



Cambodian Energy Limited

Pollutant Release and Transfer Registers (PRTR) 2019

Content

1. CEL General Company Information
2. Environmental Protection
3. Participation on PRTR System (Reporting Data)
4. Commitment

1. CEL Company Information

1.1 Information about Company				
Company Name	Cambodian Energy Limited			
Address:	Province/Town	Preah Sihanouk	Distric/Quarter	Stueng Hav
	Commune/Sangkat	Kampenh	Village	Phum Pir
	Telephone Number		Fax number	
	Email			
Geographical location	N:			
Zone	E:			
Map				
Altitude	6			
Area (m2)	260000			
Activity/Process	Power Energy			
Number of workers	179			
Date of Establishment	30-Nov-11			



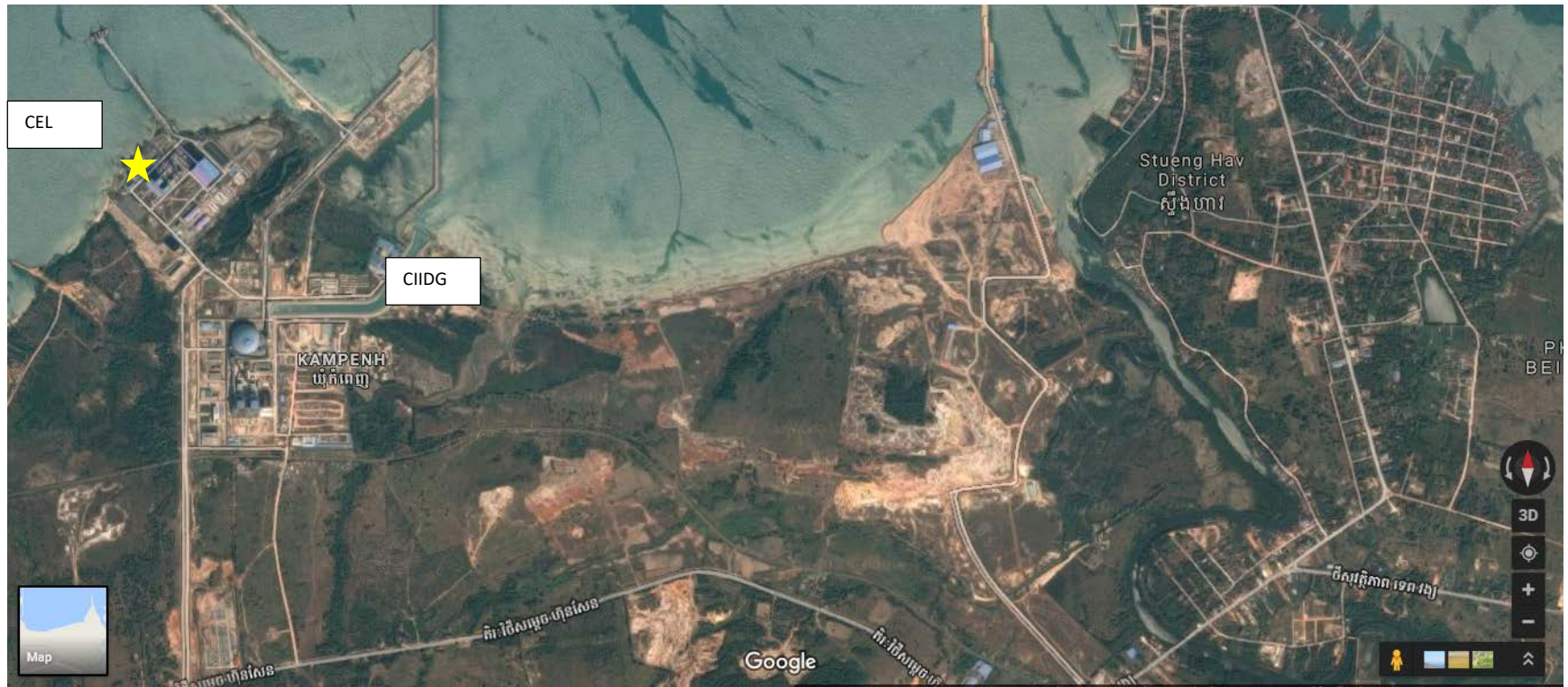
1. CEL Company Information

Cambodian Energy Limited coal fired power is the Independent Power Produce (IPP) owned by HNG Capital with the scheme as “Built – Own – Operate” (BOO) for a 30-year concession which mentioned in Power Purchase Agreement between EdC and CEL.

