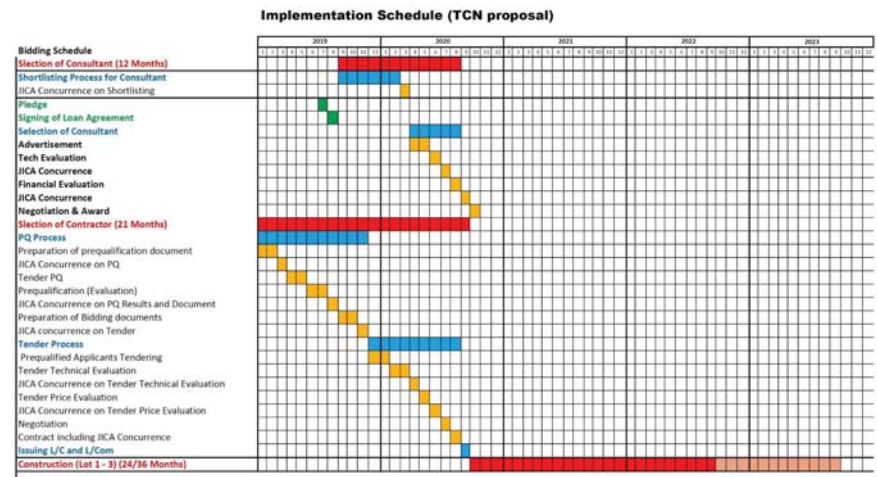
Estimated budget for the project is about USD 200 million, which will be provided by JICA as a loan. However, cost of ESIA, RAP and land acquisition is provided by TCN.

### 2.6.2 Project Schedule

The implementation schedule for the construction of the transmission lines and substations is in Table 2.3.



TABLE 2.3 PROPOSED PROJECT IMPLEMENTATION SCHEDULE



Note: [1] Consultant requires only for supervision as owner Engineer. TCN Project team has the expertise to implement the procurement process for the selection of both Consultant and the Contractors for the project. This is similar to arrangement for other Donors funding projects undertaken by TCN.  
 [2] Shortlist process for Consultant begins after the signing of the loan and continue with the selection process later after signing. However, PQ process for the selection of contractor expected to start January 2019 (6 months before the pledge while the actual tender process continue after the signing of the loan.

**2.7 SOCIAL BASELINE AROUND PROJECT AREA (CONTROL GROUP)**

The data presented in this section were based on information from literature as well as interviews and field survey conducted in the affected communities in December 2017. Interviews were conducted with community leaders in the affected communities to supplement data obtained from National Bureau for Statistics. Interviews were also conducted with households that are in the corridor but within the affected communities as a control group. The analyses of the census data of affected people is in Chapter 5.

The Local Government Areas affected are in Table 2.1.

**TABLE 2.1 LGAs AFFECTED**

| Lot # | State | LGA         |
|-------|-------|-------------|
| LOT3  | Lagos | Badagry     |
|       | Ogun  | Ewekoro     |
|       |       | Ifo         |
|       |       | Ado-Odo/Ota |

**2.7.1 Political and Administrative Structure**

Nigeria is a Federal Republic made up of 36 States and a Federal Capital Territory. Nigeria became an independent state in 1960 and a republic in 1963. It started off with three regions namely Eastern, Northern and Western regions until a fourth; the Mid-West region was created in 1963. Nigeria experienced the first military coup in 1966, and a thirty-month civil war from 1967 to 1970. The military government created 12 states from the four regions in 1967. Between 1967 and 1996, the 12 states were further divided into 19, then 21 and finally 36 states. Ogun State was created in 1976 out of the Western State. Ogun State currently has 20 LGAs, including Ifo, Ewekoro and Ado-Odo/Ota. Each of the LGAs is run by an elected Executive Chairman and elected Counselors. The Chairman appoints a cabinet to assist in performing the executive functions of the local government. Lagos state was created on the 27<sup>th</sup> May 1967 by virtue of the state creation and Transitional Provisions Decree No.14 of 1967. Lagos state is known as the financial hub of Nigeria, it currently has 20 LGAs including Badagry. Badagry is not part of the Metropolitan Lagos.

Nigeria operates a presidential system of governance that conducts public administration through three arms of government at the federal and state levels. The arms are the executive, the legislature and the judiciary. The executive arm is made up of elected and appointed officers. The legislatures at both levels are elected. The legislature at the federal level is bicameral, made up of the 109-member Senate and 360-member House of Representatives. Ogun State has three seats in the Senate and nine in the House of Representatives. Ifo, Ewekoro and Ado-Odo/Ota LGAs are in Ogun east senatorial zone and represented by a Senator.

The LGA administration is run by an elected Executive Chairman and appointees of the Chairman representing the executive arm of local government administration. There is also the legislature made up of ten Counselors elected from the wards in the LGA. The Chairman is the chief security officer of the LGA and the office is important in the operations of the proposed project.

Communities within the project area are governed by traditional rulers otherwise called Baales. Each Baale rules his community with his Chiefs-in-Council. The Council is responsible for all administrative, customary issues and conflict arbitration. Thus, in these communities, leadership structure is made up of the traditional rulers, religious leaders, youths and women leaders. Traditional leaders usually initiate and approve projects for implementation while religious; youths and women leaders assist in sensitization and mobilization of community members for fund raising. In each community, there is a Community Development Committee (CDC) whose concern is on community development advocacy and project/programme implementation. Youth Council with an elected president and executive is usually responsible for law enforcement, social and environmental development in each community. No doubt, the observed leadership structure in the communities is a useful tool for mobilizing residents for increased participation in decision making, planning and implementation of development programs and projects.

**2.7.2 Land Planning and Uses**

Land ownership in the project site is either by community or family. However, by virtue of the Public Lands Acquisition Law, the state government may acquire land compulsorily for public purpose from individual land owners subject to the payment of compensation to such landowners. Some lands in the project area is currently leased to migrant farmers, especially of Igede and Ogoja ethnic groups. These lands are cultivated extensively for commercial production. A lot of grazing activities are also practiced by the Fulani pastorals. The wayleave is served by the existing road infrastructure and other rural roadways from which access along the wayleave is provided.

The residential areas are mixed urban such as Ejio, Arigbajo, Apou, Kokoo, etc, and mostly rural settlements, with few semi-urban settlements especially in communities such as Sojuolu, Igbele, Bandu, Panko and Yafin. The line route map showing location of affected communities is in Figure 2.3. The population in these communities is predominately made up of middle to high income earners, and their residential areas and the surrounding sub-places consist largely of single unit residential homes. On the other hand, the rural settlements such as Uji, Olori, Olowo and Ijegemo-Taiwo are sparsely populated with low cost, single unit dwellings on small stands.

In addition, existing or planned land use areas that shall be lost due to the project were identified as shall be found in this section and the yet to be submitted Resettlement Action Plan. Generally, the land is currently used for estates (residential, industrial and plantation), farmlands, and cultural purposes.

**2.7.3 Demography**

Following the 2006 census, the National Population Commission (NPC) published the population of Nigeria as 140,431,790 comprising 71,345,488 males and 69,086,302 females. The NPC estimated annual population growth at 3.2% (NDHS, 2008). The current population, projected at 3.2% annual growth and using the exponential model is 180,735,714, with a density is 198.6 per square kilometer. A higher male population and sex ratio of 103 was recorded for the country. Children (age 0-14) constituted 41.8% of the population while those less than 20 years were 52.3% and those less than 25 years 61.9%. The elderly (65 years and above) were 3.2% of the population. The age dependency ratio was 82.0. Given these proportions, the population of Nigeria is quite young. Average household size in Nigeria is 4.9 (NBS 2012).

According to the 2006 census, Lagos State has a population of 10,694,915 (NBS, 2012), with a projected population of 12,130,986.7 for the year 2015 (NBS, 2012). The population of Ogun State according to the 2006 census is 4,424,096, with a projected population of 5,037,594.173 for the year 2015 (NBS, 2012). The density of Lagos state and Ogun state are 3304.55 and 307.17 square kilometers respectively. In Lagos state, children aged (0-14 years) constituted 30.3% of the population, those from (15-44 years) constitute 49.3%, (45-64 years) constitute 15.28% while 2.8% of the population are 65 years and above. The age dependency ratio of the population in the state is 70.9%. Similarly, children (age 0-14 years) in Ogun state constituted 38.3%, those within (15-44 years) are 39.9%, those within (45-64 years) are 15.3%, while the elderly (65 years and above) occupy 3.6% of the population. The age dependency ratio of the population in the state is 88.5%.

The project cuts across Ifo, Ewekoro and Ado-Odo/Ota Local Government Areas (LGA) in Ogun state, and Badagry Local Government Area in Lagos state. In Ogun state, Ifo LGA has a total population of 539,170 comprising of 269,206 males and 269,964 females, Ado-Odo/Ota is made up of 527,242 persons comprising of 261,523 males and 265,719 females while the population of Ewekoro is 55,156, comprising of 28, 212 males and 26,881 females. Conversely, in the Lagos axis, Badagry LGA has a total population of 237,731 comprising of 119,821 males and 117,910 females. According to the National Bureau of Statistics (NBS) 2012, the literacy level in Ogun state is 78.8%, with Ifo, Ado-Odo/Ota and Ewekoro LGA's recording 64.6%, 60.0% and 67.7% respectively. Also, the literacy level in Lagos state is 80.5%, with Badagry LGA recording 81.3%. Data on infant mortality and life expectancy of Ogun state from NBS revealed that Ogun state has an infant mortality level of 67% and life expectancy of 53 years, while Lagos state has an infant mortality level of 45% and life expectancy of 51 years. This information is presented in Table 2.4

**TABLE 2.4 RELEVANT LIVELIHOOD INDICES IN THE PROJECT STATES**

| Livelihood Indices                     | Ogun state |           | Lagos state |            |
|--|------------|-----------|-------------|------------|
|  | Population | 4,424,096 |             | 10,694,915 |
| Literacy                               | 78.8       |           | 80.5        |            |
| Youth Literacy in any language (%)     | Male       | Female    | Male        | Female     |
|  | 98.2       | 88.1      | 99.4        | 99.3       |
| Adult literacy in English language (%) | Male       | Female    | Male        | Female     |
|  | 80.3       | 77.2      | 95.8        | 92.3       |
| Infant Mortality                       | 67         |           | 45          |            |
| Life expectancy                        | 53years    |           | 51years     |            |

Source: NBS (2012)

**TABLE 2.5 GENDER DISTRIBUTION IN THE PROJECT AREA**

| Age Bracket |             | Ewekoro  |            | Ifo      |            | Ado-Odo/Ota |            | Badagry  |            | Average  |            |
|-------------|-------------|----------|------------|----------|------------|-------------|------------|----------|------------|----------|------------|
| Years       | Percent (%) | Male (%) | Female (%) | Male (%) | Female (%) | Male (%)    | Female (%) | Male (%) | Female (%) | Male (%) | Female (%) |
| 01-18       |             | 52.4     | 47.6       | 49.2     | 50.8       | 51.2        | 48.8       | 50.4     | 49.6       | 50.8     | 49.2       |
| 19-39       | 30.7        | 48.3     | 51.7       | 51.2     | 48.8       | 50.3        | 49.7       | 49.3     | 50.7       | 49.8     | 50.2       |
| 40-65       |             | 47.6     | 52.4       | 50.2     | 49.8       | 49.7        | 50.3       | 49.6     | 50.4       | 49.3     | 50.7       |
| >65         | 14.4        | 45.4     | 54.6       | 49.8     | 50.2       | 51.2        | 48.8       | 47.4     | 52.6       | 48.5     | 51.6       |

Source: EEMS Survey 2017

Persons within the age bracket of (19-39) years formed the bulk of the population (above 30%) across the LGAs, while those above 65 year of age were the least (below 15%) represented in the project area. This also implies that the communities have able-bodied labour force that could participate actively in the various activities that will take place during the construction and operation phase of the transmission line. Generally, the average population of females (50.4%) was slightly higher than that of males (49.6%) across the four project LGAs.

### 2.7.4 Ethnic Composition

Eight ethnic groups were recorded to be present within the project area. These ethnic groups and their respondent populations in each affected LGA are presented in Table 2.6.

**TABLE 2.6 ETHNIC GROUPS OF THE PROJECT AREA (%)**

| Ethnicity | Local Government Areas |      |             |         | Average (%) |
|-----------|------------------------|------|-------------|---------|-------------|
|           | Ewekoro                | Ifo  | Ado-Odo/Ota | Badagry |             |
| Yoruba    | 75.3                   | 66.9 | 61.5        | 17.4    | 55.3        |
| Egun      | 10.2                   | 14.8 | 23.1        | 69.6    | 29.4        |
| Igede     | 4.0                    | 3.9  | 3.8         | 1.7     | 3.4         |
| Ogoja     | 3.0                    | 1.0  | 2.3         | 2.6     | 2.2         |
| Aja       | 2.0                    | 3.9  | 0.8         | 0.9     | 1.9         |
| Ihori     | 2.0                    | 1.0  | 0.8         | 1.7     | 1.4         |
| Igbo      | 1.0                    | 4.8  | 3.8         | 4.3     | 3.5         |
| Hausa     | 2.5                    | 3.9  | 3.8         | 1.7     | 3.0         |
|           | 100%                   | 100% | 100%        | 100%    | 100%        |

Source: EEMS Survey 2017

The Yoruba and the Eguns of Badagry and Benin Republic extraction made up about four-fifths of the respondent populations (Note that the Eguns prefer to be so-called rather be referred to Yoruba). While the presence of the Igede, Ogoja, Aja and Ihori ethnic groups in the area is owed largely to availability of land for farming purposes, the presence of the Igbo and the Hausa (Fulani) is owed to commerce and pastoral purposes respectively.

### 2.7.5 Religion

The study revealed that the people are adherents of three religions. These are Islam, Christianity, Animist/ African Traditional Religion (ATR). Christianity was the most practiced religion with about 54% of the respondents across the LGA's. This was followed by Islam with an average of 35.5%. While about 10% were adherents of the ATR in one form or the other. This information is presented in Figure 2.14

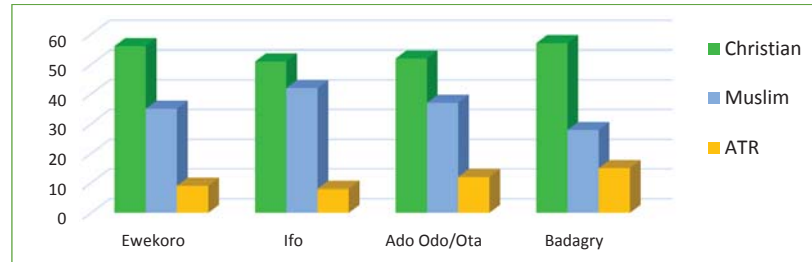


Figure 2.14 Main Religious Groups in the LGAs

Source: EEMS Survey 2017

The adherents of these various religions observe one festival or the other. For example notable ATR festivals in the area include Etutu Ilu, Obaluwaye, Oluweri, Egungun, Oro, Ogun, Ogun-Ajobo, Ikore, Eyinbi, Yemoja, Esu, Okesa, Igbo Ore, Igbo Omowoko, Lasu, Zangbeto, Yoho, Todan and Sango-dore among others. The Islamic and Christianity adherents in the area observe the world wide traditional Muslim and Christian festivals respectively.



Plate 2.1: Central mosque in Alapako Oke Community



Plate 2.2: Methodist Church in Olori Community



Plate 2.3: A typical shrine in Ekundayo Community

These festivals are celebrated with pomp and pageantry and have spiritual, traditional, socio-economic and financial implication for both the indigenes and settlers. Traditional festivals offer opportunities for the people to seek divined favour, prosperity, bumper harvest, peace, security, long lives and good health for the communities.

### 2.7.7 Land Use

The proposed transmission line's wayleave lies within the south western zone of the country. Derived savanna and riparian forest were the two identified habitats (see Figure 2.15) The area has undulating beautiful scenery. Farming constitutes the major land use activity in Ado-Odo/Ota, Ewekoro and Ifo LGAs, while fishing and farming both constitute the major land use in Badagry LGA. Oil palm (*Elaeis guineensis*) plantation, Banana plantation and crop farming. Other notable land uses

include fishing. Building of residential houses and cottage industries are some of the apparent changes in land use pattern observed around the study area.

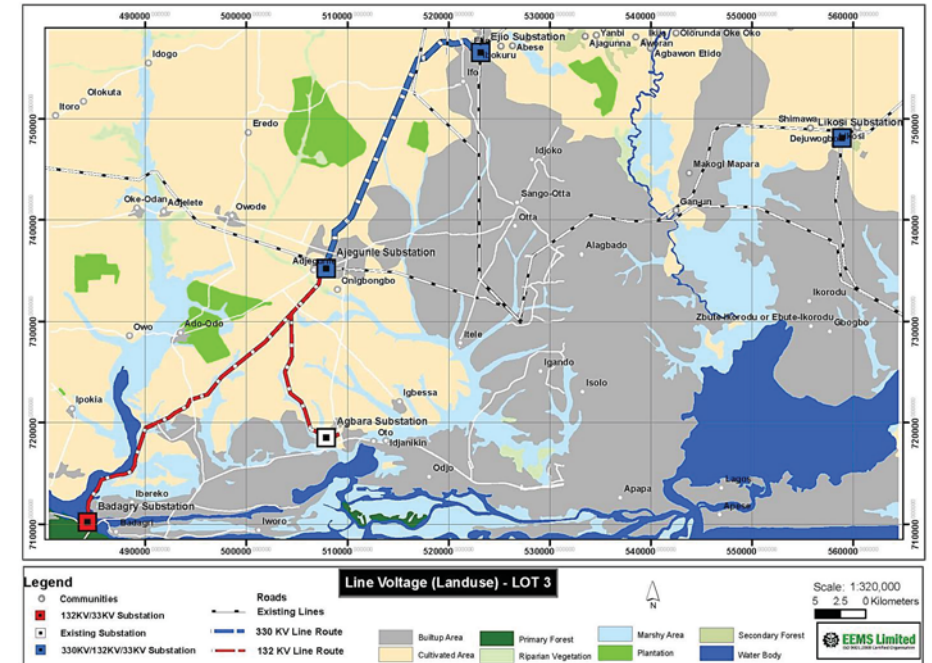


Figure 2.15 Land Use Map

### 2.7.8 Educational Attainment

The educational attainment among respondents in the Project LGAs is presented in Table 2.7.

TABLE 2.7 EDUCATIONAL STATUS AMONG THE RESPONDENTS IN THE PROJECT AREA

|                     | Ewekoro | Ifo  | Ado-Odo/Ota | Badagry | Average (%) |
|---------------------|---------|------|-------------|---------|-------------|
| No formal education | 3.4     | 4.1  | 2           | 1.7     | 2.8%        |
| Primary             | 7.7     | 16.7 | 17          | 15.5    | 14.2%       |
| Secondary           | 48.7    | 33.3 | 62.5        | 22.4    | 41.7%       |
| CoE and polytechnic | 18.8    | 25.1 | 6           | 20.7    | 17.7%       |
| University Degree   | 21.4    | 20.8 | 12.5        | 39.7    | 23.6%       |

Source: EEMS Survey 2017

The high literacy levels in the project area is exemplified by the about 83% of the respondent population having up to secondary school or tertiary education. Those having no formal education or primary education summed up to be 17%. Ado-Odo/Ota had the highest number of respondents who have acquired primary and secondary school education recording a total of 17% and 62.5% respectively. On the other hand, Ifo LGA had the highest number of respondents without formal education.

### 2.7.9 Occupation

The economic life of the communities revolves mainly around farming and fishing. The percentage occupational distribution of the people is shown in **Table 2.8**.

**TABLE 2.8 OCCUPATIONAL DISTRIBUTION IN THE PROJECT AREA**

| OCCUPATION              | Ewekoro | Ifo | Ado-Odo/Ota | Badagry | Average (%) |
|-------------------------|---------|-----|-------------|---------|-------------|
| Farmer                  | 66      | 87  | 80          | 61      | 72.3        |
| Pastoralist             | 2       | 0   | 1           | 0       | 0.7         |
| Self-employed           | 17      | 6   | 7           | 8       | 9.4         |
| Private sector employee | 7       | 2   | 3           | 5       | 4.2         |
| Public sector employee  | 3       | 4   | 3           | 5       | 3.7         |
| Trading and Fishing     | 5       | 3   | 7           | 21      | 8.9         |

Source: EEMS Survey 2017

It is clear from the above that majority of the inhabitants in the project area are farmers with about 72.3% of the respondents across the LGAs practicing farming. This occupation was observed to be the attracting index for the Igede and Ogoja ethnic groups present in the study area. The self-employed were the second largest respondent population with 9.4%. The least practiced occupation is livestock rearing (pastoralist) taking about 0.7% of the population in Ado-Odo/Ota and Ewekoro LGAs. This occupation type is not practiced in communities within Ifo and Badagry LGAs.

The most commonly cultivated crops in the project area are cassava, maize, rice, banana, okra, pepper and vegetables. Fruit trees are also cultivated in this area. They include mango, cashew, and guava among others. The area is also blessed with oil palm products. Those engaged in hunting, kill animals (games) of various types especially grass cutters, hares, antelope and rabbits. The fishing settlements are found mainly in Badagry LGA, and they include Tohan, Panko, Isalu, Zenvie, Igboviye and Yafin Communities. Brewing of local gin is also common.



### Plate 2.4: Cassava Production

### Plate 2.5: Oil palm plantation in Iberese

#### 2.7.10 Health and STD

This section presents the baseline health data based on information generated from sampled groups in the study communities. Data obtained from these facilities were subsequently compared with state and National data and averages that are available.

The commonest and most prevalent diseases affecting all age groups in the communities are Malaria Fever (32.8%), Upper Respiratory Tract Infection (21.8%), Typhoid Fever (11.7%), Diarrhea/vomiting (10.5%) and Rheumatism (7.5%). Other common ailments in across all project LGAs: include Worm Infestation, Diabetes Mellitus, Lower Respiratory Tract Infection, and Arthritis. The high prevalence rate of malaria could be explained by the following factors:

- The abundance of mosquitoes (the insect vector of malaria, which consists predominantly of *Plasmodium falciparum*, and less of *Plasmodium vivax* and *Plasmodium malariae*);
- Presence of stagnant water;
- Absence of pest control practices, and
- Inadequate prophylactic drug supply.

A cursory look at Table 2.9 shows that water related diseases have the highest prevalence percentage. Upper Respiratory Tract Infection has the second highest prevalence occurrence in the region. This could be due to bush clearing/ burning and unpaved surfaces.

**TABLE 2.9 PREVALENCE OF DISEASES IN THE PROJECT AREA**

| S/N | Disease                           | Proportion of Infection (%) |
|-----|-----------------------------------|-----------------------------|
| 1   | Malaria Fever                     | 30.8                        |
| 2   | Upper Respiratory Tract Infection | 19.8                        |
| 3   | Typhoid Fever                     | 11.7                        |
| 4   | Hypertension                      | 7.5                         |
| 5   | Vomiting and Diarrhea             | 10.5                        |
| 6   | Worm Infestation                  | 5.7                         |
| 7   | Diabetes Mellitus                 | 5.1                         |
| 8   | Lower Respiratory Tract Infected  | 4.3                         |
| 9   | Arthritis                         | 2.4                         |
| 10  | Others                            | 2.5                         |

Source: EEMS Survey 2017

Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) have become very important public health concern in Nigeria. However, there are no data on sexual practices, knowledge and beliefs about HIV/AIDS and other Sexually Transmissible Infections (STIs) in the study area. Therefore, several questions were included in this study to ascertain the level of their awareness about these health problems. Both men and women were asked about their sexual

practices. They were also asked about what they believed was the mode of transmission of HIV and where they sought treatment for STIs. Condom use and availability were also reported.

