

The Consortium of Sumitomo Corporation and IHI Corporation



Environmental Monitoring Report_Rev01

Third Quarter
(April, May, June 2017)

July 2017

Prepared by: SGS Moçambique Lda



Contents

1. <i>Project Background</i>	3
2. <i>Errors and Omissions</i>	3
3. <i>QUARTERLY SUMMARY REPORT FORM</i>	5
3.1. <i>Ambient Air Reporting</i>	5
3.2. <i>Noise Reporting</i>	9
3.3. <i>Water quality of Wastewater effluent Reporting</i>	15
3.4. <i>Water quality (Ambient Coastal Waters)</i>	16
4. <i>CONCLUSIONS</i>	18
5. <i>APPENDICES AND ATTACHMENTS</i>	19



1. Project Background

SGS Moçambique Lda was contracted by SUMITOMO CORPORATION to execute their approved Environmental Monitoring Plan dated 20 September 2016 – RevD EMoP (ambient air quality, noise, coastal and waste water) in order to establish the environmental situation within and in the vicinity of their site before and during the major construction activities of the Maputo Gas Fired Combined Cycle Power Plant (CCGT). The construction of the plant is now in an advanced phase with lifting and assembling of structures on-going in the site.

Monitoring activities are required by SUMITOMO in terms of the requirements of their Environmental License for the constructions of the plant with the objective of characterize the existing environmental quality during major construction works.

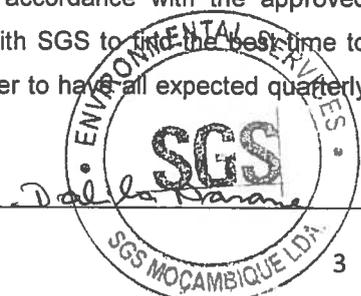
The field work is conducted Quarterly by SGS Technicians targeting the main environmental parameters listed in the EMoP. Sampling locations, as well as sampling frequencies that are defined within the mentioned document and SGS was hired to quantify ambient concentrations of fine particulate matter (PM₁₀), sulphur and nitrogen dioxide (SO₂ & NO₂), Environmental noise, Coastal water quality and Waste water quality.

The results of the surveys have been reported against the Environmental Standards for the Project as per RevD of EMoP.

2. Errors and Omissions

Ambient Air Quality (specifically NO_x, SO₂ and atmospheric conditions) was not measured during the 3rd Quarter according to required methodology, failing to comply with EMoP requirement. SGS is waiting for new equipment that was meant to arrive during month of April. After receive the equipment these measurements should be carried out. Due to delay registered in suitable equipment arrival, SGS measured the parameters of concern using the same methodology used in the baseline measurements and previous quarter.

Due to the inconsistencies found in the Baseline results (Nov 2016), both Q1 (Dec-2016), Q2 (Mar-2017) and Q3 (Jun-2017) monitoring were not conducted fully in accordance with the approved monitoring methodology and chronogram. SUMITOMO will engage with SGS to find the best time to perform compensatory monitoring campaigns in the near future in order to have all expected quarterly reports compiled.



For 3rd Quarter (June 2017), there was no wastewater sampling for the months of April and May, due to the removal of the wastewater by a third party company. The removal action, was taken by SUMITOMO after recommendations on the 2nd Quarter report, were TSS parameter was very high. After removal, new waste water entered the pit, and June results show lower TSS.

3. QUARTERLY SUMMARY REPORT FORM

3.1. Ambient Air Reporting

Maputo Gas Fired Combined Cycle Power Plant Development Project Monitoring Plan - 3rd Quarter Report		Form 1					
Subject: Ambient Air Quality		Project Phase: L3	Construction Location: L3				
Executants: SGS Moçambique Lda		Site Responsible: SUMITOMO CORPORATION					
Item	Unit	Standards for Project	Baseline	Q1	Q2	Q3	Comments
NO ₂	ug/m ³	190 (1-hr)	3.3	Not measured	3.3	0	Parameter concentration probably comply with Project Standard, although a direct comparison is not possible.
SO ₂	ug/m ³	20 (24-hr)	0	Not measured	0	0	Parameter concentration probably comply with Project Standard, although a direct comparison is not possible.
PM ₁₀	ug/m ³	50 (24-hr)	40.4	Not measured	59.2	81.8	Result do not comply with Project Standard and is higher than baseline and previous quarter. Possibly due to construction activities. Improvement of dust control measures needed.
Wind direction				Not measured	Not measured	Not measured	
Wind velocity	m/s		Not measured	Not measured	measured	measured	
Temperature	°C		Not measured	Not measured	measured	measured	
Relative Humidity	%		Not measured	Not measured	measured	measured	
Executant Representative Sign.		Not measured		Not measured	Not measured	Not measured	



Quarterly Monitoring Report
- 3rd Quarter

Subject: Ambient Air Quality		Maputo Gas Fired Combined Cycle Power Plant Development Project Monitoring Plan - 3rd Quarter Report			Form 1		
Executants: SGS Moçambique Lda		Project Phase: Construction		Location: L4			
		Site Responsible: SUMITOMO CORPORATION					
Item	Unit	Standards for Project	Baseline Nov-16	Q1 Dec-16	Q2 Mar-17	Q3 Jun-17	Comments
NO2	ug/m3	190 (1-hr)	4.7	Not measured	2.2	5.4	Parameter concentration probably comply with Project Standard, although a direct comparison is not possible.
SO2	ug/m3	20 (24-hr)	1.4	Not measured	0	0	Parameter concentration probably comply with Project Standard, although a direct comparison is not possible.
PM10	ug/m3	50 (24-hr)	57.3	Not measured	60.1	93.1	Result do not comply with Project Standard and is higher than baseline and previous quarter. Possibly due to construction activities. Improvement of dust contrl measures needed.
Wind direction			Not measured	Not measured	Not measured	Not measured	
Wind velocity	m/s		Not measured	Not measured	Not measured	Not measured	
Temperature	°C		Not measured	Not measured	Not measured	Not measured	
Relative Humidity	%		Not measured	Not measured	Not measured	Not measured	
Executant Representative Sign.							

Maputo Gas Fired Combined Cycle Power Plant Development Project Monitoring Plan - 3rd Quarter Report										Form 1
Subject:		Ambient Air Quality		Project Phase: Construction		Location: L6				
Executants:		SGS Moçambique Lda		Site Responsibil: SUMITOMO CORPORATION						
Item	Unit	Standards for Project	Baseline	Q1	Q2	Q3	Comments			
NO2	ug/m3	190 (1-hr)	3.3	Not measured	2	0	Parameter concentration probably comply with Project Standard, although a direct comparison is not possible.			(30/06/2017)
SO2	ug/m3	20 (24-hr)	0.8	Not measured	0	0	Parameter concentration probably comply with Project Standard, although a direct comparison is not possible.			
PM10	ug/m3	50 (24-hr)	38.2	Not measured	29.6	139.9	Result do not comply with Project Standard and is higher than baseline and previous quarter. Possibly due to construction activities. Improvement of dust contrl measures needed.			
Wind direction			Not measured	Not measured	Not measured	Not measured				
Wind velocity	m/s		Not measured	Not measured	Not measured	Not measured				
Temperature	°C		Not measured	Not measured	Not measured	Not measured				
Relative Humidity	%		Not measured	Not measured	Not measured	Not measured				
Executant Representative Sign.										

Quarterly Monitoring Report
- 3rd Quarter

Subject:		Maputo Gas Fired Combined Cycle Power Plant Development Project Monitoring Plan - 3rd Quarter Report				Form 1	
Executants:		Ambient Air Quality		Project Phase: Construction Location: L8		Site Responsible SUMITOMO CORPORATION	
Item	Unit	Standards for Project	Baseline	Q1	Q2	Q3	Comments
NO2	ug/m3	190 (1-hr)	2.2	Not measured	2.2	6.7	Parameter concentration probably comply with Project Standard, although a direct comparison is not possible. Q3 result higher than baseline and previous quarter.
SO2	ug/m3	20 (24-hr)	0.5	Not measured	0.5	4.2	Parameter concentration probably comply with Project Standard, although a direct comparison is not possible.
PM10	ug/m3	50 (24-hr)	29.9	Not measured	50.9	63.6	Result do not comply with Project Standard and is higher than baseline and previous quarter. This could be due to more trains and cars passing by the sampling location
Wind direction			Not measured	Not measured	Not measured	Not measured	
Wind velocity	m/s		Not measured	Not measured	Not measured	Not measured	
Temperature	°C		Not measured	Not measured	Not measured	Not measured	
Relative Humidity	%		Not measured	Not measured	Not measured	Not measured	
Executant Representative Sign.							



