



General Information

*Mandatory

*Not mandatory

EIA Reference	
Construction or Modification Date	N/A
EIA Reference Number	N/A
Competent Authority	
Has an EA been issued, and if no, please explain*	No, not yet. The plant requires NEMA authorisation. An application for NEMA authorisation is currently underway.
Project Description*	Application for a new Atmospheric Emissions Licence: LCOA Woodchip Treatment Pilot Plant, Atlantis.

Application information	
Current AEL Number	N/A
Application Reason*	New application
Is the application for/on behalf of a municipality?*	
Yes	No
Is the application for/on behalf of a provincial organ of state, which has been delegated the power to perform the licensing authority function in terms of subsection (2) of the Air Quality Act by the metropolitan or district municipality?*	
Yes	No
Does the proposed listed activity fall within the boundaries of more than one province?*	
Yes	No
Does the application relate to an activity that forms part of a matter declared as a national priority in terms of Cabinet decision and notice referred to in section 24C(2B) of the Environmental Management Act, 1998, as amended by the National Environmental Management Laws Second Amendment, 2013*?	
Yes	No
Does the application relate to activities listed in terms of section 24(2) of the National Environmental Management Act, or in terms of section 19(1) of the National of the National Environmental Management: Waste Act, 2008, or the Minister has been identified as the competent authority?*	
Yes	No
Does the application relate to a prospecting, mining, exploration or production activity as contemplated in Section 36(5)(e) of the Air Quality Act*?	
Yes	No
Licensing Authority*	City of Cape Town Metropolitan Municipality

Facility Information	
Facility/Property*	LCOA Woodchip Treatment Pilot Plant.
Postal Address	Office 301, Vinyard Centre, 10 VineYard Road Cape Town, South Africa,7780
District Municipality	Not applicable
Local Municipality	Not applicable
Province	Western Cape
Postal Code	7780
Facility/Property Address	Neil Hare Road, Atlantis Industrial, Atlantis
Latitude	33°36'31.55" S
Longitude	18°28'14.42" E
Phone Number*	+27 21 671 5118
Does your facility have less than 100 employees?*	No
Does the facility have a complaint's register?	Yes
The Standard Industrial Classification SIC (a system for classifying industries by a four-digit code).	

Enterprise Name	LCOA (Pty) Ltd
Trading As	LCOA
Type of Enterprise, e.g. Company/Close Corporation/Trust, etc	Company
Company/Close Corporation/Trust Registration Number (Registration Numbers if Joint Venture)	2014/014564 /07
VAT registration number	4100276080
Registered Address	Office 301, Vineyard Centre, 10 Vineyard Road Cape Town, South Africa,7780
Postal Address	Office 301, Vineyard Centre, 10 Vineyard Road Cape Town, South Africa,7780
Telephone Number (General)	+27 21 671 5118
Fax Number (General)	None
Industry Type/Nature of Trade	Mineral beneficiation and waste treatment
Land Use Zoning as per Town Planning Scheme	Risk Industry
Land Use Rights if outside Town Planning Scheme	nN/A
Responsible Person Name or Emission Control Officer (where appointed)	Ryan Moss
Telephone Number	+27 21 671 5118
Cell Phone Number	+27 82 330 9243
Fax Number	none
E-mail Address	ryan@mazule.co.za
After Hours Contact Details	+27 72 197 7020

Location & extent of plant	
Extent (km ²)	1.1 ha
Elevation above mean sea level (m)	125 m
Designated Priority Area (Highveld Priority Area etc.)	Not applicable
Description of surrounding land use within a 5 km radius, specifically noting the names and	

of residential and commercial areas in relation to the site of the works:

The wood chip treatment plant is located off Neil Hare Road in the southernmost part of Atlantis Industrial. North to north-west of the site lie Atlantis Industrial and residential suburbs of Atlantis. The north-south running R27 and R304 regional roads pass approximately 4 km to west and east of the plant respectively.

The closest residential suburbs of Atlantis include Avondale (3.8 km to the north), Protea Park (3.7 km to the north-northeast), and Witsand (3.3 km to the north-east). There are scattered residences on smallholdings north-east to south-east from the site within a predominantly agricultural area, and, among others, an animal rescue and guide dog training centre, hatchery, kennels, and stables.

There are a wide variety of industries within Atlantis Industrial including but not limited to, power generation, chemicals manufacturing, food and food product production, plastics and packaging manufacturing, and a foundry. The Apollo Brick clay brick manufacturing works is situated 3 km southwest of the site. The Atlantis Sand Sales drying plant lies directly north-east of the plan with the Atlantis

Sand Sales sand mine, and Atlantis Shooting Range 1 km south of the site. The Atlantis Wastewater Treatment Works is located 500 east of the site.

The area west of the site consist primarily of undeveloped coastal flats.

Nature of Process

Overview Facility-wide Process Description

The wood chip is sourced from metalliferous mines and consists of ore fines contaminated with wood splinters from mine roof supports, pulverised during blasting. The wood chip is burned off for the recovery of ore/mineral fines which is sold and further processed or recovered. The plant is designed to processes 7.5 tonnes of feedstock per day to recover approximately 6.8 to 7.1 tonnes of fines, referred to in the process as "silicates".