**TABLE 2.10 SEXUAL PRACTICES AMONG INHABITANTS**

| No of Sexual Partner | Percentage (%) |      |             |         | Average % |
|----------------------|----------------|------|-------------|---------|-----------|
|                      | Ewekoro        | Ifo  | Ado-Odo/Ota | Badagry |           |
| 1                    | 42.3           | 49.3 | 37.5        | 50.3    | 44.85     |
| 2                    | 34.1           | 30.1 | 58.6        | 29.5    | 38.075    |
| 3                    | 10.4           | 9.3  | 17.4        | 10.5    | 11.9      |
| 4                    | 8.1            | 7.1  | 12          | 7.7     | 8.725     |
| 5                    | 3.8            | 3.2  | 8.5         | 2.0     | 4.375     |
| Above 6              | 1.3            | 1    | 3.5         | 0       | 1.45      |

Source: EEMS Survey 2017

About 83% of the respondents who were sexually active had only one or two sex partners. However, keeping of two sexual partners was the most commonly practiced behavior among respondents in Ado Odo/ Ota.

## CHAPTER THREE

### 3.0 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

It is imperative to analyse the Acts and bye-laws relevant to this project. This will help in understanding the legalities and procedures in implementing the project and identifying gaps that need to be strengthened in order to comply with the JICA as well as World Bank's Policy on resettlement and rehabilitation of project affected persons.

The following subsections summarize policy, legislative and institutional framework in which the projects shall be implemented with respect to social issues as well as World Bank policy on resettlement & rehabilitation and indigenous population.

#### 3.1 POLICY FRAMEWORK

##### 3.1.1 Land Acquisition and Compensation Policies

Land required for the construction, operation and maintenance of the project shall be acquired and allocated to the project by the Government.

The legal framework provides the basis for three key elements of the Resettlement Action Plan (RAP). They include:

- Establishing rates for compensation;
- Determining eligibility for compensation and resettlement assistance, including development initiatives aimed at improving the social and economic well-being of affected populations;
- Establishing mechanisms to resolve grievances among affected populations related to compensation and eligibility.

Land ownership in Nigeria is subject to a range of diverse cultural and traditional practices and customs. Land can be classified according to the following broad categories:

*Communal land:* consists mostly of under-developed forests and is owned by the community collectively and not a particular individual. Those individuals who clear it first claim ownership.

*Clan or family land:* is owned by clans and families, as the name suggests.

*Institutional land:* land allocated to traditional institutions such as traditional authorities and chiefs.

*Individual land:* land acquired by an individual, which may be inherited by the immediate family, depending on customary practices

The legal framework for land acquisition and resettlement in Nigeria is the Land Use Act (LUA) of 1978, reviewed under Cap 202, 1990 and now Cap L5, Laws of the Federal Republic of Nigeria (LFN), 2004.

The relevant World Bank policy (OP) 4.12, which addresses land acquisition and resettlement, was adopted in 2001.

The differences between the Land Use Act and the Bank's OP 4.12/JICA Guidelines mostly concern rehabilitation measures, which are neither proscribed, underprovided for, nor mandated in the Act.

### 3.1.2 National Land Policy

The legal basis for land acquisition and resettlement in Nigeria is the Land Use Act Cap L5, LFN 2004, According to the Act, all lands in Nigeria is vested in the Governor of each State, to be held in trust for the use and common benefit of all people. Lands are further classified into urban and rural (non-urban) for administrative purposes.

The administration of urban land is directly under the control and management of the Governor; whereas non – urban land is under the control and management of the Local Government Area.

The Governor had the right to grant Statutory Rights of Occupancy to all lands. Local Government has the right to grant Customary Rights of Occupancy over non-urban lands.

The Land Use Act gives Governor the power to revoke both Statutory and Customary rights to land for the overriding public interest.

In doing so, the Act requires that the State or Local Government should pay compensation to the current holder or occupier with equal value. The Act also requires the State or Local Government to provide alternative land for affected people who will lose farmlands and alternative residential plots for people who will lose their houses in lieu of monetary compensation.

There is need for an integrated approach towards land use planning and coordination of activities of all stakeholders in land use in the context of this project. Specifically, the involvement of land owners, community groups, women, youth and the less privileged in making land use related decisions that affect them is considered critical to the successful implementation of the proposed use policy.

The imperative for the transmission line to have a ROW with land adequate for the planned purpose predisposes the adoption of this policy in this project.

### 3.1.3 National Social Protection Policy

The revised national policy on social protection was approved by the Federal Executive Council (FEC) in July 2017 to enhance social justice, equity and all-inclusive growth in the country. The framework seeks to achieve these using a transformative mechanism for mitigating poverty and unemployment in Nigeria. Specifically, the policy covers the six-social investment programmes in Figure 3.1



**Figure 3.1 Focal Social Investment Programmes**

The social protection policy also includes the following schemes

**National Health Insurance Scheme (NHIS):** The National Health Insurance Scheme established under Act 35 of 1999 Constitution is aimed at providing easy access to healthcare for all Nigerians at an affordable cost through various prepayment systems. NHIS is totally committed to securing universal coverage and access to adequate and affordable healthcare in order to improve the health status of Nigerians, especially for those participating in the various programmes/products of the Scheme. Participants in the scheme pay a fixed regular affordable amount, and the funds are pooled, allowing the Health Maintenance Organisations (HMOs) to pay for those needing medical attention. It is primarily a risk sharing arrangement which can improve resource mobilisation and equity.

**National Pension Scheme:** is a contributory scheme where employees contribute is established by the Pension Reform Act 2004 with the following objectives:

- To ensure that every person who worked in either the Public Service or Private Sector receives his retirement benefits as and when due;

- To assist individuals by ensuring that they save to cater for their livelihood during old age and thereby reducing old age poverty;
- To ensure that pensioners are not subjected to untold suffering due to inefficient and cumbersome process of pension payment;
- To establish a uniform set of rules, regulations and standards for the administration and payments of retirement benefits for the Public Service of the Federation, Federal Capital Territory and the Private Sector; and
- To stem the growth of outstanding pension liabilities.

**National Primary Health Care (PHC):** To provide technical and programmatic support to states, LGAs, and other stakeholders in the functioning, planning, implementation, supervision and monitoring of PHC services in Nigeria. In pursuance of this overall mission, the scheme has seven goals namely:

Control Preventable Diseases: Eradicate polio and limit the occurrence and impact of diseases using education, immunization and other proven interventions.

Improve access to Basic Health Services: Make basic health services available by ensuring communities have access to health facilities, services and basic health insurance.

Improve quality of care: Ensure basic health services are people-oriented and delivered according to established quality standards and protocols.

Strengthen the institution: Strengthen Zonal structures, State representation, internal communications, monitoring and evaluation, procurement and the financial management system.

Develop high-performing health workforce: Organize systems and structures to deliver effective support services through, for example, PHC guidelines, norms and enabling acts for states and LGAs

Strengthen partnerships: Mobilize and coordinate stakeholders such as Ministries, Departments and Agencies and development partners to support the implementation of PHC.

Strengthen community engagement: Promote community participation, ownership and responsibility for health through Ward Development Committees and communication and programmes.

**National Poverty Eradication Programme (NAPEP):** is a 2001 program by the Nigerian government aiming at poverty reduction, in particular, reduction of absolute poverty. It was designed to replace the Poverty Alleviation Program and coordinate and oversee various other institutions, including ministries, and develop plans and guidelines for them to follow with regards to poverty reduction. NAPEP goals include training youths in vocational trades, to support internship, to support micro-credit, create employment in the automobile industry, and help VVF patients. The program is seen as an improvement over the previous Nigerian government poverty-reduction programmes. According to a 2008 analysis, the program has been able to train 130,000 youths and engaged 216,000 people (Karl, et al 2008).

### 3.1.4 National Gender Policy

The policy seeks to promote gender equality and eliminate discrimination based on gender, ethnicity, religious beliefs, etc. The key policy areas are focused around 5 critical areas:

- (i) Culture re-orientation and sensitisation to change gender perceptions and stereotypes;
- (ii) Promotion of women's human rights and in particular focusing on sexual and gender based violence (SGBV) and in supporting new legislations and legal rights of women;
- (iii) Promoting the empowerment of women and integrating gender within key sectors as highlighted within the NGP – (Agriculture/Rural Development; Environment/Natural Resource; Gender and HIV/AIDS; Health and Reproductive Health/Rights; Education/Training; Labour/Employment);
- (iv) Women's political participation and engendered governance including gender and conflict management and
- (v) Supporting institutional development including the use of ICT and building strategic partnerships, including identifying new partnerships with men's organisations, faith-based organisations and traditional institutions.

## 3.2 LEGAL FRAMEWORK

### 3.2.1 The 1999 Constitution of the Federal Republic of Nigeria

Property ownership is guaranteed alongside other fundamental human rights like freedom of speech, association, and movement. Specifically Sections 43 confers the right to acquire immovable property by citizens and Section 44 reserves government's power of eminent domain and prescribes how this power is to be exercised by the government.

Section 44 (1) provides that *"no moveable property or any interest in an immovable property shall be taken possession of compulsorily and no right over or interest in any such property shall be acquired compulsorily in any part of Nigeria except in the manner and for the purposes prescribed by a law that, among other things:*

*(a) requires the prompt payment of compensation therefore and*

*(b) gives to any person claiming such compensation a right of access for the determination of his interest in the property and the amount of compensation to a court of law or tribunal or body having jurisdiction in that part of Nigeria.*

This implies that non-compliance in respect to the manner (process), purposes recognised by law, and is met with promptitude in the payment of compensation and allowing claimant unfettered access to property being taken to ascertain claims and /or reserves affected persons to adjudicate on quantum of compensation would void an otherwise valid acquisition or resettlement. The basic land tenure law which is the Land Use Act Cap L5, LFN 2004 operationalizes the provisions of Section 44 of the Constitution.

### 3.2.2 Land Use Act CAP L5, LFN 2004 and Resettlement Procedures

The Land Use Act Cap L5, Laws of the Federation of Nigeria 2004 is the key legislation that has direct relevance to this project. Relevant Sections of these laws as may relate to this project with respect to land ownership and property rights, resettlement and compensation are summarized in this section.



The Land Use Act is the applicable law regarding ownership, transfer, acquisition and all such dealings on Land. The provisions of the Act vest every Parcel of Land in every State of the Federation in the Executive Governor of the State. He holds such parcel of land in trust for the people and government of the State.

The Act categorized the land in a state to urban and non-urban or local areas. The administration of the urban land is vested in the Governor, while the latter is vested in the Local Government Councils. At any rate, all land irrespective of the category belongs to the State while individuals only enjoy a right of occupancy as contained in the certificate of occupancy, or where the grants are "deemed".

The Governor administers the land for the common good and benefits of all Nigerians. The law makes it lawful for the Governor to grant statutory rights of occupancy for all purposes; grant easements appurtenant to statutory rights of occupancy and to demand rent. The Statutory rights of Occupancy are for a definite time (the limit is 99 years) and may be granted subject to the terms of any contract made between the state Governor and the Holder.

The Local Government Councils may grant Customary Rights of Occupancy for agricultural (including grazing and ancillary activities), residential and other purposes. But the limit of such grant is 500 hectares for agricultural purpose and 5,000 hectares for grazing except with the consent of the Governor. The LGA, under the Act is allowed to enter, uses and occupies for public purposes any land within its jurisdiction that does not fall within an area compulsorily acquired by the Government of the Federation or of relevant State; or subject to any laws relating to minerals or mineral oils.

The State is required to establish an administrative system with specific responsibilities including managing the revocation of the rights of occupancy, and payment of compensation for the affected parties. So, the Land Use Act provides for the establishment of a Land Use and Allocation Committee in each State that determines disputes as to compensation payable for improvements on the land. (**Section 2 (2) (c)**).

In addition, each Local Government is required to set up a Land Advisory Committee, to advise the Local Government on matters related to the management of land. The holder or occupier of such revoked land is entitled to the value of the unexhausted development as at the date of revocation. (**Section 6 (5)**). Where land subject to Customary right of Occupancy and used for agricultural purposes is revoked under the Land Use Act, the local government can allocate alternative land for the same purpose (**section 6 (6)**).

If Local Government refuses or neglects within a reasonable time to pay compensation to a holder or occupier, the Governor may proceed to effect assessment under section 29 and direct the Local Government to pay the amount of such compensation to the holder or occupier. (Section 6(7)).

Where a Right of occupancy is revoked on the grounds either that the land is required by the Local, State or Federal Government for public good, the holder and the occupier shall be entitled to compensation for the value at the date of revocation of their unexhausted improvements. Unexhausted improvement has been defined by the Act as:

*"anything of any quality permanently attached to the land directly resulting from the expenditure of capital or labour by any occupier or any person acting on his behalf, and*

*increasing the productive capacity, the utility, or the amenity thereof and includes buildings, plantations of long-lived crops or trees, fencing walls, roads and irrigation or reclamation works, but does not include the result of ordinary cultivation other than growing produce".*

**Developed Land** is also defined in the generous manner under **Section 50(1)** as follows:

*"land where there exists any physical improvement in the nature of road development services, water, electricity, drainage, building, structure or such improvements that may enhance the value of the land for industrial, agricultural or residential purposes".*

It follows from the foregoing that compensation is not payable on vacant land on which there exist no physical improvements resulting from the expenditure of capital or labour. The compensation payable is the estimated value of the unexhausted improvements at the date of revocation.

Payment of such compensation to the holder and the occupier as suggested by the Act may appear confusing as it raises the following question: Does it refer to holder in physical occupation of the land or two different parties entitled to compensation perhaps in equal shares? The correct view appears to follow from the general tenor of the Act.

First, the presumption is more likely to be the owner of such unexhausted improvements. Secondly, the provision of **Section 6(5)** of the Act, which makes compensation payable to the holder and the occupier according to their respective interests, gives a pre-emptory directive as to who shall be entitled to what.

Again the Act provides in **Section 30** that where there arises any dispute as to the amount of compensation calculated in accordance with the provisions of **section 29**, such dispute shall be referred to the appropriate Land Use and Allocation Committee. It is clear from **Section 47 (2)** of the Act that no further appeal will lie from the decision of such a Committee. If this is so, then the provision is not only retrospective but also conflicts with the fundamental principle of natural justice, which requires that a person shall not be a judge in his own cause.

The Act must, in making this provision, have proceeded on the basis that the Committee is a distinct body quite different from the Governor or the Local Government. It is submitted, however, that it will be difficult to persuade the public that this is so since the members of the committee are all appointees of the Governor.

Where a Right of occupancy is revoked for public purposes within the state of the Federation; or on the grounds of requirement of the land for the extraction of building materials, the quantum of compensation shall be as follows:

- In respect of the land, an amount equal to the rent, if any, paid by the occupier during the year in which the right of occupancy was revoked.
- In respect of the building, installation or improvements therein, for the amount of the replacement cost of the building, installation or improvements to be assessed on the basis of prescribed method of assessment as determined by the appropriate officer less any depreciation, together with interest at the bank rate for delayed payment of compensation.

With regards to reclamation works, the quantum of compensation is such cost as may be substantiated by documentary evidence and proof to the satisfaction of the appropriate officer.

- In respect of crops on land, the quantum of compensation is an amount equal to the value as prescribed and determined by the appropriate officer.

Where the right of occupancy revoked is in respect of a part of a larger portion of land, compensation shall be computed in respect of the whole land for an amount equal in rent, if any, paid by the occupier during the year in which the right of occupancy was revoked less a proportionate amount calculated in relation to the area not affected by the revocation; and any interest payable shall be assessed and computed in the like manner.

Where there is any building installation or improvement or crops on the portion revoked, the quantum of compensation shall be entitled to compensation for the value at the date of revocation of their unexhausted improvements on the portion revoked.

### 3.2.3 Electric Power Sector Reform No. 6, 2005

This Act deals with acquisition of land and access right for electricity projects among other things. Section 77 of the Act empowers the Nigeria Electricity Regulatory Commission (NERC) to make a declaration that land is required by a license for purpose of generation or distribution of electricity. Section 77 (9) states: *“where the president issues a notice under sub-section 6, the Governor shall in accordance with the provisions of section 28(4) of the Land Use Act, revoke the existing right of occupancy respecting the land and grant a certificate of occupancy in favour of the concerned licensee in respect of the land identified by the commission in such notice.....who shall be entitled to claim compensation in accordance with the provisions of the Land Use Act”.*

## 3.3 INSTITUTIONAL FRAMEWORK

This section gives highlights on relevant institutions through which planning, and implementation of the project will be affected. A number of institutions have been identified and will be involved in the overall implementation of this project. These include:

- The Federal Government of Nigeria (FGN);
- Federal Ministry of Power, Works & Housing (FMPWH)
  - ✓ Transmission Company of Nigeria (TCN)
  - ✓ JICA Project Implementation Unit (PIU)
  - ✓ Ikeja Electricity Distribution Company
  - ✓ Ibadan Electricity Distribution Company
  - ✓ Eko Electricity Distribution Company
- Federal Ministry of Environment
- Nigerian Electricity Regulatory Agency
- National Environmental Standards and Regulatory Enforcement Agency
- Lagos State Government

- ✓ Bureau for Land Survey
- ✓ Bureau for Physical Planning
- ✓ State Ministry of Environment
- Ogun State Government
  - Bureau for Land Survey
  - Bureau for Physical Planning
  - ✓ Ogun State Ministry of Environment;
- Local Government Authorities (LGAs) :
  - Ewekoro LGA
  - Ifo LGA
  - Ado Odo/Ota LGA
  - Badagry LGA
- The Customary Chiefs District Councils and Village Heads

### 3.3.1 The Federal Government of Nigeria (FGN)

Responsibilities for commitments proposed in the RAP exist within Federal Government of Nigeria, ratifications of multilateral and endorsed agreements and conventions, and are delegated internally to the relevant Ministry, which in this case is the Federal Ministry of Power, Works and Housing.

### 3.3.2 Federal Ministry of Power, WORKS & Housing (FMPWH)

All consultation efforts are co-ordinated by the Ministry of Power, Works & Housing through the Transmission Company of Nigeria (TCN). The FMPWH is responsible for the approval of payment of compensation to PAPs. Payment is effected by TCN.

### 3.3.3 Transmission Company of Nigeria (TCN)

TCN as the implementation agency for the project on behalf Federal Government of Nigeria. The TCN established the Project Implementation Unit (PIU) the end to end delivery of the project on its behalf.

### 3.3.4 Project Implementation Unit (PIU)

Is a unit established by TCN with responsibility for the end to end delivery of all JICA funded projects, including planning, feasibility, ESIA, ESMP, RAP, engineering, procurement and construction. PIU, headed by a substantive Project Director with members representing relevant departments serves as the interface with other relevant agencies for this project and the overall coordinator of all efforts for realizing this project.

### 3.3.5 Electricity Distribution Company (DISCO) -Ikeja, Ibadan and Eko

The three Electricity Distribution Companies are part of the 11 power distribution companies that was unbundled from defunct PHCN and successfully privatized and handed over to new investors in November 2013. The Ikeja DISCO is responsible for electricity distribution in Lagos Mainland, while Eko DISCO covers the Lagos Island and Ibadan DISCO covers Ogun State.

The DISCOs own and maintain the distribution network and supporting equipment. In addition, they manage meter installations, carry out servicing and billing, co-ordinate consumer credit and revenue collection. This role makes the DISCOs the direct customers and a major stakeholder in realizing the overall objectives of this project, because they collect revenue from consumers on behalf all other stakeholders in the supply chain from generation to transmission and distribution.

### 3.3.6 Federal Ministry of Environment

This Ministry is responsible for the overall environmental policy of the country. It has the responsibility for ESIA/ESMP implementation, and has developed certain guidelines and regulations to protect the environment and promote sustainable development. It will approve the ESIA/ESMP before the project can go ahead and also monitor the implementation of the ESMP, when the project commences. Furthermore, it can issue directives to the project implementation unit on specific actions related to the environment in the project area. The Ministry normally involves the State and at certain stages the Local Governments in this responsibility depending on the specific activity.

### 3.3.7 Lagos and Ogun States Governments

**Lagos State Lands Bureau:** was established in 1999 to ensure optimal utilisation of land resources to for sustainable development of the state, with the following as its responsibilities;

- (i) Land Policy and Land Matters
- (ii) Acquisition of Land for State purposes
- (iii) Land Registry (Administration & Control) in conjunction with Ministry of Justice
- (iv) Subsequent Transaction including Assignment, Mortgage, Leases, Power of Attorney
- (v) Resolving Land disputes between individuals in conjunction with Ministry of Justice
- (vi) Neighborhood Improvement Charge (NIC) in areas not enumerated
- (vii) Servicing and Monitoring of Land Use Allocation Committee
- (viii) Allocation of Land reclamation in conjunction with other relevant Agencies
- (ix) Compensation for acquired Lands
- (x) Land Use and Allocation Matters
- (xi) Issuance and Revocation of Certificates of Occupancy
- (xii) Dispute resolution on Land Matters
- (xiii) Creation and Management of Residential and Industrial Schemes
- (xiv) Any other duty as may be assigned by the Governor.

**Lagos State Ministry of Environment:** The Ministry of the Environment has the following responsibilities;

- Environmental service matters
- Policy matters on air and other forms of pollution
- Beautification and development of open spaces in the State except horticulture
- Control of outdoor advertisements and signposts
- Field laboratory and geo-physical survey in conjunction with other stakeholders

- Collation of data on industrial hazards and setting of standards
- Monitoring of cemeteries
- Liaison with NAFDAC, NDLEA, FMENV and Lagos State Environmental and Special Offences and Enforcement Unit on any related matter
- Supervision of Lagos State Environmental Protection Agency (LASEPA), Lagos State Waste Management Agency (LAWMA), Lagos State Signage and Advertisement Agency (LASAA) and Lagos State Waste Water Management Office (LSWMO)
- Development, control and maintenance of public parks and gardens
- Evaluation of Environmental Impact Assessment (EIA) and Environmental Audit Report (EAR).
- Control, management and monitoring of public toilets
- Co-ordination of environmental sanitation exercise and protection services
- Initiation, formulation, execution and monitoring of all issues relating to climate change towards mitigating the negative impact of climate change
- Ground water hydrology
- Control of water pollution and hygiene
- Identification and management of gullies and degraded areas
- Preparation of master plan of drainage system in Lagos State
- Collection and disposal of storm water
- Supervision and management of donor agencies assisted projects
- Development and management of drainage plans
- Design, construction and maintenance of primary and secondary collectors
- Supervision of projects on major channels being funded by World Bank
- Laboratory services for sewage, water and environmental pollution
- Control of water pollution and hygiene
- Treatment of waste water
- Liaison with Water Corporation on other related matters.

**Lagos State Ministry of Physical Planning and Urban:** Has the following responsibilities;

- Vetting and Approval of Building Plans
- Undertaking Comprehensive Land use, Re-planning, Improvement (i.e. Reclamation and Re-
- Planning of Oko-Awo and Idumagbo Area
- Housing Development and General Development of Lagos State

**Lagos State Ministry of Women Affairs and Social Development:** has the responsibility

- To promote Gender Equality and provide Empowerment facilities for Socio-economic Development for people displaced by the project in Lagos State
- To promote the survival, protection, participation and development of children

- To promote family harmony and reduce juvenile delinquency
- To provide care, support, rehabilitation and empowerment for the vulnerable groups(challenged persons, older persons, destitute and the likes)

To collaborate and network with Non-Governmental Organisations, Professional Institutions and other MDAs on issues affecting women, children/vulnerable ones

**Ogun State Bureau for Lands and Survey:** This bureau is responsible for the issuance of right of way (ROW) and certificate of occupancy (C of O) for portions of line route and substation sites that falls within Ogun State. Other functions of the Agency include

- Preparation and issuance of Certificates-of-Occupancy and other certificate evidencing titles.
- Preparation and issuance of Right-of-Occupancy.
- Production and printing of Titled Deed Plan (TDP).
- Street naming and house numbering in Ogun State.
- Provision of Geospatial information infrastructure.
- Textual and graphic data on Ogun State, including land record, aerial photographs, satellite images, engineering drawing, and scanned pictures of building.
- Property search and verification of land record.
- Land application processing and administration.

**Ogun Ministry of Urban and Physical Planning:** is responsible for the formulation of Physical Planning policies and the coordination of physical development within the State. Though the Ministry is the policy making body, it has the Urban and Regional Planning Board as its parastatal and is responsible for:

- (i) controlling all various physical developments be it Residential, Commercial, Industrial, Public, and Institutional uses.
- (ii) Monitoring all the development in order to control the growth of Urban Sprawl in Ogun State.