3.2. Noise Reporting

Subject:		Maputo Gas Fired Combined Cycle Power Plant Development Project Monitoring Plan - 3rd Quarter Report		Form 2a		
Executants:		Noise		Location: L1		
Executants:		SGS Moçambique Lda		Site Responsible: SUMITOMO CORPORATION		
Item	Unit	Standards for Project	Baseline	Q2	Q3	Comments
Day time Noise (7:00 – 22:00)	dBA	70	51.6	55.7	56.7	Results comply with the Project Standard. Q3 results are higher than the baseline and previous quarter and moth, possibly due to construction activities
Night time Noise (22:00 – 07:00)	dBA	70	54.7	55.8	50.2	Results comply with the Project Standard and are lower than the baseline and previous quarter, but higher than previous month
24h Average Noise	dBA	70	Not measured	55.7	55.2	Results comply with the Project Standard and are similar to previous quarter, but higher than previous month.
Wind direction			Not measured	Not measured	Not measured	
Wind velocity	m/s		Not measured	Not measured	Not measured	
Temperature	°C		Not measured	Not measured	Not measured	
Relative Humidity	%		Not measured	Not measured	Not measured	
Executant Representative Sign.						

Dalila S. Soares

Subject:		Maputo Gas Fired Combined Cycle Power Plant Development Project Monitoring Plan - 3 rd Quarter Report				Form 2a		
Executants:		Project Phase: Construction				Location: L2		
SGS Moçambique Lda		Site Responsible: SUMITOMO CORPORATION						
Item	Unit	Standards for Project	Baseline	4th Month/Q2	5th Month	6th Month	Q3	Comments
Day time Noise (7:00 – 22:00)	dBa	70	Nov-16 N/A	Mar-17 N/A	Apr-17 56.1	May-17 N/A	Jun-17 63.6	Results comply with the Project Standard. Q3 results are higher than the previous month sampled (5th month), possibly due to construction activities
Night time Noise (22:00 – 07:00)	dBa	70	N/A	N/A	50.6	N/A	53.8	Results comply with the Project Standard. Q3 results are higher than the previous month sampled (5th month), possibly due to construction activities
24h Average Noise	dBa	70	Not measured	N/A	54.8	N/A	61.9	Results comply with the Project Standard. Q3 results are higher than the previous month sampled (5th month), possibly due to construction activities
Wind direction			Not measured	Not measured	Not measured	Not measured	Not measured	
Wind velocity	m/s		Not measured	Not measured	Not measured	Not measured	Not measured	
Temperature	°C		Not measured	Not measured	Not measured	Not measured	Not measured	
Relative Humidity	%		Not measured	Not measured	Not measured	Not measured	Not measured	
Executant Representative Sign.								

Maputo Gas Fired Combined Cycle Power Plant Development Project Monitoring Plan - 3rd Quarter Report **Form 2a**
 Noise **Construction Location: L3**

Executants: **SGS Mocambique Lda** **Site Responsible: SUMITOMO CORPORATION**

Item	Unit	Standards for Project	SGS Mocambique Lda			Site Responsible:			Comments
			Baseline	Q2	5th Month	6th Month	Q3		
Day time Noise (7:00 – 22:00)	dBA	70	Nov-16 Not measured	Mar-17 56.2	Apr-17 N/A	May-17 55.6	Jun-17 N/A	Jun-17 Results comply with the Project Standard.	
Night time Noise (22:00 – 07:00)	dBA	70	Not measured	47.7	N/A	49.9	N/A	Results comply with the Project Standard.	
24h Average Noise	dBA	70	Not measured	54.6	N/A	54.2	N/A	Results comply with the Project Standard.	
Wind direction			Not measured	Not measured	Not measured	Not measured	Not measured		
Wind velocity	m/s		Not measured	Not measured	Not measured	Not measured	Not measured		
Temperature	°C		Not measured	Not measured	Not measured	Not measured	Not measured		
Relative Humidity	%		Not measured	Not measured	Not measured	Not measured	Not measured		

Executant Representative Sign.

Dalila Soares

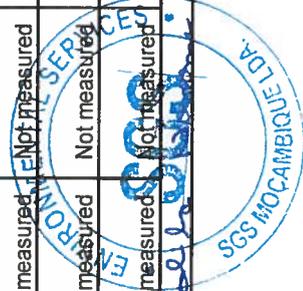
Maputo Gas Fired Combined Cycle Power Plant Development Project Monitoring Plan - 3rd Quarter Report										Form 2a
Subject: Noise										Construction Location: L4
Executants: SGS Moçambique Lda										Site Responsible: SUMITOMO CORPORATION
Item	Unit	Standards for Project	Baseline Nov-16	Q2 Mar-17	5th Month Apr-17	6th Month May-17	Q3 Jun-17	Comments		
Day time Noise (7:00 – 22:00)	dBa	70	54	55	61.1	54.9	59.6	Results comply with the Project Standard. Q3 results are higher than the baseline and previous quarter and moth, possibly due to construction activities		
Night time Noise (22:00 – 07:00)	dBa	70	52.1	49.1	54.7	44.9	51.8	Results comply with the Project Standard and are lower than the baseline, but higher than previous quarter and previous month		
24h Average Noise	dBa	70	Not measured	53.6	59.6	53.1	58	Results comply with the Project Standard and are higher than previous quarter and previous month.		
Wind direction			Not measured	Not measured	Not measured	Not measured	Not measured			
Wind velocity	m/s		Not measured	Not measured	Not measured	Not measured	Not measured			
Temperature	°C		Not measured	Not measured	Not measured	Not measured	Not measured			
Relative Humidity	%		Not measured	Not measured	Not measured	Not measured	Not measured			



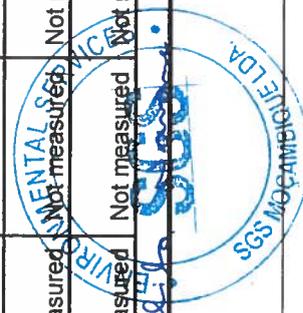
Maputo Gas Fired Combined Cycle Power Plant Development Project Monitoring Plan - 3rd Quarter Report **Form 2a**

Subject: Noise **Project Phase:** Construction **Location:** L6

Executants:	SGS Moçambique Lda		Site Responsible:			SUMITOMO CORPORATION		Comments
	Standards for Project	Baseline	Q2	5th Month	6th Month	Q3		
Day time Noise (7:00 – 22:00)	70	53.2	58.1	67.5	66.8	68.6	Jun-17	Results comply with the Project Standard. Q3 results are higher than the baseline and previous quarter and month, possibly due to construction activities
Night time Noise (22:00 – 07:00)	70	51.8	49.3	50.6	61	66.1		Results comply with the Project Standard. Q3 results are higher than the baseline and previous quarter and month, possibly due to construction activities
24h Average Noise	70	Not measured	56.4	65.5	65.4	67.8		Results comply with the Project Standard and are higher than previous quarter and previous month.
Wind direction		Not measured	Not measured	Not measured	Not measured	Not measured		
Wind velocity	m/s	Not measured	Not measured	Not measured	Not measured	Not measured		
Temperature	°C	Not measured	Not measured	Not measured	Not measured	Not measured		
Relative Humidity	%	Not measured	Not measured	Not measured	Not measured	Not measured		
Executant Representative Sign.		Not measured	Not measured	Not measured	Not measured	Not measured		

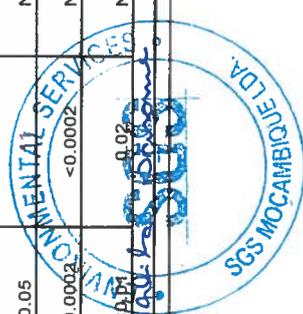


Subject:		Maputo Gas Fired Combined Cycle Power Plant Development Project Monitoring Plan - 3rd Quarter Report				Form 2a	
Noise		Project Phase:		Construction Location: L8			
Executants:		SGS Mocambique Lda		Site Responsible: SUMITOMO CORPORATION			
Item	Unit	Standards for Project	Baseline Nov-16	Q1 Dec-16	Q2 Mar-17	Q3 Jun-17	Comments
Day time Noise (7:00 – 22:00)	dBA	70	51	Not measured	64	59.5	Results comply with the Project Standard. Q3 results are higher than the baseline but lower than previous quarter
Night time Noise (22:00 – 07:00)	dBA	70	46.6	Not measured	61.2	59.5	Results comply with the Project Standard. Q3 results are higher than the baseline but lower than previous quarter
24h Average Noise	dBA	70	Not measured	Not measured	63.1	59.5	Results comply with the Project Standard and are lower than previous quarter.
Wind direction			Not measured	Not measured	Not measured	Not measured	
Wind velocity	m/s		Not measured	Not measured	Not measured	Not measured	
Temperature	°C		Not measured	Not measured	Not measured	Not measured	
Relative Humidity	%		Not measured	Not measured	Not measured	Not measured	
Executant Representative Sign.							



