

## Environmental Monitoring for the Project for Reinforcement of Transmission Network in Nacala Corridor in Republic of Mozambique

| Environmental Parameter   | Item   | Unit                | Measured Value (mean) | Measured Value (Max.) | Mozambique Standards: Decree 18/2004 and supplement 67/2010 | Referred international Standards – WB/IFC Guidelines | Remarks (Measurement Point, Frequency, Method)   |
|---------------------------|--|---------------------|-----------------------|-----------------------|---|--|--|
| <b>Construction Phase</b> |  |                     |                       |                       |   |  |  |
| Air Quality               | SPM <sub>10</sub>  | μ gm/m <sup>3</sup> | 7.3                   | 16.0                  | Not Specified   | 50<br>150 Interim Value                              | <Sampling points><br>200m and 1km away from the project site in parallel to the transmission lines<br><Sampling date><br>24 hr sampling (from 13 Dec. to 14 Dec.)<br><Sampling method><br>High Volume Dust Sampler |
|                           | SPM <sub>25</sub>  | μ gm/m <sup>3</sup> | 3.6                   | 6.0                   | Not Specified   | 35<br>75 Interim Value                               | <Sampling points><br>200m and 1km away from the project site in parallel to the transmission lines<br><Sampling date><br>24 hr sampling (from 13 Dec. to 14 Dec.)<br><Sampling method><br>High Volume Dust Sampler |
| Noise and vibration       | Noise and vibration level  | dB                  | 50.6                  | 82.3                  | Not Specified   | 70 (Day-time)<br>70 (Night-time)                     | <Sampling points><br>100m away from the control building<br><Sampling date><br>24 hr sampling (from 13 Dec. to 14 Dec.)<br><Sampling method><br>Sound level meter  |
| Waste                     | Solid waste (including demolition waste)<br>Sanitary waste<br>Housekeeping waste |                     | Properly disposed     |                       |   |  | Worksite and camp site (weekly collection by supplier Namialo)   |
| <b>Operation Phase</b>    |  |                     |                       |                       |   |  |  |
| Waste                     | Solid waste and sanitary waste<br>Housekeeping waste of the substation           |                     |                       |                       |   |  | Substation Worksite (weekly)   |



# NAMIALO SUBSTATION CONSTRUCTION PROJECT

MECONTA DISTRICT, ADMINISTRATIVE POST OF NAMIALO – MOZAMBIQUE

DECEMBER 2018

PROPONENT:  
**AICHI ELECTRIC**



**AASERVIÇOS A&D, LDA**

NAMIALO SUBSTATION PROJECT  
MECONTA DISTRICT, ADMINISTRATIVE POST OF NAMIALO – MOZAMBIQUE

# ENVIRONMENTAL MONITORING

PROPONENT

**AICHI ELECTRIC**

**ADDRESS:**

Namialo - MOÇAMBIQUE

**CELL :** +258 84 50 54 739

**E-MAIL:** tanakaharuhisha@aichi-electronic.com

CONTACT PERSON:

**HARUHISA TANAKA**

ELABORATED BY

**AASERVIÇOS A&D, LDA**  
**Ambiente e Desenvolvimento**

**ADDRESS:**

2, Rua 2560, Muahivire Expansão

**Cell.** 26216900, Celular: 842999030

**Email:** artmaciel@gmail.com

Nampula - Moçambique

DECEMBER 2018

## ÍNDICE

|  |    |
|--|----|
| PRESENTATION NOTE .....  | 4  |
| 1. INTRODUCTION .....  | 4  |
| 2. PROJECT DESCRIPTION .....   | 6  |
| 2.1. COMPANY IDENTIFICATION.....   | 6  |
| 2.2. PROJECT LOCATION .....  | 6  |
| 3. MONITORING PLANNING AND METHODOLOGY AND CRITERIA FOR THE<br>SELECTION OF SAMPLE AREAS ..... | 7  |
| 4. OBJECTIVES OF ENVIRONMENTAL MONITORING.....   | 8  |
| 4.1 LEGAL FRAMEWORK.....   | 9  |
| 5. RESULTS OF ENVIRONMENTAL MONITORING.....  | 12 |
| 4. Results of environmental monitoring carried out at Namialo Substation Project<br>14         |    |
| 5. CONCLUSION.....   | 15 |
| 6. REFERENCES .....  | 16 |
| 7. APPENDICES .....  | 17 |

## PRESENTATION NOTE

According to the MITADER environmental assessment regulation, the Decree 54/2015 of December 31, Namialo Substation Construction Project was categorized as "B", and to comply with the national as well as international Guidelines it is important to conduct environmental monitoring as endorsed by the proposer.

For the preparation of the environmental monitoring report, AICHI ELECTRIC awarded the environmental monitoring in Namialo's substation to AAServiços, Lda, represented by Artur Afonso as a Consultant and Environmental Auditor registered with the Ministry of Land, Environment and Rural Development (MITADER). The report includes the following parts:

1. Introduction,
2. Methodology,
3. Environmental Monitoring
4. Conclusion.

### 1. INTRODUCTION

Air quality monitoring can be used basically in two ways, in the environmental diagnosis of the areas of influence, before the implementation of an enterprise, and in the evaluation of impacts in the implementation stages of the enterprise.

Environmental monitoring can be defined as the systematic sampling of air, water, soil and biota in order to observe and study the environment, as well as to obtain knowledge of this process (Artiola et al., 2004; Wiersma, 2004).

Air quality monitoring can be performed to achieve several objectives: to know the air quality of a given region, to assess the likely effects of pollution on humans, animals, plants and materials, to provide data to emergence during periods of atmospheric

stagnation, when levels of pollutants in the air represent risks to public health, safety and well-being of the population, among others (Rosa, Suzuki, Santi, 2000).

Dust (represented by  $MP_{10}$  and  $MP_{2.5}$ ) is the significant atmospheric pollutant resulting from the release at the design site and other related construction activities. Therefore, the monitoring of environment air quality at the construction stage of Namialo substation project becomes necessary.

Some concerns arise when dust levels are very high, including:

- Safety - unpaved roads may have reduced visibility due to dust. This can lead to increased accidents and incidents.
- Health - Dust particles from various materials can become a health hazard if attached to the lung.
- Vegetation - Large amounts of dust can have debilitating effects on vegetation.

Air sampling through environmental monitoring can produce data that can be used to understand the state, the concentration of the pollutant in the environment and its processes (Wiersma, 2004). To this end, WHO and the World Bank Group, among several pollutants, consider  $MP_{10}$  and  $MP_{2.5}$ , establishing guideline values for them, in order to enable the progressive adoption of guideline values by countries, according to their specificities and management structure of air quality.

This report presents the results of the environmental monitoring process of  $MP_{10}$ ,  $MP_{2.5}$ , and noise on the site where a substation was built in Namialo, Meconta District – Nampula province by AICHI Electric.