**Ogun State Ministry of Women Affairs and Social Development:** has the responsibility

- To promote Gender Equality and provide Empowerment facilities for Socio-economic Development
- To promote the survival, protection, participation and development of children
- To promote family harmony and reduce juvenile delinquency
- To provide care, support, rehabilitation and empowerment for the vulnerable groups(challenged persons, older persons, destitute and the likes)
- To collaborate and network with Non-Governmental Organisations, Professional Institutions and other MDAs on issues affecting women, children/vulnerable ones.

**Ogun State Ministry of Agriculture** is the organ of Government responsible for formulating policies on food and agriculture for the State. The ministry is to enhance self-sufficiency in food production, provide raw materials for agro-based industries, generate employment opportunities and obtain desirable levels of export in order to improve the country's foreign exchange earnings.

Ogun State has 1.2million hectares of arable land which is 74% of the State's total land area. Only 30% of this arable land or 35,000 hectares is under cultivation. The major crops grown or cultivated in the State include: Cassava, Rice, Maize, Oil-Palm, Cocoa, Rubber, Citrus, Cotton, Soya-Bean, Vegetable, Pine apple, Sugar-Cane, among others. Livestock and fish farming are strong and viable in the State.

The mandate of the ministry include;

- Formulating and implementing agricultural policies and programmes for Ogun State.
- Regulation of farm practice and certification of farm produce.
- Ensuring food safety and food security.
- Promotion of mechanized agriculture.
- Ensuring availability and provision of quality agricultural inputs
- Coordinating agricultural cooperative societies and commodity groups
- Promoting and managing Irrigation Schemes
- Delivery of agricultural research proven technologies to farmers for adoption through effective Extension Services
- Promoting the development of the Livestock and Fishery industries in the State.

**Ogun State Ministry of Environment:** The Ministry of Environment was established in July 2003 with the aim of creating better living and conducive environment for the entire people of Ogun State. The Ministry has five (5) departments and two (2) sister Agencies namely, Ogun Environmental Protection Agency (OGEPA) and Ogun State Emergency Management Agency (SEMA).

- Department of Administration & Supplies: is involved in the management, co-ordination and facilitation of the activities of other Departments.
- Department of Environmental Conservation & Resources Management: is responsible for environmental Sanitation, landscaping and beautification, environmental and natural resources conservation, meteorological services, water shed management and water quality monitoring, climate change, etc.
- Department of Planning, Research & Statistics: plan, undertake research and gather data or information which will allow the Ministry to grow and develop.
- Department of Finance & Accounts: responsible for budgeting and other financial management responsibilities.
- Department of Flood & Erosion Control: Management of flood and erosion issues, including planning, designing, and construction and maintenance of control structures.

### 3.3.8 Local Government Authorities

The project will pass through four LGAs, three in Ogun State -Ewekoro, Ifo and Ado Odo/Ota as well as Badagry LGA in Lagos State. These LGAs are involved in the ESIA approval process. According to the EIA act, the LGAs will have representatives in the panel that will review the report and advise the Minister to make decisions on the project. The LGAs also have roles in the administration of lands in rural areas and hence, will be involved in the resettlement process as well as sites for the substations.

### 3.3.9 The Customary District Councils

The line route will pass through the Chiefdoms as several villages under them. The Obas (traditional head of chiefdom) and Community or Village Heads (Baales) have important role to play in the project with respect to mobilization of the community members to support the project, grievance redress, peace and security of personnel, equipment and facilities to be installed. Close contact and regular consultation shall be maintained with customary chiefs throughout the life of the project.

### 3.3.10 Traditional / Political Governance & Community Organization

Three broad groups are identifiable in each of the communities – male elders, youths and women. The role of male elders is traditional governance of the communities. They dominate the political arena and the decision-making positions, while the youth leaders are usually at the bottom rungs of the ladder of authority. The traditional role of the youths includes constituting a labour force in development projects, security of the community and to enforce law and order.

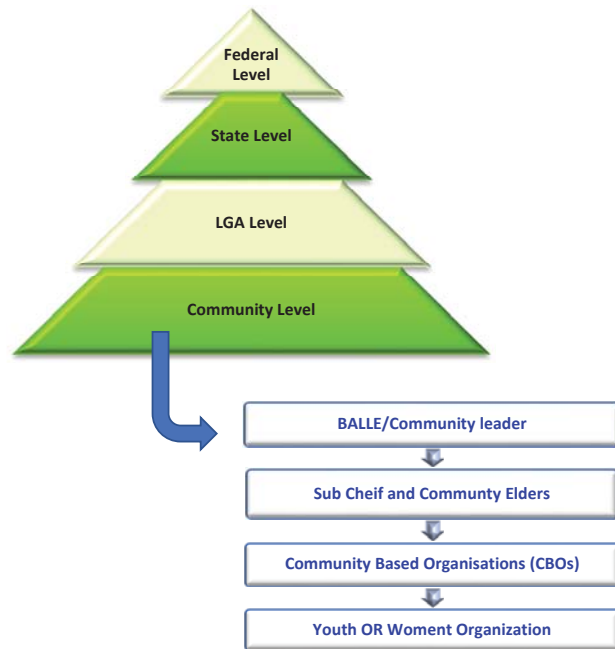


Figure 3.2 Traditional Governance Structure at Village Level

### 3.3.11 Witness NGO

To enhance transparency and trust from PAPs it is suggested that a witness NGO, recognized and credible in the project area, be retained, through a public proposal and selection process, by the PIU

to provide independent advice and report on RAP implementation and management focusing on consultation activities, compensation and resettlement related activities and grievances management. This NGO could be a recognized and credible Human Right advocacy group or an NGO active in environmental management or rural development.

This outside look will ensure that proper procedures and stated compensation processes are followed, that PAP grievances are well taken care of, and that PAPs are treated with fairness.

This NGO will revise reports of compensation payment process, meet with PAPs, check implementation of the measures, reconstruction, etc. in the field, and provide comments and recommendations. All PAPs will be informed of the NGO role and function and need to have access to its representatives, in a confidential manner if necessary, to explain and discuss their difficulties of grievances.

### 3.3.12 Contractors

Each contractor shall appoint a qualified environmental manager who, after approval by the PIU, will be responsible for daily management on-site and for the respect of management measures from the ESMP and RAP. This manager will report regularly to the environment specialist of the PIU during the entire construction period.

Contractors must hold all necessary licenses and permits before the work begins. It will befall on them to provide the PIU with all the required legal documents, including the signed agreements with owners, authorizations for borrow pits and for temporary storage sites, etc.

### 3.3.12 TCN HSE Department

The HSE department of TCN shall be responsible for ensuring implementation of management measures during operation phase (post-commissioning), including audits, compliance monitoring and preparation of periodic reports required by regulations.

## 3.4 INTERNATIONAL FUNDER POLICIES, PROCEDURES AND GUIDELINES

### 3.4.1 World Bank Safeguard Policy (OP 4.12)

Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood<sup>1</sup>) as a result of project-related land acquisition<sup>2</sup> and/or restrictions on land use. The policy has the following objectives;

- Minimize displacement
- Treat resettlement as a development program
- Provide affected people with opportunities for participation
- Assist displaced persons in their efforts to improve their incomes and standards of living, or at least to restore them
- Assist displaced people regardless of legality of tenure
- Pay compensation for affected assets at replacement cost
- Assistance to people referred to as special groups -women and children, very poor people, chronically ill or disabled, etc.

### 3.4.2 IFC Performance Standards for Investment

The IFC Performance Standards are directed towards clients, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities. There are 8 performance standards;

1. Assessment and Management of Environmental and Social Risks and Impacts
2. Labor and Working Conditions
3. Resource Efficiency and Pollution Prevention
4. Community Health, Safety, and Security
5. Land Acquisition and Involuntary Resettlement
6. Biodiversity Conservation and Sustainable Management of Living Natural Resources
7. Indigenous Peoples
8. Cultural Heritage

### 3.4.3 JICA Guideline for Environmental and Social Considerations

The objectives of the guidelines are to encourage Project proponents etc. to have appropriate consideration for environmental and social impacts, as well as to ensure that JICA's support for and examination of environmental and social considerations are conducted accordingly. The guidelines outline JICA's responsibilities and procedures, along with its requirements for project proponents etc., in order to facilitate the achievement of these objectives. In doing so, JICA endeavors to ensure transparency, predictability, and accountability in its support for and examination of environmental and social considerations.

### 3.5 GAP ANALYSIS

The results of gap analysis are presented in the Table 3.1.

**TABLE 3.1 GAP ANALYSIS: LAND USE ACT VS WORLD BANK/JICA REQUIREMENTS**

| Type of property  | National Legislation   | TCN Policies  | OP 4.12 of the WB/JICA Guidelines   | GAP between National Legislation/TCN Policy and WB/JICA guideline  | Proposal to fill the gap  |
|---|--|---|---|--|---|
| <b>COMPENSATION</b>                                     |  |   |   |  |   |
| Lands   | Land Use Act (LUA) 1978 - alternative land can be allocated by the issuing authority for the same purpose based upon the rights held upon such land.                                       | In Nigeria, the Land Use Act of 1978 bestowed land in the hands of government for use of overriding public interest therefore no compensation is paid for lands. Compensation is paid in cash to PAPs | Compensations in kind are recommended. Assistance should be provided for the restoration of productivity and achieving production levels (at least equivalent to the land replaced). The cash compensation is possible if the affected lands account for less than 20% of the household's land. | WB/JICA prefer compensation in kind, while TCN pay cash in line with LUA<br>WB/JICA recognises payment for land, while the LUA Act does not (because it is owned by Government for common public good) | Compensations in cash for loss of assets at full replacement cost to restore and potentially improve the standard of living and/or livelihoods of the displaced populations. Cash compensation is recommended in line with TCN policy to mitigate likely distrust of by PAPs as well as giving them control on their resettlement options.<br>Assistance should be provided for the restoration of productivity and achieving production levels (at least equivalent to the land replaced). |
| Buildings (houses, annexes and other affected property) | Land Use Act 1978 -Cash compensation for improvements based upon market value.   | Compensation for buildings and other properties is based on the present value of depreciation. Pay cash to PAPs to minimise suspicion   | Compensations in kind are recommended. Compensation should be based on the present value of depreciation, as well as all transaction costs (taxes, permits, etc.).  | LUA Compensation is based on unexhausted value (apply depreciation), while WB/JICA is based on replacement value   | Compensation in cash based on replacement value, as well as all transaction costs. The customer will provide to physically displaced people a choice of options for adequate housing with security of tenure.<br>Cash compensation is preferred by TCN and favoured by PAPs.  |
| Crops   | Land Use Act 1978 - the holder and the occupier shall be entitled to compensation for the value at the date of revocation of their unexhausted improvements which includes crops and trees | Compensation is paid using the Federal/ States/ Geopolitical region rates.  | For perennial crops, compensation shall take into account the production delivery time. For annual crops, the land offered as compensation allows the restoration of production.  | Harmonised compensation rates for crops does not take into account land restoration as recommended by WB/JICA  | Crop substitution at the cost of replacing such production.<br>For perennial crops, compensation takes into account the production delivery time.<br>For annual crops, the land offered as compensation allows the restoration of production.   |
| Economic Impact   | The Environmental Impact Assessment (EIA) Act No. 86 of  | In Nigeria, only communities that   | Resettlement program that allows the owner to gain full trade   | No difference  | Resettlement program that allows the owner to gain full trade income flow.  |

RAP of Lagos and Ogun States Transmission Project

| Type of property                                   | National Legislation  | TCN Policies   | OP 4.12 of the WB/JICA Guidelines   | GAP between National Legislation/TCN Policy and WB/JICA guideline                | Proposal to fill the gap  |
|--|---|--|---|--|---|
|  | 1992 is the core legislation that governs EIA in Nigeria. It requires that development projects be screened for their potential impact. Based on the screening, an EIA may be required. Guidelines issued in 1995, the FMEEnv directs the screening process.                              | are re-located from power station site or Dam site that enjoy resettlement program with restored standard of living. | Income flow.  |  | Compensation offered for the recovery cost of commercial activities elsewhere, the loss of net income during the transition period; and transfer fees and relocation of the plant, machinery or other equipment, as applicable.<br><br>Provide replacement property of equal or greater value, or cash compensation at full replacement cost to persons with legal rights or right to claim on the land which are recognized or recognizable under national laws. |
| Assistance to resettled PAPs                       | The Resettlement Plan is based on this tentative implementation schedule of the project. FMP shall submit report to the donor agency, which ensure that all the PAPs are fully compensated and resettled before the start of the construction works.                                      | For power stations and dams whereby resettlement is to be carried out only.  | PAPs should, in addition to the relocation allowance, receive assistance in their resettlement and monitoring thereafter. | TCN/LUA does not provide for allowances and assistance as recommended by WB/JICA | PAPs should, in addition to the relocation allowance, receive assistance in their resettlement and monitoring thereafter to improve their standard of living on another suitable site.  |
| <b>ELIGIBILITY</b>                                 |   |  |   |  |   |
| Legals or customary owners of land and titled land | The Land Act 1978 gives government the right to revoke statutory and customary rights to land for the overriding public interest. The Act gives the government the right to acquire land by revoking both statutory and customary rights of occupancy for the overriding public interest. | Eligible   |   | WB/JICA is silent by different types of land ownership                           | Eligible.   |
| Illegal occupants                                  | All affected lands are owned by the communities, and are going to be restored to  | Compensation for improvements on land.   | Relocation assistance and compensation for lost of assets (other than land).  | No difference  | Relocation assistance and compensation for lost of assets (other than land), and support for the resumption of activities, if any.  |

RAP of Lagos and Ogun States Transmission Project

| Type of property | National Legislation   | TCN Policies  | OP 4.12 of the WB/JICA Guidelines   | GAP between National Legislation/TCN Policy and WB/JICA guideline | Proposal to fill the gap  |
|------------------|--|---|---|---|---|
|                  | occupants by the community and the compliance will be monitored by the FMP/resettlement committee. |   |   |   |   |
| Tenants          | Entitled to compensation based on the amount of rights they hold upon land.                        | Compensation for the improvement such as crops, trees and structures. | They must be compensated, whatever the type of legal recognition of their land tenure (formal or informal). | No difference   | Compensation whatever the type of legal recognition of the land tenure, and support for the resumption of activities, if any. |

## CHAPTER FOUR

### 4.0 STAKEHOLDER CONSULTATIONS

This chapter outlines the public information and consultation process that has been designed and implemented in order to facilitate the informed participation of the project affected persons (PAPs), communities and other stakeholders affected by or with interest in the project. As such, consultation objectives, activities and outcomes are reported.

#### 4.1 CONSULTATION FRAMEWORK

##### 4.1.1 General Objectives

General stakeholder engagement objectives of this study were to:

- Inform stakeholders on the proposed infrastructures and activities and seek their informed opinion about the socio-environmental risks and opportunities potentially associated with the project as well as take the measures and actions in order to manage the anticipated impacts;
- Obtain feedback from stakeholders on issues of concern and expectations in order to optimize the project;
- Generate a social and institutional dialogue in order to assess and strengthen the project's social acceptability;
- Help to consolidate, through the ESIA and RAP process, the efforts made by the TCN in order to establish lasting relationships with affected communities and other stakeholders.

##### 4.1.2 Target Stakeholder Groups

Target stakeholder groups for the stakeholder engagement process include:

- Concerned agencies and organisations at State and National levels;
- State-level (Ogun and Lagos) agencies;
- LGA-level agencies
- Customary authorities in communities affected by the line; -Obas, Ba'ales and Village Heads crossed by the line route.
- Industrial and commercial actors affected by the line, including relevant TCN departments, and JICA.
- Security agencies, national civil security and defence corps, department of security service, and the Nigerian Police

##### 4.1.3 Stakeholder Information and Consultation Stages

Three stakeholder information and consultation rounds were planned, and two has been implemented through the development of the line route survey, the ESIA/ESMP study and RAP of this project. They were planned according to key stages, or decision moments, throughout the study where the informed participation of stakeholders were likely to make the most significant contribution to the on-going analysis.

These included the scoping stage (1st stage), the preliminary route assessment and the documentation of the affected communities and displaced households stage (2nd stage). The third stage of consultations for the disclosure of the findings of the ESIA, ESMP and RAP preliminary results (3rd stage).

Table 4.1 outlines the studies' stakeholder engagement process and presents, for each consultation stage, the specific engagement objectives, target groups and implementation periods.

**TABLE 4.1 STAKEHOLDER CONSULTATION IMPLEMENTATION**

| STAGE   | OBJECTIVES   | TARGET GROUPS  | IMPLEMENTATION PERIOD |
|---|--|--|-----------------------|
| STAGE 1: Environmental and Social Scoping                       | <ul style="list-style-type: none"> <li>• Present the project and the ESIA process to key authorities;</li> <li>• Identify key issues, concerns and expectations related to the project and study area;</li> <li>• Complete the stakeholders' list and validate the general approach for consultations.</li> </ul>  | <ul style="list-style-type: none"> <li>• Transmission Company of Nigeria (TCN)</li> <li>• Concerned ministries</li> <li>• State and LGA Administration</li> <li>• Customary Chief's of areas affected by the line</li> </ul>   | May/June 2017         |
| STAGE 2: Line Route Study                                       | <ul style="list-style-type: none"> <li>• Involve key stakeholders in the analysis of the « hot spots » identified along with the provisional line route.</li> <li>• Inform affected communities and involve them in environmental and social optimization of the line route;</li> <li>• Identify the concerns and expectations of affected communities, displaced households and women;</li> <li>• Inform affected households of their rights and options for resettlement.</li> </ul> | <ul style="list-style-type: none"> <li>• Transmission Company of Nigeria (TCN)</li> <li>• Concerned ministries</li> <li>• Local authorities</li> <li>• State-level and LGA-level authorities and technical services.</li> <li>• Affected people and their leaders.</li> <li>• Women representatives.</li> <li>• Customary chiefs.</li> </ul> | Oct./Nov. 2017        |
| STAGE 3: Disclosure of Preliminary Results (ESIA, ESMP and RAP) | <ul style="list-style-type: none"> <li>• Present, validate and enhance preliminary ESIA and RAP results.</li> <li>• Ensure compliance of the proposed measures with the requirements of regulatory authorities;</li> <li>• Evaluate the social acceptability of the project and its proposed measures.</li> </ul>  | <ul style="list-style-type: none"> <li>• Transmission Company of Nigeria (TCN)</li> <li>• Concerned ministries at national and state levels.</li> <li>• Local authorities and community leaders from affected LGAs.</li> <li>• NGOs.</li> </ul>  | Feb. 2018             |

#### 4.2 FIRST STAGE CONSULTATIONS

The first consultation stage took the combined format of individual semi-structured interviews with community members and customary chiefs as well as group meetings with institutional stakeholders (organisations at national, state and LGA level). This approach has proved to be useful to better define the scope and framework of the RAP study.

The objectives of these meetings are as follows;



- Present the project and the ESIA process to the communities and relevant agencies;
- Identify key issues, concerns and expectations of the communities and agencies related to the project and study area;
- Identify current practices and requirements of each agency related to the project;
- Complete the stakeholders' list and validate the general approach for consultations;
- Identify relevant information sources and collect available data and reports.

#### 4.2.1 Activities Performed in Ogun State

The activities carried out as part of the first-stage stakeholders' engagement in Ogun State are:

- Meeting between TCN top management headed by the MD/CEO and the Governor of Ogun State and other Senior Government Officials at Government House Abeokuta.
- Meetings at State level in Abeokuta with relevant State Ministries, Agencies and affected LGAs in Ogun States.
- Meetings at community level, held in each community within the project area in Ogun States.

Table 4.2 show list of the stakeholders met in Ogun State during the first stage of consultations.

**TABLE 4.2 OGUN STATE STAKEHOLDER GROUPS CONSULTED**

| STAKEHOLDER GROUP   | TYPE OF STAKEHOLDER            | LOCATION OF MEETING                           | DATE       |
|---|--------------------------------|---|------------|
| Ejio (Arigbajo) Communities                                       | PAPs/ Customary Chiefs         | Palace of the Kabiyesi of Ejio                | 25-03-2017 |
| Korogboji Community, Agbara                                       | PAPs/ Customary Chiefs         | Baale of Korogboji's Palace                   | 26-03-2017 |
| Ajgunle(New Agbara) Communities                                   | PAPs/ Customary Chiefs         | Baale of Ajgunle's Palace                     | 25-03-2017 |
| Ogun State Bureau of Lands  | Institutional                  | Dept of Energy Office, Ogun State             | 11-05-2017 |
| Ogun State Ministry of Rural Development                          | Institutional                  | Dept of Energy Office, Ogun State Secretariat | 11-05-2017 |
| Ogun State Ministry of Communication, Development and Cooperation | Institutional                  | Dept of Energy Office, Ogun State Secretariat | 11-05-2017 |
| Ogun State Bureau Of Electrical                                   | Institutional                  | Dept of Energy Office, Ogun State             | 11-05-2017 |
| Ogun State Ministry Of Housing                                    | Institutional                  | Dept of Energy Office, Ogun State             | 11-05-2017 |
| Ogun Governor's Office  | Institutional                  | Dept of Energy Office, Ogun State             | 11-05-2017 |
| Transmission Company of Nigeria                                   | Promoter                       | Dept of Energy Office, Ogun State             | 11-05-2017 |
| <b>TOTAL NUMBER OF PARTICIPANTS</b>                               | <b>52 (including 12 women)</b> |   |            |



Plate 4.1 Scoping Meeting with Ogun State



Plate 4.2 Scoping Meeting with Ejio Community

#### 4.2.2 Activities Performed in Lagos State

The activities carried out as part of the first-stage stakeholders' engagement are:

- Meeting between TCN top management headed by the MD/CEO and the representative of the Governor of Lagos State in Abuja.
- Meetings at State level in Ikeja with relevant Federal and State Ministries, Agencies and affected LGAs
- Meetings at community level, held in each community within the project area in Lagos State.

Table 4.3 show lists the stakeholders met during the first consultation stage.

**TABLE 4.3 LAGOS STATE STAKEHOLDER GROUPS CONSULTED**

| STAKEHOLDER GROUP                                   | ROLE OF STAKEHOLDER   | LOCATION OF MEETING             | DATE       |
|---|---|---------------------------------|------------|
| Yafin Community, Badagry                            | Beneficiary   | Baale's Palace                  | 26/03/2017 |
| Badagry LGA   | Local Government administration   | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| NBET  | Electricity trading (link between generators, transmitter and distribution) | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| NSCDC   | security safeguard of national infrastructures                              | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Office of the Surveyor General                      | Issues land permit  | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Federal Road Safety Corp                            | Safety of road transportation system  | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Ministry of Water Front Infrastructure              | regulates developments in water fronts in Lagos State                       | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| LASIMRA   | regulates infrastructural developments in Lagos State                       | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Lagos State Ministry of Transport                   | Owns Lagos state government constructed roads                               | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Ministry of Physical Planning and Urban Development | coordinates urban development   | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Lagos State Ministry of Environment                 | protection of Lagos environment   | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| JICA  | Financier of the project through a loan                                     | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Transmission Company of Nigeria                     | owner of the project  | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| LASEPA  | regulatory agency for environment in Lagos State                            | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Tripod Limited                                      | NGO   | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Ikeja Electric Distribution Company                 | electricity distribution on Lagos mainland                                  | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Nigerian Inland Waterways Agency                    | controls water transport  | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Nigerian Conservation Foundation                    | NGO   | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Lagos State Electricity Board                       | Provides electricity infrastructure in rural Lagos                          | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| NEMSA   | Electricity measurement standard agency                                     | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Eko Electricity Distribution                        | electricity distribution on Lagos Island                                    | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Lands Bureau  | Administration of land in Lagos   | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| Department of State Services                        | National security   | Primal Hotel Hall, Ikeja, Lagos | 22-06-2017 |
| <b>TOTAL NUMBER OF PARTICIPANTS</b>                 | <b>47 (including 6 women)</b>   |                                 |            |



Plate 4.3 Scoping Meeting in Lagos State

#### 4.2.3 Outcomes and Results Obtained

The following results were achieved from the consultations:

- The communities understood the objectives and requirements of the project and pledged support and cooperation;
- The relevant agencies are aware of the project and the ESIA process (team, objectives and schedules);
- The requirements of Ogun State and Lagos State Laws and Regulations relevant to the project were highlighted by the agencies and understood by TCN and its consultants;
- The main stakeholders' concerns and expectations were documented and have been considered for inclusion in the scope of the studies;
- A preliminary list of stakeholders was completed and the orientations of the Stakeholder Engagement Framework was enhanced;
- The Ogun State Governor established a committee to provide support for the project, while Lagos State Governor provided a high ranking cabinet member (Commissioner for Energy) to coordinate Lagos State support for the project.