3.3. Water quality of Wastewater effluent Reporting

Maputo Gas Fired Combined Cycle Power Plant Development Project Monitoring Plan - 3rd Quarter Report										Form 3a	
Subject:		Wastewater effluent			Project Phase:			Construction		Location	L7
Exocutant:		SGS Mocambique Lda			Site Responsible:			SUMITOMO CORPORATION			
Item	Unit	Standards for Project	Baseline Nov-16	Q2 Mar-17	5th Month Apr-17	6th Month May-17	Q3 Jun-17	Comments (June 2017)			
Temperature	°C	N/A	Not measured	26.1			23.4	Result do not comply with Project Standard. Q3 results is higher than the previous quarter. Neutralization or removal of the waste water is advisable.			
pH	-	6.0-9.0	8.8	9.1			11.7	Q3 results is higher than the previous quarter			
DO	mg/l	N/A	Not measured	0			10	Q3 results is similar to previous quarter			
BOD ₅	mg/l	N/A	<2	<2			<2	Q3 results is similar to previous quarter			
COD	mg/l	N/A	34	24			<15	Q3 results is lower than previous quarter			
TSS	mg/l	50	Not measured	150			20	Result comply with Project Standard. Q3 results is lower than the previous quarter			
Oil & grease	mg/l	10	4	2			<1	Results comply with Project Standard. Q3 results is lower than the previous quarter			
total residual chlorine	mg/l	0.2	Not measured	0.08			0.06	Results comply with Project Standard. Q3 results is lower than the previous quarter			
Total Cr (Chromium)	mg/l	0.5	<0.01	0.06	N/A	N/A	0.11	Results comply with Project Standard. Q3 results is higher than the previous quarter			
Cu (Copper)	mg/l	0.5	<0.01	<0.01	N/A	N/A	<0.01	Results comply with Project Standard. Q3 results is similar to previous quarter			
Zn (Zinc)	mg/l	1	<0.02	0.03	N/A	N/A	<0.02	Results comply with Project Standard. Q3 results is lower than the previous quarter			
Pb (Lead)	mg/l	0.5	<0.01	<0.01	N/A	N/A	<0.01	Results comply with Project Standard. Q3 results is similar to previous quarter			
Cd (Cadmium)	mg/l	0.1	<0.002	<0.002	N/A	N/A	<0.002	Results comply with Project Standard. Q3 results is similar to previous quarter			
Total Fe (Iron)	mg/l	1	0.05		N/A	N/A	0.04	Results comply with Project Standard. Q3 results is lower than the previous quarter			
Hg (Mercury)	mg/l	0.005	<0.0002	<0.0002	N/A	N/A	<0.0002	Results comply with Project Standard. Q3 results is similar to previous quarter			
As (Arsenic)	mg/l	0.5	<0.01	0.02	N/A	N/A	<0.01	Results comply with Project Standard. Q3 results is lower than the previous quarter			
Exocutant Representative Sign.											



3.4. Water quality (Ambient Coastal Waters)

Maputo Gas Fired Combined Cycle Power Plant Development Project Monitoring Plan - 3rd Quarter Report										Form 5
Subject:		Water quality – Ambient Coastal Water			Project Phase Construction			Location: L9		
Executant:		SGS Moçambique Lda			Site Responsi SUMITOMO CORPORATION					
Item	Unit	Standards for Project	Baseline	Q1	Q2	Q3	Comments			
Temperature	°C	N/A	Not Measured	Dec-16	Mar-17	Jun-17	Jun-17			
pH	-	6.5 – 8.5	7.7	Not measured	8	8	Result comply with Project Standard. Q3 result is similar to previous quarter and higher than baseline			
DO	mg/l	6 or more	Not Measured	Not measured	0	5.4	Result do no comply with Project Standard, but is higher than previous quarter			
BOD5	mg/l	5 or less	<2	Not measured	<2	<2	Result comply with Project Standard. Q3 result is similar			
COD	mg/l	20 or less	210	Not measured	42	25	Result do not comply with Project Standard, but Q3 results is lower previous campaign			
TSS	mg/l	N/A	Not Measured	Not measured	50	60	Q3 result is higher than previous quarter. Possibly due to shallow location and naturally high TSS (mangrove)			
Oil & grease	mg/l	0.5	5	Not measured	<1	<1	Result probably comply with Project Standard			
Total Cr (Chromium)	mg/l	0.05	<0.01	Not measured	<0.01	<0.01	Result comply with Project Standard			
Cu (Copper)	mg/l	0.02	<0.01	Not measured	<0.01	<0.01	Result comply with Project Standard			
Zn (Zinc)	mg/l	0.18	<0.01	Not measured	<0.02	<0.02	Result comply with Project Standard			
Pb (Lead)	mg/l	0.03	<0.01	Not measured	<0.01	<0.01	Result comply with Project Standard			
Cd (Cadmium)	mg/l	0.001	<0.001	Not measured	<0.002	<0.002	Result comply with Project Standard			
Hg (Mercury)	mg/l	0.002	<0.002	Not measured	<0.0002	<0.0002	Result comply with Project Standard			
As (Arsenic)	mg/l	0.05	0.07	Not measured	<0.01	<0.01	Result comply with Project Standard			
Executant Representative Sign.										

ENVIRONMENTAL SERVICES
 MOÇAMBIQUE Lda
 Signature: *[Handwritten Signature]*
 Stamp: *[Circular Stamp]*

Maputo Gas Fired Combined Cycle Power Plant Development Project Monitoring Plan - 3rd Quarter Report		Form 5					
Subject: Water quality - Ambient Coastal Water		Project Phase: Construction Location: L12					
Executant: SGS Moçambique Lda		Site Responsible: SUMITOMO CORPORATION					
Item	Unit	Standards for Project	Baseline	Q1	Q2	Q3	Comments
Temperature	°C	N/A	Nov-16	Dec-16	Mar-17	Jun-17	Jun-17
pH	-	6.5 - 8.5	Not Measured	Not Measured	26.1	22.1	
DO	mg/l	6 or more	7.9	Not Measured	8	8	Result comply with Project Standard.
BOD5	mg/l	5 or less	Not Measured	Not Measured	0	6.2	Result comply with project Standard and is higher than previous quarter
COD	mg/l	20 or less	<2	Not Measured	<2	<2	Result comply with Project Standard.
TSS	mg/l	N/A	300	Not Measured	52	<15	Result comply with project Standard. And are lower than previous quarter.
Oil & grease	mg/l	0.5	Not measured	Not Measured	60	60	Q3 result is similar to previous quarter. Possibly due to shallow location and naturally high TSS (mangrove)
Total Cr (Chromium)	mg/l	0.05	3	Not Measured	<1	<1	Result probably comply with Project Standard.
Cu (Copper)	mg/l	0.02	0.01	Not Measured	0.01	<0.01	Result comply with Project Standard.
Zn (Zinc)	mg/l	0.18	<0.01	Not Measured	<0.01	<0.01	Result comply with Project Standard.
Pb (Lead)	mg/l	0.03	<0.01	Not Measured	<0.02	<0.02	Result comply with Project Standard.
Cd (Cadmium)	mg/l	0.001	<0.001	Not Measured	<0.01	<0.01	Result comply with Project Standard.
Hg (Mercury)	mg/l	0.002	<0.0002	Not Measured	<0.002	<0.002	Result comply with Project Standard.
As (Arsenic)	mg/l	0.05	0.002	Not Measured	<0.0002	<0.0002	Result comply with Project Standard.
Executant Representative Sign.							



4. CONCLUSIONS

The available results here compiled account for the third quarter of activities and for the second quarterly comparison of results.

During the present quarter by observed data in this report and in the course of measurements monitored parameters are below the Project Guidelines values except for Coastal water COD, Waste water pH and Ambient PM10, which presented results higher than the Project Standard.

The waste water pH should be neutralized or removed for external treatment.