## 2. PROJECT DESCRIPTION

### 2.1. COMPANY IDENTIFICATION

Company Name: AICHI Electric

Address:

Tel:

Legal Representative:

Name: Fukio Oguri

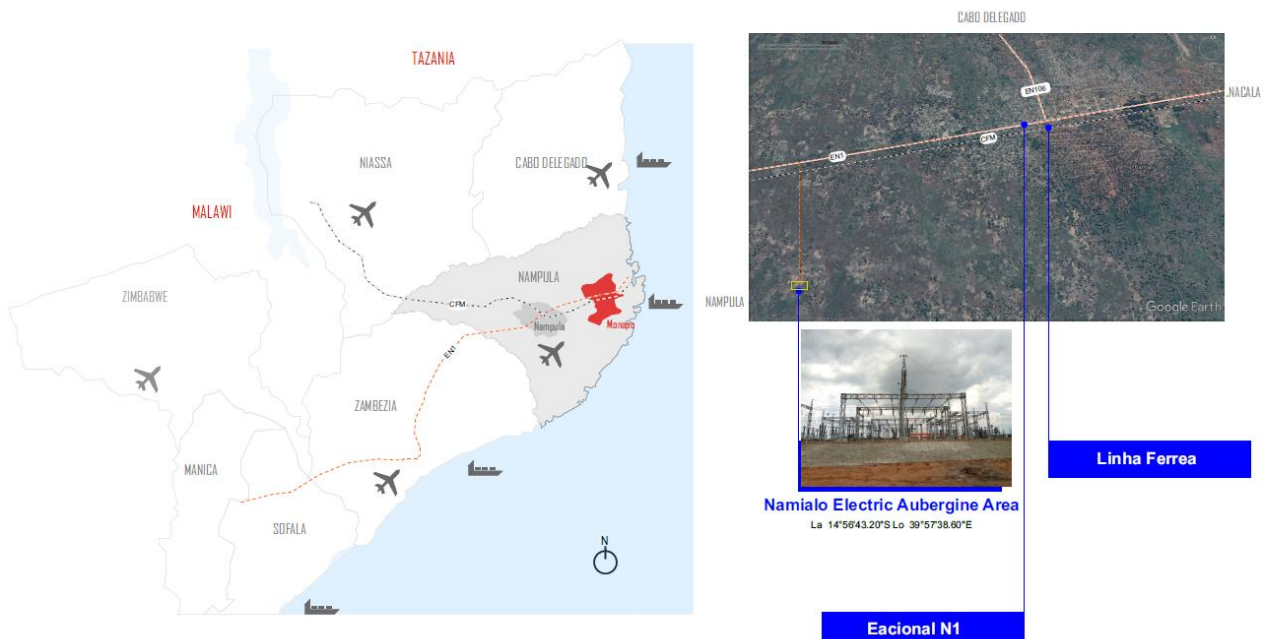
Position: Director

Contact person

Position Responsibility

### 2.2. PROJECT LOCATION

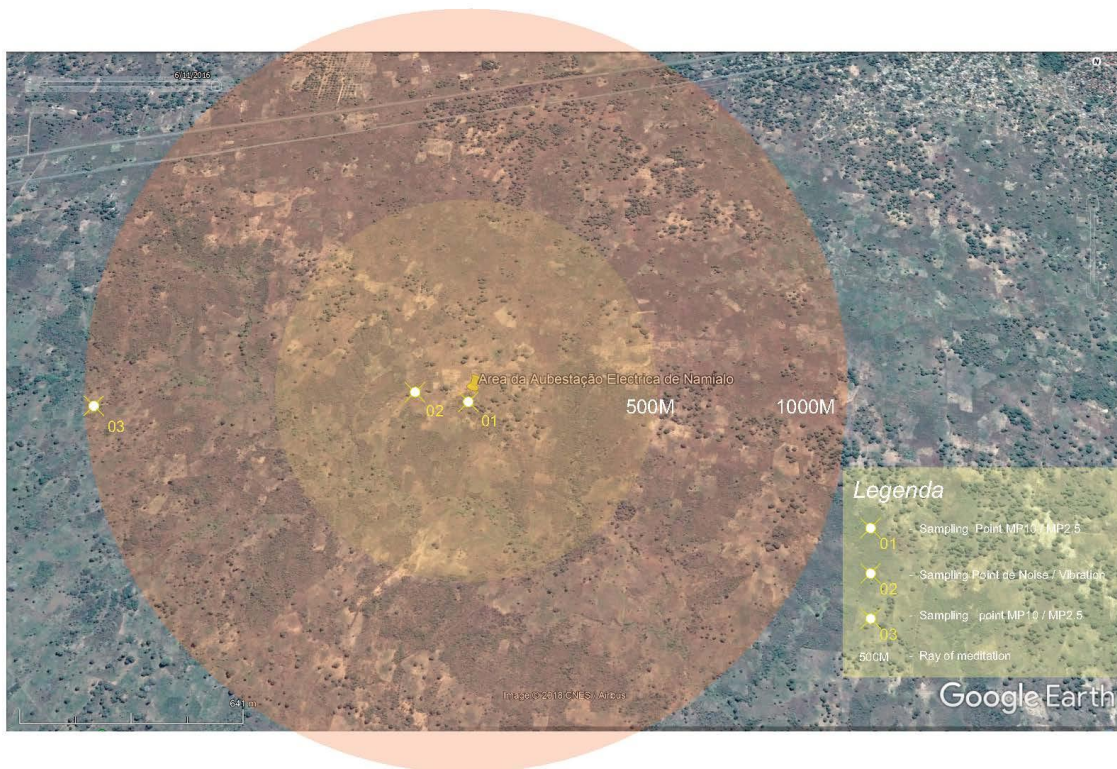
The Substation construction project is located at Namialo Administrative Post, in Meconta District, in Nampula province. The location of the substation is approximately 78 km from the city of Nampula and 72 km from the sea.



### 3. MONITORING PLANNING AND METHODOLOGY AND CRITERIA FOR THE SELECTION OF SAMPLE AREAS

The planning of the monitoring process was performed considering the stage of the activity, since it is in the final phase of the construction of the substation and was based on strategic locations where dust and noise could be monitored. The air quality monitoring involved MP<sub>10</sub> and MP<sub>2.5</sub> measurements. The monitoring included noise and the data was collected in 3 points namely:

1. Near the project
2. Within 200metres
3. Within 1 km.



The methodology for the preparation of this environmental monitoring report was in compliance with the National Legislation namely the Regulations on the EIA Process (Decree 54/2015 of 31 December) and procedures prescribed in the guiding instruments and World Bank / IFC Guidelines. The work includes the following phases:



- Preliminary recognition of current environmental conditions;
- Evaluation of the activities to be carried out and carried on by the project;
- Analysis of procedures for locating infrastructures, air quality management during construction of the project;
- Preparation of the final document that constitutes this Environmental Monitoring Report.