Process steps:

- 1) Wood chip feedstock is delivered to site in 1 tonne bags.
- 2) Bagged feedstock is stored on concrete blocks and covered with a canvas tarpaulin.
- 3) Bags are conveyed and tipped by bottom discharge into the hopper by telehandler.
- 4) An open screw conveyor conveys wood chip to kiln.
- 5) The diesel fired rotary kiln operates at 800 °C to 900 °C and burns off the wood.
- 6) Larger, heavier particles of "oversized" treated product fall into the kiln's drop-out box and from the drop-out box into a pan.
- 7) The pan is conveyed to a bund by telehandler and the oversize tipped into the bund for cooling overnight. The oversize is covered by a heat resistant tarpaulin whilst cooling.
- 8) 1 tonne bags are manually filled with oversize using spades. The bags of oversize are weighed.
- 9) The bags of oversize are conveyed by telehandler to a vibratory screen.
- 10) The screen separates the oversize into +1mm and -1mm sized product.
- 11) The oversize and -1mm product discharge directly into bags.
- 12) The -1mm bagged product is conveyed by telehandler to the product storage area ready for transportation to customer.
- 13) The oversize is bagged, conveyed and loaded into a rotary mill by telehandler.
- 14) The milled (resized) product discharges directly into bags and is conveyed to the storage area by telehandler ready for transportation to customer.
- 15) The product storage area is surfaced with concrete blocks and the bags are covered with a tarpaulin.
- 16) Finer, airborne particles (treated product) are extracted by fan from the kiln to a cyclone. The larger, heavier particles separated out in the cyclone fall directly into a drum and are then tipped into bags for storage ready for transportation to customer.
- 17) Remaining, very fine airborne particles are extracted by fan from the cyclone to a bag filter. The very fine particles are knocked out of the bag filter into a drum and are then tipped into bags for storage ready for transportation to customer.

Erf 299 consist mostly of compacted un-stabilised soils. The plant area and all process infrastructure are placed on a 20 m by 20 m concrete slab. Loose concrete blocks have been laid down at the feedstock and product storage areas. The plant includes the following infrastructure:

Key process infrastructure:

- Feed hopper
- Screw conveyor
- Portable diesel burners
- Rotary kiln with drop-out box (larger particles) and exit gas cyclone filter in series with exit gas bag filter (airborne particles)
- Screen

<ul style="list-style-type: none"> Rotary mill Bagging station <p>Ancillary infrastructure:</p> <ul style="list-style-type: none"> Vibracrete wall Portacabins and shipping containers for storage, laboratory services, and an administrative office Diesel generator for electricity supply Fuel storage (flow bins) 				
Scheduled Processes		N/A	Yes	No
APPA Registration Certificate Number	N/A			
Date of Registration Certificate	N/A			
Scheduled Process number	N/A			
Process Description	N/A			

Facility Wide Listed Activities with Regulatory Applicability	
SEC 21 Subcategory (e.g. SA1001)	4.2 (Combustion installations)
Description	Combustion installations not used primarily for steam raising and electricity generation (except drying).
Application	All combustion installations
SEC 21 Subcategory (e.g. SA1001)	4.21 (Metal Recovery)
Description	The recovery of metal from any form of scrap material by the application of heat
Application	All installations
SEC 21 Subcategory (e.g. SA1001)	8.1 (Thermal treatment of general and hazardous waste)
Description	Facilities where general and hazardous waste are treated by the application of heat.
Application	All installations

Facility Wide Air Pollutant Emissions Subcategory 4.2 Combustion Installations						
SEC 21 Subcategory	Pollutant Name	Minimum Emissions Standards (mg/Nm ³) (Existing)	Minimum Emissions Standards (mg/Nm ³) (New)	Potential to Emit Value (mg/Nm ³)	Past Max Actual (Annual) (mg/Nm ³)	Future Minimum Emissions Standards (mg/Nm ³)
PM		100	50		Unknown at this stage	
SO ₂		1000	500			
NO _x expressed as NO ₂		1200	500			

Facility Wide Air Pollutant Emissions Subcategory 4.21 Metal Recovery						
SEC 21 Subcategory	Pollutant Name	Minimum Emissions Standards (mg/Nm ³)	Minimum Emissions Standards (mg/Nm ³)	Potential to Emit Value (mg/Nm ³)	Past Max Actual (Annual) (mg/Nm ³)	Future Minimum Emissions Standards

		(Existing)	(New)			(mg/Nm ³)
PM			10		Unknown at this stage	
CO			50			
SO ₂			50			
NO _x expressed as NO ₂			200			
HCl			10			
HF			1			
Pb + As + Sb + Cr + Co +Cu + Mn + Ni + V			0.5			
Hg			0.05			
Cd + Ti			0.05			
TOC			10			
NH ₃			10			
			Ng I- TEQ/Nm³			
PCDD/PCDF			0.01			