Present and previous monthly and quarter on site measurements of DO gave low results of 0 mg/l, so SGS requested an external Lab to test for DO in Lab in order to double check the on-site equipment result. Before each measurement event, a verification of the on/site equipment is done using the Zero Oxygen Solution (MSDS attached) and the equipment is checked (verified), but given the recurrent low results, samples for DO analysis were taken to a laboratory for analysis on the same day they were collected.

Following the removal of contaminated water from L7 after the Q2 report, TSS values have decreased in L7 for this quarter campaign.

PM10 registered exceedances in all 4 locations, probably because of heavy construction activities occurring on site, SGS recommend that the dust control measures in place be re-evaluated for effectiveness and changed if needed.

It must be noted that due to the inconsistencies found in the Baseline results (Nov 2016), both Q1 (Dec-2016), Q2 (Mar-2017) and Q3 (Jun-2017) monitoring were not conducted fully in accordance with the approved monitoring chronogram. According to SGS supplier, the new equipment that complies with the EMoP requirement for SO₂, NO₂ and atmospheric conditions will be available for the Q4 campaign.



5. APPENDICES AND ATTACHMENTS

Appendix 1– Sampling Locations

Appendix 2 – Chronogram of Activities

Attachment 1– Sound Level Meter Calibration Certificate

Attachment 2 – Certified Laboratory Analytical Results-**INSTITUT FRESENIUS** - L7 (Apr-17, May-17, Jun-17)

Attachment 3 – Certified Laboratory Analytical Results-**INSTITUT FRESENIUS** – L9&L12 (Jun-17)

Attachment 4 – Certified Laboratory Analytical Results – X-Lab Earth Science – L3, L4, L6&L8 (SO₂/NO₂ – Jun-17)

Attachment 5 – Internal Bulletins – SGS Moçambique Lda – L3, L4, L6&L8 (PM₁₀ – Jun-17)

Attachment 6 – Laboratory Analytical Results – SwissLab – DO, Residual Chlorine (Jun-17).

Attachment 7 – MSDS Zero Oxygen Solution.

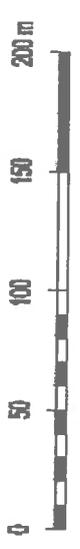
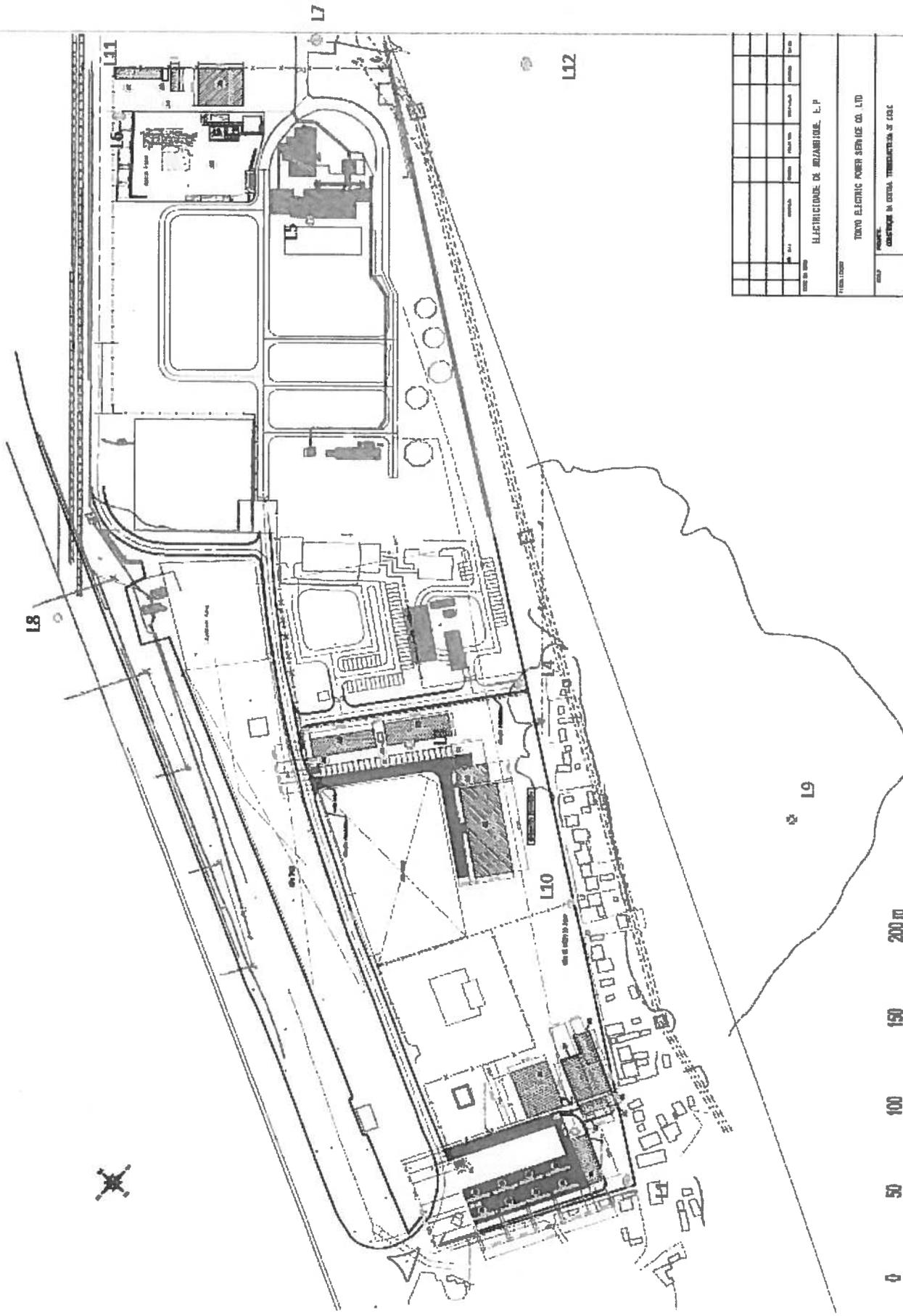


APPENDICES



Appendix 1– Sampling Locations





Legend: sample location

NO. DE HOJA	FECHA	PROYECTO	CLIENTE	ESCALA	PROYECTADO POR	REVISADO POR	APROBADO POR
		ELABORACIONES DE ARZABUJADE, E.P.	COMPAÑIA NACIONAL DE ELECTRICIDAD				
TITULO		TOMO ELECTRIC POWER SERVICE CO. LTD					
OBJETO		CONSTRUCCION DE CENTRAL TRANSFORMADORA DE 220KV					
AUTOR		INGENIERO EN ELECTRICIDAD Y MECANICA DE FLUIDOS					
FECHA DE ELABORACION		1964					
LUGAR		ESTACION DE ELECTRICIDAD					

Appendix 2 – Chronogram of Activities



MAPUTO GFCCPPDP - ENVIRONMENT MONITORING MONTHLY REPORT FOR BASELINE, CONSTRUCTION & COMMISSIONING STAGE

ITEM	POINT	STAGE	2016												2017												2018																							
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8																
Ambient Air quality parameter	L3	Baseline																																																
		Construction Commissioning																																																
	L4	Baseline																																																
		Construction Commissioning																																																
Noise and Vibration	L5	Baseline																																																
		Construction Commissioning																																																
	L6	Baseline																																																
		Construction Commissioning																																																
Wastewater emission parameters	L8	Baseline																																																
		Construction Commissioning																																																
	L7	Baseline																																																
		Construction Commissioning																																																
Costal Water Quality at Maputo	L9	Baseline																																																
		Construction Commissioning																																																
	L10	Baseline																																																
		Construction Commissioning																																																
Air emission parameters	L11	Baseline																																																
		Construction Commissioning																																																
	EDM	Baseline																																																
		Construction Commissioning																																																
CEMS																																							CEMS will be provided as per Chapter 6 - Technical Specifications of the Contract Document Part 2, Clause 9.17 Stack CEMS.											

ATTACHMENTS



Attachment 1– Sound Level Meter Calibration Certificate



CERTIFICATE OF CONFORMANCE

CERTIFICATE NUMBER	2017-AS-0823
ORGANISATION	SGS RANDBURG
ORGANISATION ADDRESS	KENT STREET, FERNDALE RANDBURG, JOHANNESBURG
CALIBRATION OF	INTEGRATING SOUND LEVEL METER complete with 1/2" MICROPHONE and 1/2" PRE-AMPLIFIER
MANUFACTURERS	LARSON, DAVIS, PCB and, BRÜEL & KJÆR
MODEL NUMBERS	LXT 1, 4936 and PRMLXT1
SERIAL NUMBERS	0002066, 2544222 and 014176
DATE OF CALIBRATION	05 - 08 MAY 2017
RECOMMENDED DUE DATE	-----
PAGE NUMBER	PAGE 1 OF 4

This certificate is issued in accordance with the conditions of approval granted by the South African National Accreditation System (SANAS). This Certificate may not be reproduced without the written approval of SANAS and M and N Acoustic Services.