To this end, the monitoring stations were installed in the vicinity of the project in order to verify the values of particular matter concentration and noise / vibration levels and compliance with the air quality standards established by the World Bank / IFC.

The choice of points was made after a field visit, involving informal conversations with project representatives and observation. These procedures allowed to identify the sampling areas. After identification of the areas, the sampling points were chosen in the vicinity of the project (local) and at a distance of 1 km in parallel to the substation power transmission lines, where the equipment for the measurement of noise, vibration and samplers of particulate matter were positioned.

At the request of the proponent the samplings were carried out within 24 hours for all parameters.

#### 4. OBJECTIVES OF ENVIRONMENTAL MONITORING

This environmental monitoring has as a general objective to know the air quality of the area in which Namialo substation is located and has the following specific aims:

- Measure in real time the concentrations of MP<sub>10</sub> and MP<sub>2.5</sub> in the local environment air, within 1 km of the project in a 24-hour period;
- Determine the noise levels within 100 meters of the building in a 24-hour period;
- Provide the daily average concentration values of MP<sub>10</sub> and MP<sub>2.5</sub> and the noise / vibration levels observed.

This report was prepared by AA SERVIÇOS, A & D, LDA, resulting from environmental monitoring of MP<sub>10</sub> and MP<sub>2.5</sub> air quality, and noise around the project.

Monitoring was carried out on December 13 and 14, 2018 at Namialo in Namialo to determine the air quality of the project area and the degree of implementation and effectiveness of the mitigation measures applied to the activities of the project in accordance with the WB / IFC Standards and Guidelines.

#### 4.1 LEGAL FRAMEWORK

Air quality monitoring is important to ensure that the National Air Quality Standards (Table 1) as well as international standards are not exceeded. The national legal framework for air quality includes:

- Decree No. 18/2004 approving the Regulation of Environmental Quality and Effluents' Emissions;
- Decree No. 67/2010 as a supplement of the Regulation on Environmental Quality and Effluents' Emissions (Decree No. 18/2004) World Bank Guideline

The Government of Mozambique, through the regulation in its article 7 of Decree N° 18/2004 of June 2, defined the fundamental parameters that must portray the air quality so that it maintains its capacity of self- and has no significant negative impact on public health and ecological balance by establishing national air quality standards.

**Table 1 - Air quality standards, Mozambique**

| PARAMETER ( $\mu\text{g m}^{-3}$ ) | SAMPLING TIME |            |           |           |     |           |     |          |     |                        |     |      |     |
|------------------------------------|---------------|------------|-----------|-----------|-----|-----------|-----|----------|-----|------------------------|-----|------|-----|
|                                    | 10 MIN        | 15 MIN     | 30 MIN    | 1 HOUR    |     | 8 HOURS   |     | 24 HOURS |     | ANNUAL ARITHMETIC MEAN |     |      |     |
|                                    |               |            |           | STANDARDS |     |           |     |          |     |                        |     | PRIM | SEC |
|                                    |               |            |           | PRIM      | SEC | PRIM      | SEC | PRI M    | SEC | PRIM                   | SEC |      |     |
| Dioxide                            | 500           |            |           | 800       |     |           |     | 100      |     |                        | 40  |      |     |
| Dioxide                            |               |            |           | 190       |     |           |     |          |     |                        | 10  |      |     |
| Monoxide                           |               | 100<br>000 | 60<br>000 | 30<br>000 |     | 10<br>000 |     |          |     |                        |     |      |     |
| Ozone                              |               |            |           | 160       |     | 120       |     | 50       |     |                        | 70  |      |     |
| Particles                          |               |            |           |           |     |           |     | 150      |     |                        | 60  |      |     |

Source: Mozambique (2010).

**Prim:** primary; **Sec:** secondary; **min:** minute

Projects with significant sources of atmospheric emissions and potential for significant impacts on environment air quality should prevent or minimize impacts by ensuring that emissions do not result in concentrations of pollutants that meet or exceed relevant environmental quality guidelines and standards through (IFC and WHO, 2007). In addition, the IFC and WHO Air Quality Guidelines for particular matter (Table 2) or other internationally recognized sources (WORLD BANK / IFC, 2007).

Air Quality Standards (PQAs) play a key role in air quality management, as they form the basic benchmark for establishing air quality management goals and legal instruments. Given the relevance of standards in air quality management, it is important that they are in line with scientific knowledge about the impacts of air pollution and damage to human health and the environment.

The air quality standards define legally the maximum limits for the concentration of pollutant in atmospheric component that guarantees the protection of health and the environment. Two types of air quality standards are established: Primary Standard and Secondary Standard and, according to the World Health Organization (WHO), it is up to each country to establish its own air quality standards according to their specificities, ie, governments in formulating policies should consider their own

circumstances instead of directly employing the guidelines as the standard. Therefore, variations may occur due to the country's level of development, health risks, technological viability, economic considerations and other social and political factors (WHO, 2000).

In this case, the primary standards are concentrations of atmospheric particular material which, when exceeded, may affect the health of the population and may be understood as maximum tolerable levels of particulate material concentration in the atmosphere. Secondary patterns are understood to be concentrations of atmospheric particulate matter below which the minimum adverse effect on population well-being is predicted, as well as minimal damage to the environment in general (WHO, 2006).

**Table 2 - Air quality standards – WHO**

| Air Quality Guidelines               |                  |  |
|--------------------------------------|------------------|--|
|                                      | Averaging Period | Guidelines value in $\mu\text{g m}^{-3}$   |
| Particulate Matter PM <sub>10</sub>  | 1-year           | 70 (Interim target-1)<br>50 (Interim target-2)<br>30 (Interim target-3)<br>20 (guideline)<br>150 (interim target-1)<br>100 (Interim target-2)<br>75 (Interim target-3) |
|                                      | 24-hour          | 50 (guideline)   |
| Particulate Matter PM <sub>2.5</sub> | 1-year           | 35 (Interim target-1)<br>25 (Interim target-2)<br>15 (Interim target-3)<br>10 (guideline)<br>75 (Interim target-1)<br>50 (Interim target-2)<br>37.5 (Interim target-3) |
|                                      | 24-hour          | 25 (guideline)   |

Noise and vibration regulations or standards are not currently available the Mozambican legal framework, and other standards and guidelines are often referred to in cases where noise impacts need to be assessed. For this reason, the present study uses standards of prevention and reduction of pollution established by the General Directives of the EHS of the IFC (2007). These guidelines represent the maximum noise values that should be achieved at neighboring / near receivers. It is stated within the IFC EHS Noise Level Guidelines that noise impacts will not exceed

the levels shown in Table 3, or will result in a maximum increase in background levels of 3dB at the nearest receiving point.

