

# Hendrina Power Station

## Fugitive Emission Management Plan

September 2016

Ref Nr: RESK1311-019 R1

### 1 BACKGROUND

Hendrina Power Station generates electricity by using natural resources such as coal, water, and fuel oil. Major activities of the plant are boiler units (located in the station), Ash dams (located adjacent to the power plant), AWR return dams (located at the ash dams), coal stock yard (located inside), conveyancing of ash via ash pipe lines (which runs from the power plant boilers to the ash booster, then to the ash dams). Roads inside the boundaries of the station are tarred, except the movement of trucks at the coal stock operations. Roads outside the station are tarred except the road at the side of the ash dams and AWR areas.

Most releases into the atmosphere from power stations are from the tall stacks. These stacks aid in the dispersion of pollutants before they reach ground-level, and the emissions can be well quantified, either by direct measurements, or by calculations based on the amount and characteristics of the coal burnt. All stacks are fitted with Fabric filter bags which curb about 99% of PM pollutants before going out to the atmosphere.

Fugitive dust may be emitted from a number of premises at the power station, most notably are the sources such as coal stock operations, ash dams area. Fugitive dust may also originate from a number of other sources, including untarred roads; adjacent Agricultural/farming lands as well as the Mining activities and natural sources like non grassy land and wind. These dusts tend to be generated mainly in association with strong winds, or when a surface is disturbed. Fugitive emissions are usually sporadic and emitted over a large area, and so are very difficult to quantify.

A fugitive emission management plan has been compiled for Hendrina Power Station, based on the identification of sources of fugitive dust, an assessment of the significance of emissions from these sources, and the control measures which are already implemented to control emissions. Additional control measures and a plan for implementation have been identified where required.

This plan aims to conform to the requirement of the Dust Control Regulations (Regulation No. 827) as set out under the National Environmental Management: Air Quality Act, 2004 (Act No 39 of 2004). It is also in line to conform section 7.5 of the Hendrina Power Station Atmospheric Emission License (license No: 17/4/AEL/MP313/11/16).

The responsible person for the implementation of this plan is Justice Ramagoma: Environmental Manager.

### 2 PERMISSIBLE DUST FALLOUT

Restriction Areas	Dust fall rate (D) (mg/m <sup>2</sup> /day, 30- days average)	Permitted frequency of exceeding dust fall rate
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Residential area	D < 600	Two within a year, not sequential months
Non-residential area	600 < D < 1200	Two within a year, not sequential

### 3 METHOD APPLIED

The dust deposition monitoring is based on ASTM D1730-1970, which is the international method for collection and analysis of dust fallout. The results of measured samples are compared the South African National Dust Control Regulations. This method employs a device consisting of cylindrical 5L container half filled with deionised water exposed for one calendar month (30 +/- 3).

The water is treated with an inorganic algaecide to prevent algae growth in the bucket. The reagent used for this is a 5% copper sulphate solution. The bucket stands comprises a ring that is raised above the bucket to prevent contamination of perching birds. The bucket is connected to a 2.1 m steel pole. Samples are then taken by the supplier on a monthly basis and results reported to the station in +/- 15 after collection.

### 4 AREA SOURCE OF FUGITIVE DUST AND MITIGATIONS

The area source for each fugitive dust emissions is given, the section is followed by mitigation measures which aim to give current controls, future plan controls, frequency of applying mitigations, and the timeframes.

#### 4.1 Ashdams facility

Hendrina Power Station makes use of the wet ashing system. The ash water is transported via ash lines using water as the transport medium to the ash dam that is situated 5km from the station. Once the ash water has reached the ash dam area, the ash settles on the ash dam with the water been draw into the penstock for re-use at the station.

The ash on the dam slope is left to dry. On average, 1731588, 41 Tons of ash is disposed at the Ash dam complex on an annual basis.

##### 4.1.1 Mitigations

Ash dams slopes are annually rehabilitated in the form of vegetation plantation. Truck water sprays are also used to suppress dust especially where trucks moves in and out.

#### 4.2 Coal stockyard

The station has 3 types of coal stockpiles: live stockpile which is readily available and not-compacted coal that remains from 1 day to 3 months and is used daily for supply of coal to the plant; Strategic coal which is compacted coal for long term storage, can be stored for years and used later; and emergency coal which is compacted and remains for many years.

### **4.2.1 Mitigations**

The Strategic stockpile is compacted as and when required. A water tanker is used for dust suppression on the strategic coal stockpile and roads around the stockpile area as and when required.

The station runs two main conveyor belts (A & B) which received the coal from the mine. Coal is transported to the stockpile via Conveyor belt number 16 and reclaimed back via Conveyor belt number 18.