Calibrations performed by this laboratory are in terms of standards, the accuracies of which are traceable to national measuring standards as maintained by NMISA

The measurement results recorded in this certificate were correct at the time of calibration. The subsequent accuracy will depend on factors such as care, handling, frequency of use and the amount of different users. It is recommended that re-calibration should be performed at an interval, which will ensure that the instrument remains within the desired limits and/or manufacturer's specifications.

The South African National Accreditation System (SANAS) is member of the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA). This arrangement allows for mutual recognition of technical test and calibration data by member accreditation bodies worldwide. For more information on the arrangement please consult www.ilac.org

Calibrated by:  C. DE CLERCQ (CALIBRATION TECHNICIAN)	Authorized/Checked by:  M. NAUDE (SANAS TECHNICAL SIGNATORY)	Date of Issue: 11 MAY 2017
---	--	-----------------------------------

1. PROCEDURE

The Integrating Sound Level Meter was calibrated according to procedure 1002/P/003 and to the IEC 60691 and IEC 60804 specifications as well as the manufacturer's specifications.

The 1/2" Microphone was calibrated according to procedure 1002/P/002 as well as the manufacturer's specifications.

2. MEASURING EQUIPMENT

JF-W	50BR-022	50 Ohm Step Attenuator	#328640728
Agilent	33220A	Function Generator	MY 48006158
Agilent	33220A	Function Generator	MY 44026082
Major Tech	MT 669	Data Logger	150828471
Keysight	34465A	Digital Multimeter	MY 54506327
B&K	4226	Multi-Function Acoustic Calibrator	2912645
Gems	3500B0001A01B000	Pressure Sensor	1606-0204475

<p>Calibrated by:</p> <p> C. DE CLERCQ (CALIBRATION TECHNICIAN)</p>	<p>Authorized/Checked by:</p> <p> M. NAUDÉ (SANAS TECHNICAL SIGNATORY)</p>
--	--

3. RESULTS

3.1 The following parameters of the Integrating Sound Level Meter were calibrated:

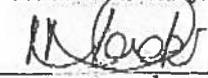
Parameter	Specification	Uncertainty of Measurement in dB
Input sensitivity	Manufacturer's specification	± 0,23
Amplitude Linearity (at 31,5 Hz, 1 kHz and 8 kHz from 60,0 dB to 140,0 dB)	IEC 60651: section 6.3 & 6.4	± 0,27
Weighting Network A (31,5 to 20 000) Hz	IEC 60651: section 6.1 & 6.2	± 0,27
Weighting Network C (31,5 to 20 000) Hz	IEC 60651: section 6.1 & 6.2	± 0,27
Linear (31,5 to 20 000) Hz	Manufacturer's Specification	± 0,27
Detector network (Fast, Slow and Impulse)	IEC 60651: section 7.1, 7.2 & 7.3	± 0,27
Integrating (Time Averaging)	IEC 60804: section 9.3.2 & 9.3.3	± 0,27
Integrating (Pulse Range)	IEC 60804: section 9.3.4	± 0,33
Impulse Integrating (A1-weighted)	IEC 60804: annex B	± 0,27
Max. /Min. Level	Manufacturer's specification	± 0,27
Peak Level	Manufacturer's specification	± 0,27
SPL(LAEB)	Manufacturer's specification	± 0,27
Percentage dose (LEP,d)	Manufacturer's specification	± 0,27

Conclusion: The Integrating Sound Level Meter complied with the above-specified clauses of the IEC 60651 and IEC 60804 specifications, Type 1.

3.2 The following parameters of the 1/2" Microphone were calibrated:

Input Sensitivity at 250 Hz
 Frequency Response (31,5 to 16 000) Hz
 Frequency Response done Electro Acoustically (31,5 to 16 000) Hz

Conclusion: The parameters measured for the 1/2" Microphone, complied with the manufacturer's specification.

Calibrated by:  C. DE CLERCQ (CALIBRATION TECHNICIAN)	Authorized/Checked by:  M. NAUDÉ (SANAS TECHNICAL SIGNATORY)
--	--

CERTIFICATE OF CALIBRATION

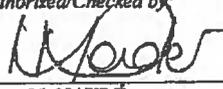
CERTIFICATE NUMBER	2017-AS-0824
ORGANISATION	SGS RANDBURG
ORGANISATION ADDRESS	KENT STREET, FERNDAL, RANDBURG, JOHANNESBURG
CALIBRATION OF	ACOUSTIC CALIBRATOR
MANUFACTURER	LARSON DAVIS
MODEL NUMBER	CAL 150
SERIAL NUMBER	3329
DATE OF CALIBRATION	11 MAY 017
RECOMMENDED DUE DATE	MAY 2018
PAGE NUMBER	PAGE 1 OF 3

This certificate is issued in accordance with the conditions of approval granted by the South African National Accreditation System (SANAS). This Certificate may not be reproduced without the written approval of SANAS and M and N Acoustic Services.

Calibrations performed by this laboratory are in terms of standards, the accuracies of which are traceable to national measuring standards as maintained by NMISA.

The measurement results recorded in this certificate were correct at the time of calibration. The subsequent accuracy will depend on factors such as care, handling, frequency of use and the amount of different users. It is recommended that re-calibration should be performed at an interval, which will ensure that the instrument remains within the desired limits and/or manufacturer's specifications.

The South African National Accreditation System (SANAS) is member of the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA). This arrangement allows for mutual recognition of technical test and calibration data by member accreditation bodies worldwide. For more information on the arrangement please consult www.ilac.org

Calibrated by:  W.S. SIBANYONI (CALIBRATION TECHNICIAN)	Authorized/Checked by:  M. NAUDE (SANAS TECHNICAL SIGNATORY)	Date of Issue: 15 MAY 2017
---	--	-----------------------------------

Director: Marlanka Naude

1. PROCEDURE

The UUT was calibrated according to the procedures 1002/p/001 and also to the IEC 60942 specifications for Sound Level Calibrators as well as the manufacturer's specifications.

2. MEASURING EQUIPMENT

Agilent	34461A	Digital Multimeter	MY 53205694
Major Tech	MT 669	Data Logger	150828410
G.R.A.S	42 AA	Piston Phone	18259
G.R.A.S	26 AJ	½" Pre-Amplifier	188475
B&K	2610	Measuring Amplifier	1450796
G.R.A.S	40 AQ	½" Microphone	160816
Leader	LDM-170	Distortion Meter	0106240
Svantek	SV 35	Acoustic Calibrator	58106

3. RESULTS

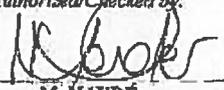
3.1 The following parameters of the Acoustic Calibrator were calibrated:

Output levels	IEC 60942: section 5.2.3
Output frequency	IEC 60942: section 5.3.3
Selective Distortion	IEC 60942: section A.4.9

The Acoustic Calibrator output levels were adjusted from 92,9 dB to 94,0 dB and from 112,9 dB to 114,0 dB.

These results were corrected to the ambient condition of 1013,25 Pa.

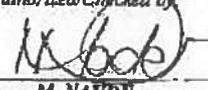
Conclusion: The Acoustic Calibrator complied with the above-specified clauses of the IEC 60942 specification, **Class 1**.

Calibrated by:  _____ W.S. SIBANYONI (CALIBRATION TECHNICIAN)	Authorized/Checked by:  _____ M. NAUDÉ (SANAS TECHNICAL SIGNATORY)
--	--

4. REMARKS

- 4.1** The reported expanded uncertainties of measurements are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95.45 %, the uncertainties of measurements have been estimated in accordance with the principles defined in the GUM (Guide to Uncertainty of Measurement) ISO, Geneva, 1995
- 4.2** The environmental conditions were: Temperature: (23 ± 2) °C
 Relative Humidity: (50 ± 15) % RH
- 4.3** Calibration labels bearing cal date, due date (if requested), certificate number and serial number have been affixed to the instrument.
- 4.4** The uncertainties of the measurements were taken into account when the above statements of compliance to the relevant specifications are made.
- 4.5** The total uncertainty of measurements was estimated as follows:
- | | |
|--------------------------------|----------|
| Integrating Sound Level Meter: | ± 0,3 dB |
| ½" Microphone: | ± 0,3 dB |
- 4.6** The Condition of the ½" Microphone has a dent and scratches on the protection grid.