Table 4.4 provides a summary of the main comments and recommendations made by stakeholders in Ogun State on different social and environmental issues of concern to them with respect to the project. Responses provided on the spot, where applicable were also provided.

TABLE 4.4 COMMENTS BY STAKEHOLDERS IN OGUN STATE

| TOPIC                      | CONCERNS, COMMENTS AND RECOMMENDATIONS  | STAKEHOLDERS THAT MADE THE COMMENT / RECOMMENDATION | ACTIONS THAT ADDRESS CONCERNS                      |
|----------------------------|---|---|--|
| Location of Proposed Sites | Some sites are under acquisition while others are free. The ones that are free, Government will acquire for the project in the interest of the public but the project will be responsible for the processing charges. | OGSG/ Bureau of Lands and Survey                    | The lands needed will be compiled and sent to OGSG |

| TOPIC              | CONCERNS, COMMENTS AND RECOMMENDATIONS  | STAKEHOLDERS THAT MADE THE COMMENT / RECOMMENDATION | ACTIONS THAT ADDRESS CONCERNS  |
|--------------------|---|---|--|
|                    | The Governor mentioned that need to raise the lines where crossing rail lines eg. Lagos – Ewekoro (Lafarge Cement) rail line at Apomu village   | Bureau of Lands and Survey                          | This shall be included in the EPC contract   |
| Project Components | Requested additional substation as follows<br>In Ijebu Area, which will be in Obere to feed Ogun East.<br>Aiyetoro to feed the communities along Benin Border.<br>Idi-Iroko, Waasimi axis.<br>The State Government will provide land and fast track approval of the substation sites and ROW acquisition, while TCN will pay for the processing only. | Department Power/Energy, Governor's Office          | TCN explained that there will be no need for building substations as the proposed substations will be sufficient for the areas mentioned. All that is needed is to invest in distribution infrastructure |
| Substations Sites  | Ejio – Under Government acquisition. TCN needs to apply for de-acquire and re-acquire   | Bureau for Lands and Survey                         | Application along with supporting documents will be prepared and submitted   |
| Line corridor      | Ajegunle SS – Free, Government will acquire on behalf of TCN and issue C of O<br>Ejio – Ajegunle – Within Government acquisition and some are free<br>Ajegunle- Badagry – Partly free and within Government acquisition   | Bureau for Lands and Survey                         |  |

Table 4.5 provides a summary of the main comments and recommendations made by stakeholders in Lagos State on different social and environmental issues of concern to them with respect to the project. Responses to these inputs from stakeholders are also provided, where applicable.

TABLE 4.5 COMMENTS BY STAKEHOLDERS IN LAGOS STATE

| TOPIC             | CONCERNS, COMMENTS AND RECOMMENDATIONS   | STAKEHOLDERS THAT MADE THE COMMENT / RECOMMENDATION | ACTIONS TO ADDRESS CONCERNS  |
|-------------------|--|---|--|
| Security          | Give warning signals where challenges from host communities may arise, provide real time security  | DSS   | Schedule of field activities will be shared with security agencies |
|                   | Where security issues occur, there should be a formal request to the Commandant General requesting for man power/ motorised patrols and aerial surveillance.<br>Collaboration with other security agencies | NSCDC   |  |
| Compensation/ RAP | Who is responsible for compensation  | Lands Bureau  | TCN is responsible for payment                                     |

| TOPIC                     | CONCERNS, COMMENTS AND RECOMMENDATIONS   | STAKEHOLDERS THAT MADE THE COMMENT / RECOMMENDATION | ACTIONS TO ADDRESS CONCERNS  |
|---------------------------|--|---|--|
| Lines Crossing Water Ways | Seek for permission before it crosses any major water ways and obtain permit. Any line of construction between 100m of the shore line will need permit   | NIWA  | There is no Section of the line that crosses navigable or major waterway   |
| Survey                    | Is it the office of the Surveyor General that will do the survey?<br>Provide preliminary line route to see how it will affect the development in that area.<br>What informed the choice of Yafin community as location for substation?<br>There is plan for a deep sea port in Badagry area. Supply maps to the Surveyor General's office, to check against other plans. | Office of the Surveyor General                      | TCN has hired consultants to do the line survey, ESIA and RAP. Surveyor General will be consulted  |
| Environment               | Consult Lagos State Environment Protection Amendment Law 2017<br>Asses Alternative Routes?<br>Ensure safety of workers and community<br>You need a forest permit from LASPARK before any tree can be cut.<br>Do not permit use of herbicide<br>protect birds and biodiversity areas<br>Waste Management issue  | LASEPA  | These will be included in the scope of the studies.<br>Requirement for forest permit will be included in the ESMP  |
|                           | Biodiversity Management should be developed and included in the ESMP.<br>Stick to faithful implementation of the report  | NCF   | These will be included in the scope of the studies   |
| Traffic                   | How do we handle traffic generated from movement of equipment during the construction phase  | Ministry of Transport and FRSC                      | Traffic study will be carried out at major road crossings  |
| Line route/ ESIA          | Would like to know the scope of work, duration of the project and advised to consult Ministry of Local Government Community Affairs  | LSEB  | Scope of the project was further clarified   |
| Cultural heritage         | Respect Historical Heritage sites. Local Government is the coordinator for CDC's   | Badagry LGA   | Physical cultural properties including heritage sites is in the scope of the ESIA (see physical cultural resources management plan).<br>Physical cultural resources was also one of the criteria for line route. |
| Line route                | ROW in that area has been given to NIPP so if additional ROW is needed, TCN should check   | Ministry of Physical Planning                       | The NIPP project is not in the same area. The  |

| TOPIC                   | CONCERNS, COMMENTS AND RECOMMENDATIONS  | STAKEHOLDERS THAT MADE THE COMMENT / RECOMMENDATION | ACTIONS TO ADDRESS CONCERNS   |
|-------------------------|---|---|---|
|                         | with the Ministry to see if it can be accommodated within the gazetted ROW<br>Respect physical planning regulations 2005 with emphases on setbacks, substations |   | line covered by this project is from Ajegunle to Yafin Village.<br>Setback distance by NERC is 15m and is respected by this project |
| Encroachment            | How do we intend to stop construction under ROW/ transmission line  | IKEDC   | Periodic monitoring and involvement of NSCDC  |
| Support for the project | Will like to collaborate with TCN/Consultants to ensure hitch free process  | EKEDC   | EKEDC is a critical partner in the project  |
| Support for the project | Want to be part of the project from commencement to decommissioning   | NEMSA   | NEMSA has been involved in the project along with other key stakeholders  |

### 4.3 SECOND STAGES OF CONSULTATION

The second stage of stakeholder information and consultation to present the preliminary line route, as well as methodology and approach for ESIA and RAP study. At the same obtain feedback to refine the approach and the methodology and include concerns expressed in the study.

#### 4.3.1 Activities Performed

The activities carried out as part of the second stakeholder engagement stage are:

- Meetings in Abuja, Abeokuta and in the communities with relevant ministries and agencies.
- Meetings with PAPs in each community affected by the line route
- Field trip to show to stakeholders where the line will pass.
- Printed and digital line route map as well as images illustrating examples of the type of proposed infrastructure (pylons and lines) were also exhibited. A project background information document, in a poster form was produced and distributed by the consultant to the authorities and representatives prior to meetings for public advertising.
- PAPs were invited to attend the village level meetings with the Village Chief or District Head in their communities. The meetings included women (17%) as well as youths in each village (see attendance register in Appendix 3A).

**TABLE 4.6 STAKEHOLDER GROUPS MET DURING SECOND STAGE CONSULTATIONS**

| Stakeholder Group | Type of | Location of Meeting | Date |
|-------------------|---------|---------------------|------|
|-------------------|---------|---------------------|------|

|   | Stakeholder                               |  |                     |
|---|---|--|---------------------|
| Transmission Company of Nigeria                                     | Promoter                                  | TCN Office, Abuja                              | 31-08-17            |
| Field Visit with TCN and Relevant Agencies in Lagos and Ogun States | Institutional                             | Various Hotspots along the proposed line route | 05-09-17 & 06-09-17 |
| Affected Communities  | Community leaders and PAPs                | Apomu  | 19-11-17            |
|   |   | Leshi  |                     |
|   |   | Joga Owode                                     |                     |
|   |   | Sowole   | 20-11-17            |
|   |   | Oke Oji  |                     |
|   |   | Atan Iju Ilogbo                                |                     |
|   |   | Alapako  |                     |
|   |   | Coker Igbogun                                  | 21-11-17            |
|   |   | Gbeko  |                     |
|   |   | Idolehin                                       |                     |
|   |   | Ijegemo  |                     |
|   |   | Onilogbo                                       |                     |
|   |   | Iberese  | 26-11-17            |
|   |   | Abisoye  |                     |
|   |   | Asokere  |                     |
|   |   | Bandu  |                     |
|   |   | Adigbon  |                     |
|   |   | Igbele Ajana                                   | 01-12-17            |
|   |   | Ajegunle                                       |                     |
|   |   | Ejio   | 02-12-17            |
| Erekiti   |   |  |                     |
| Tohon   | 08-12-17                                  |  |                     |
| Yafin   |   |  |                     |
| TOTAL NUMBER OF PARTICIPANTS  | Total participants 119 including 12 women |  |                     |

**NOTE:** The communities listed were the ones known to have been affected by the project at that time. Full list of communities affected, as identified during the field survey is Appendix 1.



Plate 4.4 Presentation of the Line Route to Baale of Ajegunle, Ado Odo/Ota LGA



Plate 4.5 Presentation of the Line Route to Institutional Stakeholders in Abeokuta

#### 4.3.2 Outcomes and Results Obtained

Issues raised by stakeholders during second stage consultations are in Table 4.7

**TABLE 4.7 COMMENTS BY STAKEHOLDERS DURING SECOND STAGE CONSULTATIONS**

| SECTIONS OF THE LINE   | COMMENTS AND RECOMMENDATIONS   | STAKEHOLDERS THAT MADE THE COMMENT / RECOMMENDATION | ACTIONS THAT ADDRESSES COMMENTS  |
|--|--|---|--|
| Ejio-Arigrbajo-Apomu axis                                      | <b>Option C:</b> consider running parallel to the Lagos-Ibadan Expressway on the left-hand side of the road (Northwards) before going left.  | TCN   | This was not possible, because of the need to avoid a shrine (6.848790°N, 3.201160°E) in Arigrbajo Forest as well as Mobile Petrol Station (6.854169°N, 3.191616°E) along the road |
|  | <b>OPTION B:</b> Try to avoid the structures around Lat 6.835046, Long 3.138859.   | TCN   | The line route has been amended to avoid the structures indicated  |
|  | <b>Option B:</b> Try to avoid a ware house around Lat 6.612138 and Long 3.013081   | TCN   | The warehouse has been avoided   |
|  | <b>Option C:</b> Try to reduce the number of angle greater than 15°  | TCN   | The multi-criteria modelling used in analyses of route alternatives took into account the number of angle points.  |
| 330kV Line Crossing Lagos-Abeokuta Expressway at Apomu Village | Take the line to avoid Mobil filling station at Apomu village, to minimise compensation costs.   | TCN   | The Mobile Petrol station has been avoided completely.   |
| 330kV line at Igbogun-Olaogun Village                          | <b>Option B:</b> Realign the line to avoid the police station opposite Obasanjo's House Also avoid the telecommunication mast Shift, with at least 10m clearance from the corridor | Ogun State Ministry of Environment                  | The final line route avoided the Police Stations well as all telecommunication towers along the route.   |

| SECTIONS OF THE LINE                               | COMMENTS AND RECOMMENDATIONS  | STAKEHOLDERS THAT MADE THE COMMENT / RECOMMENDATION | ACTIONS THAT ADDRESSES COMMENTS   |
|--|---|---|---|
| 132kV line at OPIC Estate Agbara Industrial Estate | Shift the Line to avoid palm oil mills and houses as much as possible.  | Ogun State Lands Bureau/Ministry of Environment     | All large palm plantations along the route including those in Aiyeye, Igbele, Agbara, etc has been avoided  |
| Yafin Community Jetty                              | <b>Option B:</b> passing by the shoreline, but shift the line, such that the corridor is least 10m from nearest residence and completely avoiding crossing over the jetty at Yafin Village  | Lands Bureau and LASIMRA                            | The center line is more than 50m from the Yafin Jetty against 15m setback recommended by NERC.  |
| General  | Optimise, and do a cost benefit analysis to ascertain the best line route   | MPP & UD  | The three-line route alternatives subjected to multi-criteria analyses involving, economic, social and environmental issues   |
| General Comments by Community leaders              | Compensation should be paid directly to PAPs and not through any third party. PAPs request that they be paid in cash instead of building houses for them. They argue that they want to decide the new location by themselves and control the cost and quality to avoid trust issues | Communities   | Although the OP 4.12 discourages cash for land, the Land Use Act allows it. TCN also prefer cash compensation as a policy. Hence, cash payment will be adopted to respect request of the affected people. |
| Yafin Village                                      | The corridor crossed two shrines, which cannot be moved and also proposed site for Baale's Palace. Need to avoid them   | Baale of Yafin                                      | The line has been re-aligned and the sacred sites were avoided  |
| Tohun Village                                      | The corridor crossed the middle of the small community of Tohun   | Baale of Tohun                                      | The line was adjusted, to pass at the Southern side of the community, thereby minimising houses affected  |
| Igbele Village                                     | The corridor affects palm oil factory and its plantations, which should be avoided considering people driving livelihood from the factory as workers  | Community members                                   | The line was adjusted to avoid the factory and its palm plantations.  |

#### 4.4 THRID STAGE OF CONSULTATION

The third stage of stakeholder consultation presented the preliminary results of the ESIA and RAP with the following objectives;

- To obtain feedback to validate and enhance preliminary ESIA and RAP results.
- Ensure compliance of the proposed measures with the requirements of regulatory authorities;
- Evaluate the social acceptability of the project and its proposed measures.

##### 4.4.1 Activities Performed

The activities carried out as part of the third stakeholder engagement stage are:

- Meetings in Abuja with TCN, Abeokuta and in the communities.
- Summary of impacts and mitigation were presented, and the draft report were shared with relevant agencies for comments.
- ESIA and RAP report were placed on public display for 30 days in the 4 LGAs affected by the project for general public to comment. This was advertised in newspapers and radio stations in the area.

**TABLE 4.8 STAKEHOLDER GROUPS MET DURING THIRD STAGE**

| Stakeholder Group  | Type of Stakeholder                                    | Location of Meeting | Date       | Total number pf participants | No of Women |
|--|--|---------------------|------------|------------------------------|-------------|
| Transmission Company of Nigeria (TCN)  | Promoter   | Abuja               | 08/05/2018 | 19                           | 2           |
| Panel of Experts, Federal Ministry of Environment, Ogun State Ministry of Environment, Lagos State Ministry of Environment, affected communities' heads, PAPs and general public | Regulators, affected people and concerned institutions | Abeokuta            | 19/10/2018 | 252                          | 38          |
| Concerned government ministries at and agencies  | Institutional  | Abeokuta            | 26/04/2018 | 32                           | 1           |
| NGO  | Conservation Foundation                                | Lagos               | 07/03/2018 | 12                           | 1           |

#### 4.4.2 Outcomes and Results Obtained

Summary of comments by the stakeholders that participated in the 3<sup>rd</sup> round of consultation are as follows;

- Ogun State bureau for lands and survey require satellite imagery with the line route and substation survey plan superimposed as part of requirements for issuing permit.
- The PAPs indicated their preference for payment through check rather than bank transfer.
- TCN requested for a downward review of the compensation budget, because it was considered too high.
- Shepherd school who are the owners of a portion of the Ajegunle substation requested that the location for their proposed main gate, along the Ajegunle Road be preserved.
- Comments by the NGO are presented in Section 4.4.3.
- Federal Ministry of Environment did make any comment to the RAP, but their comments on the ESIA has been addressed in the revised ESIA submitted to them (see ESIA report).

#### 4.4.3 Outcome of Consultations with NGO

The Nigerian Conservation Foundation (NCF) is an NGO dedicated to nature conservation and sustainable development in Nigeria, established in 1980 and was registered in 1982 as a Charitable Trust under the Land (Perpetual Succession) Act of 1961 - a policy that was replaced by the Company and Allied Matters Act of 1990.

NCF was invited to participate in the scoping meeting held in Lagos on 22<sup>nd</sup> June 2017. A meeting of stakeholders also took place on March 07 2018 with the participation of TCN and JICA, where the results of ESIA and RAP was discussed.

After presentation of the project and results achieved the following discussions took place.

- NCF is currently working on IWC (International Water bird Census), which is organized by Wetlands International, to monitor the migratory birds in Badagry area. IWC was also conducted in December 2017- January 2018 at Badagry area. The IWC report in 2017 is available and can be shared with the team.

- Some of the bird species listed as migratory bird is not migratory species, therefore, further review may be necessary. It is agreed that TCN will share the draft ESIA report to NCF to provide their feedback for the potential impact on ecosystem from the proposed project.
- There is no fact that the presence of transmission line causes bird strike around the project area. However, since no bird strike survey has been conducted, NCF has been planning to carry out such a survey to understand actual situation of bird strike.
- Migration route is not main concern for NCF since bird can fly over transmission lines; however NCF concerns place to stay in winter.
- December is a good timing for bird survey since many species of bird visit the area since the migratory birds fly from outside of Nigeria, e.g. Europe from December to February in general (the biodiversity survey in this ESIA study was conducted in December 2017).
- NCF has been working on several projects for local community to enhance their way of livelihood in sustainable manner. For example, NCF is educating local people to find alternative livelihood resource such as chicken farming, instead of hunting.
- NCF accommodates about 90 staffs and there are several project offices throughout Nigeria. The staff of NCF works as project officer for the community support project.
- NCF shows their interest for the collaboration of TCN's project if there is any opportunity

As a follow up to the meeting the ESIA report was shared with NCF and the comments received as well as responses generated are in Table 4.8. Furthermore, NCF also sent a report of bird survey they conducted in the Mangrove Swamp area around Badagry (See Appendix 3A).

**TABLE 4.9 NCF COMMENTS AND RESPONSE**

|  |   |  |
|--|---|--|
| <b>COMMENT FROM NCF MINUTES OF MEETING</b>   | Some species listed are not migratory   |  |
| <b>RESPONSE</b>  | Four (4) species were listed as migratory in the ESIA. These species are; <ul style="list-style-type: none"> <li><i>Ardea alba</i>,</li> <li><i>Ardea cinerea</i>,</li> <li><i>Egretta garzetta</i>, and</li> <li><i>Milvus migrans</i></li> </ul> All were either full migrants or partial.          | References; <ul style="list-style-type: none"> <li>Habitat/Ecology section of IUCN RED LIST 2017 version 3</li> <li>Ringim, A. S., Magige, F. J. &amp; Jasson, R. M. (2017). 'A comparative study of species Diversity of Migrant Birds Between Protected and Unprotected Areas of the Hadejia-Nguru Wetlands, Nigeria'</li> <li>Checklist of Western Palearctic birds species migrating within Africa 2004</li> </ul> |
| <b>RESPONSE TO NCF REQUEST TO INCORPORATE RESULT OF THEIR STUDY INTO THE ESIA REPORT</b> | It is believed that the essence of adding the document '2016 coastal flyway counts for Nigeria: A water birds count along the coastal creeks and Estuaries in Badagry and Calabar' is to possibly incorporate the Avian species inventory of Badagry area into the draft ESIA report.                 |  |
|  | It would not be proper to add inventory of species obtained from a mangrove wetland (see page 2 of PDF document sent by NCF) to the LAGUN report which do not cut across (see project RoW and habitat classification in the EIA report). The Badagry SS where the ROW terminates is a Riparian Swamp. |  |



Consultation at lakpa koOke



Consultation at AiogboAkia



Consultation at Ibo



Consultation at Zisu



Consultation at Igbosa



Consultation at Iraebo



Consultation at Zinve



Consultation at IragbonThogli



Consultation at Bandu



Consultation at Shoiuolu



Consultation at Eio



Consultation at Ijegemo Isale Odo



Consultation at Zinsu Ijegemo



Consultation at Egudu Adeshina

**Plate 4.6 Community Consultations**

## CHAPTER 5

### 5.0 RESULT OF CENSUS SURVEY SOCIO-ECONOMIC BASELINE OF THE PROJECT AFFECTED PERSONS

#### 5.1 GENERAL DESCRIPTION OF THE PROJECT AREA AND PROJECT AFFECTED PERSONS

**TABLE 5.1 PROJECT-AFFECTED AREA AND PERSONS**

| Lot #        | Local Government Areas (LGAs) | Number of Affected Communities | Estimated Length of ROW across LGAs (km) | Baseline Census Dates    |
|--------------|-------------------------------|--------------------------------|--|--------------------------|
| 3            | Ewekoro                       | 9                              | 15                                       | 16/01/2018 to 22/01/2018 |
|              | Ifo                           | 17                             | 5  | 23-01-18                 |
|              | Ado-Odo/Ota                   | 49                             | 50                                       | 24/01/2018 to 10/02/2018 |
|              | Badagry                       | 7                              | 11                                       | 11/02/2018 to 15/02/2018 |
| <b>Total</b> |                               | <b>82</b>                      | <b>81</b>                                |                          |

[Data source] EEMS Field Survey

**TABLE 5.2 SUMMARY OF PAPS IN EACH LGA**

| Lot # | LGA          | (1) Land owner without any structures and activities | (2) residential land  |  |          |  | (3) Agricultural land |              | (4) Commercial land |              |          | (5) Encroacher |           | (6) Others (religious building, Public building, etc.) |           |
|-------|--------------|--|-----------------------|--|----------|--|-----------------------|--------------|---------------------|--------------|----------|----------------|-----------|--|-----------|
|       |              |  | land owner with house | Secondary residence (house owner without land) |          | Residential Tenant holder without land | with land             | without land | With land           | without land | employee | without land   | With land |  |           |
|       |              | PAPs   | HHS                   | PAPs   | HHS      | PAPs                                   | PAPs                  | PAPs         | PAPs                | PAPs         | PAPs     | HHS            | PAPs      | Number   |           |
| 3     | Ewekoro      | 37   | 521                   | 3230   | 0        | 0                                      | 0                     | 335          | 406                 | 9            | 1        | 0              | 0         | 0  | 12        |
|       | Ifo          | 44   | 77                    | 477  | 2        | 9                                      | 49                    | 267          | 380                 | 2            | 0        | 0              | 0         | 0  | 0         |
|       | Ado-Odo/Ota  | 247  | 577                   | 3577   | 1        | 6                                      | 34                    | 670          | 1123                | 14           | 4        | 0              | 0         | 0  | 4         |
|       | Badagry      | 12   | 9                     | 56   | 0        |  | 0                     | 0            | 57                  | 0            | 0        | 0              | 0         | 0  | 0         |
|       | <b>TOTAL</b> | <b>340</b>   | <b>1184</b>           | <b>7340</b>                                    | <b>3</b> | <b>15</b>                              | <b>83</b>             | <b>1271</b>  | <b>1966</b>         | <b>25</b>    | <b>5</b> | <b>0</b>       | <b>0</b>  | <b>0</b>   | <b>16</b> |

[Data source] EEMS Field Survey

**Note:** Number of PAPs are double-counted because some household own land that is used for multiple purpose, i.e. Residential, agricultural and commercial.  
HHS: households

## 5.2 DEMOGRAPHICS OF AFFECTED PEOPLE

### 5.2.1 Age and Sex Structure

**TABLE 5.3 POPULATION DATA IN PROJECT AFFECTED AREA (2016)**

| LOT # | LGA         | TOTAL   | MALE | FEMALE |
|-------|-------------|---------|------|--------|
| 3     | Ewekoro     | 76,600  | 51%  | 49%    |
|       | Ifo         | 750,000 | 51%  | 49%    |
|       | Ado-Odo/Ota | 733,400 | 51%  | 49%    |
|       | Badagry     | 327,400 | 51%  | 49%    |

[Data source] National Population Commission projection from 2006 census

### 5.2.2 Households Affected

The total number of households affected by the is 3,479 with Ado Odo LGA having the highest with 1,921 (55%) and Badagry LGA the least with 66 households (1.9%). Female heads of households constitute 12.7% of the total households (see Table 5.4).

