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Atmospheric Emissions Licence Holder: Sasol South Africa Limited in respect of its Sasolburg Operations, Midland Chemicals

Atmospheric Emissions licence Reference Number: FDDM-MET-2013-24-R2

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**ATMOSPHERIC EMISSIONS LICENCE ISSUED IN TERMS OF SECTION 43 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT, 2004, (ACT NO. 39 OF 2004)**

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This Atmospheric Emissions Licence issued to **Sasol South Africa Limited in respect of its Sasolburg operations, Midland Chemicals**, in terms of section 41(1)(a) (as read with Section 47) of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) ("the Act"), in respect of Listed Activity Numbers 2.1, 6.1, 7.1, 7.2, 7.7 and 8.1. The Atmospheric Emissions Licence has been issued on the basis of information provided in the company's renewal application and information that became available during processing of the application.

The Atmospheric Emissions Licence is valid until **30 April 2029**.

The Atmospheric Emissions Licence is issued subject to the conditions and requirements set out below which form part of the Atmospheric Emissions Licence and which are binding on the holder of the Atmospheric Emissions Licence, Sasol South Africa Limited in respect of its Sasolburg Operations' Midland Chemical facilities, hereinafter referred to as the ("the licence holder").

#### 1. ATMOSPHERIC EMISSIONS LICENCE ADMINISTRATION

|  |  |
|--|--|
| Name of the Licensing Authority          | Fezile Dabi District Municipality        |
| Atmospheric Emissions Licence Number     | FDDM-MET-2013-24-R2                      |
| Atmospheric Emissions Licence Issue Date | Date of Signature by Air Quality Officer |
| Atmospheric Emissions Licence Type       | Final                                    |
| Review Date, not later than              | 30 April 2029                            |

-Air Quality Officer Signature: ..... AEL No.: FDDM-MET-2013-24-R2 Date: 19 April 2024

## 2. ATMOSPHERIC EMISSIONS LICENCE HOLDER DETAILS

|   |   |
|---|---|
| Enterprise Name   | Sasol South Africa Limited through its Sasolburg Operations' Midland Chemicals plants |
| Trading as  | N/A   |
| Enterprise Registration Number<br>(Registration Numbers if Joint Venture) | 1968/0139141/07   |
| Registered Address  | 50 Katherine Street<br>Sandton  |
| Postal Address  | PO Box 1<br>Sasolburg<br>1947   |
| Telephone Number (General)  | 016 960 1111  |
| Industry Sector   | Petrochemical Company   |
| Name of Responsible Officer   | [REDACTED]  |
| Name of Emission Control Officer  | [REDACTED]  |
| Telephone Number  | [REDACTED]  |
| Cell Phone Number   | [REDACTED]  |
| Fax Number  | [REDACTED]  |
| Email Address   | [REDACTED]  |
| After Hours Contact Details   | [REDACTED]  |
| Land Use Zoning as per Town Planning Scheme                               | Industrial  |