**Table 3 - Noise Matrix - World Bank / IFC**

| Noise Level Guidelines                  |                                 |                            |
|---|---------------------------------|----------------------------|
|   | One hour L <sub>Aeq</sub> (dBA) |                            |
| Receiver                                | Daytime<br>07:00 – 22:00        | Nighttime<br>22:00 – 07:00 |
| Residential; institutional; educational | 55                              | 45                         |
| Industrial; commercial                  | 70                              | 70                         |

## 5. RESULTS OF ENVIRONMENTAL MONITORING

### 5.1 AIR QUALITY

According to the values obtained in the monitoring of air quality, the conditions of environmental air quality surrounding Namialo substation are considered good due to the rural nature of the study area and the lack of any industrial development in the general area of the Project. Its behavior in terms of concentration of breathable particulate material is related to the winds. Therefore, at the given period of the day there was an insignificant increase in concentration values, however, remaining at very low levels not exceeding the established standards of the air quality. The behavior of the particulate matter concentration values at different times of the day is presented in Figure 1.



**Figure 1:** Conduct of SPM<sub>10</sub> and SPM<sub>2.5</sub> concentration

## 5.2 NOISE LEVELS

In the area in which the project is located, the environmental noise is generally reduced. The circulation of vehicles and the use of machinery during construction are the main sources of noise.

Nevertheless, at a distance of 1km from the project, the noise is practically still low being only possible to hear the sound of birds and frogs among other small animals. Levels and noise trends at different times throughout the day are shown in Figure 2

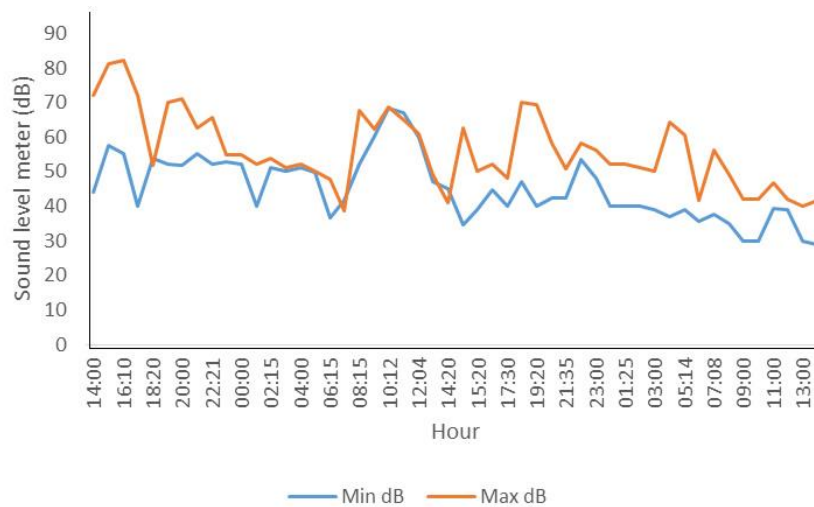


Figure 2: Variation of noise

The medium and maximum values of particulate matter concentration and noise levels monitored over the 24 hours were determined and are summarized in Table 4.

#### 4. Results of environmental monitoring carried out at Namialo Substation Project

| Environmental Parameter   | Item                      | Unit                     | Measured Value (Mean) | Measured Value (Max.) | Mozambique Standards: Decree 18/2004 and Supplement 67/2010 | Referred International Standards – WB/IFC Guidelines | Remarks (Measurement Point, Frequency, Method)  |
|---------------------------|---------------------------|--------------------------|-----------------------|-----------------------|---|--|---|
| <b>Construction Phase</b> |                           |                          |                       |                       |   |  |   |
| Air Quality               | SPM <sub>10</sub>         | ( $\mu\text{g m}^{-3}$ ) | 7,3                   | 16                    | Not Specified   | 50<br>150 Interim Value                              | One Sampling Point near the project site and one sampling point 1 km away from the project site<br>·At least once in three months (one every season) – 24 hr. day sampling<br>·High Volume Dust Sampler may be used |
|                           | SPM <sub>2.5</sub>        | ( $\mu\text{g m}^{-3}$ ) | 3,58                  | 6                     | Not Specified   | 35<br>75 Interim Value                               | One Sampling Point near the project site and one sampling point 1 km away from the project site<br>·At least once in three months (one every season) – 24 hr. day sampling<br>·High Volume Dust Sampler may be used |
| Noise                     | Noise and vibration level | dB                       | 50,645                | 82,3                  | Not Specified   | 70 (Day-time)<br>70 (Night-time)                     | 100m from the construction site<br>· Per Month one 24-hr. day sampling<br>· Sound level meter   |

## 5. CONCLUSION

From the environmental monitoring carried out in Namialo substation construction project area, involving the MP<sub>10</sub> and MP<sub>2.5</sub>, the results for the sampling point within 1km radius, in general, showed levels of concentration of the items listed, very low given that the values determined are within the air quality standards. These results corroborate the rural nature of the study area and the lack of any industrial development in the general area of the Project. However, the values registered at the site show a slight increase in the levels of dust concentration for both the aerodynamic diameter particulate material  $\leq 2.5\mu\text{m}$  and  $\leq 10\mu\text{m}$ . These values are related to their proximity to the area of construction activities and the range of the preferred direction of the winds at the sampling points. However, overall concentration levels are well below air quality standards.

Concerning the noise levels, it is concluded that in the construction area of the project are detectable due to the activities that are taking place in the place, involving machinery (backhoes, electric power generator, vehicle circulation). However, at the furthest point from the site of construction activities, noise is greatly reduced.

We can conclude that the air quality surrounding the project under construction is good.



## 6. REFERENCES

Wiersma, G.B. (Ed.) (2004). Environmental Monitoring. Boca Raton, FLA: CRC Press.

ROSA, Antonio C.; SUZUKI Rogério Y.; SANTI, Maria Moura. (2000) Monitoramento da qualidade do ar: avaliação de metodologia baseada no licenciamento ambiental. Associação Brasileira de Engenharia Sanitária e Ambiente.

WHO. **Air quality guidelines for Europe**. WHO regional publications - European series, n. 91. Copenhagen: WHO, 2000.

WHO. **Health effects of particulate matter**: Policy implications for countries in eastern Europe, Caucasus and central Asia. Copenhagen, 2013. Disponível em: <[http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0006/189051/Health-effects-of-particulate-matter-final-Eng.pdf](http://www.euro.who.int/__data/assets/pdf_file/0006/189051/Health-effects-of-particulate-matter-final-Eng.pdf)> Aceso: 11 Abr. 2018.

\_\_\_\_\_. **WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide**. Global update 2005. Geneva: WHO, 2006.