The two main conveyor belts feed into the coal staithes which feeds into the station using two incline belts. The incline belts then feed the coal into the coal bunkers which is situated on the 170 ft level. The coal is then gravity fed into the mills via the raw coal pipes.

### **4.3 Unpaved roads**

A large percentage of unpaved roads are found inside the ash dam complex. These roads are used on a daily basis by Maintenance personnel who are responsible for the overall management of the Ashdam complex.

The Ash dam complex is located about 11KM from the Power Station and about 40% of the this road is unpaved on which Pick up; tipper trucks and Yellow plant uses for the carrying out of day to day activities

#### **4.3.1 Mitigations**

The dust at the Ash dams is suppressed using a watering tank as and when necessary.

### **4.4 Other sources: Farming activities and the mine/s, and ash leaked from ashline system before the reaching ashdams**

The station is located adjacent to the farmers and the mines. Occasionally, dust can be seen around the farming lands machines are busy at the farmers. At a routine period, dust is seen from the mines.

#### **4.4.1 Mitigations**

The station does not have control to mitigate dust from farmers and mines.

Mitigations from ashlines leaks: rehabilitation of the area/s, by removing ash spillage formations.

## **5 METEOROLOGY**

The station does not have a weather station, most of the time meteorological data is provided in to the monthly fugitive emission sampling reports. However, the station through the engineering department is planning to have a weather station in the near future.

## 6 SAMPLING POINTS FOR FUGITIVE EMISSION MONITORING

The station has installed dust buckets in all areas identified as a source or potential sources of fugitive emissions at the following areas:

- Coal stock area: 1 bucket installed and monitored
- Ash dam complex area: 2 buckets installed and monitored
- Other buckets are installed and monitored at the following sites:
  - i) Pukos House (east side of ashdams)
  - ii) Seepage pump (north east of ashdams)
  - iii) Sewage plant
  - iv) Landfill site
  - v) Wilge street Pullenshope (North East of Pullenshope)

## 7 ACCOMMODATING FOR INTERESTED AND AFFECTED PARTIES

A complaint register is kept at the Power Station manager for any environmental related complaint. Complaint register is checked regularly by the Environmental Officer. See appendix 1.