## 3. SITUATION AND EXTENT OF PLANT

### 3.1 LOCATION AND EXTENT OF PLANT

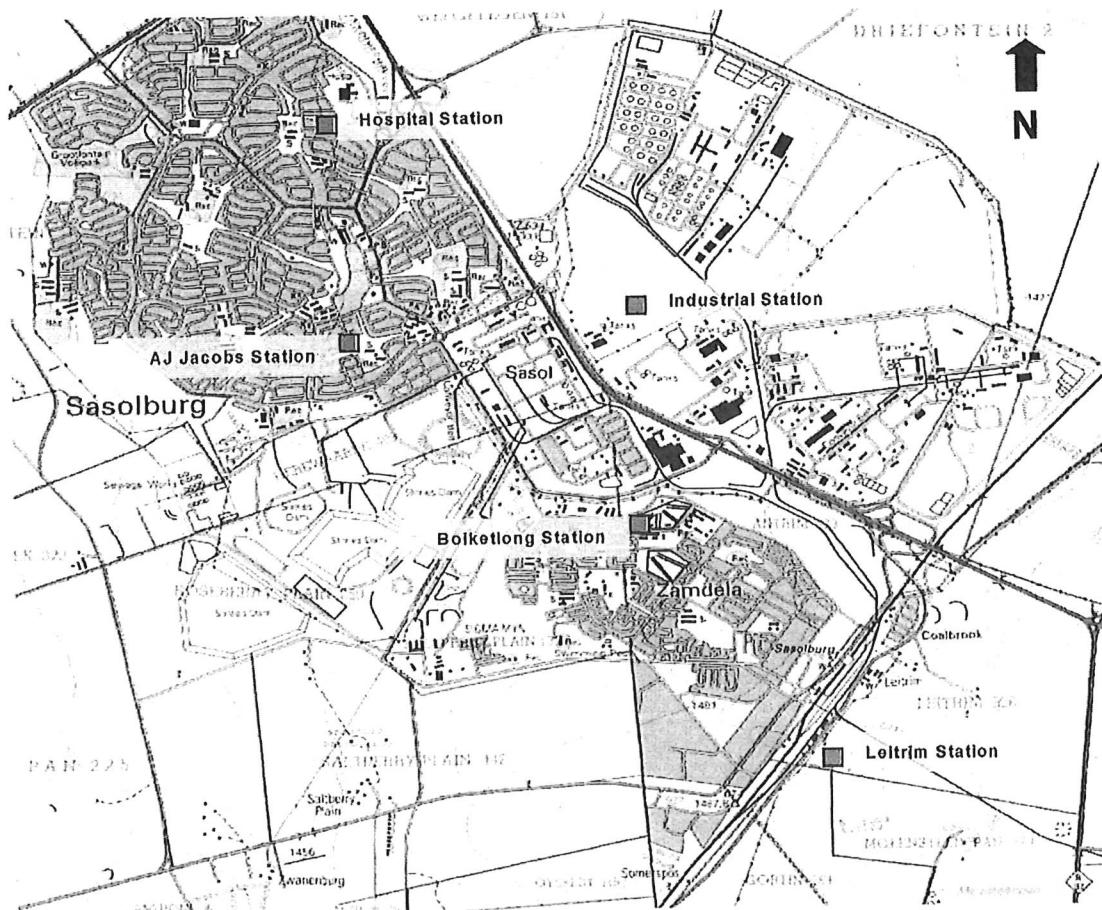
|   |  |
|---|--|
| Physical Address of the Premises                | Sasol Midlands site<br>Bergius street<br>Sasolburg<br>1947   |
| Description of Site (Erf)                       | Subdivision 6 of 2 of Driefontein No- 2 and certain subdivisions of the farm Saltberry Plain, Roseberry Plain Flerewarde and Antrim and subdivision 5 of 4 of Montrose, District of Sasolburg, Free State. |
| Coordinates of Approximate Centre of Operations | Midlands Latitude: S 26.82642<br>Longitude: E 27.87342   |

|   |                                   |
|---|-----------------------------------|
| <b>Extent</b>                             | 15.51 km <sup>2</sup>             |
| <b>Elevation Above Mean Sea Level (m)</b> | 1 498 m                           |
| <b>Province</b>                           | Free State Province               |
| <b>District Municipality</b>              | Fezile Dabi District Municipality |
| <b>Local Municipality</b>                 | Metsimaholo Local Municipality    |
| <b>Designated Priority Area</b>           | Vaal Triangle Priority Area       |

### 3.2 Description of Surrounding Land Use within 5 km radius

Within a 5 km radius from the Sasol One facility is the town of Sasolburg, a residential area as well as an informal settlement called Zamdela. Other land use includes heavy as well as light industries. Sasol's water treatment facility and waste areas also falls within this 5 km radius.

Within 5 km from the Sasol Midland site is mainly heavy industrial area as well as some farm land and game reserves operated and maintained by Sasol. Zamdela also falls within the specified radius from the Midland site.