Facility Wide Air Pollutant Emissions Subcategory 8.1 Thermal Treatment of general and hazardous waste						
SEC 21 Subcategory	Pollutant Name	Minimum Emissions Standards (mg/Nm³) (Existing)	Minimum Emissions Standards (mg/Nm³) (New)	Potential to Emit Value (mg/Nm³)	Past Max Actual (Annual) (mg/Nm³)	Future Minimum Emissions Standards (mg/Nm³)
PM			10		Unknown at this stage	
CO			50			
SO ₂			50			
NO _x expressed as NO ₂			200			
HCl			10			
HF			1			
Pb + As + Sb + Cr + Co +Cu + Mn + Ni + V			0.5			
Hg			0.05			
Cd + Ti			0.05			
TOC			10			
NH ₃			10			
			Ng I- TEQ/Nm³			
PCDD/PCDF			0.01			

Contact Information

First Name*	Ryan
Last Name*	Moss
Job Title	
Responsibility* (Owner/Consultant etc.)	Emission Inventory Primary
E-mail*	ryan@mazule.co.za
Phone Number*	+27 21 671 5118
After hours contact phone number	+27 72 197 7020
Fax	None
Address	Office 301, Vinyard Centre, 10 Vineyard Road, Cape Town, South Africa, 7708
Province	Western Cape
District Municipality	CCT
Local Municipality	CCT
Postal Code	7708

Raw Materials & Production

C1. Raw Materials used (use permitted rate as design rate for licence renewals)							
	Material type	Max Permitted Consumption Rate	Unit	Design Consumption Rate	Unit	Actual Consumption Rate	Unit
	Woodchip	N/A		7.5	Tons/day	N/A	Tons/year

C2. Production rates						
Production name	Production Capacity Permitted	Unit	Design Production Capacity	Unit	Actual Production Capacity	Unit
Silicates	N/A		7.1	Tons/day	N/A	Tons/year

C3. By-product rates						
Product Name	Production Capacity Permitted	Unit	Design Production capacity	Unit	Actual Production Capacity	Unit
N/A	N/A		N/A	Tons/month	N/A	Tons/month

C4. Materials Used in Energy Sources								
Material	Max Permitted Consumption rate	Unit	Design Consumption rate	Unit	Actual Consumption rate	Unit	Sulphur %	Ash %

Diesel (50 ppm)	N/A		30	Litres/hour	N/A	Litres/day	0.005	0.07
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Emission Units

Emission Unit Detail Information			
New Emission Unit?*	Yes		
Emission Unit Identifier*	EU0001		
Emission Unit Name*	Feed hopper		
Emission Unit Type	Open air fugitive source		
Installation Date			
Description*	For the emptying of wood chip bags for feeding into the process.		
Batch/Continuous specification	Continuous		
Area/Line Source? Yes	Height	2.5 meters	
	Width	3 meters	
	Length	3 meters	
	Operation time (hours/day)	18 hours 272 days	
Associated stack	ID		Description
Associated control device	ID	None	Description
Reporting Group			

New Emission Unit?*	Yes		
Emission Unit Identifier*	EU0002		
Emission Unit Name*	Open screw conveyor		
Emission Unit Type	Conveyor		
Installation Date			
Description*	Conveyance of woodchip into rotary kiln.		
Batch/Continuous specification	Continuous		
Area/Line Source? Yes	Height	2.5 meters	
	Width	3 meters	
	Length	3 meters	
	Operation time (hours/day)	18 hours 272 days	
Associated stack	ID		Description
Associated control device	ID	None	Description
Reporting Group			

New Emission Unit?*	Yes		
Emission Unit Identifier*	EU0003		
Emission Unit Name*	Rotary Kiln		
Emission Unit Type	Furnace		
Installation Date	N/A		
Description*	For the combustion/burn-off of wood contained in feedstock.		
Batch/Continuous specification	Continuous		
Area/Line Source? No	Height	-	

	Width	-	
	Length	-	
	Operation time (hours/day)	18 hours 272 days	
Associated stack	ID		Description
Associated control device	ID	None	Description
Reporting Group			

New Emission Unit?*	Yes		
Emission Unit Identifier*	EU0004		
Emission Unit Name*	Screen		
Emission Unit Type	Open air fugitive source		
Installation Date	N/A		
Description*	For the screening of large product particles into +1 mm and -1 mm sizes		
Batch/Continuous specification	Continuous		
Area/Line Source? Yes	Height	2.5 meters	
	Width	3 meters	
	Length	3 meters	
	Operation time (hours/day)	18 hours 272 days	
Associated stack	ID		Description
Associated control device	ID		Description
Reporting Group			

New Emission Unit?*	Yes		
Emission Unit Identifier*	EU0005		
Emission Unit Name*	Rotary mill		
Emission Unit Type	Open air fugitive source		
Installation Date	N/A		
Description*	For the milling of +1 mm product particles		
Batch/Continuous specification	Batch		
Area/Line Source? Yes	Height	2.5 meters	
	Width	3 meters	
	Length	3 meters	
	Operation time (hours/day)	18 hours 272 days	
Associated stack	ID		Description
Associated control device	ID		Description
Reporting Group			