## 7. APPENDICES

### 7.1. SAMPLING PARTICULATE MATTER

| LARGE STAKE: <u>1</u> LOCAL _____ DATE <u>13</u> / <u>12</u> /2018 |                               |                   |          |          |                           |                           |                           |                           |  |
|--|-------------------------------|-------------------|----------|----------|---------------------------|---------------------------|---------------------------|---------------------------|--|
| COORDINATES: X _____ Y _____                                       |                               |                   |          |          |                           |                           |                           |                           |  |
| TIME   | DUST ( $\mu\text{g m}^{-3}$ ) |                   | NOISE    |          | WIND SPEED                |                           | VIBRATION                 |                           | REMARKS  |
|  | MP <sub>10</sub>              | MP <sub>2.5</sub> | MIN (DB) | MAX (DB) | MIN ( $\text{m s}^{-2}$ ) | MAX ( $\text{m s}^{-2}$ ) | MIN ( $\text{m s}^{-2}$ ) | MAX ( $\text{m s}^{-2}$ ) |  |
| 14:00  | 14                            | 5                 | 44.1     | 72.0     | 2.8                       | 4.7                       | 0                         | 0                         | Circulating noise of vehicles, compactor   |
| 15:00  | 10                            | 5                 | 57.7     | 81.3     | 2.8                       | 3.8                       | 0                         | 0                         |  |
| 16:10  | 11                            | 4                 | 55.1     | 82.3     | 2.2                       | 3.0                       | 0                         | 0                         | The level of dust is low, due to soil humidity (Rain)  |
| 17:00  | 8                             | 4                 | 40.0     | 72.0     | 4.7                       | 5.8                       | 0                         | 0                         | There was no dust activity and the level of noise lowered due to activity closure of the day |
| 18:20  | 7                             | 5                 | 53.7     | 51.8     | 4.2                       | 5.4..                     | 0                         | 0                         | There was no dust activity and the level of noise lowered due to activity closure of the day |
| 19:40  | 8                             | 4                 | 52.0     | 70.2     | 1                         | 1                         | 0                         | 0                         | Idem   |
| 20:00  | 8                             | 4                 | 51.8     | 71.0     | 1                         | 1                         | 0                         | 0                         | Idem   |
| 21:20  | 6                             | 4                 | 55.3     | 62.6     | 1                         | 1                         | 0                         | 0                         | Idem   |
| 22:21  | 5                             | 3                 | 52.3     | 65.7     | 2                         | 2                         | 0                         | 0                         | Idem   |
| 23:15  | 4                             | 4                 | 52.9     | 54.8     | 1                         | 4                         | 0                         | 0                         | Idem   |
| 00:00  | 5                             | 3                 | 52.1     | 54.8     | 1                         | 3                         | 0                         | 0                         | Idem   |
| 01:25  | 6                             | 4                 | 40.0     | 52.0     | 1                         | 3                         | 0                         | 0                         | Idem   |

## 7.2. SAMPLING PARTICULATE MATTER

| LARGE STAKE: 1      LOCAL      DATE: 14/12/2018 |                               |                   |          |          |                           |                           |                           |                           |         |
|---|-------------------------------|-------------------|----------|----------|---------------------------|---------------------------|---------------------------|---------------------------|---------|
| COORDENATES: X _____ Y _____                    |                               |                   |          |          |                           |                           |                           |                           |         |
| TIME  | DUST ( $\mu\text{g m}^{-3}$ ) |                   | NOISE    |          | WIND SPEED                |                           | VIBRATRION                |                           | REMARKS |
|   | MP <sub>10</sub>              | MP <sub>2.5</sub> | MIN (DB) | MAX (DB) | MIN ( $\text{m s}^{-2}$ ) | MAX ( $\text{m s}^{-2}$ ) | MIN ( $\text{m s}^{-2}$ ) | MAX ( $\text{m s}^{-2}$ ) |         |
| 02:15   | 5                             | 5                 | 51.0     | 53.8     | 1                         | 2                         | 0                         | 0                         |         |
| 03:00   | 4                             | 5                 | 50.0     | 51.0     | 1                         | 3                         | 0                         | 0                         |         |
| 04:00   | 3                             | 4                 | 51.0     | 52.0     | 1                         | 3                         | 0                         | 0                         |         |
| 05:00   | 5                             | 4                 | 49.9     | 50.0     | 2                         | 3                         | 0                         | 0                         |         |
| 06:15   | 3                             | 4                 | 36.7     | 47.8     | 1                         | 3                         | 0                         | 0                         |         |
| 07:22   | 5                             | 4                 | 41.7     | 38.5     | 3.7                       | 5.0                       | 0                         | 0                         |         |
| 08:15   | 7                             | 6                 | 52.1     | 67.8     | 2.5                       | 4.7                       | 0                         | 0                         |         |
| 09:45   | 14                            | 5                 | 60.2     | 62.2     | 1.5                       | 2.8                       | 0                         | 0                         |         |
| 10:12   | 12                            | 5                 | 68.2     | 68.8     | 0.5                       | 1.8                       | 0                         | 0                         |         |
| 11:20   | 13                            | 4                 | 67.0     | 65.0     | 0.5                       | 1.6                       | 0                         | 0                         |         |
| 12:04   | 14                            | 6                 | 60.0     | 61.0     | 2.5                       | 3.7                       | 0                         | 0                         |         |
| 13:20   | 15                            | 5                 | 47.1     | 49.0     | 11.5                      | 20.7                      | 0                         | 0                         |         |
| 14:20   | 16                            | 5                 | 45.2     | 40.9     | 11.6                      | 19.6                      | 0                         | 0                         |         |



### 6.3 SAMPLING PARTICULATE MATTER

| LARGE STAKE : 2      1km      DATE <u>13</u> / <u>12</u> / 2018 |                               |                   |          |          |                           |                           |                           |                           |  |
|---|-------------------------------|-------------------|----------|----------|---------------------------|---------------------------|---------------------------|---------------------------|--|
| COORDENATES: X _____ Y _____                                    |                               |                   |          |          |                           |                           |                           |                           |  |
| TIME  | DUST ( $\mu\text{g m}^{-3}$ ) |                   | NOISE    |          | WIND SPEED                |                           | VIBRATION                 |                           | REMARKS  |
|   | MP <sub>10</sub>              | MP <sub>2.5</sub> | MIN (DB) | MAX (DB) | MIN ( $\text{m s}^{-2}$ ) | MAX ( $\text{m s}^{-2}$ ) | MIN ( $\text{m s}^{-2}$ ) | MAX ( $\text{m s}^{-2}$ ) |  |
| 14:30   | 11                            | 5                 | 34.6     | 62.5     | 1.8                       | 2.8                       | 0                         | 0                         | Noise of birds and movements of trees                                      |
| 15:20   | 10                            | 4                 | 39.0     | 50.0     | 2.6                       | 3.9                       | 0                         | 0                         |  |
| 16:30   | 11                            | 3                 | 44.9     | 52.0     | 4.6                       | 8.0                       | 0                         | 0                         | Soil humidity due to rain  |
| 17:30   | 10                            | 3                 | 40.1     | 48.0     | 4.5                       | 6.0                       | 0                         | 0                         | Noise of insects (cricket, frogs and movements of trees) and soil humidity |
| 18:40   | 8                             | 3                 | 47.1     | 70.2     | 1                         | 2                         | 0                         | 0                         | Noise of insects (cricket, frogs and movements of trees) and soil humidity |
| 19:20   | 8                             | 2                 | 40.0     | 69.2     | 1                         | 2                         | 0                         | 0                         | Idem   |
| 20:20   | 7                             | 2                 | 42.3     | 58.2     | 1                         | 2                         | 0                         | 0                         | Idem   |
| 21:35   | 6                             | 2                 | 42.3     | 50.7     | 1                         | 2                         | 0                         | 0                         | Idem   |
| 22:20   | 8                             | 2                 | 53.5     | 58.2     | 1                         | 2                         | 0                         | 0                         | Idem   |
| 23:00   | 2                             | 2                 | 48.0     | 56.2     | 1                         | 2                         | 0                         | 0                         | Idem   |
| 00:16   | 3                             | 2                 | 40.0     | 52.0     | 1                         | 2                         | 0                         | 0                         | Idem   |
| 01:25   | 4                             | 2                 | 40.0     | 52.0     | 1                         | 2                         | 0                         | 0                         | Idem   |