## 4. GENERAL CONDITIONS

### 4.1. Process and ownership changes

The holder of the atmospheric emissions licence must ensure that all unit processes and apparatus used for the purpose of undertaking the listed activity in question, and all appliances and mitigation measures for preventing or reducing atmospheric emissions, are at all times properly maintained and operated.

Building, plant or site works related to the listed activity or activities used by the licence holder shall be extended, altered or added subject to the applicable requirements for an environmental authorisation from the competent authority as per the provisions of the National Environmental Management Act 1998 (Act No. 107 of 1998) (NEMA), as amended read with the Environmental Impact Assessment Regulations thereunder. The investigation, assessment and communication of potential impact of such an activity must follow the required assessment procedure as prescribed in the Environmental Impact Assessment Regulations published in terms of section 24(5) of the National Environmental Management Act.

Any changes in processes or production increases which may have an impact on atmospheric emissions, by the licence holder, will require prior approval by the licensing authority.

Any changes to the type and quantities of input materials and products, or to production equipment and treatment facilities which may have an impact on atmospheric emissions will require prior written approval by the licensing authority.

The licence holder must, in writing, inform the licensing authority of any change of ownership of the enterprise. The licensing authority must be informed within 30 (thirty) days after the change of ownership.

The licence holder must immediately on cessation or decommissioning of the listed activity inform, in writing, inform the licensing authority.

### 4.2. General duty of care

The licence holder of the licence must, when undertaking the listed activity, adhere to the duty of care obligations as set out in section 28 of the NEMA.

The licence holder must undertake the necessary measures to minimize or contain the atmospheric emissions. The measures are set out in section 28(3) of the NEMA.

Failure to comply with the above condition is a breach of the duty of care, and the licence holder will be subject to the sanctions set out in section 28 of the NEMA.

### 4.3. Sampling and/or analysis requirements

Measurement, calculation and/or sampling and analysis shall be carried out in accordance with any nationally or internationally acceptable standard. A different method may be acceptable to the licensing authority as long as it has been consulted and agreed to the satisfactory documentation necessary in confirming the equivalent test reliability, quality and equivalence of analyses.

The licence holder is responsible for quality assurance of methods and performance. Where the holder of the licence uses external laboratories for sampling or analysis, accredited laboratories shall be used.

#### **4.4. General requirements for licence holder**

The licence holder is responsible for ensuring compliance with the conditions of this licence by any person acting on his, her or its behalf, including but not limited to, an employee, agent, sub-contractor or person rendering a service to the holder of the licence.

The licence does not relieve the licence holder to comply with any other statutory requirements that may be applicable to the carrying on of the listed activity.

A copy of the licence must be kept at the premises where the listed activity is undertaken. The licence must be made available to the environmental management inspector representing the licensing authority who requests to see it.

The licence holder must inform, in writing, the licensing authority of any change to its details including the name of the emissions control officer, postal address and/or telephonic details.

#### **4.5. Statutory obligations**

The licence holder must comply with the obligations as set out in Chapter 5 of the Act.

#### **4.6. Annual payment of atmospheric emissions licence processing fee**

The licence holder must, for the period of validity of the licence, pay the processing fee annually to the licensing authority. Alternatively the licence holder can pay the emissions licence processing fee once off.

#### **4.7 Variation of Atmospheric Emissions Licence**

The Air Quality Officer reserves the right to by notice, in writing, set and adjust the emissions limit value or operating conditions after consultation with the holder.

#### **4.8 Non- Compliance with Conditions**

If the licence holder fails to comply with the conditions or requirements of this Atmospheric Emissions License, the Air Quality Officer may by notice in writing call upon such a holder to comply with such conditions or requirement within a reasonable period specified in the notice, and in the event of failure on the part of such holder to comply with the said conditions or requirement within the period so specified, the Air Quality Officer may cancel the Atmospheric Emissions License or suspend the operation thereof for such period as he or she may deem fit.

## 5. NATURE OF PROCESS

### 5.1. PROCESS DESCRIPTION

#### Polyethylene

Midlands Chemicals operates two polyethylene plants on the Sasol Midland Site, namely the Poly 2 and Poly 3 plants.