New Emission Unit?*	Yes		
Emission Unit Identifier*	EU0006		
Emission Unit Name*	Bagging station		
Emission Unit Type	Open air fugitive source		
Installation Date	N/A		
Description*	For the bagging of product in 1-tonne bags		
Batch/Continuous specification	Continuous		
Area/Line Source? – Yes	Height	2.5 meters	

	Width	3 meters	
	Length	3 meters	
	Operation time (hours/day)	18 hours 272 days	
Associated stack	ID		Description
Associated control device	ID		Description
Reporting Group			

New Emission Unit?*	Yes		
Emission Unit Identifier*	EU0007		
Emission Unit Name*	Diesel generator		
Emission Unit Type	Generator		
Installation Date	N/A		
Description*	Electricity generation		
Batch/Continuous specification	Continuous		
Area/Line Source? – No	Height	-	
	Width	-	
	Length	-	
	Operation time (hours/day)	18 hours 272 days	
Associated stack	ID		Description
Associated control device	ID		Description
Reporting Group			

New Emission Unit?*	Yes		
Emission Unit Identifier*	EU0008		
Emission Unit Name*	Internal paved roads		
Emission Unit Type	Open air fugitive source		
Installation Date	N/A		
Description*	Fugitive dust entrained by trucks travelling on paved surfaces		
Batch/Continuous specification	Continuous		
Area/Line Source? – Yes	Height	0 meters	
	Width	4 meters	
	Length	135 meters	
	Operation time (hours/day)	18 hours 272 days	
Associated stack	ID		Description
Associated control device	ID		Description
Reporting Group			

New Emission Unit?*	Yes		
Emission Unit Identifier*	EU0009		
Emission Unit Name*	Windblown dust		
Emission Unit Type	Open air fugitive source		
Installation Date	N/A		
Description*	Windblown dust from the exposed compacted unstabilised soils on Erf 299		
Batch/Continuous specification	Continuous		
Area/Line Source? – Yes	Height	0 meters	
	Width	85 meters	

	Length	85 meters	
	Operation time (hours/day)	24 hours 365 days	
Associated stack	ID		Description
Associated control device	ID		Description
Reporting Group			

Control Device

Control Device Detail Information			
Device Type*	Cyclone		
Control Unit ID* (CD001)	CD001		
Control Unit Name*	Cyclone		
Description*	Removal of saleable PM from off-gas extracted from the rotary kiln.		
Model Number	N/A		
Date Manufactured	N/A		
Commission date	N/A		
Date of significant modification or upgrade	N/A		
Design Capacity	N/A		
Min. Control Efficiency (%)	N/A		
Min. Utilization (%)	N/A		
Associated emissions unit	ID		Description
Associated stack	ID		Description

Controlled Pollutant List	
Substance name	Control Efficiency* %

Disposal of Waste and Effluents Arising from Control Device	
Waste/ Effluent Type	
Hazardous Components Present	
Method of Disposal	
Comments	

Control Device Detail Information	
Device Type*	Bagfilter
Control Unit ID* (CD001)	CD002
Control Unit Name*	Bagfilter
Description*	Removal of saleable PM from off-gas extracted from the rotary kiln.
Model Number	N/A
Date Manufactured	N/A
Commission date	N/A
Date of significant modification or upgrade	N/A
Design Capacity	N/A

Min. Control Efficiency (%)	N/A			
Min. Utilization (%)	N/A			
Associated emissions unit	ID		Description	
Associated stack	ID		Description	

Controlled Pollutant List	
Substance name	Control Efficiency* %

Disposal of Waste and Effluents Arising from Control Device	
Waste/ Effluent Type	
Hazardous Components Present	
Method of Disposal	
Comments	

Stack

Stack Detail Information				
Stack ID* (S01)	SV0001			
Stack Name*	Rotary Kiln Baghouse Stack			
Stack Orientation* (Conical Cap/Vertical etc.)	Horizontal			
Stack Height* (meter)	7			
Stack Diameter* (meter)	0.49			
Height above nearby building (meter)	n/a			
Exit Gas Velocity* (meter/second)	3.1			
Exit Gas Flow Rate* (cu meter/sex)	2179			
Exit Gas Temperature* (Celsius)	45.8			
Latitude Measure*	33.609081°S			
Longitude Measure*	18.470752°E			
Waste/Effluent type	None			
Hazardous components present	None			
Method of disposal	N/A			
Associated emissions unit	ID	EU0003	Description	Rotary Kiln
Associated control device	ID	CD001	Description	Cyclone
		CD002	Description	Bagfilter

Reporting Group

Reporting Groups		
Reporting Group ID (e.g. RG001)	Reporting Group Description	Associated Emission Units
EU0001 – Feed Hopper	EU0001 – Feed Hopper	EU0001 – Feed Hopper