Reinforcement of transmission network in Nacala corridor

Table 14: Environmental Monitoring Form for the Project for Reinforcement of Transmission Network in Nacala Corridor in Republic of Mozambique

Monitoring of Waste Disposal (Weekly) Month of January 2018

| Parameter: | Item:              | 2018/01/01~01/06 |                                   | Confirmed by : |
|------------|--------------------|------------------|-----------------------------------|----------------|
|            |                    | Check Result:    | Countermeasure:                   |                |
| Waste      | Solid waste        | OK / NG          |                                   | 片山             |
|            | Sanitary Waste     | OK / NG          |                                   |                |
|            | Housekeeping Waste | OK / NG          |                                   |                |
| Parameter: | Item:              | 2018/01/15~01/20 |                                   | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                   |                |
| Waste      | Solid waste        | OK / NG          |                                   | 片山             |
|            | Sanitary Waste     | OK / NG          |                                   |                |
|            | Housekeeping Waste | OK / NG          |                                   |                |
| Parameter: | Item:              | 2018/01/22~01/27 |                                   | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: / Comment         |                |
| Waste      | Solid waste        | OK / NG          | Collected by Supplier Jan. 26, 18 | 片山             |
|            | Sanitary Waste     | OK / NG          |                                   |                |
|            | Housekeeping Waste | OK / NG          |                                   |                |
| Parameter: | Item:              | 2018/01/29~02/03 |                                   | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                   |                |
| Waste      | Solid waste        | OK / NG          |                                   | 片山             |
|            | Sanitary Waste     | OK / NG          |                                   |                |
|            | Housekeeping Waste | OK / NG          |                                   |                |

Reinforcement of transmission network in Nacala corridor

Table 14: Environmental Monitoring Form for the Project for Reinforcement of Transmission Network in Nacala Corridor in Republic of Mozambique

Monitoring of Waste Disposal (Weekly) Month of February 2018

| Parameter: | Item:              | 2018/02/05~02/10 |                 | Confirmed by : |
|------------|--------------------|------------------|-----------------|----------------|
|            |                    | Check Result:    | Countermeasure: |                |
| Waste      | Solid waste        | OK / NG          |                 | KH.            |
|            | Sanitary Waste     | OK / NG          |                 |                |
|            | Housekeeping Waste | OK / NG          |                 |                |
| Parameter: | Item:              | 2018/02/12~02/17 |                 | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: |                |
| Waste      | Solid waste        | OK / NG          |                 | KH.            |
|            | Sanitary Waste     | OK / NG          |                 |                |
|            | Housekeeping Waste | OK / NG          |                 |                |
| Parameter: | Item:              | 2018/02/19~02/24 |                 | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: |                |
| Waste      | Solid waste        | OK / NG          |                 | KH.            |
|            | Sanitary Waste     | OK / NG          |                 |                |
|            | Housekeeping Waste | OK / NG          |                 |                |
| Parameter: | Item:              | 2018/02/26~03/03 |                 | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: |                |
| Waste      | Solid waste        | OK / NG          |                 | KH.            |
|            | Sanitary Waste     | OK / NG          |                 |                |
|            | Housekeeping Waste | OK / NG          |                 |                |

Reinforcement of transmission network in Nacala corridor

Table 14: Environmental Monitoring Form for the Project for Reinforcement of Transmission Network in Nacala Corridor in Republic of Mozambique

Monitoring of Waste Disposal (Weekly) Month of March 2018

| Parameter: | Item:              | 2018/03/05~03/10 |  | Confirmed by : |
|------------|--------------------|------------------|--|----------------|
|            |                    | Check Result:    | Countermeasure:                              |                |
| Waste      | Solid waste        | OK / NG          |  | 片山             |
|            | Sanitary Waste     | OK / NG          |  |                |
|            | Housekeeping Waste | OK / NG          |  |                |
| Parameter: | Item:              | 2018/03/12~03/17 |  | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: / Comment.                   |                |
| Waste      | Solid waste        | OK / NG          | Cleaned up Septic Tank by Supplier Mar.15,18 | 片山             |
|            | Sanitary Waste     | OK / NG          |  |                |
|            | Housekeeping Waste | OK / NG          |  |                |
| Parameter: | Item:              | 2018/03/19~03/24 |  | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                              |                |
| Waste      | Solid waste        | OK / NG          |  | 片山             |
|            | Sanitary Waste     | OK / NG          |  |                |
|            | Housekeeping Waste | OK / NG          |  |                |
| Parameter: | Item:              | 2018/03/26~03/31 |  | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                              |                |
| Waste      | Solid waste        | OK / NG          |  | 片山             |
|            | Sanitary Waste     | OK / NG          |  |                |
|            | Housekeeping Waste | OK / NG          |  |                |



Reinforcement of transmission network in Nacala corridor

Table 14: Environmental Monitoring Form for the Project for Reinforcement of Transmission Network in Nacala Corridor in Republic of Mozambique

Monitoring of Waste Disposal (Weekly) Month of April 2018

| Parameter: | Item:              | 2018/04/02~04/07 |   | Confirmed by : |
|------------|--------------------|------------------|---|----------------|
|            |                    | Check Result:    | Countermeasure: / Comment:                  |                |
| Waste      | Solid waste        | OK / NG          |   | KH             |
|            | Sanitary Waste     | OK / NG          |   |                |
|            | Housekeeping Waste | OK / NG          | Threw the rest of Bottled Water Apr. 7, '18 |                |
| Parameter: | Item:              | 2018/04/09~04/14 |   | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                             |                |
| Waste      | Solid waste        | OK / NG          |   | KH.            |
|            | Sanitary Waste     | OK / NG          |   |                |
|            | Housekeeping Waste | OK / NG          |   |                |
| Parameter: | Item:              | 2018/04/16~04/21 |   | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                             |                |
| Waste      | Solid waste        | OK / NG          |   | KH.            |
|            | Sanitary Waste     | OK / NG          |   |                |
|            | Housekeeping Waste | OK / NG          |   |                |
| Parameter: | Item:              | 2018/04/23~04/28 |   | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                             |                |
| Waste      | Solid waste        | OK / NG          |   | KH.            |
|            | Sanitary Waste     | OK / NG          |   |                |
|            | Housekeeping Waste | OK / NG          |   |                |
| Parameter: | Item:              | 2018/04/30~05/05 |   | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                             |                |
| Waste      | Solid waste        | OK / NG          |   | KH.            |
|            | Sanitary Waste     | OK / NG          |   |                |
|            | Housekeeping Waste | OK / NG          |   |                |