The Cambodian Energy Limited have 2×51 MW (Net) coal fired power plant consist of two coal fired steam generators (boiler), two turbine generators and balance of plant (BOP) system. The boilers are utilized with coal firing and Circulating Fluidized Bed (CFB) type. The advantages of Boiler CFB technology is low SO₂ emissions, low NO_x emissions, low CO and carbon emissions.



1. CEL Company Information (Map View)



2. Environmental Protection

INSTALLED SYSTEM for Environmental Protection

1. CEMS System
2. ESP System
3. Limestone System
4. WWTP

MONITORING SYSTEM

1. Ambient Air Quality, Noise, Wind Speed and Wind Direction

- 1.1 Ambient Air Quality – Twice a year in 3 locations (SO₂, NO₂, PM)
- 1.2 Noise Measurement – Twice a year in 3 locations

2. Coastal Water and Waste Water & Leachate Test

- 2.1 Coastal Water – Twice a year in 7 locations nearby CEL Plant
- 2.2 Waste Water & Leachate Test – Twice a year

3. Fish Larvae, Plankton & Benthos, Coral Reef and Sea Grass

- 3.1 Fish Larvae Survey – Twice a year in 7 locations nearby CEL Plant
- 3.2 Plankton & Benthos Survey – Twice a year in 7 locations nearby CEL Plant
- 3.3 Coral Reef & Sea Grass Survey – Twice a year in 7 locations nearby CEL Plant