EU0002 – Open Screw Conveyor	EU0002 – Open Screw Conveyor	EU0002 – Open Screw Conveyor
EU0003 – Rotary Kiln	EU0003 – Rotary Kiln	EU0003 – Rotary Kiln
EU0004 – Screen	EU0004 – Screen	EU0004 – Screen
EU0005 – Rotary Mill	EU0005 – Rotary Mill	EU0005 – Rotary Mill
EU0006 – Bagging Station	EU0006 – Bagging Station	EU0006 – Bagging Station
EU0007 – Diesel Generator	EU0007 – Diesel Generator	EU0007 – Diesel Generator
EU0008 – Internal Paved Roads	EU0008 – Internal Paved Roads	EU0008 – Internal Paved Roads
EU0009 – Wind Blown Dust	EU0009 – Wind Blown Dust	EU0009 – Wind Blown Dust

Activity & Emission

Emission Detail for Reporting Groups EU0001	
Pollutant Name	Particulate Matter (PM30/TSP)
Maximum Release Rate* (g/s)	5.17E-03
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0001	
Pollutant Name	Particulate Matter (PM10)
Maximum Release Rate* (g/s)	2.44E-03
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0001	
Pollutant Name	Particulate Matter (PM2.5)
Maximum Release Rate* (g/s)	3.70E-05
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-

Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0002	
Pollutant Name	Particulate Matter (PM30/TSP)
Maximum Release Rate* (g/s)	5.17E-03
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0002	
Pollutant Name	Particulate Matter (PM10)
Maximum Release Rate* (g/s)	2.44E-03
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0002	
Pollutant Name	Particulate Matter (PM2.5)
Maximum Release Rate* (g/s)	3.70E-05
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0003	
Pollutant Name	Particulate Matter (PM2.5)
Maximum Release Rate* (mg/Nm ³)	10
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on MES

Emission Detail for Reporting Groups EU0003	
Pollutant Name	Carbon Dioxide (CO2)
Maximum Release Rate* (mg/Nm ³)	50
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on MES

Emission Detail for Reporting Groups EU0003	
Pollutant Name	Sulphur dioxide (SO2)

Maximum Release Rate* (mg/Nm ³)	50
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on MES

Emission Detail for Reporting Groups EU0003	
Pollutant Name	Oxides of nitrogen as nitrogen dioxide (NO ₂)
Maximum Release Rate* (mg/Nm ³)	200
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on MES

Emission Detail for Reporting Groups EU0003	
Pollutant Name	Hydrogen Chloride (HCL)
Maximum Release Rate* (mg/Nm ³)	10
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on MES

Emission Detail for Reporting Groups EU0003	
Pollutant Name	Fluoride as Hydrogen fluoride (F as HF)
Maximum Release Rate* (mg/Nm ³)	1
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	50 074
Maximum Gas Exit Velocity (m/s)	12.3
Emission Hours	24
Basis for Emission Rates	Dispersion modelling based on MES

Emission Detail for Reporting Groups EU0003	
Pollutant Name	Pb + As + Sb + Cr + Co + Cu + Mn + Ni + V (Metals)
Maximum Release Rate* (mg/Nm ³)	0.5
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on MES

Emission Detail for Reporting Groups EU0003	
Pollutant Name	Hg (Mercury)
Maximum Release Rate* (mg/Nm ³)	0.05

Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on MES

Emission Detail for Reporting Groups EU0003	
Pollutant Name	Cd + Ti (Metals)
Maximum Release Rate* (mg/Nm ³)	0.05
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on MES

Emission Detail for Reporting Groups EU0003	
Pollutant Name	Ammonia (NH ₃)
Maximum Release Rate* (mg/Nm ³)	10
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on MES

Emission Detail for Reporting Groups EU0003	
Pollutant Name	PCDD/PCDF (NH ₃)
Maximum Release Rate* (ng I-TEQ/Nm ³)	0.1
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on MES

Emission Detail for Reporting Groups EU0004	
Pollutant Name	Particulate Matter (PM ₃₀ /TSP)
Maximum Release Rate* (g/s)	1.40E-01
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0004	
Pollutant Name	Particulate Matter (PM ₁₀)
Maximum Release Rate* (g/s)	1.87E-02
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-

Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0004	
Pollutant Name	Particulate Matter (PM2.5)
Maximum Release Rate* (g/s)	2.83E-04
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0005	
Pollutant Name	Particulate Matter (PM30/TSP)
Maximum Release Rate* (g/s)	9.33E-03
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0005	
Pollutant Name	Particulate Matter (PM10)
Maximum Release Rate* (g/s)	7.00E-03
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0005	
Pollutant Name	Particulate Matter (PM2.5)
Maximum Release Rate* (g/s)	1.06E-04
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0006	
Pollutant Name	Particulate Matter (PM30/TSP)
Maximum Release Rate* (g/s)	4.65E-03
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0006	
Pollutant Name	Particulate Matter (PM10)

Maximum Release Rate* (g/s)	2.20E-03
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0006	
Pollutant Name	Particulate Matter (PM2.5)
Maximum Release Rate* (g/s)	3.33E-05
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0007	
Pollutant Name	Carbon Monoxide (CO)
Maximum Release Rate* (g/s)	2.56E-01
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on DEWHA Australia, 2019