-----SECTION 4.6 THE END OF CERTIFICATE-----

<p>Calibrated by:</p>  C. DE CLERCQ (CALIBRATION TECHNICIAN)	<p>Authorized/Checked by:</p>  M. NAUDÉ (SANAS TECHNICAL SIGNATORY)
---	---

Attachment 2 – Certified Laboratory Analytical Results-**INSTITUT FRESENIUS - L7** (Apr-17,
May-17 and Jun-17)



SGS

INSTITUT FRESENIUS

SGS INSTITUT FRESENIUS GmbH Am Technologiepark 10 D-45699 Herten

SGS Mocambique Lda.
F250101
Ms. Dalila Narane
Avenida Vladimir Lenine, 174
P.O. BOX 657, MATOLA LINGAMO
MOSAMBIK

certificate 3420296
order no. 4186840
client no. 10074905

 **DAKKS**
Deutsche
Akkreditierungsstelle
D-PL-14115-02-00
D-PL-14115-03-00
D-PL-14115-06-00
D-PL-14115-07-00
D-PL-14115-08-00
D-PL-14115-10-00
D-PL-14115-13-00
D-PL-14115-14-00

Mr. Karol Hinz
phone +49 2366 305-657
fax +49 2366 305-611
Karol.Hinz@sgs.com

Environment, Health and Safety

SGS INSTITUT FRESENIUS GmbH
Am Technologiepark 10
D-45699 Herten

Herten, 28.06.2017

your order/project: sample L7
your order: .
date of order: 29.05.2017

time of investigation from 07.06.2017 until 20.06.2017
first sample no. 170613330
date of receipt sample 06.06.2017

Dear Sir or Madam,

may we take this opportunity to thank you for your order.
The final report of our samples is enclosed herewith.

We would be glad to answer any questions you may have.

Best regards



SGS INSTITUT FRESENIUS
i.A. Karol Hinz
Customer Service

i.A. Iris Kopitzki
Customer Service

page 1 of 2

sample L7

certificate no. 3420296

page 2 of 2

order no. 4186840

28.06.2017

sent from you matrix: waste water

sample no. 170613330
description L7
01.06.2017

date of receipt: 06.06.2017

parameter	unit		determination method limit	lab
Results :				
pH value		11,7	0,1	DIN 38404-5 HE
Non filterable substances	mg/l	20	10	DIN 38409-2-2 HE
Chemical Oxygen demand	mg/l	< 15	15	DIN 38409-41 HE
BOD5	mg/l	< 2	2	DIN EN 1899-1 HE
Dry residue filtrate 105°C	mg/l	980	10	DIN 38409-1-2 HE
Metals :				
Mercury	mg/l	< 0,0002	0,0002	DIN EN 1483 HE
Metals mw-digestion :				
Arsenic	mg/l	< 0,01	0,01	DIN EN ISO 11885 HE
Lead	mg/l	< 0,01	0,01	DIN EN ISO 11885 HE
Cadmium	mg/l	< 0,002	0,002	DIN EN ISO 11885 HE
Chromium	mg/l	0,11	0,01	DIN EN ISO 11885 HE
Iron, total	mg/l	0,04	0,02	DIN EN ISO 11885 HE
Copper	mg/l	< 0,01	0,01	DIN EN ISO 11885 HE
Zinc	mg/l	< 0,02	0,02	DIN EN ISO 11885 HE
Lv.Lipophilic substances	mg/l	< 1	1,0	DIN 38409-56 HE

The laboratory sites of the SGS group Germany according to the abbreviations mentioned above are listed at <http://www.institut-fresenius.de/filestore/89/laborstandortkuerzelsgs2.pdf>.

*** End of test report ***

This document is issued by the Company subject to its General Conditions of Service (www.sgsgroup.de/egb). Attention is drawn to the limitations of liability, indemnification and jurisdictional issues established therein. This document is an original. If the document is submitted digitally, it is to be treated as an original within the meaning of UCP 600. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Attachment 3 – Certified Laboratory Analytical Results-**INSTITUT FRESENIUS – L9&L12** (Jun-17)

Dolita Navane

SGS INSTITUT FRESENIUS GmbH Am Technologiepark 10 D-45699 Herten

SGS Mocambique Lda.
F250101
Ms. Dalila Narane
Avenida Vladimir Lenine, 174
P.O. BOX 657, MATOLA LINGAMO
MOSAMBIK

certificate 3411916
order no. 4186832
client no. 10074905

DAKKS

Mr. Karol Hinz
phone +49 2366 305-657
fax +49 2366 305-611
Karol.Hinz@sgs.com

Deutsche
Akkreditierungsstelle
D-PL-14115-02-00
D-PL-14115-03-00
D-PL-14115-06-00
D-PL-14115-07-00
D-PL-14115-08-00
D-PL-14115-10-00
D-PL-14115-13-00
D-PL-14115-14-00

Environment, Health and Safety

SGS INSTITUT FRESENIUS GmbH
Am Technologiepark 10
D-45699 Herten

Herten, 21.06.2017

your order/project: samples L9 + L12
your order: .
date of order: 01.06.2017

time of investigation from 07.06.2017 until 13.06.2017
first sample no. 170613310
date of receipt sample 06.06.2017

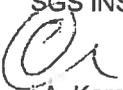
Dear Sir or Madam,

may we take this opportunity to thank you for your order.
The final report of our samples is enclosed herewith.

We would be glad to answer any questions you may have.

Best regards

SGS INSTITUT FRESENIUS


i.A. Karol Hinz
Customer Service



i.A. Iris Kopitzki
Customer Service

page 1 of 2

samples L9 + L12

certificate no. 3411916
order no. 4186832

page 2 of 2
21.06.2017

sent from you

sample no.	170613310	170613311				
description	L9	L12	determination method	lab		
	01.06.2017	01.06.2017	limit			
	sea water	sea water				
date of receipt:	06.06.2017	06.06.2017				
parameter	unit					
Results :						
pH value		8,0	8,0	0,1	DIN 38404-5	HE
Non filterable substances	mg/l	60	60	10	DIN 38409-2-2	HE
Chemical Oxygen demand	mg/l	25	< 15	15	DIN 38409-41	HE
BOD5	mg/l	< 2	< 2	2	DIN EN 1899-1	HE
Dry residue filtrate 105°C	mg/l	36000	35000	10	DIN 38409-1-2	HE
Metals :						
Mercury	mg/l	< 0,0002	< 0,0002	0,0002	DIN EN 1483	HE
Metals mw-digestion :						
Arsenic	mg/l	< 0,01	< 0,01	0,01	DIN EN ISO 11885	HE
Lead	mg/l	< 0,01	< 0,01	0,01	DIN EN ISO 11885	HE
Cadmium	mg/l	< 0,002	< 0,002	0,002	DIN EN ISO 11885	HE
Chromium	mg/l	< 0,01	< 0,01	0,01	DIN EN ISO 11885	HE
Iron, total	mg/l	0,45	0,51	0,02	DIN EN ISO 11885	HE
Copper	mg/l	< 0,01	< 0,01	0,01	DIN EN ISO 11885	HE
Zinc	mg/l	< 0,02	< 0,02	0,02	DIN EN ISO 11885	HE
Lv.Lipophilic substances	mg/l	< 1	< 1	1,0	DIN 38409-56	HE

The laboratory sites of the SGS group Germany according to the abbreviations mentioned above are listed at <http://www.institut-fresenius.de/filestore/89/laborstandortkuerzelsgs2.pdf>.