Reinforcement of transmission network in Nacala corridor

Table 14: Environmental Monitoring Form for the Project for Reinforcement of Transmission Network in Nacala Corridor in Republic of Mozambique

Monitoring of Waste Disposal (Weekly) Month of May 2018

| Parameter: | Item:              | 2018/05/07~05/12 |                 | Confirmed by : |
|------------|--------------------|------------------|-----------------|----------------|
|            |                    | Check Result:    | Countermeasure: |                |
| Waste      | Solid waste        | OK / NG          |                 | 片山.            |
|            | Sanitary Waste     | OK / NG          |                 |                |
|            | Housekeeping Waste | OK / NG          |                 |                |
| Parameter: | Item:              | 2018/05/14~05/19 |                 | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: |                |
| Waste      | Solid waste        | OK / NG          |                 | 片山.            |
|            | Sanitary Waste     | OK / NG          |                 |                |
|            | Housekeeping Waste | OK / NG          |                 |                |
| Parameter: | Item:              | 2018/05/21~05/26 |                 | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: |                |
| Waste      | Solid waste        | OK / NG          |                 | 片山.            |
|            | Sanitary Waste     | OK / NG          |                 |                |
|            | Housekeeping Waste | OK / NG          |                 |                |
| Parameter: | Item:              | 2018/05/28~06/02 |                 | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: |                |
| Waste      | Solid waste        | OK / NG          |                 | 片山.            |
|            | Sanitary Waste     | OK / NG          |                 |                |
|            | Housekeeping Waste | OK / NG          |                 |                |

Reinforcement of transmission network in Nacala corridor

Table 14: Environmental Monitoring Form for the Project for Reinforcement of Transmission Network in Nacala Corridor in Republic of Mozambique

Monitoring of Waste Disposal (Weekly) Month of June 2018

| Parameter: | Item:              | 2018/06/04~06/09 |   | Confirmed by : |
|------------|--------------------|------------------|---|----------------|
|            |                    | Check Result:    | Countermeasure: / Comment.              |                |
| Waste      | Solid waste        | OK / NG          | Collected by Supplier. Jun. 11, 18      | K.H.           |
|            | Sanitary Waste     | OK / NG          |   |                |
|            | Housekeeping Waste | OK / NG          |   |                |
| Parameter: | Item:              | 2018/06/11~06/16 |   | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                         |                |
| Waste      | Solid waste        | OK / NG          |   | K.H.           |
|            | Sanitary Waste     | OK / NG          |   |                |
|            | Housekeeping Waste | OK / NG          |   |                |
| Parameter: | Item:              | 2018/06/18~06/23 |   | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: / Comment.              |                |
| Waste      | Solid waste        | OK / NG          | Cleaned up the Septic Tank. Jun. 20, 18 | K.H.           |
|            | Sanitary Waste     | OK / NG          |   |                |
|            | Housekeeping Waste | OK / NG          |   |                |
| Parameter: | Item:              | 2018/06/25~06/30 |   | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                         |                |
| Waste      | Solid waste        | OK / NG          |   | K.H.           |
|            | Sanitary Waste     | OK / NG          |   |                |
|            | Housekeeping Waste | OK / NG          |   |                |

Reinforcement of transmission network in Nacala corridor

Table 14: Environmental Monitoring Form for the Project for Reinforcement of Transmission Network in Nacala Corridor in Republic of Mozambique

Monitoring of Waste Disposal (Weekly) Month of July 2018

| Parameter: | Item:              | 2018/07/02~07/07 |  | Confirmed by : |
|------------|--------------------|------------------|--|----------------|
|            |                    | Check Result:    | Countermeasure:                                  |                |
| Waste      | Solid waste        | OK / NG          |  | K.H.           |
|            | Sanitary Waste     | OK / NG          |  |                |
|            | Housekeeping Waste | OK / NG          |  |                |
| Parameter: | Item:              | 2018/07/09~07/14 |  | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: / Comment.                       |                |
| Waste      | Solid waste        | OK / NG          | Collected Valuable metal by supplier. Jul.14, 18 | K.H.           |
|            | Sanitary Waste     | OK / NG          |  |                |
|            | Housekeeping Waste | OK / NG          |  |                |
| Parameter: | Item:              | 2018/07/16~07/21 |  | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                                  |                |
| Waste      | Solid waste        | OK / NG          |  | K.H.           |
|            | Sanitary Waste     | OK / NG          |  |                |
|            | Housekeeping Waste | OK / NG          |  |                |
| Parameter: | Item:              | 2018/07/23~07/28 |  | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                                  |                |
| Waste      | Solid waste        | OK / NG          |  | K.H.           |
|            | Sanitary Waste     | OK / NG          |  |                |
|            | Housekeeping Waste | OK / NG          |  |                |
| Parameter: | Item:              | 2018/07/30~08/04 |  | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                                  |                |
| Waste      | Solid waste        | OK / NG          |  | K.H.           |
|            | Sanitary Waste     | OK / NG          |  |                |
|            | Housekeeping Waste | OK / NG          |  |                |

Reinforcement of transmission network in Nacala corridor

Table 14: Environmental Monitoring Form for the Project for Reinforcement of Transmission Network in Nacala Corridor in Republic of Mozambique

Monitoring of Waste Disposal (Weekly) Month of August 2018

| Parameter: | Item:              | 2018/08/06~08/11 |                 | Confirmed by : |
|------------|--------------------|------------------|-----------------|----------------|
|            |                    | Check Result:    | Countermeasure: |                |
| Waste      | Solid waste        | OK / NG          |                 | KH.            |
|            | Sanitary Waste     | OK / NG          |                 |                |
|            | Housekeeping Waste | OK / NG          |                 |                |
| Parameter: | Item:              | 2018/08/13~08/18 |                 | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: |                |
| Waste      | Solid waste        | OK / NG          |                 | KH.            |
|            | Sanitary Waste     | OK / NG          |                 |                |
|            | Housekeeping Waste | OK / NG          |                 |                |
| Parameter: | Item:              | 2018/08/20~08/25 |                 | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: |                |
| Waste      | Solid waste        | OK / NG          |                 | KH.            |
|            | Sanitary Waste     | OK / NG          |                 |                |
|            | Housekeeping Waste | OK / NG          |                 |                |
| Parameter: | Item:              | 2018/08/27~09/01 |                 | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: |                |
| Waste      | Solid waste        | OK / NG          |                 | KH.            |
|            | Sanitary Waste     | OK / NG          |                 |                |
|            | Housekeeping Waste | OK / NG          |                 |                |