Emission Detail for Reporting Groups EU0007	
Pollutant Name	Oxides of nitrogen as nitrogen dioxide (NO ₂)
Maximum Release Rate* (mg/Nm ³)	1.19E+00
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on DEWHA Australia, 2019

Emission Detail for Reporting Groups EU0007	
Pollutant Name	Particulate Matter (PM2.5)
Maximum Release Rate* (g/s)	8.13E-02
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	24
Basis for Emission Rates	Dispersion modelling based on DEWHA Australia, 2019

Emission Detail for Reporting Groups EU0007	
Pollutant Name	Sulphur dioxide (SO ₂)
Maximum Release Rate* (mg/Nm ³)	1.34E-03
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-

Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on DEWHA Australia, 2019

Emission Detail for Reporting Groups EU0007	
Pollutant Name	Total Volatile Organic Compounds (TVOC)
Maximum Release Rate* (g/s)	8.75E-02
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on DEWHA Australia, 2019

Emission Detail for Reporting Groups EU0008	
Pollutant Name	Particulate Matter (PM30/TSP)
Maximum Release Rate* (g/s)	5.83E-04
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0008	
Pollutant Name	Particulate Matter (PM10)
Maximum Release Rate* (g/s)	1.12E-04
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0008	
Pollutant Name	Particulate Matter (PM2.5)
Maximum Release Rate* (g/s)	2.71E-05
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	18
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0009	
Pollutant Name	Particulate Matter (PM30/TSP)
Maximum Release Rate* (g/s)	5.50E-02
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	24
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0009	
Pollutant Name	Particulate Matter (PM10)
Maximum Release Rate* (g/s)	2.75E-02
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	24
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Emission Detail for Reporting Groups EU0009	
Pollutant Name	Particulate Matter (PM2.5)
Maximum Release Rate* (g/s)	2.71E-05
Average Period	Daily
Maximum Gas Volumetric Flow (m ³ /hr)	-
Maximum Gas Exit Velocity (m/s)	-
Emission Hours	24
Basis for Emission Rates	Dispersion modelling based on US EPA 2006

Monitoring, Management & Mitigation

Monitoring Detail for Reporting Group EU0003 Rotary kiln baghouse	
Pollutant Name	Particulate Matter
Monitoring Method*	EPA 17 or other approved method
Monitoring Location*	SV0001
Average Monitoring Duration	60
Measured Parameters	PM concentration
	Time of Day
	Barometric Pressure
	Pitot Pressure
	Gas Temperature (Average)
	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
Volumetric Flow Rate (STP)	
Applicable Emission Unit	EU0003

Monitoring Detail for Reporting Group EU0003 Rotary kiln baghouse	
Pollutant Name	Carbon monoxide (CO)
Monitoring Method*	EPA 10 or other approved method
Monitoring Location*	SV0001
Average Monitoring Duration	60
Measured Parameters	CO concentration
	Time of Day
	Barometric Pressure
	Pitot Pressure
	Gas Temperature (Average)

	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
	Volumetric Flow Rate (STP)
Applicable Emission Unit	EU0003

Monitoring Detail for Reporting Group EU0003 Rotary kiln baghouse	
Pollutant Name	Sulphur dioxide (SO ₂)
Monitoring Method*	EPA 6C or other approved method
Monitoring Location*	SV0001
Average Monitoring Duration	60
Measured Parameters	SO ₂ concentration
	Time of Day
	Barometric Pressure
	Pitot Pressure
	Gas Temperature (Average)
	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
Volumetric Flow Rate (STP)	
Applicable Emission Unit	EU0003

Monitoring Detail for Reporting Group EU0003 Rotary kiln baghouse	
Pollutant Name	Oxides of nitrogen expressed as Nitrogen Dioxide (NO ₂)
Monitoring Method*	EPA 7E or other approved method
Monitoring Location*	SV0001
Average Monitoring Duration	60
Measured Parameters	NO ₂ concentration
	Time of Day
	Barometric Pressure
	Pitot Pressure
	Gas Temperature (Average)
	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
Volumetric Flow Rate (STP)	
Applicable Emission Unit	EU0003

Monitoring Detail for Reporting Group EU0003 Rotary kiln baghouse	
Pollutant Name	Hydrogen Chloride (HCl)
Monitoring Method*	BS EN 1911 or other approved method
Monitoring Location*	SV0001
Average Monitoring Duration	60
Measured Parameters	HCl concentration
	Time of Day
	Barometric Pressure
	Pitot Pressure
	Gas Temperature (Average)

	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
	Volumetric Flow Rate (STP)
Applicable Emission Unit	EU0003

Monitoring Detail for Reporting Group EU0003 Rotary kiln baghouse	
Pollutant Name	Fluoride a Hydrogen Fluoride (F as HF)
Monitoring Method*	EPA 13A or other approved method
Monitoring Location*	SV0001
Average Monitoring Duration	60
Measured Parameters	HF concentration
	Time of Day
	Barometric Pressure
	Pitot Pressure
	Gas Temperature (Average)
	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
Volumetric Flow Rate (STP)	
Applicable Emission Unit	EU0003