**TABLE 5.4 PROJECT AFFECTED HOUSEHOLDS**

| Lot #        | Local Government Areas (LGAs) | Gender of Head of Households |              | Total (Project Affected Households: PAHs) |
|--------------|-------------------------------|------------------------------|--------------|---|
|              |                               | Male                         | Female       |   |
| 3            | Ewekoro                       | 823                          | 130          | 953                                       |
|              | Ifo                           | 486                          | 53           | 539                                       |
|              | Ado-Odo/Ota                   | 1667                         | 254          | 1921                                      |
|              | Badagry                       | 61                           | 5            | 66  |
| <b>Total</b> |                               | <b>3037</b>                  | <b>441</b>   | <b>3479</b>                               |
|              |                               | <b>87.3%</b>                 | <b>12.7%</b> | <b>100%</b>                               |

[Data source] EEMS Household Survey

**TABLE 5.5 MARITAL STATUS OF HEADS OF HOUSEHOLDS**

| Lot #        | Local Government Areas (LGAs) | Marital Status |              |             |                     | Total         |
|--------------|-------------------------------|----------------|--------------|-------------|---------------------|---------------|
|              |                               | Single         | Married      | Widowed     | Divorced/ Separated |               |
|              | Ewekoro                       | 202            | 601          | 76          | 74                  | 953           |
|              | Ifo                           | 114            | 339          | 43          | 42                  | 539           |
|              | Ado-Odo/Ota                   | 407            | 1210         | 154         | 150                 | 1921          |
|              | Badagry                       | 14             | 41           | 5           | 5                   | 66            |
| <b>Total</b> |                               | <b>737</b>     | <b>2192</b>  | <b>278</b>  | <b>271</b>          | <b>3478</b>   |
|              |                               | <b>21.2%</b>   | <b>63.0%</b> | <b>8.0%</b> | <b>7.8%</b>         | <b>100.0%</b> |

[Data source] EEMS Household Survey

**TABLE 5.6 HOUSEHOLD SIZE AFFECTED**

| Lot #        | Local Government Areas (LGAs) | Household Size |              |              |             |             | Total       |
|--------------|-------------------------------|----------------|--------------|--------------|-------------|-------------|-------------|
|              |                               | 1 to 2         | 3 to 5       | 6 to 10      | 11 to 15    | >15         |             |
|              | Ewekoro                       | 60             | 518          | 277          | 58          | 40          | 953         |
|              | Ifo                           | 34             | 293          | 157          | 33          | 23          | 539         |
|              | Ado-Odo/Ota                   | 121            | 1043         | 558          | 116         | 80          | 1920        |
|              | Badagry                       | 4              | 36           | 19           | 4           | 3           | 66          |
| <b>Total</b> |                               | <b>219</b>     | <b>1889</b>  | <b>1011</b>  | <b>211</b>  | <b>147</b>  | <b>3478</b> |
|              |                               | <b>6.3%</b>    | <b>54.3%</b> | <b>29.1%</b> | <b>6.1%</b> | <b>4.2%</b> | <b>100%</b> |

[Data source] EEMS Household Survey

### 5.2.3 Dependency Rate

The total dependency ratio is the proportion of the population not in the work-force who are 'dependent' on those of working-age, it's a calculation which groups those aged under 15 with those over 65 years as the 'dependants' and classifying those aged 15-65 years as the working-age population.

You can calculate the ratio by adding together the number of children (aged under 15 years), and the older population (aged 65+), dividing that percentage by the working-age population (aged 15-65 years), multiplying that percentage by 100 so the ratio is expressed as the number of 'dependants' per 100 people aged 15-64 years. The higher the dependency ratio, the more people who are not of working age, and fewer who are in the labour force (and paying taxes). The age group distribution of the total population affected is shown in Table 5.7

**TABLE 5.7 DEPENDENCY RATE AMONG AFFECTED POPULATION**

| Age Bracket (years) | Ewekoro      | Ifo          | Ado-Odo/Ota   | Badagry    | TOTAL         |
|---------------------|--------------|--------------|---------------|------------|---------------|
| 01-14               | 2,056        | 1,288        | 4,368         | 155        | 7,867         |
| 15-39               | 1,659        | 925          | 3,393         | 115        | 6,092         |
| 40-65               | 1,531        | 901          | 2,954         | 106        | 5,492         |
| >65                 | 663          | 228          | 1,195         | 33         | 2,119         |
| <b>TOTAL</b>        | <b>5,909</b> | <b>3,342</b> | <b>11,910</b> | <b>409</b> | <b>21,570</b> |
| Dependency Ratio    | 85.24%       | 83.02%       | 87.65%        | 85.16%     | 86.21%        |

[Data source] EEMS Household Survey

Using the method described, the national average for Nigeria 88.2% in 2015, up from 87.9% in 2010 (NBS, 2016). However, one of the obvious limitations of dependency ratios is the assumption that people under 15 years and over 65 years are outside of the labour force, as well as the assumption that those aged 15-64 are participating in the labour force. Although the retirement age in Nigeria is 65 years, it is rarely applied particularly in the private sector. Furthermore, people that retire at that always get engaged either being self employed or contract jobs.



### 5.2.4 Education and Literacy

UNESCO defines literate person as one who can with understanding both read and write a short simple statement on his(her) everyday life in any language, and an illiterate person as one who cannot with understanding both read and write a short simple statement on his (her) everyday life.

The Education attainment status of Heads of Households (HofH) affected by the project is in Table 5.8, while the literacy rate is in Table 5.9.

**TABLE 5.8 EDUCATIONAL STATUS OF HofH**

| Lot # | Local Government Areas (LGAs) | # of Household | No Formal Education | Primary Education | Secondary Education | CoE and Polytechnic | University Degree or above |
|-------|-------------------------------|----------------|---------------------|-------------------|---------------------|---------------------|----------------------------|
|       |                               |                | Percent (%)         |                   |                     |                     |                            |
| LOT3  | Ewekoro                       | 953            | 2.2                 | 7.9               | 45.6                | 22.7                | 21.6                       |
|       | Ifo                           | 539            | 3.8                 | 15.8              | 35.1                | 24.8                | 20.5                       |
|       | Ado-Odo/Ota                   | 1921           | 2.0                 | 17.4              | 48.5                | 15.3                | 16.8                       |
|       | Badagry                       | 66             | 1.7                 | 15.5              | 22.4                | 20.7                | 39.7                       |
|       | Average (%)                   |                | 2.4                 | 14.2              | 37.9                | 20.9                | 24.7                       |

[Data source] EEMS Field Survey

**TABLE 5.9 LITERACY RATE OF PAPs**

| Lot #                     | Local Government Areas (LGAs) | Literacy Rate (%) |        |        |
|---------------------------|-------------------------------|-------------------|--------|--------|
|                           |                               | Male              | Female | Total  |
| 3                         | Ewekoro                       | 98.7              | 88.9   | 97.0   |
|                           | Ifo                           | 98.4              | 88.5   | 97.2   |
|                           | Ado-Odo/Ota                   | 97.8              | 85.9   | 95.8   |
|                           | Badagry                       | 92.8              | 92.5   | 92.8   |
| <b>*Ogun State</b>        |                               | 98.2              | 88.1   | 93.5   |
| <b>*Lagos State</b>       |                               | 99.4              | 99.3   | 99.3   |
| <b>*Nigeria (Average)</b> |                               | 86                | 79     | 82.6   |
| <b>Total PAPs</b>         |                               | 18,147            | 3,422  | 21,570 |
|                           |                               | 84.1%             | 15.9%  | 100%   |

[Data source] EEMS Field Survey

\*NBS (2016)

According available data published in July 2017 by National Bureau for Statistics (NBS) National summary for the year 2016 shows that 86 % of men are literate and 79% of women among youths. The youths literacy levels in Ogun State are 98.2% and 88.1% among men and women respectively. For Lagos State youth literacy are 99.4% (men) and 99.3% women (NBS, 2017).

### 5.3 ECONOMICS

The economic life of the communities revolves mainly around multiple sources of income. Some people that work in the organised private and public sectors also practice agriculture or other means of earning livelihood.

### 5.3.1 Occupation of Affected Heads of Household

Table 5.10 presents the general occupation of the heads of affected households. The percentages do not add up to 100, because many of them declared multiple occupation and were not sure which they can consider the major one.

**TABLE 5.10 OCCUPATION IN THE PROJECT AREA**

| Lot # | Local Government Areas (LGAs) | Occupation of Head of Household (%) |             |                                   |                  |                 |            |                    |            |
|-------|-------------------------------|-------------------------------------|-------------|-----------------------------------|------------------|-----------------|------------|--------------------|------------|
|       |                               | Farmer                              | Pastoralist | Self-employed/<br>Business Person | Private employee | Public Employee | Trading    | Hunter / Fisherman | Others     |
| LOT3  | Ewekoro                       | 72.3                                | 1.7         | 24.2                              | 8.9              | 17.3            | 6.2        | 0.0                | 1.2        |
|       | Ifo                           | 78.3                                | 0.5         | 17.3                              | 2.8              | 24.7            | 3.1        | 0.2                | 0.8        |
|       | Ado-Odo/Ota                   | 81.2                                | 2.8         | 19.9                              | 4.7              | 18.6            | 3.2        | 0.4                | 0.7        |
|       | Badagry                       | 62.3                                | 0.4         | 18.4                              | 3.3              | 20.7            | 2.9        | 18.3               | 0.2        |
|       | <b>Average</b>                | <b>73.5</b>                         | <b>1.4</b>  | <b>20.0</b>                       | <b>4.9</b>       | <b>20.3</b>     | <b>3.9</b> | <b>4.7</b>         | <b>0.7</b> |

[Data source] EEMS Field Survey

**NOTE:** The percentages do not add up to 100, because many households earn income from more than one occupation.

### 5.3.2 Income and Livelihoods of Household

Income analyses presented in Table 5.11 contain proportion of affected households in each LGA that practices the vocations and other means of livelihoods in the project area. Distinction is made between occupations that generates income and those that do not. The distinction is necessary because agriculture generally in Nigeria is subsistence in nature and only excess are sold to generate income. The heads of household were asked to list all livelihood supporting activities they engage, and then mention if they generated income from them in the past one year.

The proportion of households “having practiced” is obtained by dividing the number of household that engage in the particular livelihood activity in the LGA by the total number of households in that LGA. While those that declared it as having received income from it within the past 12 months is obtained by dividing the number by the number of people that practiced that same occupation.

It is observed that most households engage in more than one job to boost income, varying work activity with the seasons, and level of acquired skills and relative size of household farmland holding.

As Table 5.11 show, farming attracts the highest proportion of the respondents up to 72.2% and 71.8% in Ifo and Ado-Odo/Ota respectively practice farming and generate substantial income from it 87.3% and 78.3%. The people of Badagry practice farming the least but practice hunting or fishing the highest.

The proportion that earn income from other sources such as Business, Pension, Money transfer from family and friends, Salary, Odd or casual work, etc are also included in table 5.11

**TABLE 5.11 INCOME ANALYSIS OF HOUSEHOLDS**

| Activity                    |  | LOCAL GOVERNMENT AREA |        |             |         |
|-----------------------------|--|-----------------------|--------|-------------|---------|
|                             |  | EWEKORO               | IFO    | ADO-ODO/OTA | BADAGRY |
| <b>Number of Households</b> |  | 953                   | 539    | 1921        | 66      |
| Cultivation Farming         | Household having practiced                   | 60.80%                | 72.20% | 71.80%      | 47.10%  |
|                             | Household having declared a source of income | 85.30%                | 87.30% | 78.30%      | 77.50%  |
| Tree Cropping /Plantation   | Household having practiced                   | 11.50%                | 6.10%  | 9.40%       | 15.20%  |
|                             | Household having declared a source of income | 7.10%                 | 38.10% | 18.20%      | 23.90%  |
| Livestock                   | Household having practiced                   | 9.40%                 | 13.80% | 11.00%      | 3.70%   |
|                             | Household having declared a source of income | 65.30%                | 88.20% | 34.50%      | 56.30%  |
| Fishing or Hunting          | Household having practiced                   | 0.00%                 | 0.20%  | 0.40%       | 18.30%  |
|                             | Household having declared a source of income | 10.00%                | 58.60% | 50.20%      | 52.30%  |
| Charcoal                    | Household having produce                     | 2.30%                 | 12.60% | 13.30%      | 15.70%  |
|                             | Household having declared a source of income | 0.50%                 | 50.00% | 50.00%      | 44.40%  |
| Fuel Wood                   | Household having collected                   | 32.30%                | 49.20% | 40.20%      | 40.80%  |
|                             | Household having declared a source of income | 30.00%                | 46.90% | 23.40%      | 36.50%  |
|                             | Business                                     | 24.20%                | 17.30% | 19.90%      | 18.40%  |
|                             | Pension                                      | 2.70%                 | 4.10%  | 2.60%       | 3.20%   |
|                             | Money transfer (family)                      | 8.60%                 | 13.30% | 14.60%      | 14.30%  |
|                             | Renting (land, house, etc.)                  | 2.20%                 | 11.80% | 8.50%       | 7.40%   |
|                             | Salary (official)                            | 26.20%                | 27.50% | 23.30%      | 24.00%  |
|                             | Odd or casual contract work                  | 23.40%                | 18.80% | 24.80%      | 12.20%  |
|                             | Other sources                                | 2.70%                 | 11.80% | 14.50%      | 9.00%   |

[Data source] EEMS Field Survey

Table 5.12 show the income from all sources (see Table 5.11). The people that are living in the abject poverty line (on less than N10,00/month equivalent to less than USD 1/day) has highest proportion in Badagry LGA (19.7%), while Ewekoro has the lowest (15.7%).

**TABLE 5.12 TOTAL MONTHLY INCOME OF HOUSEHOLDS**

| Lot # | Local Government Areas (LGAs) | Estimated Monthly Income (Percent -%) |               |                |                 |            | TOTAL       |
|-------|-------------------------------|---------------------------------------|---------------|----------------|-----------------|------------|-------------|
|       |                               | <10,000                               | 10,001-50,000 | 50,000-100,000 | 100,001-500,000 | >500,000   |             |
|       | <b>Ewekoro</b>                | 15.7                                  | 34.5          | 24.80          | 14.7            | 10.3       | 100%        |
|       | <b>Ifo</b>                    | 17.8                                  | 36.7          | 24.5           | 12.3            | 8.7        | 100%        |
|       | <b>Ado-Odo/Ota</b>            | 18.1                                  | 40.7          | 26.5           | 12.5            | 2.2        | 100%        |
|       | <b>Badagry</b>                | 19.7                                  | 45.8          | 22.9           | 10.8            | 0.8        | 100%        |
|       | <b>Average</b>                | <b>17.8</b>                           | <b>39.4</b>   | <b>24.7</b>    | <b>12.6</b>     | <b>5.5</b> | <b>100%</b> |

[Data source] EEMS Field Survey

**5.4 EXISTING INFRASTRUCTURES**

**Educational Facilities:** Field survey, information from questionnaires, and responses from respondents during FGD’s revealed the presence of over 755 primary schools, 181 secondary schools and 1 tertiary institution in the project area. In addition, Ado-Odo/Ota LGA accounts for about 35% of these schools. About 90% of these schools are privately owned with high tuition fees that many of the households cannot afford. Most of the communities in the study area, especially in Ifo, Badagry and Ewekoro LGAs only have access to government owned secondary schools. The pupils in these communities often walk distances of 3 – 4 km to bigger communities such as Atan, Badagry, Bandu and Agbara to access government owned secondary schools. Information on the educational facilities in the project area is presented in Table 5.13.

**TABLE 5.13 EDUCATIONAL FACILITIES IN THE PROJECT AREA**

| Category  | Ewekoro LGA  |                                | Ifo LGA      |                                | Ado-Odo/Ota LGA |                                | Badagry LGA  |                                |
|-----------|--------------|--------------------------------|--------------|--------------------------------|-----------------|--------------------------------|--------------|--------------------------------|
|           | Total Number | Number Connected to Power Grid | Total Number | Number Connected to Power Grid | Total Number    | Number Connected to Power Grid | Total Number | Number Connected to Power Grid |
| Primary   | 133          | 133                            | 33           | 23                             | 505             | 465                            | 84           | 78                             |
| Secondary | 12           | 12                             | 11           | 4                              | 148             | 145                            | 10           | 8                              |
| Tertiary  | 2            | 2                              | 0            | 0                              | 2               | 2                              | 0            | 0                              |

\* N.G = National grid; Source: EEMS 2017

The manpower in virtually all the schools is inadequate with high teacher/student ratio of over 1:40. About 65% of the existing schools lack basic facilities like water supply, electricity and toilet. In addition, instruction materials are grossly inadequate. The pressure placed by the inadequate educational facilities often compel some parents with children of secondary school age to send their children to relatives and friends in bigger towns in order to access secondary school education.

As at present, only one tertiary educational institute (Shepard University) in Ajibawo community of Ado-Odo/Ota LGA is present in the project area. In addition, there is no adult literacy school in any of these communities which could have helped stem the high rate of illiteracy among adults.



**Plate 5.1** A teacher (Mrs. Kayode) in Alapako



**Plate 5.2** Local Government Primary School, Coker



Plate 5.3 Ifeolowa Primary School Ejjo



Plate 5.4 United Primary school Ajegunle

**Potable Water Supply:** About 62.2% of communities in Ado-Odo/Ota LGA have access to water supply as against about 59.5% in Ewekoro, 50.6% in Ifo and 53.2% in Badagry LGA. Most of the water schemes in the area are privately owned boreholes and wells. Some communities in Ijegemo and Sowole depend almost exclusively on water sourced from rivers and streams. Information on the number of boreholes as well as protected streams in each of the project LGA is presented in Table 5.14

**TABLE 5.14 NUMBER OF WATER SOURCE ACROSS THE PROJECT AREA**

| Category                 | Ewekoro LGA  |                                   | Ifo LGA      |                                   | Ado-Odo/Ota LGA |                                   | Badagry LGA  |                                   |
|--------------------------|--------------|-----------------------------------|--------------|-----------------------------------|-----------------|-----------------------------------|--------------|-----------------------------------|
|                          | Total Number | Number Connected to national Grid | Total Number | Number Connected to national Grid | Total Number    | Number Connected to national Grid | Total Number | Number Connected to national Grid |
| Communal                 | 16           | 155                               | 6            | 202                               | 15              | 3269                              | 10           | 510                               |
| Private                  | 162          |                                   | 317          |                                   | 5407            |                                   | 819          |                                   |
| Protected spring (wells) | 7            |                                   | 19           |                                   | 27              |                                   | 7            |                                   |

Source: EEMS, 2017

As could be seen in Table 5.14, the number of privately owned boreholes is higher compared to communally owned ones. About 60% of the boreholes in Ado-Odo/Ota are powered from light source provided by the National grid as against 57% in Ewekoro, 59% in Ifo and 61% in Badagry. Been connected to the national grid is not enough as all the functional boreholes rely more on AC powered sources to pump water. It was also observed that 85% of the communally owned boreholes (40 boreholes) and 35.4% of the privately owned ones have obsolete pipes and fittings.



Plate 5.5 Galloons on the bank of Ijegemo stream for fetching drinking water



Plate 5.6 Borehole facility in Ekundayo

**Electricity:** Forty – one communities representing about 62% are linked to the national grid line for electricity supply. This information is presented in Table 5.15

**TABLE 5.15 NUMBER OF COMMUNITIES IN THE LGASCONNECTED TO THE NATIONAL GRID**

|                                      | Ewekoro | Ifo | Ado-Odo/Ota | Badagry |
|--------------------------------------|---------|-----|-------------|---------|
| Communities connected to the N.G     | 1       | 5   | 25          | 10      |
| Communities not connected to the N.G | 1       | 4   | 20          | 0       |

Source: EEMS, 2017

The breakdown indicated that all ten communities within the RoW in Badagry LGA are connected to the national grid as against 25 (53%) within the Ado-Odo/Ota Local LGAt that is connected to the national grid. In Ewekoro LGA, Ejjo community is connected while Sojuolu is not connected. Five (5) of the 9 communities in Ifo LGA are connected.

**Health Facilities:** The health facilities in the area comprise of nine (9) Primary Health Centres (PHC) and fifty-eight (58) hospitals (Table 5.16). The grossly inadequate health facilities provide both out-patient and in-patient services. The number of health facilities presenting in each LGAs of the project area is presented in Table 5.16

**TABLE 5.16 NUMBER OF HEALTH FACILITIES IN THE PROJECT AREA**

|          | Ewekoro LGA  |                                | Ifo LGA      |                                | Ado-Odo/Ota LGA |                                | Badagry LGA  |                                |
|----------|--------------|--------------------------------|--------------|--------------------------------|-----------------|--------------------------------|--------------|--------------------------------|
|          | Total Number | Number Connected to Power Grid | Total Number | Number Connected to Power Grid | Total Number    | Number Connected to Power Grid | Total Number | Number Connected to Power Grid |
| PHC      | 2            | 2                              | 0            | 0                              | 3               | 3                              | 4            | 4                              |
| Hospital | 20           | 20                             | 6            | 6                              | 31              | 29                             | 1            | 1                              |

Source: EEMS, 2017

The ratio of public to private hospitals in the project area is about 3:2. All of the LGAs have PHCs, except the eight project affected communities in Ifo LGA. Interestingly, about 95% of the health facilities are connected to the national grid. Plate 5.7 is a picture of a health facility in Ajegunle community (Ado-Odo/Ota LGA)



**Plate 5.7: A Primary Health Centre in Ajegunle (Ado-Odo/Ota LGA)**

Source: EEMS, 2017

**Household Facilities:** Several facilities were surveyed to be present in the households of the project area. The household sample taken per LGA was arrived at by taking into consideration the length of the line that pass through the LGA, the number of communities affected and the population. These include power generators, televisions, cars/trucks, refrigerators, etc. (Table 5.17). Most of these facilities are meant to improve the livelihood of the households while others are income generating. Result on the survey of these facilities revealed that gas stove/kerosene, TV and radio are the most common facility among households in the project area, where almost all households have them.

**TABLE 5.17 HOUSEHOLD FACILITIES**

| FACILITIES                           | Ewekoro    | Ifo        | Ado-Odo/Ota | Badagry   |
|--------------------------------------|------------|------------|-------------|-----------|
| <b>Number of Households Surveyed</b> | <b>638</b> | <b>217</b> | <b>309</b>  | <b>57</b> |
| Power generator                      | 68.5%      | 66.7%      | 64.1%       | 63.8%     |
| Gas stove/Kerosene                   | 99.1%      | 94.0%      | 96.4%       | 96.6%     |
| Refrigerator                         | 85.9%      | 82.9%      | 90.0%       | 90.8%     |
| Television                           | 100.0%     | 94.0%      | 97.1%       | 95.7%     |
| Radio/cassette/music system          | 98.7%      | 95.7%      | 98.1%       | 98.6%     |
| Car/Truck                            | 13.6%      | 8.5%       | 8.1%        | 8.2%      |
| Motor Cycle                          | 3.6%       | 15.4%      | 5.8%        | 9.7%      |
| Bicycle                              | 8.2%       | 21.4%      | 12.3%       | 16.9%     |
| Plow                                 | 0.3%       | 0.0%       | 2.3%        | 0.0%      |
| Cart                                 | 0.6%       | 0.0%       | 1.6%        | 0.5%      |
| House in town                        | 4.5%       | 5.1%       | 3.2%        | 3.4%      |
| Land in town                         | 0.5%       | 0.9%       | 1.9%        | 2.4%      |

Source: EEMS 2017

**Transport Facilities:** The project area is traversed by several roads, amongst which are:

- The Lagos – Abeokuta express way
- Sango-Idi-Iroko Road
- The Sokoto road in Egbele Village
- Ado road
- The Coker – Atan road
- Smaller feeder roads linking the major roads with the impacted communities, and
- Unpaved roads connecting small villages and settlements.