##### Poly 2:

The Poly 2 process involves the manufacture of linear low density polyethylene in a fluidized bed gas phase reactor.

The polymer together with some unreacted gas is transferred out of the reactor to the degassing bin where hydrocarbons are separated from the polymer. The liquid hydrocarbons are recovered in the monomer recovery section of the plant and recycled back to the reactor. The polymer is pneumatically transferred from the degassing bin and is stored in intermediate storage silos. At the extruder, virgin polymer from storage is mixed with additives, melted and thereafter cut it into pellets in an underwater cutter. This polymer pellets are thereafter dried and cooled before being pneumatically conveyed to the Pack Silos from which it is bagged at the packline and stored in the warehouse. Emergency venting occurs through the plant flare system where hydrocarbons are converted to CO<sub>2</sub>, CO and H<sub>2</sub>O.

##### Poly 3:

The Poly 3 plant produces low density polyethylene. Ethylene and propylene is fed to a tubular reactor where initiator is added and the polymerization reaction takes place. The polymer-gas mixture exiting the reactor is separated and the unreacted gas is recycled back to the reactor. The polymer is then fed into an extruder with additives and cut it into pellets in an underwater cutter. The polymer pellets are then dried and transferred to blending silos where the dissolved ethylene is purged out with air and the product is blended to be homogeneous. After degassing the product is pneumatically conveyed to the Pack Silos from which it is bagged at the packline and stored in the warehouse. Emergency venting occurs through the plant flare system where ethylene is converted to CO<sub>2</sub>, CO and H<sub>2</sub>O.

#### Chlorine and HCl Burners

Midland Chemicals operate a chlorine, hydrochloric acid, sodium hydroxide and calcium chloride production facilities on the Sasol Midland Site. Salt is conveyed to a dissolving tank where the salt is dissolved up to a specific brine concentration. After several purification steps, the brine solution is fed to the chloro-caustic electrolyzers where chlorine, hydrogen and aqueous sodium hydroxide is manufactured. The chlorine manufactured is stored, exported via pipeline to the VCM plant and sold externally as liquid chlorine. The chlorine is also reacted with hydrogen to create hydrochloric acid in the HCl burners. The hydrogen is either used at the HCl burners to manufacture HCl or sent to the VCM plant as a fuel gas. The hydrochloric acid produced in the HCl burners is stored and sold as a final product. Scrubbers designed to control emissions in these processes might contain traces of HCl and Cl<sub>2</sub>.

#### Vinyl Chloride Monomer

Midland Chemicals operate a Vinyl Chloride Monomer (VCM) production facility on the Sasol Midland Site. The facility uses two different reactions for the manufacturing of the intermediate 1,2-dichloroethane (EDC). The first is the direct chlorination of ethylene to produce EDC. The second is the oxychlorination step where ethylene, oxygen, hydrogen and HCl react to produce crude EDC and water. The water is separated after the oxychlorination reactor and the crude EDC is sent to the EDC purification unit. The water stream is fed to the water recovery unit for purification before being exported to the Chlorine Plant as brine make up. EDC from the purification step is fed to the EDC cracker together with EDC from the direct chlorination step. In the EDC cracking unit EDC is cracked to VCM and HCl after which the cracked stream is fed to the VCM purification unit.

Here the VCM and HCl are separated and HCl is recycled as feed to the oxychlorination unit. The VCM is sent to storage in two spheres at the PVC Plant. By products from the EDC Purification Unit and plant vent gasses are incinerated and the recovered dilute hydrochloric acid is exported to the Chlorine plant.

### Polyvinyl Chloride

Midland Chemicals operate a Polyvinyl chloride plant on the Sasol Midland Site. VCM from the VCM plant is suspended in water whilst the reaction is brought up to the desired temperature. The polymerization reaction takes place and the polyvinyl chloride (PVC) is formed. The reactor is discharged into a blow down vessel which feeds into the stripper, where unreacted VCM is recovered from the slurry and recycled. The PVC/water mixture is then fed to the slurry stock tank and then to the centrifuge where the PVC is separated. Once the PVC is separated, it is dried, screened and pneumatically fed to the storage area for packaging. The unreacted VCM is recovered by liquefaction and stored for reuse. The uncompressible tail gas from the latter unit is fed to the incinerator at the VCM Plant as plant availability allows.