Monitoring Detail for Reporting Group EU0003 Rotary kiln baghouse	
Pollutant Name	Sum of lead, arsenic, antimony, chromium, cobalt, copper, manganese, nickel, and vanadium (Pb + As + Sb + Cr + Co + Cu + Mn + Ni + V)
Monitoring Method*	EPA 29 or other approved method
Monitoring Location*	SV0001
Average Monitoring Duration	60
Measured Parameters	Pb + As + Sb + Cr + Co + Cu + Mn + Ni + V concentration
	Time of Day
	Barometric Pressure
	Pitot Pressure
	Gas Temperature (Average)
	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
Volumetric Flow Rate (STP)	
Applicable Emission Unit	EU0003

Monitoring Detail for Reporting Group EU0003 Rotary kiln baghouse	
Pollutant Name	Mercury (Hg)
Monitoring Method*	USEPA Method 30A or other approved method
Monitoring Location*	SV0001
Average Monitoring Duration	60
Measured Parameters	Hg concentration
	Time of Day

	Barometric Pressure
	Pitot Pressure
	Gas Temperature (Average)
	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
	Volumetric Flow Rate (STP)
Applicable Emission Unit	EU0003

Monitoring Detail for Reporting Group EU0003 Rotary kiln baghouse	
Pollutant Name	Cadmium and thallium (Cd + Ti)
Monitoring Method*	USEPA Method 30A or other approved method
Monitoring Location*	SV0001
Average Monitoring Duration	60
Measured Parameters	Cd + Ti concentration
	Time of Day
	Barometric Pressure
	Pitot Pressure
	Gas Temperature (Average)
	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
Volumetric Flow Rate (STP)	
Applicable Emission Unit	EU0003

Monitoring Detail for Reporting Group EU0003 Rotary kiln baghouse	
Pollutant Name	Ammonia (NH3)
Monitoring Method*	EPA CTM 027 or other approved method
Monitoring Location*	SV0001
Average Monitoring Duration	60
Measured Parameters	NH3 concentration
	Time of Day
	Barometric Pressure
	Pitot Pressure
	Gas Temperature (Average)
	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
Volumetric Flow Rate (STP)	
Applicable Emission Unit	EU0003

Monitoring Detail for Reporting Group EU0003 Rotary kiln baghouse	
Pollutant Name	Dioxins and furans (PCDD/PCDF)
Monitoring Method*	USEPA Method 23 or other approved method
Monitoring Location*	SV0001
Average Monitoring Duration	60
Measured Parameters	NH3 concentration
	Time of Day
	Barometric Pressure

	Pitot Pressure
	Gas Temperature (Average)
	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
	Volumetric Flow Rate (STP)
Applicable Emission Unit	EU0003

Monitoring Detail for Reporting Group EU0007 Diesel generator	
Pollutant Name	Carbon monoxide (CO)
Monitoring Method*	EPA 10 or other approved method
Monitoring Location*	SV0001
Average Monitoring Duration	60
Measured Parameters	CO concentration
	Time of Day
	Barometric Pressure
	Pitot Pressure
	Gas Temperature (Average)
	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
Volumetric Flow Rate (STP)	
Applicable Emission Unit	EU0007

Monitoring Detail for Reporting Group EU0007 Diesel generator	
Pollutant Name	Oxides of nitrogen expressed as Nitrogen Dioxide (NO2)
Monitoring Method*	EPA 7E or other approved method
Monitoring Location*	SV0001
Average Monitoring Duration	60
Measured Parameters	NO2 concentration
	Time of Day
	Barometric Pressure
	Pitot Pressure
	Gas Temperature (Average)
	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
Volumetric Flow Rate (STP)	
Applicable Emission Unit	EU0007

Monitoring Detail for Reporting Group EU0007 Diesel generator	
Pollutant Name	Particulate Matter
Monitoring Method*	EPA 17 or other approved method
Monitoring Location*	SV0001
Average Monitoring Duration	60
Measured Parameters	PM concentration
	Time of Day
	Barometric Pressure
	Pitot Pressure

	Gas Temperature (Average)
	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
	Volumetric Flow Rate (STP)
Applicable Emission Unit	EU0007

Monitoring Detail for Reporting Group EU0007 Diesel generator	
Pollutant Name	Sulphur dioxide (SO2)
Monitoring Method*	EPA 6C or other approved method
Monitoring Location*	SV0001
Average Monitoring Duration	60
Measured Parameters	SO2 concentration
	Time of Day
	Barometric Pressure
	Pitot Pressure
	Gas Temperature (Average)
	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
Volumetric Flow Rate (STP)	
Applicable Emission Unit	EU0007

Monitoring Detail for Reporting EU0007 Diesel generator	
Pollutant Name	Total volatile organic compounds (TVOC)
Monitoring Method*	BSEN 13526 or other approved method
Monitoring Location*	SV0002
Average Monitoring Duration	60
Measured Parameters	PM concentration
	Time of Day
	Barometric Pressure
	Pitot Pressure
	Gas Temperature (Average)
	Gas Velocity (Average)
	Duct Diameter
	Volumetric Flow Rate (actual)
Volumetric Flow Rate (STP)	
Applicable Emission Unit	EU0007