**Plate 5.8: Sokoto Road**



**Plate 5.9: The Coker – Atan road**



**Plate 5.10: Gboje - Iragbo road**

**Plate 5.11: Erekiti road**

Apart from the tarred Lagos-Abeokuta express way and the Sokoto road, the Ado road and others are either partially tarred or not tarred

Public buses, cars and motorcycles are the major means of transportation in the project area. Public motor vehicles ply roads that link the project communities to major towns such as Agbara, Atan, Ifo and Badagry while motorcycle transport is used for shorter distances and unpaved roads.

**5.4.3 Housing Types**

Field survey was conducted to identify quality of housing used by the PAPs. The materials used in construction surveyed and presented in Tables 5.18 to 5.20 and sample pictures in Plates 5.13 and 5.14.

**House Roofing Materials:** Results on the roofing materials are presented in Tables 5.18

**TABLE 5.18 ROOFING MATERIALS (%)**

| Material                      | Ewekoro | Ifo | Ado-Odo/Ota | Badagry | Average (%) |
|-------------------------------|---------|-----|-------------|---------|-------------|
| Corrugated Iron Sheets        | 25      | 43  | 20          | 34      | 30.4        |
| Thatch                        | 2       | 21  | 1           | 9       | 8.2         |
| Asbestos                      | 39      | 11  | 36          | 23      | 27.2        |
| Bamboo/reed                   | 0       | 5   | 1           | 3       | 2.2         |
| Aluminum roofing              | 33      | 17  | 40          | 29      | 29.7        |
| Nil / No roof / Not completed | 1       | 3   | 3           | 2       | 2.2         |

Source: EEMS Survey, 2017

The use of iron sheets, asbestos and aluminum accounted for about 87% of the roofing materials. The least used roofing material is bamboo and thatch, accounting for about 2.2% and 8.2% respectively.



Aluminum roofing in Bandu | Corrugated iron sheet in Oloaparun | Asbestos in Igbele

**Plate 5.12: Roofing materials for household dwellings**

**House Walling Materials:** Results of household walling materials are presented in Table 5.19.

**TABLE 5.19 WALLING MATERIALS OF HOUSES IN THE PROJECT AREA**

|                     | Ewekoro | Ifo | Ado-Odo/Ota | Badagry | Average (%) |
|---------------------|---------|-----|-------------|---------|-------------|
| Mud                 | 2       | 9   | 5           | 7       | 5.7         |
| Mud bricks          | 13      | 20  | 12          | 16      | 15.2        |
| Wood                | 3       | 5   | 3           | 6       | 4.2         |
| thatch              | 0       | 15  | 4           | 5       | 6           |
| Compacted (combine) | 1       | 1   | 1           | 1       | 1           |
| Concrete (blocks)   | 75      | 50  | 70          | 60      | 56          |
| Others              | 6       | 2   | 5           | 5       | 4.5         |

Source: EEMS Survey 2017

On the average, the use of bricks as walling materials is predominant. However, the use of mud bricks is most pronounced among communities in Ifo and Badagry LGAs. It was also observed that walling materials for a house could be mud, bricks and woods. Also, some houses are walled exclusively of bamboo, tarpaulin and zinc.



Zinc in Alapako



Mud in Olowo



concrete in Berese

**Plate 5.13: Walling Materials for Household Dwellings**

**House Flooring Material:** Table 5.20 is the results of flooring material from the study.

**TABLE 5.20 FLOORING MATERIALS OF HOUSES IN THE PROJECT AREA**

| Material type         | Ewekoro | Ifo | Ado-Odo/Ota | Badagry | Average (%) |
|-----------------------|---------|-----|-------------|---------|-------------|
| Earth/sand/dirt/straw | 7       | 23  | 12          | 18      | 15          |
| Smoothed mud          | 2       | 19  | 3           | 15      | 9.8         |
| Smooth cement         | 63      | 35  | 59          | 42      | 49.8        |
| Wood/planks           | 3       | 8   | 5           | 8       | 6           |
| Ceramic tiles         | 25      | 15  | 21          | 17      | 19.5        |

EEMS Survey 2017

Five flooring materials were observed to be in use. While smooth cement (49.8%), ceramic tiles (19.5%) and sand (15%) are the most used flooring materials across all the communities and LGAs,

the use of woods/planks and smoothen mud were observed more among households in Ifo and Badagry LGAs.

## CHAPTER 6

### 6.0 IMPACT OF THE LINES AND THE SUBSTATIONS

This section presents a summary description of the project's impacts on the human population. Potential environmental and impacts are described in the ESIA report of the project. Social and economic impacts of resettlement will be detailed in the present chapter. These impacts were assessed using data collected from field surveys, relevant documents and consultations with various stakeholders and PAPs.

#### 6.1 General

The Lot 3 of the project require the construction 87.5km of electricity transmission lines, consisting of 29.6km of a 330 kV line from Ejo to Ajegunle and 57.9km of 132kV from Ajegunle to Agbara and Ajegunle to Badagry as described in Section 2.4 and Table 2.1. However, multi-circuit tower will be utilised for the 132kV line from Ajegunle to Iberese Village (6.2km), before the two lines move in separate directions to Agbara and Badagry respectively. It also includes new substations at Ejo, Ajegunle and Badagry and expansion of the existing Agbara substation.

The construction, operations and maintenance activities of the ROW and transmission line will involve periodic access to the structures.

For the project affected households and communities, negative impacts occurring during the construction phase include:

- Dust, noise and exhaust gas emissions;
- Soil erosion and properties of affected land;
- Loss of arable land and crop damaged as a result of clearing the ROW of trees for mitigation measures and for temporary access, work areas and work camps;
- Degradation of water and soil quality resulting from an accidental spill of hydrocarbons and other material as well as disturbance and displacement of wildlife, which could be accentuated by poor waste management practices. The spill could occur from machinery and vehicles, in workplaces and in work camps;
- Disturbance and displacement of wildlife due to noise generated vehicular movement or from construction and maintenance activities;
- Conflicts or grievance related to resettlement of affected households;
- Potential perturbation of communities or households associated to the arrival of workers and conflict over the distribution of jobs and other economic activities related to line construction.

The main long-term impacts, at the tower and substation location, and clearance of the ROW are:

- Permanent loss of crop areas and tree plantation in the ROW;
- Prohibition of constructing any structure (houses, shed, etc.) in the ROW;

- Potential perturbation of communities or households associated with the arrival of workers and conflict over the distribution of jobs and other economic activities related to maintenance of ROW.

### 6.2 IMPACTS ON HOUSES, SECONDARY AND OTHER STRUCTURES

Structures affected by the project are mainly residential houses with few commercial structures and no community structures.

#### 6.2.1 Houses

Residential structures affected by the project are 1,251 (324 are occupied) which will be removed from the line ROW and the substation sites. The owners of these structures will be compensated to reconstruct their houses, elsewhere. However, this relocation will result in loss of time, income and disruption of the organization for the daily life of affected households. It would need to and these have been mitigated. There also 340 households with undeveloped residential land. Only 324 of these structures are occupied with total population of 1592, and these are the people that will be physically displaced. 860 structures are either uncopied/uncompleted and will be affected only economically.

As indicated previously (see chapter 4), the consultations carried out as part of this preliminary assessment showed that many affected households are concerned about not receiving adequate and timely compensation for resettlement and loss of crops, trees or land. An adequate and timely compensation would therefore be given, and new houses of displaced households would be built before the beginning of construction or any other activities capable of disrupting the PAPs. Where properly managed, the envisaged impacts will therefore be minimal.

#### 6.2.2 Commercial Structures

Within the ROW, there are 30 commercial structures that will be affected by the project. Over 90% of them are small shops, a hotel, one private clinic and one block of class room in a school. Only 5 out of the commercial structures are tenements.

#### 6.2.3 Community Structures and Site

There 16 other types of structures, -one private hospital and 14 shrines that will be relocated. The owners have agreed to relocate them, but the project will provide compensation.

### 6.3 AGRICULTURAL LAND AND TREES

The number of affected households that own both land and crops are 1,271, which 1,966 cultivate other people's land, including those that have economic trees. There a total 29,281 trees that would be affected.

### 6.4 CUMULATIVE IMPACTS

#### 6.4.1 Other Projects in the Area

The following proposed and existing projects within 10 square km radius are expected to exert cumulative impacts. They are

- Proposed 330kV Nigeria-Benin Transmission Line

- Ewekoro cement Plant Line 1- An operating 1.3million tonnes per annum clinker cement plant
- Ewekoro cement Plant Line 2–An Operating 2.7 million tonnes per annum clinker cement plant
- Abeokuta Independent Power Project (Energy Culture)- A 147 megawatt gas powered power plant with a 500m transmission line
- Olorunsogo Gas Fired Power Plants Phase I and II (333MW open cycle and 750MW- combined cycle respectively)
- 132kv transmission line – An existing transmission line linking Ota to Abeokuta.
- 330kv transmission line – An existing transmission line linking Olorunsogo Power Plant to Ikeja West
- 330kV single circuit linking Osogbo to Ikeja West
- 132 kV line from Ikeja West to Agbara and to Ojo

### 6.3.2 Description of Cumulative Impacts

**Resettlement Impacts:** there is no information about the resettlement impacts of the existing projects in the area, because they were completed long time ago, and records could not be obtained. However, the proposed 330Kv Nigeria-Benin transmission line from Ajegunle to Benin Republic, will have similar effects on the people, particularly Ajegunle.

**Air Quality and Noise:** Given the findings of impact assessment and distance of the Ewekoro cement plant (line 1 and 2) from the project area, it appears unlikely that the cumulative impact on noise and air quality will not be significant. Also, the cumulative impact of Olorunsogo Power Plant Phase I & II from the project area will be localized to immediate environment.

**Traffic:** The construction phase will require large amounts of material and equipment to be transported to the Project site. It is expected that the Abeokuta IPP and ongoing construction of railway line project will use similar transport routes (Lagos – Abeokuta express way) which will place pressure on the local road network especially during the construction phases of the projects.

Given the foregoing, there is increased potential for accidents and disruption to the road traffic network for local users associated with the increase in traffic movements from overlapping construction traffic. It is expected that the traffic management plan to be developed for the project will consider other traffic movements associated with the development of the project in view which will help to mitigate this impact. However, in overall consideration, this impact is considered to be **moderate** due to the high likelihood of accidents occurring.

**Economy, Employment and Skills:** The operation of the various considered projects earlier outlined is proposed to occur simultaneously with the project in view. As such, the economic, employment and skills development opportunities will be greater for all the projects combined than a single project.

It should be noted that expectations regarding economic development, employment and skills development will be high amongst stakeholders in the local community and as such, in the event that one project does not meet expectations, there is the potential for all projects within the area to be the target of this negative outcome.

Based on the above, the cumulative impacts of the various proposed industrial projects on the economy, employment opportunities and skills development within the communities is expected to be positive.

### 6.4 ECONOMIC IMPACT OF CONSTRUCTION AND MAINTENANCE

There will be no significant adverse impacts on local and regional economy during the line construction even though temporary unskilled jobs may be available for few people in the communities. The impacts to the villages and communities located along the line will be relatively small due to the limited duration of the project, to population resettlement along the corridor and the limited number of workers involved

Moreover, livelihoods of the affected households may be affected with the acquisition of their lands. Appropriate compensation will be provided to replace economic loss. This risk is quite low since firstly, despite the land use density, it is possible to find alternative plots including through family and village solidarity. About 3000 families will lose a piece of cropland or house. These will be compensated adequately. In this context, the risk of loss will be greatly reduced.

The most important economic benefit generated by the project is the improved availability and reliability of electricity supply to Lagos and Ogun States. This can increase access to electricity, which can improve economic activities and added convenience to people's lives. The project could also generate jobs for the operation and maintenance of the power lines and substations.

Improving the availability and reliability of energy in the region will include improving the storage and processing of agricultural products, increasing market value and / or extending their shelf life. The storage inside a refrigerator can keep dairy products, fruits and vegetables that can subsequently be sold or consumed during the following days. These improvements may add value to agricultural products and in the long term, generate better income for farmers.

Overall, the project will bring positive impacts to the local economy and livelihoods of people both directly (new employment) or indirectly (increased access to reliable electricity).

### 6.5 IMPACTS ON GENDER

Project impacts on women will primarily be felt during the construction phase. They are related to the fact that women are primarily responsible for field work and crops' production.

Only 552 of the affected households are headed or represented by women (15.9%). The project is likely to increase the vulnerability of women, since consultations in the project area have shown that, in general, women do not own land although the land law is such that the land belongs to the family. This makes women's situation unfavorable since men control resources such as land and other important assets.

Due to limited ownership and access to resources, women play a very minor role in the decision-making process. This situation increases the risk for women, as many examples show that men may tend to use compensation for purposes other than those for which they are dedicated (reconstruction, acquisition of land, amounts allocated to the compensation) to leave their families. This is why it is important to make compensations in kind (i.e. land for land and house for house)

rather than a cash compensation or to put in some control and information mechanisms to reduce those risks (see chapter 8 for details).

## 6.6 IMPACTS ON VULNERABLE GROUPS

As mentioned previously, women that are heads in about 16% of the impacted households. There are no head of households younger than 18 years old. Specific mitigation measures, such as prioritizing local people and businesses for job opportunities and procurement, participation of able members of these households to work on their land (cutting, trees, reconstruction, etc.), leaving them the use of cut trees, salvage material from displaced houses or other structures (houses, shelter, etc.), could help these economically vulnerable households increase their revenues. Measures to ensure the realisation of this is included in the EPC contract special conditions (Appendix A of the ESMP).

Administrative burden of compensation procedures should be reduced to minimal especially for the vulnerable households giving them timely information, enhanced access that reduces their strain in the compensation process and ultimately minimize incidental costs to them.

## 6.7 IMPACT ON MINORITY/ INDIGENOUS GROUPS

There are no groups that could be described as indigenous or minority in the area.

# CHAPTER SEVEN

## 7.0 VALUATION AND COMPENSATION

### 7.1 INTRODUCTION

Valuation of assets and other forms of losses occasioned by the project was conducted by qualified Estate Surveyors and Valuers to ascertain individuals whose properties or livelihoods will be directly or indirectly affected by the project activities.

A general principle adopted in the formulation of the compensation valuation is that lost income and assets were valued at their full replacement cost such that the project affected populations should experience no net loss. This is in accordance with World Bank Operational Policy on involuntary resettlement -OP 4.12 as well as the Nigerian Land Use Act discussed under Section 3.2.2.

In line with the above principle, an all-encompassing survey and valuation of the assets and loss of income by the Project-Affected Persons (PAPs) was conducted.

### 7.2 ELIGIBILITY CRITERIA

The World Bank Resettlement Policy/Guidelines require compensation for the lost assets and replacement costs to both titled and non-titled landholders and resettlement assistance for lost income and livelihoods.

In this project, the absence of formal titles will not constitute a barrier to resettlement assistance and rehabilitation. Furthermore, the principles adopted herein contain special measures and assistance for vulnerable affected persons, such as female-headed households, physically challenged persons, and the poor.

The social impact of the project on the affected persons shall be minimized by using the following measures.

- Economic Rehabilitation
- Asset Based Compensation
- Cash Compensation
- Mitigating Risks of Impoverishment
- Consultation with Affected Populations, and
- Grievance Redress Mechanisms

#### 7.2.1 Notification

Prior to the conduct of surveys and administration of study questionnaires, the PAPs were officially notified of the enumeration exercise through a letter addressed to each village head and customary chiefs. Furthermore, the RAP team engaged all stakeholders in several consultation meetings held in each affected community. These public consultations served as avenue to educate them on the purpose of the project and the possible associated impacts and their respective rights.



The traditional rulers, youth associations, market associations, NGOs and other stakeholders along the corridor of the planned ROW have been identified as veritable partners in this project and adequate consultation has been carried out prior to the implementation of the RAP Study.

In the course of administering questionnaire and census, useful interactions between the field staff and the PAPs revealed their disposition to the project and PAPs willingness to support TCN in achieving the project.

All parties mentioned in this RAP report were adequately notified before the commencement of surveys, and will be engaged for the payment of compensation, resettlement activities and disbursement of project assistance planned by TCN.

### 7.2.2 Value of Land

The land use Act does not provide for compensation for land, only for assets and improvements. However, World Bank OP 4.12 provides for land replacement, asset replacement as well as restoration of livelihoods. Therefore, there is no justification to make presentation on the value for lands which the PAPs currently occupy under the laws of Nigeria. Nevertheless, going by the principles of payment of compensation adequate enough and in such a way that PAPs are not left poorer or impoverished because of the project, TCN will give adequate assistance to the PAPs to enable them obtain another land to relocate the affected assets to as well for restoration of livelihoods.

### 7.3 ENTITLEMENT MATRIX FOR RESETTLEMENT ACTIVITIES

This provides a framework for entitlement for each category of impacts of the project. To determine the eligible person for compensation the Land Use Act and the Criteria set by the World Bank contained in OP 4.12 of the WB Operational Manual were both considered, and the more stringent applied (See Table 7.1 and 7.2).

**TABLE 7.1 NIGERIAN LAND USE ACT VS WORLD BANK/IFC**

| Category     | Nigerian Land Use Act   | World Bank/IFC  | What was Applied  |
|--------------|---|---|---|
| Land Owners  | Cash compensation based upon market value                                   | Recommends land-for-land compensation, or cash compensation at replacement cost.  | Cash compensation at replacement cost for households.<br>Land for land for community land                       |
| Land Tenants | Entitled to compensation based on the amount of rights they hold upon land. | Entitled to some form of compensation subject to the legal recognition of their occupancy.  | Entitled to compensation based on the amount of rights they hold upon land.                                     |
| Land Users   | Not entitled to compensation for land; entitled for compensation for crops  | Entitled for compensation for crops and be entitled for land replacement and income loss compensation for minimal of the pre-project level. | Entitled for compensation for crops, assistance to obtain replacement and income loss compensation for a period |
| Owners of    | Cash compensation based   | Entitled to in-kind   | Cash compensation based   |

| Category                      | Nigerian Land Use Act                              | World Bank/IFC  | What was Applied   |
|-------------------------------|--|---|--|
| Non-permanent Buildings       | on prevailing market value                         | compensation or cash compensation at full replacement cost including labour and relocation expenses, prior to displacement.                     | on prevailing market value, relocation expenses, prior to displacement.  |
| Owners of permanent Buildings | Cash compensation based on prevailing market value | Entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, prior to displacement. | Cash compensation based on prevailing market value, relocation expenses, legal and other transaction charges, prior to displacement. |

The RAP for the project is aligned with the World Bank Operational Policy (OP 4.12) which indicates best practices to restoration of livelihoods of people affected by the implementation of the project. Hence, where there are gaps between the Land Use Act (1978) and the World Bank Policy (OP 4.12), in regard to compensation of PAPs, the more stringent requirement will apply. This is to ensure compliance with the OP 4.12 without going against the Land Use Act.

The principles adopted thus forms the basis for establishing eligibility and makes for the provision for all types of losses (land, structures, business / employment, and work day wages). All affected persons shall be compensated at full replacement costs.

**TABLE 7.2 ENTITLEMENT MATRIX**

| Item                 | Type of loss                            | Entitled Persons   | Entitlements  | Responsibility |
|----------------------|---|--|---|----------------|
| <b>A. LAND</b>       |   |  |   |                |
| A1                   | Loss of residential and commercial land | Private landowner with title deed or similar ownership document, and customary recognized in the community | <ul style="list-style-type: none"> <li>Land relocation assistance for land (cash compensation) will be at market value based on the market survey results conducted by TCN.</li> <li>Livelihood restoration (assistance and training):G1</li> <li>Special assistance, if applicable: H1</li> </ul>  | TCN/PIU        |
| A2                   | Loss of residential and commercial land | Land user of public owned land   | <ul style="list-style-type: none"> <li>No compensation for land</li> <li>Livelihood restoration (assistance and training): G1</li> <li>Special assistance, if applicable: H1</li> </ul>   | TCN/PIU        |
| A3                   | Loss of agricultural land               | Landowner and land user with legal title   | <ul style="list-style-type: none"> <li>Land relocation assistance for land (cash compensation).</li> <li>Cash compensation for loss of crops and trees during the construction stage at the market value of crops based on the harmonized compensation rate in South-west area in Nigeria: C1</li> <li>Livelihood restoration (assistance and training): G2</li> <li>Special assistance, if applicable: H1</li> </ul> | TCN/PIU        |
| A4                   | Loss of agricultural land               | Landowner and land user without legal title  | <ul style="list-style-type: none"> <li>No compensation for land.</li> <li>Cash compensation for loss of crops and trees during the construction stage at the market value of crops based on the harmonized compensation rate in South-west area in Nigeria: C1</li> <li>Livelihood restoration (assistance and training): G2</li> <li>Special assistance, if applicable: H1</li> </ul>                                | TCN/PIU        |
| <b>B. STRUCTURES</b> |   |  |   |                |
| B1                   | Loss of structure                       | Owner of structure   | <ul style="list-style-type: none"> <li>Cash compensation will be paid at the replacement cost and associated in-direct cost (e.g. registration tax, etc.) evaluated by TCN.</li> <li>Shifting allowance: F1</li> <li>Special assistance, if applicable: H1</li> </ul>   | TCN/PIU        |
| B2                   | Loss of rental Structure                | Person renting in a residential or commercial structure with rental agreement or receipt of payment        | <ul style="list-style-type: none"> <li>No compensation for structure</li> <li>Shifting allowance: F1</li> <li>Special assistance, if applicable: H1</li> </ul>  | TCN/PIU        |

| Item   | Type of loss  | Entitled Persons  | Entitlements  | Responsibility  |
|--|---|---|---|---|
| B3   | Loss of rental Structure  | Owner of structure  | <ul style="list-style-type: none"> <li>Cash compensation will be paid at the replacement cost and associated in-direct cost (e.g. registration tax, etc.) evaluated by TCN.</li> </ul>  | TCN/PIU   |
| <b>C. CROPS AND TREES</b>  |   |   |   |   |
| C1   | Loss of crops and tress   | Owner Farmer  | <ul style="list-style-type: none"> <li>Cash compensation for loss of crops and trees during the construction stage will be paid at the market value of crops based on the harmonized compensation rate in South-west area in Nigeria</li> </ul>   | TCN/PIU   |
| <b>D. OTHER PRIVATE PROPERTIES OR SECONDARY STRUCTURES</b>           |   |   |   |   |
| D1   | Other property or secondary structure (i.e. shed, outdoor latrine, rice store, animal barn etc.)        | Owners of structures (regardless if the land is owned or not)                   | <ul style="list-style-type: none"> <li>Cash compensation will be paid at the replacement cost and associated in-direct cost (e.g. registration tax, etc.) evaluated by TCN.</li> </ul>  | TCN/PIU   |
| <b>E. LOSS OF INCOME</b>   |   |   |   |   |
| E1   | Job loss due to relocation of business to another area or business operator decides not to re-establish | Business owner  | <ul style="list-style-type: none"> <li>1 month income assistance</li> <li>Shifting allowance : F1</li> <li>Livelihood restoration (assistance and training):G1</li> </ul>   | TCN/PIU   |
| <b>F. REHABILITATION ASSISTANCE</b>                                  |   |   |   |   |
| F1   | Loss of residential/commercial structures   | Relocating APs/ APs reorganizing or rebuilding on same plot                     | <ul style="list-style-type: none"> <li>Moving cost will be paid for assistance at the value evaluated by TCN based on the quantity and size of items need to be moved.</li> </ul>   | TCN/PIU   |
| <b>G. LIVELIHOOD RESTORATION (ASSISTANCE &amp; TRAINING to PAPs)</b> |   |   |   |   |
| G1   | Effects on livelihood   | All affected commercial owners/operators of businesses/ workers of businesses / | <ul style="list-style-type: none"> <li>Professional assistance and advice to reestablish and develop the business</li> <li>Vocational or skilled training for business owners or their family members</li> <li>Priority is given for PAPs for the position of construction workers</li> </ul>   | TCN/PIU<br>TCN/PIU and contractor<br>TCN/PIU and contractor |
| G2   | Effects on livelihood   | All affected owners/operators in agricultural land                              | <ul style="list-style-type: none"> <li>For farmers who have remaining land or farmers who cultivate on new lands will be assisted to increase productivity (i.e. increasing cropping intensity, use of high yielding seeds, diversification and introduction of new seeds or crops etc) and assistance to access existing subsidies.</li> </ul> | TCN/PIU and retained NGO<br>TCN/PIU and                     |

#### 7.4 CUT-OFF DATE

A rigorous census and inventory of affected assets and property were conducted. Notice of entry was served on the communities as mentioned in Section 7.2.1. This was to notify them about the crops/property enumeration and valuation of assets within the right-of-way (RoW) of the proposed project's line routes and substation sites for the purposes of compensation/ resettlement. The notification also included the dates for census of PAPs and property enumeration in the communities. The date of commencement of the enumeration established the cut-off-date, which was 12<sup>th</sup> January 2018. Therefore, any improvements made by PAPs on their parcel or on structures shall not be eligible for compensation.