4. Mangrove Survey

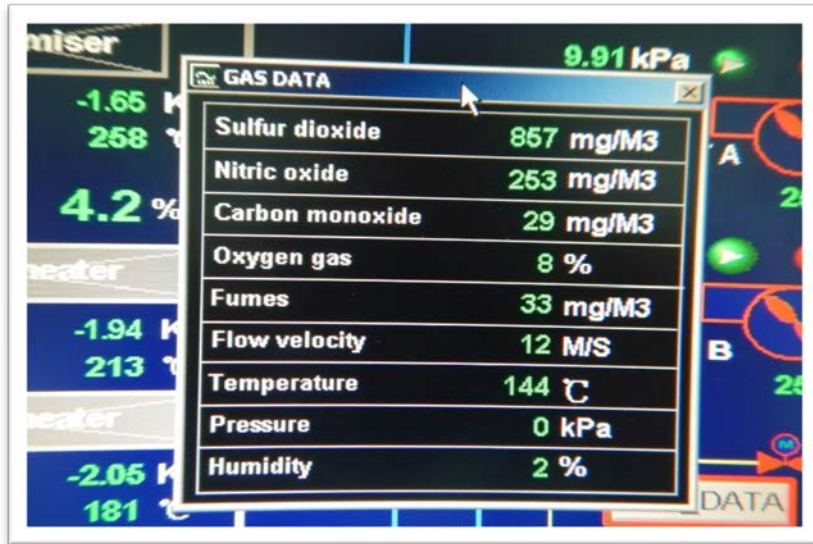
5. Traffic Survey

6. Socio-Economic and Landscape Survey

7. Public Participations Survey



2. Environmental Protection (Installed System)



2. Environmental Protection (Monitoring Works)



3. PRTR Reporting in 2018 Period

2. Description of Facilities

2.1. Chemical contained in raw materials used

Raw Material	Commercial Name	CAS Number	Annual Consumption	Measurement Unit	Used in ¹
Ammonia (NH ₃)	Ammonia	7664-41-7	880	Kg	Water Treatment Process
Hydrochloric Acid (HCl)		-	11,200	Kg	WTP Process
Sodium hydroxide (NaOH)		-	17,280	Kg	WTP Process
Tri Sodium Phosphate - TSP (Na ₃ PO ₄ ·12H ₂ O)		-	50	Kg	WWTP Process
Poly Aluminum Chloride (PAC)		-	1600	Kg	WWTP Process
Polyacrylamide (PAM)		-	150	Kg	WWTP Process

3. PRTR Reporting in 2018 Period

2.2. Manufactured product (outputs)				
Products	Annual Production	Measurement Unit	Type of Process	
			Continuons	Seasonal
Electricity	503103	MWh	No	
Demin Water	45861	M3	No	

Note: Electricity and Demin Water production depending on the EDC demand



3. PRTR Reporting in 2018 Period

2.3. Water Consumption					
Source		Water Consumption Flow (m3/hour)	Consumption Volume (m3)		
			Daily	Monthly	Annual
Water Supply					
Superficial	River				
	Lake	23.39	561.3	17072.8	204874
	Sea				
	Water Canal				
Underground					
Others (Specify)					
Total		23.39	561.3	17072.8	204874.0

Note: Water supply from Anco Water



3. PRTR Reporting in 2018 Period

2.4. Energy Consumption					
Source		Unit	Daily Consumption	Monthly Consumption	Annual Consumption
Distribution Network (Electricity)		MWh	260	7800	54441
Own Source Boiler?	Thermic (Diesel)				
	Thermic (Gas)				
	Thermic (Coal)	MT	1350	40000	268930
	Thermic (Wood)				
	Other(specify)				
Total					

3. PRTR Reporting in 2018 Period

3. Waste Generation								
3.1. Solid Waste Generation								
Process or sub-process	Type of waste	Quantity (ton/year)	Quantity of waste in stock (ton/year)	Treated directly in site		Treated directly out side		
				Quantity (ton/year)	Treated Method	Quantity (ton/year)	Treated Method	Name of landfill or company
Energy Production	Hazardous Waste	15256	397	0	Recycle	14859	Reuse	Shi Mao

Note: Total ash was taken by Shi Mao is 14859 ton/year which contain fly ash material is 8859 ton and bottom ash is 6000 ton/year



3. PRTR Reporting in 2018 Period

3.2. Liquid Waste Generation

Process/sub-process	Pollutant in liquid waste/effluents		Amount or Volume of liquid waste/effluent generated		Treatment Method
	Substance or Parameter	Unit	Quantity	Unit	
Process	BOD	mg/L	0.4		
Process	COD	mg/L	6		
Process	Total Suspended Solid	mg/L	11		
Process	Oil and Grease	mg/L	0		
Process	pH		7.6		

Note: All waste water product are treated in WWTP and the product used as reused water for cleaning, gardening, dust spraying



3. PRTR Reporting in 2018 Period

3.3. Air Emission						
Process or sub-process	Substance or Parameter	Air Emission		Amount of Exhaust Generated		Prevention
		Conducted	Fugitive	Quantity (ton/year)	Treated Method	
Energy Production	Sulfur Dioxide			1288		FGD (Limestone)
Energy Production	Nitrogen Dioxide	Yes		591		Low Temperature Firing
Energy Production	PM	Yes		39		ESP

Note: As per manual calculation in next page



3. Air Emission

Running Hour 2018:

- Unit #1 is 4847 Hours
- Unit #2 is 4882 Hours

Flue Gas Flow averagely is 160,000 Nm³/hour per Unit

- SO₂ (Sulfur Dioxide)

Average CEMS Reading in 2018:

- Unit #1 is 797 mg/Nm³
- Unit #2 is 858 mg/Nm³

SO₂ Calculation:

- Emission SO₂ Unit #1 in 2018
 $= 797 \times 160,000 \times 4847 / 1,000,000$
 $= 618,089 \text{ kg/year}$
- Emission SO₂ Unit #2 in 2018
 $= 858 \times 160,000 \times 4882 / 1,000,000$
 $= 670,201 \text{ kg/year}$
- Emission SO₂ Total Plant in 2018
 $= 618,089 + 670,201$
 $= 1,288.29 \text{ ton/year}$

- NO₂ (Nitrite Dioxide)

Average CEMS Reading in 2018:

- Unit #1 is 407 mg/Nm³
- Unit #2 is 353 mg/Nm³

NO₂ Calculation:

- Emission NO₂ Unit #1 in 2018
 $= 407 \times 160,000 \times 4847 / 1,000,000$
 $= 315,637 \text{ kg/year}$
- Emission NO₂ Unit #2 in 2018
 $= 353 \times 160,000 \times 4882 / 1,000,000$
 $= 275,735 \text{ kg/year}$
- Emission NO₂ Total Plant in 2018
 $= 315,637 + 275,735$
 $= 591.37 \text{ ton/year}$



3. Air Emission

Running Hour 2018:

- Unit #1 is 4847 Hours
- Unit #2 is 4882 Hours

Flue Gas Flow averagely is 160,000 Nm³/hour per Unit

- SPM (Solid Particulate Matters)

Average CEMS Reading in 2018:

- Unit #1 is 20 mg/Nm³
- Unit #2 is 31 mg/Nm³

SPM Calculation:

- Emission SPM Unit #1 in 2018
 $= 20 \times 160,000 \times 4847 / 1000,000$
 $= 15,510 \text{ kg/year}$

- Emission SPM Unit #2 in 2018
 $= 31 \times 160,000 \times 4882 / 1000,000$
 $= 24,215 \text{ kg/year}$

- Emission SO₂ Total Plant in 2018
 $= 618,089 + 670,201$
 $= 39,73 \text{ ton/year}$



3. PRTR Reporting in 2018 Period

4.1. Emission to

Emission to	Chemical Identity		Generation Point	Emission to		
	Chemical Name	CAS Number		Quantity (ton/year)	Unit	Estimation Method
Air	Sulfur Dioxide	9-5-7446	Boiler Flue Gas	713	mg/Nm3	
Air	Nitrogen Dioxide		Boiler Flue Gas	315	mg/Nm3	
Air	Particulate Matter		Boiler Flue Gas	22	mg/Nm3	