*** End of test report ***

This document is issued by the Company subject to its General Conditions of Service (www.sgs.com). Attention is drawn to the limitations of liability, indemnification and jurisdictional issues established therein. This document is an original. If the document is submitted digitally, it is to be treated as an original within the meaning of UCP 600. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Attachment 4 – Certified Laboratory Analytical Results – X-Lab Earth Science – L3, L4, L6&L8
(SO₂/NO₂ – Jun-17)





TEST REPORT

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Dalila Narane	Laboratory	X-Lab Earth Science
Client	SGS MOZAMBIQUE	Address	259 Kent Avenue Ferndale, 2194
Address		Telephone	+27 (0)11 590 3000
Telephone	+258 21 72 8090	Laboratory Manager	Mr Martin Olivier
Facsimile		Lab Reference	JBX17-0510
Email	dalila.narane@sgs.com	Report Number	0000001152
Project	June Campaign	Date Received	23/06/2017 11:19
Order Number	June Campaign	Date Started	27/06/2017 8:43
Samples	5	Date Reported	27/06/2017 11:15
Sample matrix	AIR		

The document is issued in accordance with SANAS's accreditation requirements.
Accredited for compliance with ISO/IEC 17025. SANAS accredited laboratory



T0775

SIGNATORIES

<hr/> <p>Greg Ondrejko Technical Supervisor/Technical Signatory</p>	 <hr/> <p>Martin Olivier General Manager/Technical Signatory</p>
---	---



X-LAB EARTH

JBX17-0510

Report number 0000001152

Client reference: June Campaign

TEST REPORT

Parameter	Units	LOR	Sample Number	Sample Name	JBX17-0510.001	JBX17-0510.002	JBX17-0510.003	JBX17-0510.004	JBX17-0510.005
					774 YU	773 YU	790 YU	772 YU	775 YU
Nitrite	µg/tube	0.3			1.3	<0.3	<0.3	1.6	<0.3
Sulphate	µg/tube	0.4			<0.4	<0.4	<0.4	1.0	<0.4

METHOD SUMMARY

METHOD

METHOD SUMMARY

ME-AN-014

Nitrogen and sulphur dioxides are determined on Radiello cartridges. The ions (NO₂, SO₄) are extracted off the cartridge and measured by ion chromatography. The method is based on Radiello method F1.

FOOTNOTES

IS Insufficient sample for analysis.
 LNR Sample listed, but not received.
 ^ Performed by outside laboratory.
 LOR Limit of Reporting

QFH QC result is above the upper tolerance
 QFL QC result is below the lower tolerance
 - The sample was not analysed for this analyte
 * Results marked "Not SANAS Accredited" in this report are not included in the SANAS Schedule of Accreditation for this laboratory / certification body / inspection body".

Samples analysed as received.
 Solid samples expressed on a dry weight

Unless otherwise indicated, samples were received in containers fit for purpose.

This document is issued by the Company under its General Conditions of Service.

Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) draw and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativity of all goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

This test report shall not be reproduced except in full, without written approval of the laboratory.
 X-Lab Earth Science is accredited by SANAS and conforms to the requirements of ISO/IEC 17025 for specific test or calibrations as indicated on the scope of accreditation to be found at <http://sanas.co.za>.



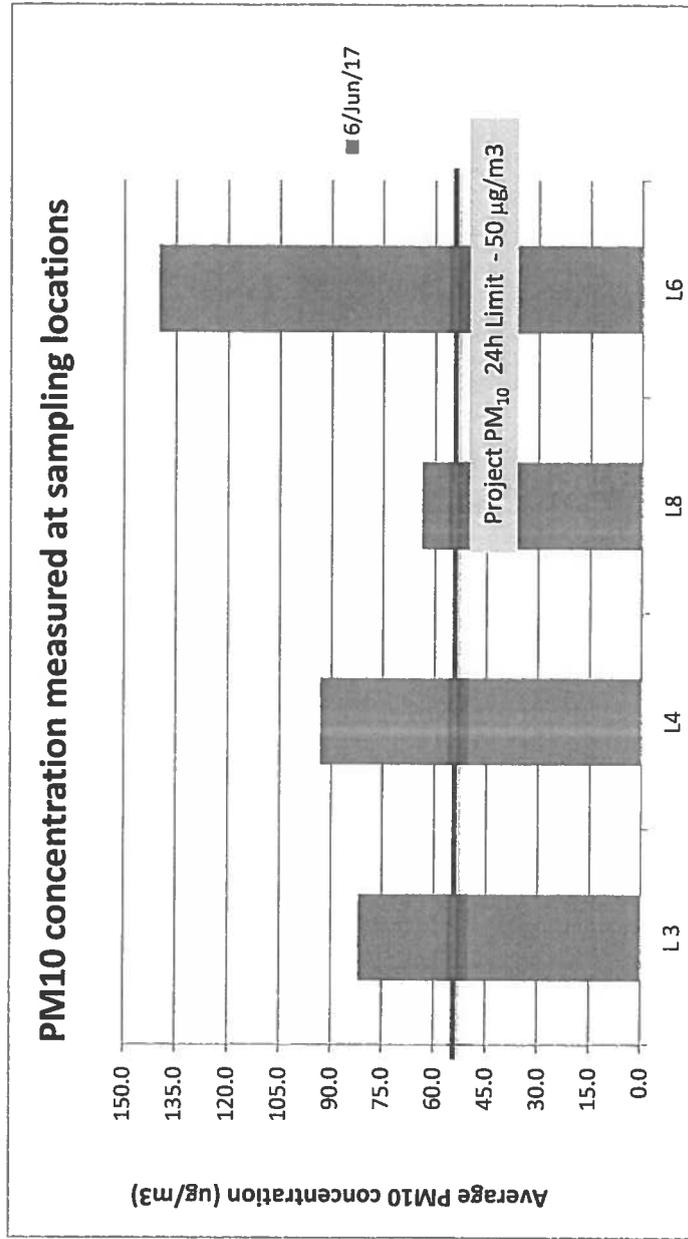
Attachment 5 – Internal Bulletins – SGS Moçambique Lda – L3, L4, L6&L8 (PM10 – Jun-17)



Client: Sumitomo Corporation

PM10 Results

Location	L3	L4	L8	L6
6/Jun/17	81.8	93.1	63.6	139.9
Sum	81.8	93.1	63.6	139.9
Average	81.8	93.1	63.6	139.9
Exceedencies	1.0	1.0	1.0	1.0



Attachment 6 – Laboratory Analytical Results – SwissLab – DO, Residual Chlorine (Jun-17).



Relatório de Ensaio nº 4471

Cliente: SGS Mocambique
Endereço:
Cliente nº: 159

Versão: 1
Rel. Ensaio Definitivo

Tipo: Águas Residuais
Amostra:
Ponto de Amostragem: Residual Water
Responsável pela Amostragem: Cliente

Data de Colheita: 01/06/2017
Data de Recepção: 02/06/2017
Data Início Análise: 02/06/2017
Data Fim Análise: 08/06/2017
Data de Emissão: 13/06/2017

Ensaio	Método Analítico	Valor Limite	Unidades	Amostra
				Amostra 7782 L7
Parâmetros Físico-Químicos				
Cloro Residual	SMEWW 4500 Cl G:2012	0,5	mg/L	0,06
Oxigênio Dissolvido	SMEWW 4500-O:2012	> 5	mg/L	10,0

Aprciaçãoção

Todos os parâmetros ensaiados estão de acordo com os valores limite definidos no Decreto n.º 18/2004 de 02 de Junho.



Assane Momade
(Director Dept. Química)

Os resultados são referentes somente às amostras analisadas. Reprodução proibida sem a permissão do laboratório, salvo na íntegra.
Sempre que o resultado da amostra estiver associado ao sinal (\pm), quer dizer que a amostra apresenta valor da incerteza associada ao respectivo ensaio.

Relatório de Ensaio nº 4472

Cliente: SGS Mocambique

Versão: 1

Endereço:

Rel. Ensaio Definitivo

Cliente nº: 159

Tipo: Água do Mar

Data de Colheita: 01/06/2017

Amostra:
Ponto de Amostragem: Sea Water

Data de Recepção: 02/06/2017

Data Início Análise: 02/06/2017

Responsável pela Amostragem: Cliente

Data Fim Análise: 13/06/2017

Data de Emissão: 13/06/2017

Ensaio	Método Analítico	Valor Limite	Unidades	Amostras	
				Amostra 7783 L9	Amostra 7784 L12
Parâmetros Físico-Químicos					
Cloro Residual	SMEWW 4500 Cl G:2012	0	mg/L	0,20	0,36
Oxigênio Dissolvido	SMEWW 4500-O:2012	> 5	mg/L	5,40	6,20

Apreciação

Os parâmetros assinalado a negrito não estão de acordo com os valores limite definidos no Decreto n.º 67/2010 de 31 de Dezembro e o Decreto 18/2004 de 02 de Junho.



Assane Momade
(Director Dept. Química)

Os resultados são referentes somente às amostras analisadas. Reprodução proibida sem a permissão do laboratório, salvo na íntegra.
Sempre que o resultado da amostra estiver associado ao sinal (\pm), quer dizer que a amostra apresenta valor da incerteza associada ao respectivo ensaio.

Attachment 7 – MSDS Zero Oxygen Solution.