### Cyanide

Methane ( $\text{CH}_4$ ) rich natural gas reacts with ammonia ( $\text{NH}_3$ ) in fluidized coke bed reactors to form a hydrogen cyanide (HCN) rich synthesis gas. The synthesis gas exiting the reactor is cooled and filtered to remove carbon soot before being fed to a pair of sodium hydroxide ( $\text{NaOH}$ ) absorbers installed in series. Here the HCN reacts with the  $\text{NaOH}$  to form sodium cyanide ( $\text{NaCN}$ ), which is the final product. The exhaust gases from the second  $\text{NaOH}$  absorber contain mainly hydrogen and nitrogen and are emitted to atmosphere via an elevated stack. The vented stream is measured for traces of HCN. During periods of low  $\text{NaCN}$  stock and high demand, solid  $\text{NaCN}$  is dissolved with water and transferred to storage as well.

### AAA/Butanol

Midland Chemicals operates an Acrylic Acid and Acrylate (AAA) as well as a Butanol plant on the Sasol Midland Site.

Butanol plant: Synthesis gas is fed to a cold box separation phase where impurities are removed from the syngas. The impurities are recycled back into the gas loop and vented into an elevated flare. The purified syngas as well as propylene are fed into a series of reactive distillation units to produce n-butanol and i-butanol as the final product. All columns are vented to the flare.

AAA plant: Acrylic acid is manufactured by reacting propylene with air through a series of reactors and a distillation / purification process. The crude Acrylic Acid is fed to three processes. It can be purified to form Glacial Acrylic Acid, it can be reacted with n-Butanol to produce Butyl Acrylate or it can be reacted with Ethanol to produce Ethyl Acrylate. All vents from the AAA plant goes through high temperature incinerator to eliminate any Acrylates entering the atmosphere, especially due to the odorous nature of Ethyl Acrylate.. Off gasses from the catalytic destruction unit and the vapour combustion unit contains  $\text{CO}_2$ ,  $\text{CO}$ ,  $\text{NO}$  and  $\text{NO}_2$ .

## 5.2. LISTED ACTIVITY

Listed Activities, as published in terms of Section 21 of the AQA, authorised to be conducted at the premises by the licence holder:

| Listed Activity Number | Category of Listed Activity | Sub-category of the Listed Activity | Listed Activity Name   | Description of the Listed Activity                    |
|------------------------|-----------------------------|-------------------------------------|--|---|
| 1                      | 2                           | 2.1                                 | Petroleum industry, the production of gaseous and liquid fuels as well | Combustion installations not used primarily for steam |

|   |   |     | as petrochemicals from crude oil, coal, gas or biomass | raising or electricity generation (furnaces and heaters)   |
|---|---|-----|--|--|
| 2 | 6 | 6.1 | Organic Chemical Industry                              | <p>The production, or use in production of organic chemicals not specified elsewhere including acetylene, ecetic, maleic or phthalic anhydride or thei acids, carbon disulphide, pyridine, formaldehyde, acetaldehyde, acrolein and its derivatives, acrylonitrile, amines and synthetic rubber.</p> <p>The production of organometallic compounds, organic dyes and pigments, surface-active agents.</p> <p>The polymerisation or co-polymerisation of any unsaturated hydrocarbons, substituted hydrocarbon (including Vinyl chloride).</p> <p>The manufacture, recovery or purification of acrylic acid or any ester of acrylic acid.</p> <p>The use of toluene di-isocyanate or other di-isocyanate of comparable volatility; or recovery of pyridine.</p> <p>All permanent immobile liquid storage facilities at a single site with a combined storage capacity of greater than 1 000 m<sup>3</sup></p> |