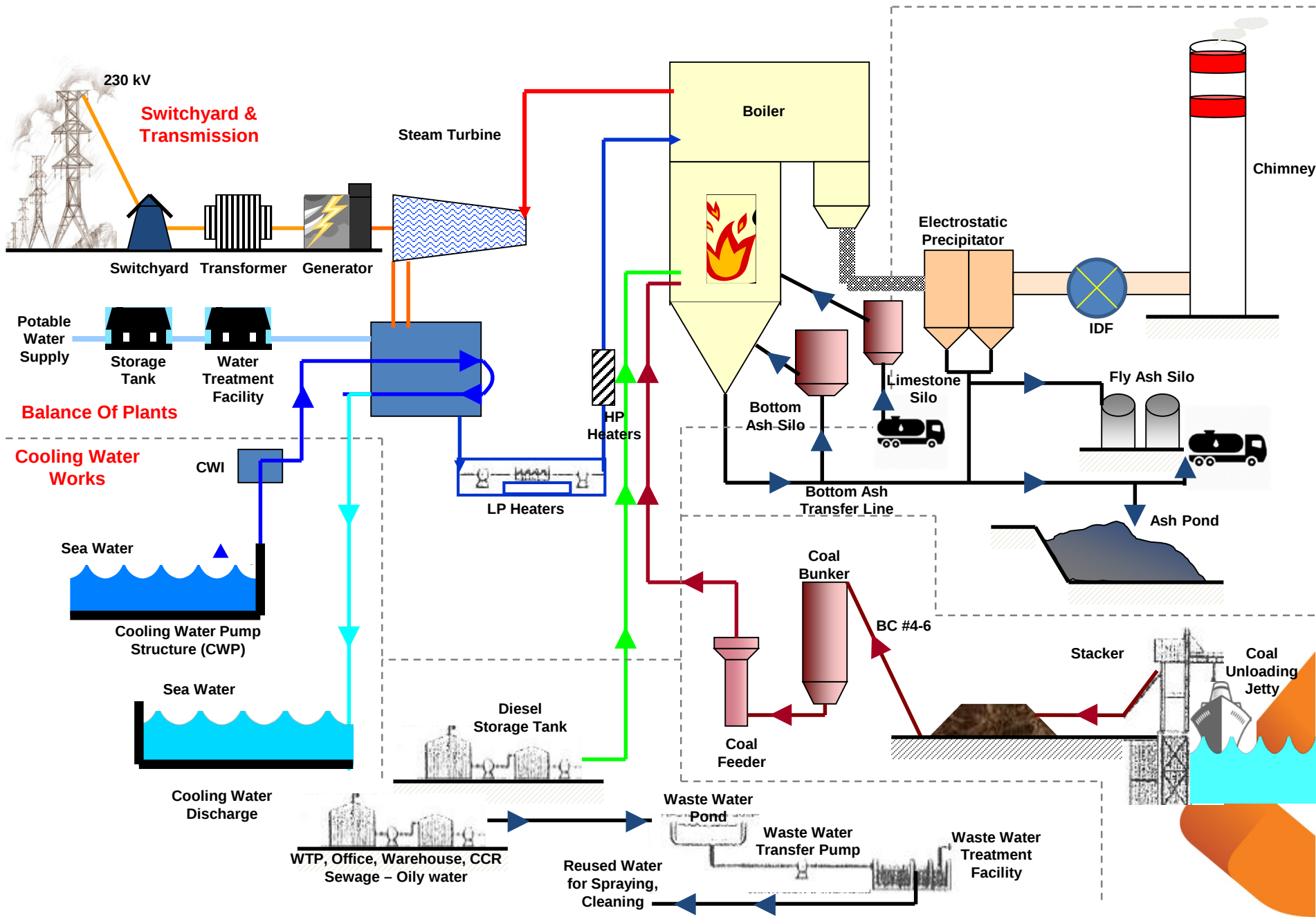
Note: Result taken from average CEMS reading



Thank You



1. Plant Process Philosophy



Appendix 3: Template for PRTR Reporting

Template for reporting document shall be made by the GDEP/DHSM (General Directorate of Environmental Protection/Department of Hazardous Substance Management).

Pollutants Release and Transfer Register - Reporting Format

Reporting year:	2018
------------------------	-------------

I. General Information

I.1: Information about the facility

I.1.1: Information about the company

Company name:	Cambodian Energy Limited			
Address:	City/Province:	Preah Sihanouk	Khan/District:	Stueng Hav
	Sangkat/Commune:	Kampenh	Area/Village:	Phum Pir

I.2: Information about the legal representative of the facility

First name Last name:	Chris Joel Louw		
Position:	016985101		
Email address	ID Number:	016985101	
	Phone number:	chris.louw@leaderenergy.net	

I.1.2: Information about the industrial facility

PRTR code:	01-003-0023 (to be classified and provided by MOE)			
Facility name:	Cambodian Energy Limited			
Address:	City/Province:	Preah Sihanouk	Khan/District:	Stueng Hav
	Sangkat/Commune:	Kampenh	Area/Village:	Phum Pir
	Phone number:	070 911 282	Fax number:	85570911282
	Email address:	johan.apryanto@leaderenergy.net		
Geographical location (Coordinates):		N:		
		E:		
Geographical location (Map attached):				
Altitude (meters above sea level) M:		6		