The enumeration was conducted from 12<sup>th</sup> January to 13<sup>th</sup> February 2018. After the line route was optimised based on the results of the ESIA study as well as the initial RAP survey, additional surveys scheduled to cover areas where the line route changed, and report updated accordingly.

#### 7.5 PROOF OF ELIGIBILITY

Various forms of evidence as proof of eligibility was considered and they cover the following:

- PAP with formal legal rights, documented in the form of land title registration certificates (certificate of occupancy or right of occupancy), leasehold indentures, tenancy agreements, rent receipts, building and planning permits, business operating licenses, and utility bills among others: unprocessed/unregistered formal legal documents will be established.
- PAP with no formal or recognized legal rights-criteria for establishing non-formal, undocumented or unrecognized claims to eligibility shall be established paying attention to each situation and its peculiarities. Alternative means of proof of eligibility will include;
- Affidavit signed by landlords and tenants;
- Witnessing or evidence by recognized traditional authority, customary heads, community elders, family heads and elders and the general community.

However only PAPs enumerated during the baseline survey shall be eligible for either the compensation or resettlement. Any new structures or additions to existing structures carried out after the cut-off date and their occupants will not be eligible for compensation or resettlement.

#### 7.6 BASIS FOR VALUATION OF LOSSES AND BUDGETS

Valuation of assets to be affected by the implementation of the project was conducted using a general principle adopted in the formulation of the compensation valuation which follows the World Bank's Policy that lost income and asset will be valued at their full replacement cost such that the PAPs should experience no net loss.

The land to be used for the construction of the project is owned by the individuals and communities located in the project area. It is noteworthy that both public consultation with the stakeholders, project communities and the census showed that the affected communities accept the project as a means for development.

| Item                                 | Type of loss   | Entitled Persons  | Entitlements  | Responsibility                                   |
|--------------------------------------|--|---|---|--|
|                                      |  |   | <ul style="list-style-type: none"> <li>• Introducing new livelihood opportunities for farmers or their family members, such as priority for APs for project related employment opportunities during construction period.</li> <li>• Priority is given for PAPs for the position of construction workers</li> <li>• Vocational or skilled training for farmers or their family members</li> </ul>  | EPC contractor<br><br>TCN/PIU and EPC contractor |
| <b>H. SPECIAL ASSISTANCE</b>         |  |   |   |  |
| H1                                   | Effects on vulnerable APs  | Vulnerable APs including the female - headed households, elderly people and differently able.   | <ul style="list-style-type: none"> <li>• 300 Naira x 30 days per person of special grant for AP household to improve living standards of vulnerable APs (such as linking to national poverty reduction programs conducted by various government institutions) and assistance to in finding suitable land for relocation and shifting.</li> <li>• All women that are part of the resettled households will be informed of the compensation benefits offered to them specifically.</li> <li>• Special help will be given such as opening a bank account, budget management, etc.</li> </ul> | TCN/PIU  |
| <b>I. COMMUNITY ASSETS</b>           |  |   |   |  |
| I1                                   | Loss of buildings and other structures (schools, shrine, temples, clinics, common wells etc.), infrastructure (local roads, footpaths, bridges, irrigation, water points etc.), common resources | Divisional Secretary of the division, local community or local authority owning or benefiting from community property, infrastructure or resources        | <ul style="list-style-type: none"> <li>• For shrine, amount of compensation will be calculated by TCN with consultation with PAPs based on replacement cost considering size, equipped item, traditional rites</li> <li>• For public assets including well, rebuild a new structure (Not money compensation)</li> </ul>   | TCN/PIU  |
| <b>J. UNANTICIPATED RESETTLEMENT</b> |  |   |   |  |
| J1                                   | Any unanticipated adverse impact due to project intervention   | Any unanticipated consequence of the project will be documented and mitigated based on the spirit of the principles agreed upon in this policy framework. |   |  |

Therefore, Project-Affected Persons (PAPs) are mainly those whose structures' (residential houses), economic trees and farm/agricultural crops will be displaced. As a result of the predominantly rural nature of the project area in Badagry (Lagos State) and predominantly urban areas in most areas of Ogun State, the project's development has serious impact on businesses, houses or means of livelihoods of the people.

The Harmonised Compensation Rate for South-West approved by the National Technical Forum on Land Administration (NTDF) was used as a basis for the computations.

As a result, Project-Affected Persons (PAPs) would be entitled to the following types of compensation and rehabilitation measures.

#### **7.6.1 PAPs Losing Structures**

The mechanism for compensating loss of residential structures will be:

##### a) PAPs with legal rights of land use:

- The cash compensation reflecting full replacement cost of the structures without depreciation or deduction for salvaged materials.
- The provision of replacement residential land (house site and garden) of equivalent size, satisfactory to the PAPs or in cash at the replacement cost.
- If the residential land and /or structure is only partially being affected by the project and the remaining residential land is not sufficient to rebuild the residential structure lost in accordance with the prevailing standards, then at the request of the PAPs, the entire residential land and structure will be acquired at full replacement cost, without depreciation.
- All relocated PAPs will be provided with transportation and subsistence allowances as specified in OP 4.12 Policy.
- Tenants who have leased a house for residential purposes will be provided with a cash grant of Six months rental fee at the prevailing market rate in the area and will be assisted in identifying alternative accommodation.
- Severely affected PAPs and vulnerable groups will receive shelter or other forms of economic rehabilitation from the proponent if deemed necessary and where applicable.
- In case of partial impact on structures and where the remaining structures remain viable for continued use, PAPs will also be entitled to additional allowance for repair of remaining structure.

##### b). PAPs without legal rights of land use.

- The Land Use Act 1978 did not make provision for their compensation. However, going by the World Bank OP 4.12, there will be no land compensation, but their houses, structures and other assets on land will be compensated as PAPs with legal rights of land use.

c). In cases where community infrastructure such as schools, dispensaries, Mosques, Churches, Palaces, Hospital, Town Halls, Police Posts, abattoirs, water sources, roads are damaged, TCN will ensure that these are restored or repaired as the case may be, at no cost to the community.

d) In case commercial structures, sections a) and b) is applied in addition to the following allowances:

- business loss due to relocation, calculated based on the amount earnings lost during movement
- job losses to employees that may lose their jobs, due to relocation of business.
- Business premises registration cost (if required at new location).

#### **7.6.2 PAPs Losing Agricultural Land and Crops**

The mechanism for compensating loss of farm land includes:

- ✓ The provision of assistance to obtain alternative site of equal size within the same community;
- ✓ Cash compensation for lost of crops and/or economic tree at full market price of estimated produce. This is arrived at by employing the appropriate valuation methodology over the types of crops or acreage covered as well as the economic trees to be affected.
- ✓ PAPs will also be provided with compensation at full replacement cost, without deduction or depreciation for salvaged materials or any other fixed assets in part or in total by the project, such as tombs and water wells.

#### **7.6.3 Compensation for Trees**

Some of the households in the project area (along with the transmission route) have fruit trees. These trees will have to be cut and cannot be replanted in the area of the line. This will be a permanent loss over the years. Evaluation of the numbers of trees for each family has been done on the basis of the investigation results. These trees will be compensated

#### **7.6.4 Access Roads and Workers Camps**

The allowance required for workers to access roads to account for the damages or temporary impacts on land for which the owners must be compensated, shall be included in the EPC contract.

## CHAPTER EIGHT

### 8.0 INCOME AND LIVELIHOOD RESTORATION STRATEGIES

The Transmission Company of Nigeria (TCN) is encouraged to use the guidelines below and involve the affected communities, local leaders, NGOs and other stakeholders to gather opinions in order to assess livelihood restoration procedures.

The World Bank (WB)'s OP, 4.12 paragraph (6c), states the following:

*“Displaced persons should be offered support after displacement, for a transition period, based on a reasonable estimate of the time likely to be needed to restore their livelihood and standards of living; and provided with development assistance, such as land preparation, credit facilities, training, in addition to the compensation they receive.”*

Additionally, WB OP 4.12, paragraph (2c), requires that displaced individuals be given assistance for their efforts to improve their living standards or to at least restore them to the highest standard between pre-displacement or standards prevailing prior to the beginning of the project implementation.

In an effort to define income and develop livelihood restoration strategies, TCN would involve participation for purposes of fostering ownership at an early stage. Assistance will be especially critical to the individual that is to be relocated far away, due to reconstruction costs that may be otherwise avoided.

It is recommended that TCN hire a consultant or partner with an NGO to coordinate the restoration programme.

#### 8.1 COMMUNITIES WITHIN THE TRANSMISSION LINE'S ROW

As discussed in chapter 7 of this report, it is recommended to inform the PAPs of the project at least 3 months before the start of the construction.

In all cases, PAPs shall be advised to construct new structures at locations near the previous ones within the affected community to reduce disruption of community life, established spatial organization and services.

Also worthy of mentioning is the fact that many communities along the ROW have experienced workers that can be hired during the construction phase. Local experienced workers and entrepreneurs with necessary experience and capacity should be given priority work opportunities, if applicable. Also, as suggested through consultations, the general contractor should liaise with village chiefs to maximise local hiring as well as the purchase of relevant local materials and services.

#### 8.2 INCOME RESTORATION AND IMPROVEMENT

Different restoration packages will be required for each of the various categories of PAPs and will depend on the type and magnitude of loss suffered, the vulnerability level of the PAPs' household,

the indicated preferences associated to their family characteristics and other relevant circumstances.

#### 8.2.1 Land base

As stated in chapter 7 of this report, the households that will lose a piece of land will receive sufficient compensation to be able to buy a new land, off-set loss of crops and rehabilitate the land to similar production level.

Further investigations paired with experience on similar projects indicate that in most cases it would be difficult and cumbersome for the TCN to find and propose replacement land for different reasons (risk of speculation, administrative burden, PAP lack of trust, etc.). It is thus preferable to pay cash compensation to the PAPs to provide them with an opportunity to purchase new land and condition it themselves and continue farming.

However, to limit impoverishment risk, adequate compensation level and implementation conditions are essential. The conditions discussed in chapters 7, 9 and 10 needs to be given to PAPs and are summarized below:

- Sufficient time to find and evaluate their option and possible replacement land and organize the resettlement;
- Support for all legal aspects of the transaction;
- All “transaction costs” such as registration fees, transfer taxes, or customary tributes are to be compensated;
- Adequate control of PAPs' use of compensations by project authorities through different mechanisms like progressive verification of land purchase would be taken.

PAPs whose crops are to be negatively impacted by the project would be provided seedlings and seeds for their gardens and crops on their replacement land.

Furthermore, compensation would cover cost of improvement (fertilized, tilled, weeded, fenced, etc.) to reach the productive condition of the original plot. Affected households will be paid by the project to do this work as much as possible, by themselves.

Additionally, technical assistance will be provided for at least a two-year period to help the impacted households improve their situation. As discussed in chapter 9 Project Implementation Unit is encouraged to engage the services of an experienced Agronomist who will also ensure coordination with governmental agricultural departments for the coordination and efficiency of the work. This specialist will assess concerns, needs and the most relevant aspects of livelihood improvement with PAPs and local administration as well as it will propose improvement and support activities.

This help could include the following:

- Practical training courses on improved agricultural techniques;
- Improved crop varieties;
- Fertilization;
- Small scale irrigation;
- Animal traction and related equipment;

- Post-harvest grain conservation;
- Agroforestry, other relevant techniques.

### 8.2.2 Trees

Trees will be destroyed during the construction of the transmission line since no trees taller than 4 meters are being kept in the wayleave. Compensation to households will be allocated according to the prescribed rates up to replace these trees. The PIU specialist will help the affected households to plant trees to restore their source of income and livelihoods.

### 8.2.3 Structures

In a limited number of cases, houses and other structures that are located in the wayleave will have to be displaced. In that case and during the survey campaign, the PAPs indicated that with adequate compensation they would not have problem obtaining an available land to relocate their houses to.

Those buildings would therefore be rebuilt on new land where the risk of spatial disruption of household activities is the lowest. All necessary steps will be taken by the TCN and the PIU or consultants in charge of compensation to make sure that the PAPs find a suitable land for reconstruction and enough time for reconstruction and proper compensation is paid. Reconstruction is to be done on parcels adjacent to the piece of land being displaced, where possible.

Each of these household will receive additional compensation to cover the following expenses:

- A moving allocation to pay for moving their goods and belongings;
- An income support for of the household to mitigate the inconvenience and time constraints related to the resettlement.
- Cost land administration, taxes and other charges associated with land acquisition.

### 8.2.4 Vulnerable Groups

A special focus must be given to the livelihood improvement of vulnerable groups prior to the construction of the project. Vulnerable groups include low income families, women, child (under 18 years heading a household) or handicap headed households.

Vulnerable households will be consulted at the onset of the operation to evaluate their concerns and needs. Special help that could be provided include, among others:

- Support to open bank account;
- Help for administrative transactions (land titling);
- Relocation logistics and other support for the physically resettled households such as :
  - Transport assistance;
  - Reconstruction advice (on materials, type of structures, etc.) to ensure the quality of construction;
- Psychological support (information, counseling, discussion);
- Special transitional funds specific to vulnerable households.

Members of affected households should also benefit from the proposed training programs. Household members within vulnerable households are to be given priority for the allocation of project related employment and other benefits.

Given the current place of females in rural communities, when cash compensations is the only acceptable option, the following possible mitigation measures would also be examined and implemented when feasible:

- Awareness programs on issues directed towards authorities, local administrators and communities;
- Assistance of the PIU to inform and assist vulnerable people and groups;
- Seeking full consent of females in the households and explaining to them the proposed compensation options;
- Payment of large amounts of cash compensation (larger than N 200,000) through carefully distributed instalments (it can be over several months) to mitigate the potential for cash misuse;
- Careful monitoring.

### 8.2.5 Non-Financial Components

#### EMPLOYMENT AND OTHER BENEFITS

Priority would be given to all able-bodied members of resettled households during the labour recruitment process. This applies to the following employment and contract opportunities: clearing of the corridor; porterage for movement of construction materials to transmission pylon development and other sites, construction of access roads and construction camps, reconstruction of community buildings and houses, provision of services and goods to the workers; administration of the compensation program, monitoring activities, etc.

Furthermore, all the affected households and communities should be given all the wood that is cut on their parcel for their own use or sale. The materials salvaged from the affected structures should also be left to the affected households and communities.

All goods and services (sand, cement, food, etc.) should be bought locally when possible. This applies to all contractors and specific provisions to that effect must be included in the construction Terms of Reference.

## CHAPTER NINE

### 9.0 INSTITUTIONAL ARRANGEMENTS FOR RAP IMPLEMENTATION

#### 9.1 ACTORS INVOLVED AND ORGANISATIONAL STRUCTURE

This section highlights relevant institutions through which the planning and implementation of the RAP for the project will be conducted. A number of institutions were identified and consulted and will be involved in the overall implementation of this RAP.

These include:

- The Federal Government of Nigeria (FGN);
- Federal Ministry of Power, Works and Housing (FMPW&H);
- Transmission Company of Nigeria (TCN);
- Federal Ministry of Environment;
- Lagos and Ogun State Government responsible for;
  - Lands administration;
  - Physical Planning,
  - Agriculture
  - Women and Social Services
- Affected Local Government Authority (LGA):
- The Customary Chiefdoms, District Council and Village Chiefs.

#### 9.2 PROCEDURES AND RESPONSIBILITIES

The responsibilities and roles of each of the institutions are discussed in Chapter 3 of this report. However, in addition to the described roles, we recommend to the PIU the establishment of Local Resettlement Committee (LRC) and the hiring of Compensation and Resettlement Manager (CRM) who shall be an independent consultant, as described in Section 9.4.

#### 9.3 STEPS TO REGISTER ROW AS PUBLIC UTILITY

The different steps that need to be followed to register the ROW as a public utility are the following.

1. FMEnv will review the ESIA/ESMP reports, the comments from review will be addressed in the final version of the ESIA and ESMP report. The FMEnv will then issue approval of the ESIA, for the project to commence.
2. In line with the Land Use Act, TCN will then serve notice of intention to the Executive Governor of Lagos/Ogun State through the Commissioner for Lands and Survey. Attached to

this notice, the authorities will find the project descriptions including what the land will be used for, technical description, line route survey report, maps and coordinates, etc.).

3. Upon approval by State government, the state government through the Lands Bureau gazettes and issues notice for acquisition and revocation of all statutory grants falling within the right of way.
  - a) Notice should show exact extent of land required and published appropriately
  - b) Notice shall give a minimum of 6 weeks prior to yielding of possession
  - c) Notice shall give or reserve rights of affected persons to enter (and their agents) for purposes of inspection/determination of their acquired interests.
  - d) Notice must state an effective date for the acquisition.
4. TCN publish list of claims/Undertake verification /Resolve grievances
5. TCN proceed to Resettlement/Payment of compensation /Receive /Compile indemnity data
6. TCN take over the ROW
7. TCN register the acquisition with relevant Deeds Registry

#### 9.4 INSTITUTIONAL ARRANGEMENT

Responsibilities in the implementation and monitoring of the ESMP and RAP are shared between multiple stakeholders, including the funding agencies, competent ministries, departmental authorities and TCN.

In order to encourage the coordination of decisions as well as application of the various measures in an appropriate way, TCN should consider the possibility of hiring a Compensation and Resettlement Manager (CRM). Furthermore, as discussed, a LRC should be put in place and a witness NGO should be invited to participate to the process.

The figure below illustrates the functioning of such institutional arrangement.



**Figure 9.1 Institutional Arrangements for RAP Implementation**

**9.4.1 Project Implementation Unit (PIU)**

Responsibility for the good implementation of the RAP lies with TCN through the PIU. It is thus its responsibility to insure the hiring of Compensation and Resettlement Manager (CRM), the witness NGO, and establishing the Local Resettlement Committee (LRC).

This structure will take care of the implementation of the RAP, including the monitoring activities and implementation.

**9.4.2 Compensation and Resettlement Manager (CRM) -Implementation Consultants**

The CRM should be an independent consultant with good experience in RAP Implementation and knowledgeable about the project area, with the following responsibilities:

- Prepare compensation and resettlement plan;
- Provision of information on compensation and resettlement activities and consultation with the PAPs;
- Ensure proper information and participation of PAPs and affected communities;
- Management of compensation payments;
- Production of reports for the RAP implementation to appropriate government authorities, TCN and the contractor in charge of the line construction.

The CRM must rely on a team of professionals and support staff able to conduct all the tasks described, to include:

- **Support staff:** secretarial services, drivers, security and legal personnel, general accountants;
- **Survey, Identification & Appraisal Team:** surveyors, appraisers, “option disclosure and agreement” officers in charge of relations with each PAP households (negotiation, compensation payment, PAP feed-back, etc.);
- **Cash compensation:** compensation officers, accountant, security officer;
- **Database management:** database officers/documentation officers;
- **Livelihood restoration and community forest:** agronomist / agro-foresters. Since this shall be undertaken during construction. It should be made part of the EPC contract.
- **Consultation specialist:** Community engagement specialist in charge of the information and participation program.

The envisaged compensation amounts and resettlement modalities for each PAP will have to be approved and endorsed by the PAPs, the competent governmental authorities and by TCN.

Communities’ and households’ fears regarding the non-payment of the Claims are important and widespread. In order to reduce those fears, it is strongly recommended that the approval of the start of the construction of the power line be conditional to the transmission of a satisfactory progress report from the CRM. This report must clearly establish, with the support of evidence, that compensations were paid, and that resettlement projects were successfully carried out prior to the initiation of the construction phase. The confirmation of the witness NGO of this report is essential.

**9.4.3 Local Resettlement Committee (LRC)**

This committee shall be established in each of the 4 LGAs, to include Village Chiefs, elected representatives of affected PAPs and LGA authorities to ensure proper management of compensation processes, reconstruction and management of grievances. As mentioned it is proposed that 4 LRCs, one each for LGA, be created.

The composition of these LRC would be:

- LGA Lands or works department representative;
- Affected village chiefs;
- 3 representatives of affected PAP with at least one women;
- 1 representative a neutral, respected person, like a respected Iman/Alfa or Church Priest to be nominated by Customary Chieftdom (Emir or Paramount Ruler), that can act as chairman so meeting procedures are followed.

LRCs are considered as local partners for the implementation of the RAP and work with the PIU and the CRM to ensure proper and equitable treatment to all PAPs and communities.

They will:

- Offer assistance to identify and select the resettlement sites;



- Will be witnesses of the final agreement with the PAP in relation to compensation valuation, signing of agreements with households and selection of resettlement sites;
- Involve in monitoring procedures;
- Identification of vulnerable people and households and work with PIU to address specific concerns of these peoples.

#### 9.4.4 Witness NGO

To enhance transparency and trust from PAPs it is suggested that a witness NGO, recognized and credible in the project area, be hired, through a public proposal and selection process, by the PIU to provide independent advice and report on RAP implementation and management focusing on consultation activities, compensation and resettlement related activities and grievances management. This NGO could be a recognized and credible Human Right advocacy group or a NGO active in rural development.

This 'outside' look will ensure that proper procedures and stated compensation processes are followed, that PAP grievances are well taken care of, and that PAPs are treated with fairness. This mode of supervision was experienced in other projects and gave good results in terms of reduction of grievances in particular<sup>1</sup>.

This NGO will review and validate CRM reports, meet with PAPs, check implementation of the measures, reconstruction, etc. in the field and provide comments and recommendations. All PAPs will be informed of the NGO role and function and need to have access to its representatives, in a confidential manner if need be, to explain and discuss their difficulties of grievances.

#### 9.4.5 Stakeholder Engagement Program

To ensure the interests of the affected persons are fully entrenched in the RAP process and income restoration, an engagement program shall be developed at the onset of the RAP implementation process. These program goals are transparent information and meaningful participation of PAPs, representatives of affected and interested groups and of the various administrative and government departments all through the project.

This participation will be done through PIU, the LRC and a vigorous program of information and consultation of affected communities and PAPs. These information and consultation will concern compensation rules and procedures, livelihoods program, PAPs rights, grievance mechanisms, etc.

Many means should be used leaflets, community meetings with graphical display to help illiterate people, radio messages in local languages, recorded approval of the project by local authorities, etc.

<sup>1</sup> Burnside and Associates Limited, 2006, Bujagali Interconnection Project Resettlement and Community Development Action Plan

## 9.5 INSTITUTIONAL CAPACITY REINFORCEMENT

In relation to the above, training and information transmission are important issues in order to raise awareness on current environmental and compensation legislations and regulations governing the project.

A training program must be implemented as part of the LRC and witness NGO set-up process to properly train key personnel involved with the supervision of compensation evaluation, procedures and implementation of others mitigation and compensation measures. Training on grievance procedures and negotiations should also be provided to the personnel in charge of supervising compensation and resettlement issues shall be provided by the CRM to the PIU, LRC and the NGO. The CRM shall be responsible to ensure its own staff has the requisite expertise and experience to handle the assignment.

Table 9.1 outlines the training proposed for the PIU, LRC and witness NGO. The training is focused on the practical aspects of compensation and resettlement, compensation process, monitoring and management. The proposed content is a minimum that can be expanded depending on the competency of the trainees and experience.

The costs associated with this training program shall be included in the CRM budget, which is 0.2% of the total compensation budget.