For RICCA, SpectroPure, Red Bird, and Solutions Plus Brands
 Emergency Contact(24 hr) – CHEMTREC®
 Domestic: 800-424-9300
 International: 703-527-3887

MSDS

ZERO OXYGEN STANDARD, 0 mg/L Dissolved Oxygen

Material Safety Data Sheet

Section 1: Chemical Product and Company Identification

Catalog Number: 9420	
Product Identity: ZERO OXYGEN STANDARD, 0 mg/L Dissolved Oxygen	
Manufacturer's Name: RICCA CHEMICAL COMPANY LLC	Emergency Contact(24 hr) – CHEMTREC® Domestic: 800-424-9300 International: 703-527-3887
CAGE Code: 4TCW6, 0V553, 4XZQ2	
Address: 448 West Fork Dr Arlington, TX 76012	Telephone Number For Information: 817-461-5601
Date Prepared: 4/2/02	Revision: 4 Last Revised: 11/05/2012 Date Printed: 01/05/2015 2:38:07 am

Section 2. Composition/Information on Ingredients

Component	CAS Registry #	Concentration	ACGIH TLV	OSHA PEL
Water, Deionized	7732-18-5	Balance	Not Available	Not Available
			Not Available	Not Available
Sodium Sulfite	7757-83-7	4.5 - 5.5% (w/v)	Not Available	Not Available
			Not Available	Not Available
Cobalt(II) Chloride, Hexahydrate	7791-13-1	< 0.01% (w/v)	Not Available	Not Available
			0.02 mg/m3	0.1 mg/m3

Section 3: Hazard Identification

Emergency Overview: May cause irritation to the eyes, skin and respiratory tract. Contains a minute amount of Cobalt Chloride, a possible carcinogen according to International Agency for Research on Cancer (IARC). Wash areas of contact with water for at least 15 minutes. If ingested, dilute with water and call a physician. Although moderately toxic in large amounts, sulfites can pose risk to some asthmatics producing central nervous system depression, broncho constriction and anaphylaxis.

Target Organs: eyes, skin, respiratory tract.

Eye Contact: May cause irritation, redness, pain, and tearing.

Inhalation: May cause irritation. This solution is not expected to be harmful via inhalation.

Skin Contact: May cause slight irritation.

Ingestion: May cause gastric irritation by the liberation of sulfurous acid. Large doses may result in circulatory disturbances, diarrhea, and central nervous system depression.

Chronic Effects/Carcinogenicity: Chronic exposure may affect thyroid, heart, lungs and kidneys due to Cobalt.

IARC - Cobalt(II) Chloride, Hexahydrate is possibly carcinogenic to humans. Cobalt(II) Chloride, Hexahydrate is possibly carcinogenic to humans.



For RICCA, SpectroPure, Red Bird, and Solutions Plus Brands
Emergency Contact(24 hr) -- CHEMTREC®
Domestic: 800-424-9300
International: 703-527-3887

MSDS

ZERO OXYGEN STANDARD, 0 mg/L Dissolved Oxygen

NTP - No.

OSHA - No.

Reproductive Information: Reproductive effects cited in 'Registry of Toxic Effects of Chemical Substances' for Cobalt(II) Chloride, Hexahydrate.
Reproductive effects cited in 'Registry of Toxic Effects of Chemical Substances' for Cobalt(II) Chloride, Hexahydrate.
Teratology (Birth Defect) Information: Mutation data cited in 'Registry of Toxic Effects of Chemical Substances' for Sodium Sulfite. Mutation data cited in 'Registry of Toxic Effects of Chemical Substances' for Cobalt(II) Chloride, Hexahydrate. Mutation data cited in 'Registry of Toxic Effects of Chemical

Section 4: First Aid Measures - In all cases, seek qualified evaluation.

Eye Contact: Irrigate immediately with large quantity of water for at least 15 minutes. Call a physician if irritation develops.
Inhalation: Remove to fresh air. Give artificial respiration if necessary. If breathing is difficult, give oxygen.
Skin Contact: Wash areas of contact with soap and water for at least 15 minutes. Call a physician if irritation develops.
Ingestion: Dilute with water or milk. Do not induce vomiting. Call a physician if necessary.

Section 5: Fire Fighting Measures

Flash Point: N/A

Method Used: N/A

LFL: N/A

UFL: N/A

Extinguishing Media: Use any means suitable for extinguishing surrounding fire.

Fire & Explosion Hazards: Not considered to be a fire or explosion hazard.

Fire Fighting Instructions: Use normal procedures/instructions. Poisonous gases may be produced in fire.

Fire Fighting Equipment: Use protective clothing and breathing equipment appropriate for the surrounding fire.

Section 6: Accidental Release Measures

Absorb with suitable material and dispose of in accordance with local regulations.

Section 7: Handling and Storage

As with all chemicals, wash hands thoroughly after handling. Avoid contact with eyes and skin. Protect from freezing and physical damage.

Safety Storage Code: General

Section 8: Exposure Control/Personal Protection

Engineering Controls: No specific controls are needed. Normal room ventilation is adequate.

Respiratory Protection: Normal room ventilation is adequate.

Skin Protection: Chemical resistant gloves.

Eye Protection: Safety glasses or goggles.

Section 9: Physical and Chemical Properties

Appearance: Clear, colorless to straw yellow liquid

Odor: Odorless

Solubility in Water: Infinite

Specific Gravity: Approximately 1

pH: N/A

Boiling Point(°C): Approximately 100

Melting Point(°C): Approximately 0

Vapor Pressure: N/A

Section 10: Stability and Reactivity

Chemical Stability: Stable under normal conditions of use and storage. This product absorbs Oxygen from the air.

Incompatibility: Strong oxidizing agents, Acids (liberates Sulfur Dioxide), high temperatures.

Hazardous Decomposition Products: Emits toxic and irritating fumes, including Sulfur Oxides, when heated to decomposition.

Hazardous Polymerization: Will not occur.



MSDS

For RICCA, SpectroPure, Red Bird, and Solutions Plus Brands
Emergency Contact(24 hr) -- CHEMTREC®
Domestic: 800-424-9300
International: 703-527-3887

ZERO OXYGEN STANDARD, 0 mg/L Dissolved Oxygen

Section 11. Toxicological Information

LD50, Oral, Mouse: (Sodium Sulfite) 820 mg/kg, details of toxic effects not reported other than lethal dose value.

Section 12. Ecological Information

Ecotoxicological Information: No information found.

Chemical Fate Information: No information found.

Section 13. Disposal Considerations

Whatever cannot be saved for recycling or recovery should be managed in an appropriate and approved waste disposal facility. Always dispose of in accordance with local, state and federal regulations.

Section 14. Transport Information

Part Numbers:

This product is not regulated.

Section 15. Regulatory Information (Not meant to be all inclusive - selected regulation represented)

OSHA Status: These items meet the OSHA Hazard Communication Standard (29 CFR 1910.1200) definition of a hazardous material.

TSCA Status: All components of this solution are listed on the TSCA Inventory or are mixtures (hydrates) of items listed on the TSCA Inventory.

Sara Title III:

Section 302 Extremely Hazardous Substances: Not Applicable.

Section 311/312 Hazardous Categories: Acute, Chronic: Yes

Fire, Pressure, Reactivity: No

Section 313 Toxic Chemicals: Not Applicable.

California: None Reported.

Pennsylvania: None Reported.

RCRA Status: Not Applicable.

CERCLA Reportable Quantity: Cobalt(II) Chloride, Hexahydrate - 1 pounds. Cobalt(II) Chloride, Hexahydrate - 1 pounds.

WHMIS: Not Applicable.

Section 16. Other Information

NFPA Ratings:

Health: 1 Flammability: 0 Reactivity: 0 Special Notice Key: None

HMIS Ratings:

Health: 1 Flammability: 0 Reactivity: 0 Protective Equipment: B (Protective Eyewear, Gloves)

Rev 1, 05-20-2002: (Section 9) Revised appearance.

Rev 2, 08-14-2006: (Section 15) revised WHMIS information.

Rev 3, 10-26-2009: Reviewed and approved for distribution.

Rev 4, 11-05-2012: Reviewed and approved for distribution; (Section 9) modified appearance from slightly yellow.



Aquaread verification sheet

Form No: PF-(MZ)-(EHS)-VE-031
Issue No: Jun-17

General informations

Parameters

Instrument serie number/ tag number	Date	Time	pH	pH	Dissolved oxygen (%)	Eventual note
113701527	01.06.17	10:30	7,01	10,0	0	

Alvaro Reis
01/06/17

environmental technician/ consultant
Name:

Environmental technician/ consultant Name: _____