Reinforcement of transmission network in Nacala corridor

Table 14: Environmental Monitoring Form for the Project for Reinforcement of Transmission Network in Nacala Corridor in Republic of Mozambique

Monitoring of Waste Disposal (Weekly) Month of September 2018

| Parameter: | Item:              | 2018/09/03~09/08 |  | Confirmed by : |
|------------|--------------------|------------------|--|----------------|
|            |                    | Check Result:    | Countermeasure: / Comment.                       |                |
| Waste      | Solid waste        | OK / NG          | Cleaned up Septic Tank<br>Collected by Supplier. | KH             |
|            | Sanitary Waste     | OK / NG          |  |                |
|            | Housekeeping Waste | OK / NG          |  |                |
| Waste      | Solid waste        | OK / NG          |  | KH             |
|            | Sanitary Waste     | OK / NG          |  |                |
|            | Housekeeping Waste | OK / NG          |  |                |
| Waste      | Solid waste        | OK / NG          |  | KH             |
|            | Sanitary Waste     | OK / NG          |  |                |
|            | Housekeeping Waste | OK / NG          |  |                |
| Waste      | Solid waste        | OK / NG          | Recovered Valuable metal                         | KH             |
|            | Sanitary Waste     | OK / NG          |  |                |
|            | Housekeeping Waste | OK / NG          |  |                |

Reinforcement of transmission network in Nacala corridor

Table 14: Environmental Monitoring Form for the Project for Reinforcement of Transmission Network in Nacala Corridor in Republic of Mozambique

Monitoring of Waste Disposal (Weekly) Month of October 2018

| Parameter: | Item:              | 2018/10/01~10/06 |                                      | Confirmed by : |
|------------|--------------------|------------------|--------------------------------------|----------------|
|            |                    | Check Result:    | Countermeasure:                      |                |
| Waste      | Solid waste        | OK / NG          |                                      | 片山.            |
|            | Sanitary Waste     | OK / NG          |                                      |                |
|            | Housekeeping Waste | OK / NG          |                                      |                |
| Parameter: | Item:              | 2018/10/08~10/13 |                                      | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                      |                |
| Waste      | Solid waste        | OK / NG          |                                      | 片山.            |
|            | Sanitary Waste     | OK / NG          |                                      |                |
|            | Housekeeping Waste | OK / NG          |                                      |                |
| Parameter: | Item:              | 2018/10/15~10/20 |                                      | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                      |                |
| Waste      | Solid waste        | OK / NG          |                                      | 片山.            |
|            | Sanitary Waste     | OK / NG          |                                      |                |
|            | Housekeeping Waste | OK / NG          |                                      |                |
| Parameter: | Item:              | 2018/10/22~10/27 |                                      | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: / Comment.           |                |
| Waste      | Solid waste        | OK / NG          | Collected by Supplier Oct. 25, '18   | 片山.            |
|            | Sanitary Waste     | OK / NG          |                                      |                |
|            | Housekeeping Waste | OK / NG          | Collected by Supplier. Oct. 27, '18. |                |
| Parameter: | Item:              | 2018/10/29~11/03 |                                      | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                      |                |
| Waste      | Solid waste        | OK / NG          |                                      | 片山.            |
|            | Sanitary Waste     | OK / NG          |                                      |                |
|            | Housekeeping Waste | OK / NG          |                                      |                |

Reinforcement of transmission network in Nacala corridor

Table 14: Environmental Monitoring Form for the Project for Reinforcement of Transmission Network in Nacala Corridor in Republic of Mozambique

Monitoring of Waste Disposal (Weekly) Month of November 2018

| Parameter: | Item:              | 2018/11/05~11/10 |                                       | Confirmed by : |
|------------|--------------------|------------------|---------------------------------------|----------------|
|            |                    | Check Result:    | Countermeasure:                       |                |
| Waste      | Solid waste        | OK / NG          |                                       | KH.            |
|            | Sanitary Waste     | OK / NG          |                                       |                |
|            | Housekeeping Waste | OK / NG          |                                       |                |
| Parameter: | Item:              | 2018/11/12~11/17 |                                       | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: / Comment.            |                |
| Waste      | Solid waste        | OK / NG          | Recovered Valuable metal Nov. 16, 18. | KH.            |
|            | Sanitary Waste     | OK / NG          |                                       |                |
|            | Housekeeping Waste | OK / NG          |                                       |                |
| Parameter: | Item:              | 2018/11/19~11/24 |                                       | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                       |                |
| Waste      | Solid waste        | OK / NG          |                                       | KH.            |
|            | Sanitary Waste     | OK / NG          |                                       |                |
|            | Housekeeping Waste | OK / NG          |                                       |                |
| Parameter: | Item:              | 2018/11/26~12/01 |                                       | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                       |                |
| Waste      | Solid waste        | OK / NG          |                                       | KH.            |
|            | Sanitary Waste     | OK / NG          |                                       |                |
|            | Housekeeping Waste | OK / NG          |                                       |                |



Reinforcement of transmission network in Nacala corridor

Table 14: Environmental Monitoring Form for the Project for Reinforcement of Transmission Network in Nacala Corridor in Republic of Mozambique

Monitoring of Waste Disposal (Weekly) Month of December 2018

| Parameter: | Item:              | 2018/12/03~12/08 |                                      | Confirmed by : |
|------------|--------------------|------------------|--------------------------------------|----------------|
|            |                    | Check Result:    | Countermeasure: / Comment.           |                |
| Waste      | Solid waste        | OK / NG          | Cleaned up Septic Tank.              | KH.            |
|            | Sanitary Waste     | OK / NG          |                                      |                |
|            | Housekeeping Waste | OK / NG          |                                      |                |
| Parameter: | Item:              | 2018/12/10~12/15 |                                      | Confirmed by : |
|            |                    | Check Result:    | Countermeasure: / Comment.           |                |
| Waste      | Solid waste        | OK / NG          | Collected by Supplier. Dec. 13, '18. | KH.            |
|            | Sanitary Waste     | OK / NG          |                                      |                |
|            | Housekeeping Waste | OK / NG          |                                      |                |
| Parameter: | Item:              | 2018/12/17~12/22 |                                      | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                      |                |
| Waste      | Solid waste        | OK / NG          |                                      | KH.            |
|            | Sanitary Waste     | OK / NG          |                                      |                |
|            | Housekeeping Waste | OK / NG          |                                      |                |
| Parameter: | Item:              | 2018/12/24~12/29 |                                      | Confirmed by : |
|            |                    | Check Result:    | Countermeasure:                      |                |
| Waste      | Solid waste        | OK / NG          |                                      | KH.            |
|            | Sanitary Waste     | OK / NG          |                                      |                |
|            | Housekeeping Waste | OK / NG          |                                      |                |