**TABLE 9.1 TRAINING PROGRAM**

| TRAINING RECIPIENTS                                  | TYPE OF TRAINING  | MINIMUM ISSUES TO BE COVERED   | FACILITATOR/TRAINERS                                    |
|--|---|--|---|
| PIU team of compensation supervisors and witness NGO | <ul style="list-style-type: none"> <li>• Workshops</li> <li>• Lectures</li> <li>• Case studies</li> </ul> | <ul style="list-style-type: none"> <li>• Compensation and resettlement process</li> <li>• Grievances management, negotiation and mediation techniques</li> </ul> | Resettlement Expert<br>Legal and/or negotiation experts |
| LRC and other stakeholders                           | <ul style="list-style-type: none"> <li>• Workshops</li> <li>• Lectures</li> <li>• Case studies</li> </ul> | <ul style="list-style-type: none"> <li>• Compensation and resettlement process</li> <li>• Grievances management, negotiation and mediation techniques</li> </ul> | Resettlement Expert<br>Legal and/or negotiation experts |

## CHAPTER TEN

### 10.0 GRIEVANCE MECHANISMS

During implementation of the project activities, it is possible that disputes/disagreements between the project developer and the PAPs will occur especially in terms of compensation, boundaries, ownership of crops or land, etc.

There are great challenges associated with grievance redress especially in a project of this magnitude.

The practice of grievance arbitration over resettlement issues in Nigeria is conducted within the framework of the Land Use Act (LUA) of 1978, reviewed under Cap 202, 1990. Two stages have been identified in the grievance procedure: customary mediation and judiciary hearings.

A grievance procedure based on community grievance committees, one per LGA, will be established for resolution of the disputes and complaints.

#### 10.1 CUSTOMARY MEDIATION

Procedures for grievances will be clearly explained during community meetings. At the village levels, a series of customary avenues exists to deal with dispute resolutions. Those avenues should be employed, when and where it is relevant as a “court of first appeal”.

Such customary avenues should provide a first culturally and amicable grievance procedure that will facilitate formal and/or informal grievance resolution for grievances such as:

- Wrongly recorded personal or community details;
- Wrongly recorded assets including land details and/or affected acreage;
- Change of recipient due to recent death or disability;
- Recent change of asset ownership;
- Wrong computation of compensation;
- Name missed out of register, etc.

A Customary Grievance Redress Committee shall be set up by the PIU in each LGA to address complaints from RAP implementation. This committee will be assisted by the PIU who will act as TCN representative and its members will include;

- Representative of State Ministry for Lands
- Representative of Land Administration- (Secretary);
- Representative of the local Government Area (s) (Member);
- Respected local Elders (Members);
- Representative of Village Head of affected village (s);

- Representative of the Oba covering the area;
- Representative of the Witness NGO.

PAPs’ complaints should first be lodged verbally or in writing through this process.

It is expected that the committee will deal with the grievances they receive within three days of receipt of the complaint. If the complaint cannot be resolved at this level, or if the plaintiff is not satisfied with the settlement proposed, the plaintiff should then be referred to the official legal procedures.

#### 10.2 COURTS OF LAW

The judicial process in accordance with applicable laws will be followed and the law courts will pass binding judgment on the matter.

#### 10.3 GRIEVANCE RESOLUTION PROCEDURES

**The first level is the Village Chief or the Compensation and Resettlement Manager (CRM):** The aggrieved person shall first report the matter to the Village Chief for resolution. Issues that can be resolved at this level include, ownership tussle, management of deceased property, boundary issues, etc.

The type of issues to report to the CRM for possible include, perceived wrong valuation, incorrect PAP data, inadequacy of compensation received, etc.

if the issue is not resolved at this stage, it can then be escalated to customary mediation described in Section 10.1 and if still no acceptable resolution is achieved, the parties may choose to go to court in accordance with laws of the Federal Republic of Nigeria. Figure 10.1 illustrates this mechanism.

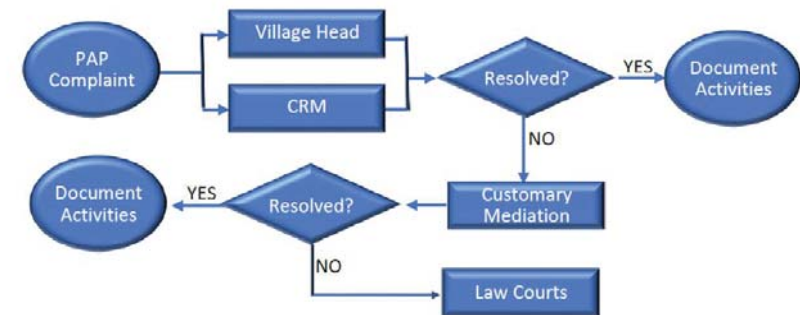


Figure 10.1 Grievance Resolution Procedure

## CHAPTER ELEVEN

### 11.0 MONITORING, REVIEW AND EVALUATION

The purpose of resettlement monitoring is to ensure that measures developed for compensating the losses were effective in restoring PAPs living standards and income levels. Monitoring will be implemented by the PIU.

During monitoring phase, the existing grievance mechanism will be regularly reviewed for improving and correspondingly, additional and more user friendly forms, which enable the field staff to forward complaints and demands of local people to the PIU.

Throughout the Project lifecycle, monitoring and evaluation activities will be reviewed; restructured or removed in case that the previously produced tools and forms are inefficient.

Monitoring and Evaluation (M&E) procedures establish the effectiveness of all land and asset acquisition and resettlement activities, in addition to the measures designed to mitigate adverse social impacts. The procedures include internal track keeping efforts as well as independent external monitoring.

The purpose of resettlement monitoring for the proposed Transmission Line Project will be to verify that:

- Actions and commitments described in the RAP are implemented;
- Eligible project affected people receive their full compensation prior to the start of the rehabilitation activities on the corridor;
- RAP actions and compensation measures have helped the people who sought cash compensation in restoring their lost incomes and in sustaining/improving pre-project living standards;
- Complaints and grievances lodged by project affected people are followed up and, where necessary, appropriate corrective actions are taken; and
- If necessary, changes in RAP procedure are made to improve delivery of entitlements to project affected people.

The World Bank operational policy (OP 4.12) states that the project sponsor (TCN) is responsible for adequate M&E of the activities set forth in the resettlement instrument.

Monitoring will provide both a warning system for the PIU and the project sponsor (TCN) and a channel for the affected persons to make known their needs and their reactions to resettlement execution.

PIU monitoring and evaluation activities and programs shall be adequately funded and staffed. PIU monitoring will be verified by the witness NGO to ensure complete and objective information.

### 11.1 MONITORING FRAMEWORK

The purpose of resettlement monitoring will be to ensure that compensation measures were effective in restoring PAPs living standards and income levels.

Also the effectiveness of the grievance mechanism provided will be followed up. As part of the monitoring and evaluation process, changes in RAP procedures will be put into effect if necessary.

The monitoring and evaluation framework consists of three elements:

- PIU monitoring;
- External monitoring undertaken by the Witness NGO; and
- Independent RAP Completion Audit.

Indicators have been established in order to measure RAP activities, results, objectives and goals. There are five categories of indicators for performance monitoring.

The first three (3) Internal Performance Monitoring are: *input, output and process indicators*.

They are mostly used for medium term measures to ensure that the RAP is relevant, effective and efficient.

The last two Impact monitoring are: *outcome and impact indicators*. They are mostly used for long term measures for assessing the results.

**TABLE 11-1 RAP MONITORING FRAMEWORK**

| COMPONENT ACTIVITY              | TYPE OF INFORMATION/ DATA COLLECTED  | SOURCE OF INFORMATION/ DATA COLLECTIONS METHODS   | RESPONSIBILITY FOR DATA COLLECTION, ANALYSES AND REPORTING        | FREQUENCY/ AUDIENCE OF REPORTING                                   |
|---------------------------------|--|---|---|--|
| Internal Performance Monitoring | Measurement of input, process, output and outcome indicators against proposed timeline and budget, including compensation disbursement           | Quarterly narrative status and compensation disbursement reports  | PIU team, including public relations representatives              | Semi-annual or as required by TCN Environmental Committee and JICA |
| Impact Monitoring               | Tracking effectiveness of inputs against baseline indicators<br>Assessment of affected people's satisfaction with inputs, processes and outputs. | Annual quantitative and qualitative surveys.<br>Regular public meetings and other consultation with project affected people; review of grievance mechanism outputs. | PIU team, including public affairs representatives<br>Witness NGO | Annual   |

In order to effectively report on the effectiveness of RAP implementation, PIU will monitor the following key indicators, in keeping with World Bank / JICA requirements on involuntary resettlement:

- The timely disbursement of compensation;
- Compensation disbursement to the correct parties;

- Public consultation and grievance procedures in place and functioning;
- The physical progress of resettlement and rehabilitation, where applicable.

PIU monitoring will provide the RAP management team with feedback on RAP implementation and help ensure that adverse impacts on affected people are mitigated in a timely manner. M&E will be the main mechanism to alert management of any delays and problems and will help TCN measure the extent to which the main objectives of the resettlement plan have been achieved.

RAP monitoring and evaluation activities will be adequately funded, implemented by qualified specialists and integrated into the overall PIU budget and activities.

PIU monitoring and evaluation activities will be supplemented and verified by monitoring efforts of the witness NGO.

The establishment of appropriate indicators in the RAP is essential since what is measured is what will be considered important. Indicators will be created for affected people as a whole, for key stakeholder groups, and for special categories of affected groups such as women.

The most important indicators for the RAP in the near term concern outputs, processes and outcomes since they define whether the planned level of effort is being made and whether early implementation experience is being used to modify/redesign RAP features. Over the medium to long term, outcome and impact indicators are critical since they are the ultimate measure of the RAP's effectiveness in restoring people's livelihoods.

Monitoring indicators may have to be defined or re-defined during the course of project in response to changes to project-related conditions. Consequently, implementation and mitigation measures may have to be adopted to incorporate these changes into the M&E plan.

### **11.1.1 Indicators**

#### **INPUT INDICATORS**

These cover the human and financial resources that are utilized in the RAP activities.

#### **OUTPUT INDICATORS**

Include activities and services produced with the inputs, which can be a database of land acquisition, Compensation payments made for the loss of assets etc.

#### **PROCESS INDICATORS**

Process indicators represent the change in the quality and quantity of access and coverage of the activities and services. Examples of process indicators in the RAP include:

1. The creation of grievance mechanisms;
2. The establishment of stakeholder channels so that they can participate in RAP implementation;
3. Information and dissemination activities.

### **OUTCOME INDICATORS**

The delivery of mitigation activities and measures to compensate physical and economic losses created by the project such as restoration and compensation of agricultural production and overall income levels, changes in PAPs and community attitudes towards the project, use of compensation payments for income generating activities.

### **IMPACT INDICATORS**

Impact indicators define the change in medium and long-term measurable results in behavior and attitudes, living standards, and conditions. Impact indicators aim to assess whether restoration activities of the RAP are effective in maintaining and even improving social and economic conditions of PAPs.

In addition to quantitative indicators, impact monitoring will be supplemented by the use of qualitative indicators to assess client satisfaction and the satisfaction of the affected people with the choices that they have made in re-establishing themselves.

Tracking this data will allow PIU determining the following types of information:

- The extent to which quality of life and livelihood has been restored;
- The success of the resettlement; and
- Whether Project-Affected Persons have experienced any hardship as a result of the project.

## **11.2 INTERNAL MONITORING**

Internal monitoring measures the progress of activities defined in the RAP. The PIU will be responsible for this process with support from appointed experts as necessary.

It is the responsibility of the PIU to conduct regular internal monitoring of the resettlement efforts and performance of the operation through LRC and grievances committee which will be responsible for implementing resettlement activities and manage grievances. The monitoring shall be a systematic evaluation of the activities of the operation in relation to the specified criteria of the condition of approval.

### **11.2.1 Objectives of Internal M&E**

The objective of internal monitoring and supervision shall be:

- To verify that the valuation of assets lost or damaged, and the provision of relocation, resettlement and other rehabilitation entitlements, has been carried out in accordance with the resettlement policies;
- To oversee that the RAP is implemented as designed and approved;
- To verify that funds for implementation of the RAP are provided by the TCN in a timely manner and in amounts sufficient for their purposes, and that such funds are used in accordance with the provisions of the RAP;

- Ensure the identification and signature/thumb print of PAPs before and during receipt of compensation entitlements; and
- Record all grievances and their resolutions, and ensure that complaints are dealt with in a timely manner.

### 11.3 EXTERNAL MONITORING AND EVALUATION

External monitoring activities will verify the process defined in the RAP which is realized by PIU.

The witness NGO shall be engaged to periodically carry out external monitoring and evaluation of the implementation of the RAP. The general objectives for external monitoring are:

- To provide an independent source of evaluation during the implementation process of resettlement and compensation. The external monitor will offer, if needed, external support and technical expertise to RAP compensation committees and implementing agencies;
- To contribute advice to solve both anticipated and unanticipated problems that may arise as the programs defined in this RAP are carried out; and
- To provide an overall assessment of RAP programs from a broader, long-term socio-economic perspective.

The following parameters will be monitored and evaluated through PIU reports and sites visits:

- Public consultation and awareness efforts of compensation distribution;
- PAPs should be fully informed and consulted about on all resettlement activities, including land acquisition, leasing land and relocation activities;
- The witness NGO representative should attend some public meeting to monitor consultation procedures, problems and issues arisen during the meetings and solutions proposed;
- Levels of PAPs satisfaction with various aspects of resettlement and compensation will be monitored and recorded;
- Operation of grievance redress mechanism, redress results, and effectiveness of grievance resolution will be monitored;
- Standards of Living - throughout resettlement implementation process, the trends of living standards of PAPs will be observed and surveyed, and any potential problems in restoration of living standards will be recorded and reported.

The witness NGO should have qualified and experienced staff and their terms of reference acceptable to the financing JICA.

In addition to verifying the information furnished in the internal supervision and monitoring reports, the independent monitoring unit shall visit a sample of 10% of PAP in each relevant district, six (6) months after the RAP has been implemented to:

- Determine whether the procedures for PAPs participation and delivery of compensation and other rehabilitation entitlements have been done in accordance with the Policy Framework and the respective RAP;

- Assess if the RAP objective or enhancement or at least restoration of living standards and income levels of PAPs have been met;
- Gather qualitative indications of the social and economic impact of project implementation on the PAPs; and
- Suggest modification in the implementation procedures of the RAP, as the case may be, to achieve the principles and objectives of this policy framework.

The terms of reference for this task and selection of qualified NGO and Consultant will be prepared by the PIU in collaboration with TCN and JICA at the beginning of project implementation stage.

Both internal and external monitoring will be ended with RAP Completion Audit.

### 11.4 RAP COMPLETION AUDIT

A RAP completion audit will be undertaken when previous monitoring has indicated that there is no significant outstanding issue regarding livelihood restoration and resettlement. It is expected that this final audit will be performed 3 years after the resettlement at the latest.

The RAP completion audit will be undertaken by an Accredited Agent with support from PIU and TCN as required.

The RAP completion audit will provide final indication that the livelihood restoration is sustainable and no further interventions are required.

Therefore, the independent audit assessing compliance programs resettlement / compensation with the provisions described in the RAP, the Nigerian legal framework applicable and the requirements of World Bank/JICA. The evaluation report will be made public through the PIU, LRC meeting and public announcement through appropriate media.

### 11.5 REPORTING

RAP monitoring reports will be prepared in accordance with World Bank/JICA guidelines. Progress will be reported for the following tasks:

- Internal monitoring;
- External monitoring;
- Compensation;
- Completion audit.

The PIU team will have primary responsibility for the implementation of all internal monitoring activities. Designated staff will collect relevant data in a standardized format. PIU will use a device such as a bar chart/Gantt chart or Microsoft Project table to assess and present information on progress of time bound actions.

### 11.5.1 Frequency/Audience of Reporting

Monthly performance monitoring reports will be prepared by the CRM and witness NGO for the PIU, beginning with the commencement of any activities related to resettlement, including income restoration.

These reports will summarize information that is collected and compiled in the quarterly narrative status and compensation disbursement reports and highlight key issues that have arisen.

As a result of the monitoring of inputs, processes, outputs and outcomes of RAP activities, project management will be advised of necessary improvements in the implementation of the RAP.

### 11.5.2 Type of Information/Data Collected

In order to measure the project process and impact performance and to assess the effectiveness of project impact mitigation measures, PIU will collect information on all the input, process outcome and impact indicators.

Impact monitoring data will be collected at appropriate intervals through qualitative and quantitative surveys, and include a review of grievance mechanism outputs. The PIU will consult directly with the affected populations through regular public and LRC meetings.

Monitoring data will be reported to the PIU and relevant external agencies quarterly or more frequently as required. The monitoring will continue for about 2 years beyond the completion of displacement process.

## CHAPTER TWELVE

### 12.0 RAP IMPLEMENTATION BUDGET AND SCHEDULE

#### 12.1 RAP BUDGET

**TABLE 12.1 COMPENSATION BUDGET**

| Element  | Amount (NGN)            |
|--|-------------------------|
| Crops  | 400,905,574.24          |
| Structures   | 2,146,630,564.12        |
| <b>Sub-total for structures and crops</b>  | <b>2,547,536,138.36</b> |
| Allow for Security, bank charges, stamp duty and other logistics, for compensation payment (2.5%) for crops      | 10,022,639.36           |
| Allow for Security, bank charges, stamp duty and other logistics, for compensation payment (2.5%) for structures | 53,665,764.10           |
| Assistance to vulnerable groups (1% of crop and structure values)  | 16,236,000.00           |
| Allow for demolition and salvage of structures (5%)  | 107,331,528.21          |
| Allow 5% contingency for structures and crops  | 127,376,806.92          |
| <b>Subtotal</b>  | <b>314,632,738.59</b>   |
| <b>Total</b>   | <b>2,862,168,876.95</b> |

See Appendix 1 for detailed methodology used as well as the calculation spread sheet attached to Appendix 1.

#### 12.2 RAP IMPLEMENTATION SCHEDULE

The RAP implementation should be completed to a reasonable extent before land take over. The implementation is in two phases. The first phase is expected to be completed within 6 months, which includes, selection of implementation consultant, selection of contractors, establishment of local resettlement committees, etc. The second phase engagement with PAPs, review of entitlements, database management, communication with PAPs, direct payments and assistance to PAPs. This is expected to take upto 6 months to one year. The third and final phase include activities such as monitoring and evaluation, grievance management and livelihood restoration. These will also take about a year to complete.

It is important that all structures to be rebuilt and payments for compensation are completed before project construction is commenced. This can be done progressively so construction can start on one end. The monitoring and evaluation activities which are scheduled to be done once a year, shall commence 6 months after completion of compensation payments. The schedule is in Table 12.2 and task assignment for implementation is in Table 12.3.

**TABLE 12.2 RAP AND ESMP IMPLEMENTATION SCHEDULE**



Project schedule for Env and Social (6).xls

[print pdf version on A3 and insert]

**TABLE 12.3 RAP IMPLEMENTATION TASKS AND RESPONSIBILITIES**

| Task  | PIU (ESMP and RAP) | TCN Head office Staff |                                    | TCN Regional office staff (RAP) |          |         | Consultant team          |                  | others                              |
|---|--------------------|-----------------------|------------------------------------|---------------------------------|----------|---------|--------------------------|------------------|-------------------------------------|
|   |                    | CRE                   | WPD                                | Environment unit                | OHS unit | WPD     | International consultant | Local consultant |                                     |
| Location  | Abuja              | Abuja                 | Abuja                              | Lagos                           |          |         |                          |                  | State, Witness NGO, LRC             |
| # of staff assigned (plan)  | 2                  | 1-2                   | 2                                  | 1                               | 0        | 1       | 1                        | 3-6 or more      |                                     |
| <b>Engagement with PAPs</b>   |                    |                       |                                    |                                 |          |         |                          |                  |                                     |
| - Informed Consent, Consultation to all PAPs (and communities) and agreement with PAPs regarding the entitlement matrix     | x                  |                       |                                    |                                 |          | x       | x                        | X                | (LRC)                               |
| - Supporting to PAPs (e.g. opening bank account, supports for vulnerable groups)  | X                  |                       |                                    |                                 |          | support | x                        | x                |                                     |
| - Signing on agreement with all PAPs  | X                  |                       |                                    |                                 |          | Support | x                        | x                |                                     |
| <b>Establishment of organization</b>  |                    |                       |                                    |                                 |          |         |                          |                  |                                     |
| - PIU (and consultant group?)   |                    |                       |                                    |                                 |          |         |                          |                  |                                     |
| - Local resettlement committee(s) in each communities   | x                  |                       |                                    |                                 |          | x       |                          | x                | LRC                                 |
| <b>Administrative activity</b>  |                    |                       |                                    |                                 |          |         |                          |                  |                                     |
| - Identification of land, structures and assets (variations from original RAP is expected due to arraignment of Line route) | x                  |                       |                                    |                                 |          | x       | x                        | x                | Witness NGO                         |
| - Compensation evaluation (re-evaluation to finalize)   | x                  |                       | x                                  |                                 |          |         |                          |                  | State (Land bureau etc.)            |
| - Entitlement document review for qualification of compensation   |                    |                       | X (visited sites and met all PAPs) |                                 |          |         | x                        | x                |                                     |
| - Financial approval for payment to PAPs  |                    |                       |                                    |                                 |          |         |                          |                  | TCN Mngt including MD, finance, TSP |
| - Payment (transfer to bank account)  | x                  |                       |                                    |                                 |          |         |                          |                  | TCN finance team will pay           |
| - Payment (direct by check)   | x                  |                       |                                    |                                 |          | x       | x                        | x                |                                     |

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| Task   | PIU<br>(ESMP and RAP)                          | TCN Head office Staff |       | TCN Regional office staff<br>(RAP) |          |     | Consultant team             |                       | others<br>State, Witness NGO,<br>LRC  |
|--|--|-----------------------|-------|------------------------------------|----------|-----|-----------------------------|-----------------------|---|
|  |  | CRE                   | WPD   | Environment<br>unit                | OHS unit | WPD | International<br>consultant | Local<br>consultant   |   |
| Location   | Abuja  | Abuja                 | Abuja | Lagos                              |          |     |                             |                       |   |
| # of staff assigned (plan)   | 2  | 1-2                   | 2     | 1                                  | 0        | 1   | 1                           | 3-6 or more           |   |
| - Data base management   | x  |                       |       |                                    |          | x   | x                           |                       |   |
| - Communication with PAPs  |  |                       |       |                                    |          |     | X                           | x                     | (LRC)   |
| - Physical resettlement assistance when needed                       | x  |                       |       |                                    |          | x   | x                           | x                     | (NGO, LRC)  |
| <b>Monitoring</b>  |  |                       |       |                                    |          |     |                             |                       |   |
| - Check the progress of compensation, relocation and RoC acquisition | X  |                       |       |                                    |          | x   | x                           | X weekly and monthly  |   |
| - External monitoring  |  |                       |       |                                    |          |     |                             |                       | X, JICA   |
| - Reporting at least every quarter to JICA                           | x<br>(based on monthly report from consultant) |                       |       |                                    |          |     | x                           |                       |   |
| - RAP completion audit   | X  |                       |       |                                    |          |     |                             |                       | Witness NGO, JICA   |
| <b>Certificate of Occupancy issuance</b>                             |  |                       |       |                                    |          |     |                             |                       | State (land bureau)<br>(payment document review or site audit, not specified) |
| - confirmation of completion of compensation                         |  |                       |       |                                    |          |     |                             |                       |   |
| - land title (CoO) issuance  |  |                       |       |                                    |          |     |                             |                       | State   |
| <b>Grievance Management</b>  |  |                       |       |                                    |          |     |                             |                       |   |
| - Identification   | X (reported from consultant or LRC directly)   |                       |       |                                    |          |     |                             | X (reported from LRC) | LRC   |
| - Solution   | X  |                       |       |                                    |          |     |                             | X                     |   |
| - Reporting  | X  |                       |       |                                    |          |     |                             |                       | LRC   |
| <b>Livelihood restoration</b>  |  |                       |       |                                    |          |     |                             |                       |   |
| - Training   |  |                       |       |                                    |          |     | x                           | x                     | NGO   |
| - Restoration assistance (technical support, material support, etc.) | x  |                       |       |                                    |          |     | x                           | x                     | NGO, contractors  |



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## APPENDICES

### APPENDIX 1: RAP IMPLEMENTATION BUDGET DETAILS

### APPENDIX 2: SAMPLE QUESTIONNAIRE FOR SOCIO-ECONOMIC/PAP CENSUS

### APPENDIX 3: CONSULTATION RECORDS

**Appendix 3a: Consultation Register of Signatures/Pictures**

**Appendix 3b: PAP Consent to be Interviewed**

**Appendix 3c: Notice of Entry/Cut-Off Date**