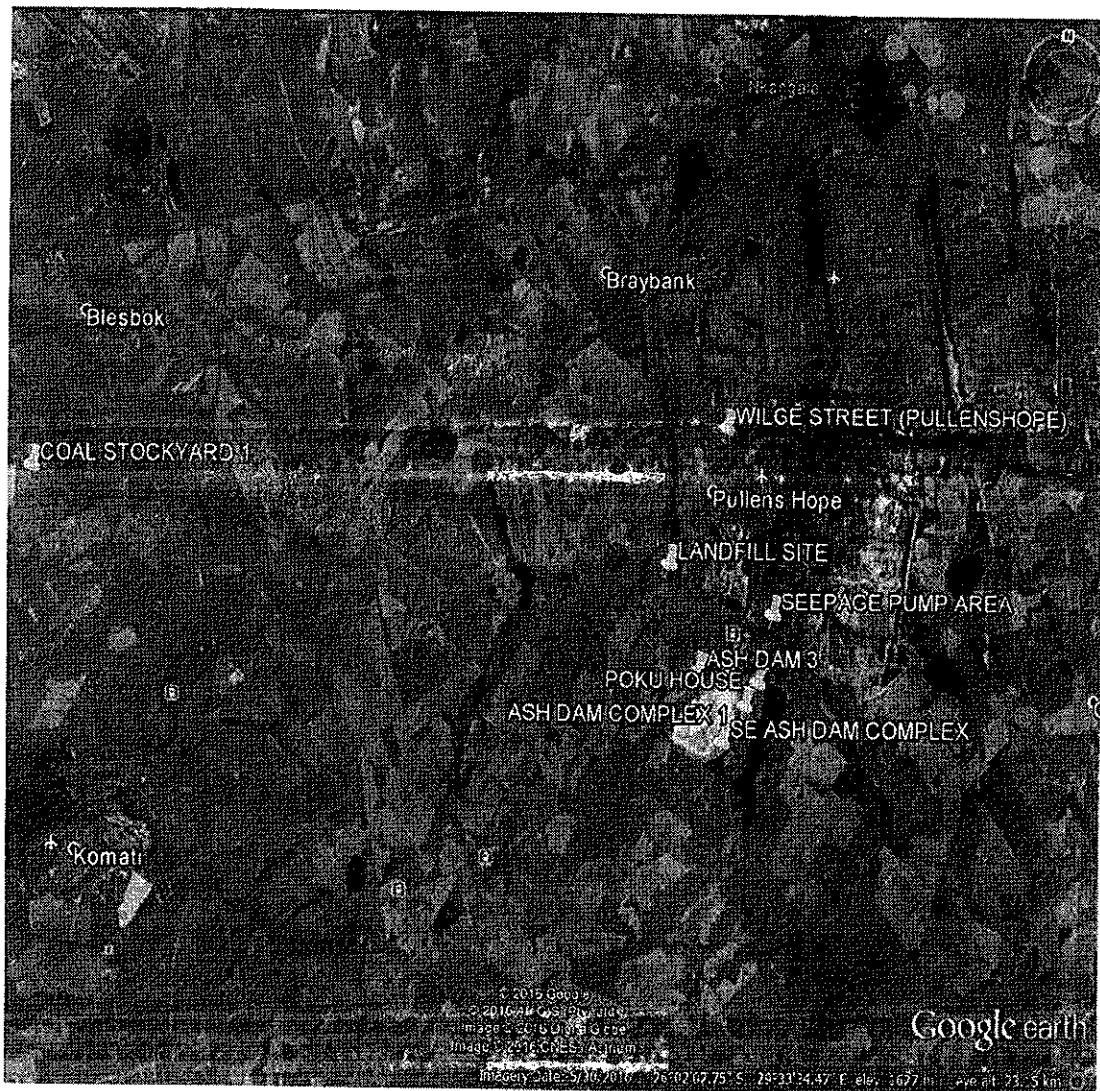
## 8 AREA SOURCE-MANAGEMENT AND MITIGATION

Area Source	Description of Specific Measures	Timeframe for Achieving Required Control Efficiency	Method of Monitoring Measures Effectiveness	Contingency Measures
Mills	Seal air fans provide PF leak sealing Air fans seals replacement programme is included in maintenance programme	Immediately	Compliance to air fans seals programme Number of times the water sprays has been used.	Water sprays to suppress dust, repair leak
Boiler	PF lines are tiled, to prevent erosion wear	Immediately	Frequency of leaks monthly	Water sprays to suppress dust, repair leak
Boiler	Coarse ash from wet hopper and sluice ways blockage. Ash hopper is sealed water provide Ash clinkers from the boiler are handled properly	Immediately		Water sprays to suppress dust, Emergency water supply to top up seal water, combustion monitoring to prevent boiler clinkers
Coal Stockyard	Coal stork, off-loading and conveyors	On-going	Ambient air quality monitoring	Correct protocol for coal handling and off-loading to be applied-conveyors are covered to reduce fugitive emissions
	Compacting of coal stockpile Water trucks for dust suppression	On-going	Visual inspection	None
Ashdam complex	Water spraying Ash dams rehabilitations	Regularly As in the programme	Visual inspection Visual inspection /audits	
Unpaved road	Water sprays by trucks Putting non-dusty road material for stabilising roads	Regularly occasionally	inspections audits Visual inspection	

## 9 LOCATION OF FUGITIVE EMISSION SOURCES

Coordinates of monitoring Sites Location	Coordinates	
	Latitude	Longitude
Coal stock yard 1	26° 01' 52.0" S	29° 36' 26.5" E
Ash dam complex 1	26° 03' 36.4" S	29° 36' 18.6" E
Poku house	26° 03' 21.0" S	29° 36' 27.7" E
Seepage pump: ash dam area	26° 02' 37.1" S	29° 36' 35.7" E
Seepgae pump: ash dam area	26° 04' 00.4" S	29° 36' 02.1" E
Ash dam 3	26° 03' 17.9" S	29° 35' 38.7" E
Landfill site	26° 02' 12.1" S	29° 35' 08.7" E
Wilge Street Pullenshope	26° 00' 42.0" S	29° 35' 46.7" E

A map showing the location of the fugitive sources



## 10 FUGITIVE EMISSION MONITORING RESULTS AND REPORTING

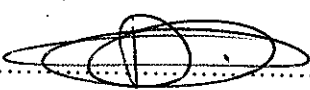
The results of the PM10 or dust fallout monitoring are received on a regular basis and shared at the station's EMS meeting; Head office and are also send to the Licensing authority. Annual reports on the implementation of the fugitive emission management plan will be submitted to the Licencing Authority

## 11 CONCLUSION

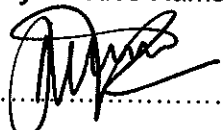
Significant sources of fugitive dust emissions have been identified, and appropriate control measures identified in this fugitive emission management plan. During the past six months the ambient air results has been indicated that the Power station in operating well below the permissible Industrial dust fall out rate of  $600 < D < 1200$ .

This fugitive emission monitoring plan will be reviewed on or before the year 2020.

**Compiled by:** Ben Madiope (Environmental Officer)

Signature:  ..... Date 02/09/2016

**Approved by:** Justice Ramagoma (Environmental Manager)

Signature:  ..... Date 02/09/2016