Monitoring Detail for Reporting Group EU0001, EU0002, EU0004, EU0005, EU0006, EU0008, EU0009	
Pollutant Name	Dustfall – none unless the air quality officer requests it.
Monitoring Method*	ASTM D1739 (1970) – only if requested by air quality officer.
Monitoring Location*	To be determined by dust monitoring service provider if dustfall monitoring is required.
Average Monitoring Duration	
Measured Parameters	

Applicable Emission Units	EU0001, EU0002, EU0003, EU0004, EU0005, EU0006, EU0007, EU0008, EU0009

Mitigation Information for mitigation required in terms of AEL: EU0003 & EU0007	
Compliance to specific measures (Y/N)	Yes
Description of specific mitigation measures	<ol style="list-style-type: none"> 1. Compliance emissions monitoring is required for listed activities as per section 21(1)(b) of NEM:AQA. The requirements for emissions monitoring of subcategory 8.1 listed activities. The current configuration of the bag filter may not meet the requirements of stack emission testing. 2. An air quality monitoring programme can confirm plant related air pollution levels and provide information useful in assessing the effectiveness of emissions management strategies. After careful consideration of the process and dispersion simulations, the following is recommended: <ol style="list-style-type: none"> a. Daily visual inspection of site operations and corrective action should excessively dust emissions or plumes be observed. b. Quarterly inspection and reporting of dust and fume emissions as well as noticeable odours sources and in response to complaints. Photographic records can be useful. 3. A complaints register must be maintained at site offices. It must include the name, contact and affiliation details of the complainant, the date of the complaint, the date and time of the pollution incident, and a detailed description of the incident i.e., nature of impact or nuisance. In response to a complaint, LCOA should investigate possible causes and if required make use of a specialist to determine the likely source through a site inspection. Remedial actions to prevent such events in future should then be taken and communicated to the complainant. 4. Emission testing and control for NOx or PM should be considered if the generator will be used as main power supply for an extended period. Venting exhaust emissions through a stack may also be considered. 5. The kiln should only be operated when the fabric filter system is operational. 6. Minimise CO, NOx, SO2, and VOC from the kiln by ensuring optimal combustion efficiencies, controlling combustion temperatures, and using low sulphur fuels.
1. Timeframe for implementing specific	Ongoing during operation

measures	
Method of monitoring mitigation measure's effectiveness	<ul style="list-style-type: none"> a) Annual stack emissions sampling. b) Annual audit of licence conditions. c) Regular review of the complaints register.
Contingency measures	In the event of an incident causing acute pollution, such as mechanical failure, works should cease until the failure is remedied.

Mitigation Information for mitigation required in terms of AEL: EU0001, EU0002, EU0004, EU0005, EU0006, EU0008, EU0009	
Compliance to specific measures (Y/N)	Yes
Description of specific mitigation measures	<ol style="list-style-type: none"> 1. An air quality monitoring programme can confirm plant related air pollution levels and provide information useful in assessing the effectiveness of emissions management strategies. After careful consideration of the process and dispersion simulations, the following is recommended: <ul style="list-style-type: none"> a. Daily visual inspection of site operations and corrective action should excessively dust emissions or plumes be observed. b. Quarterly inspection and reporting of dust and fume emissions as well as noticeable odours sources and in response to complaints. Photographic records can be useful. 2. Given the facility's location with an industrial area, the distance to sensitive receptors, and nature of the process, dustfall sampling in accordance with National Dust Control Regulations, should only be considered if visual inspection indicates excessive dust generation on site. In that case, dustfall sampling will aid in monitoring the effectiveness of implemented dust management measures. 3. A complaints register must be maintained at site offices. It must include the name, contact and affiliation details of the complainant, the date of the complaint, the date and time of the pollution incident, and a detailed description of the incident i.e., nature of impact or nuisance. In response to a complaint, LCOA should investigate possible causes and if required make use of a specialist to determine the likely source through a site inspection. Remedial actions to prevent such events in future should then be taken and communicated to the complainant. 4. Control of fugitive dust emissions to minimise off-site impacts is considered good practice. 5. Avoiding handling and transfer activities of fine or dry materials during strong wind conditions. 6. Reduce windblown dust from exposed areas of Erf 299 by limiting disturbance of surface material, compaction, watering during strong wind conditions, and should visual inspection indicate it necessary, the surfacing of the area. 7. For vehicle entrained dust, minimise the silt loading of internal roads by (a) avoiding spills of dusty materials as far as possible, (b) immediate cleaning up of spilled materials, and (c) regular sweeping or washing road surfaces. 8. Take care to not re-entrain surface dust during the sweeping process.
2. Timeframe for implementing specific measures	Ongoing during operation

Method of monitoring mitigation measure's effectiveness	a) Annual audit of licence conditions. b) Regular review of the complaints register.
Contingency measures	In the event of an incident causing acute pollution, such as mechanical failure, works should cease until the failure is remedied.