Area (M2):	260000.00
Type of Production :	Energy
Number of workers:	179
Date of establishment:	30 Nov -0001

I.3: Information about the person in charge of form filling

First name Last name:	Johan Budi Apriyanto	
ID Number:	222-17	
Contact Information	Phone number:	+855 70911282
	Email address:	johan.apriyanto@leaderenergy.net

First name Last name:	Mochamad Amin	
ID Number:	228-17	
Contact Information	Phone number:	+85570250609
	Email address:	mochamad.amin@leaderenergy.net

II. Description of Facilities

II.1: Chemicals contained in raw materials used

Raw material	Commercial name	CAS number	Annual consumption	Unit	Used in
Ammonia (NH3)	Ammonia	7664-41-7	3,500.00	Other	128

II.2: Manufactured products

Products	Annual production	Unit	Type of process	
			Continuous	Seasonal
Electricity	358350	Other	No	

II.3 Water consumption

Source	Water consumption	Consumption Volume (m3)
--------	-------------------	-------------------------

	flow (m3/hour)	Daily	Monthly	Annual
Superficial - Lake	20.09	482	14656	146564
Total				

II.4: Electricity consumption

Source	Daily Consumption	Monthly consumption	Annual consumption
	Kw-hour	Kw-hour	Kw-hour
Own source - Thermic (Coal)	5690	4150506	41505060
Total			

III. Waste generation

III.1: Solid Waste Generation

Process or sub-process	Type of waste	Quantity (ton/year)	Quantity of waste in stock (ton/year)	Treated directly in-site		Treated directly out-site		
				Quantity (ton/year)	Treatment Method	Quantity (ton/year)	Treatment Method	Name of the landfill or company
Energy production	Hazardous Waste	10358	5069	0	Recycle	5289	98	Shi Mao Trading
Auxiliary services	General Waste	0	0	0	Recycle	0	97	
Auxiliary services	General Waste	0	0	0	Recycle	0	97	
Process	General Waste	20	0	0	Recycle	0	150	
Auxiliary services	General Waste	0	0	0	Recycle	0	97	
Auxiliary services	General Waste	0	0	0	Recycle	0	97	

III.2: Liquid Waste Generation

Process/sub-process	Pollutants in liquid waste/effluents	Substance or Parameter	Treatment method
---------------------	--------------------------------------	------------------------	------------------

	Amount or Volume of liquid waste/effluent generated	Unit	Quantity	Unit	
Process	BOD	m3/year	0	m3/year	Reuse
Process	COD	m3/year	0	m3/year	Reuse
Process	Total Suspended Solids	m3/year	0	m3/year	Reuse
Auxiliary services	BOD		0		Recycle
Auxiliary services	BOD		0		Recycle

III.3: Air Emissions

Process/sub-process	Substance or Parameter	Air Emissions		Amount of Exhaust Generated		Prevention
		Conducted	Fugitive	Quantity	Unit	
Energy production	Sulfur dioxide		Yes	805	0	FGD (Limestone)
Energy production	Nitrous oxide		Yes	365	0	Low temp furnace
Energy production	PM	Yes	Yes	26	0	ESP
				0	0	
				0	0	

VI.1: Emission to

Emissions to	Chemical identity		Generation point	Emission to		
	Chemical name	CAS Number		Quantity	Unit	Estimation method
Air		9-5-7446	Boiler Flue Gas	430	ppm	132
Air			Boiler Flue Gas	227	ppm	132
Air			Boiler Flue Gas	30	ppm	132
						0
						0

IV.2: Transfer to

Transfers to	Chemical identity		Generation point	Transfer to		
	Chemical name	CAS Number		Quantity	Unit	Estimation method
				0		0

				0		0
				0		0
				0		0
				0		0

Signature

Name

ID of person filling the form

Name and signature of legal representative