|   |   |     |  |  |
|---|---|-----|--|--|
| 3 | 7 | 7.1 | Inorganic Chemical Industry                      | Production and or use in manufacturing of ammonia, fluorine, fluorine compounds, hydrogen cyanide and chlorine gas   |
| 4 | 7 | 7.2 | Inorganic Chemical Industry                      | Production, bulk handling and or use in manufacturing of hydrofluoric, hydrochloric, nitric and sulphuric acid (including oleum) in concentration exceeding 10%<br>Processes in which oxides of sulphur are emitted through the production of acid sulphites of alkalis or alkaine earths or through the production of liquid sulphur or sulphurous acid<br>Secondary production of hydrochloric acid through regeneration |
| 5 | 7 | 7.7 | Inorganic chemicals industry                     | Production of caustic soda   |
| 6 | 8 | 8.1 | Thermal treatment of general and hazardous waste | Facilities where general and hazardous waste are treated by the application of heat  |

### 5.3. UNIT PROCESS OR PROCESSES

List of all unit processes associated with the listed activities to be undertaken at the site of work.

| Unit Process           | Function of Unit Process  | Batch or Continuous Process |
|------------------------|---|-----------------------------|
| Poly 2                 |   |                             |
| Purification           | Purification of feed streams to remove trace poisons before use in the Catalyst and LLDPE manufacturing processes | Continuous                  |
| Catalyst Manufacturing | Manufacture of Ziegler Natta, silica based catalyst for the polyethylene manufacture process                      | Batch                       |

|                                |  |                                 |
|--------------------------------|--|---------------------------------|
| Reaction                       | Produce polyethylene in the fluidized bed reactor  | Continuous                      |
| Degassing and Monomer Recovery | Degassing of reactor polymer to remove hydrocarbons from the polymer and recovering the liquid hydrocarbons back to the reactor  | Continuous                      |
| Flare                          | <ul style="list-style-type: none"> <li>- Flaring of hydrocarbons not recovered at the monomer recovery unit</li> <li>- Flaring of reactor inventory during reactor shutdown / purging</li> </ul> | Continuous<br><br>When required |
| Blending and Extrusion         | Intermediate storage and feed of reactor polymer to the extruder where the polymer is pelletised   | Batch                           |
| Packaging and Storage          | Bagging of polymer into 25kg bags and 1.25ton semi bulk bags and storage of polymer before being transported to customers  | Batch                           |

### Poly 3

|                                    |  |               |
|------------------------------------|--|---------------|
| Ethylene Compression               | Compress Ethylene feed from the battery limit supply to the required reaction pressure   | Continuous    |
| Reaction                           | Produce Polyethylene in the tubular reactor  | Continuous    |
| Separators and Recycle Gas Systems | Separate the unconverted hydrocarbons and polymer from the exit of the reactor and recycle the unconverted raw material back to the reactor via the ethylene compressors | Continuous    |
| Extrusion                          | Pelletise polymer  | Continuous    |
| Pellet degassing and blending      | Remove residual hydrocarbons from polymer pellets and homogenise the polymer batches   | Continuous    |
| Flare system                       | Flaring ethylene or propylene during reactor shutdown / purging  | When Required |
| Packaging and Storage              | Bagging of polymer into 25kg bags and 1.25ton semi bulk bags and storage of polymer before being transported to customers  | Batch         |

### VCM and PVC

|                 |   |                         |
|-----------------|---|-------------------------|
| Reactor         | Direct Chlorination reactor – manufacture of 1,2-dichloroethane (EDC) from ethylene and chlorine.   | Continuous              |
| Cracker         | EDC Cracker – cracking of EDC to form vinyl chloride monomer (VCM) and hydrogen chloride (HCl)  | Continuous              |
| Reactor         | Oxychlorination reactor – manufacture of EDC by oxychlorination of ethylene   | Continuous              |
| Incinerator     | Incineration of liquid and gas byproducts from VCM and PVC plant.   | Continuous              |
| Scrubbers       | By-product recovery unit: hydrochloric acid recovery from mixed gaseous and liquid plant streams from both the VCM and PVC Plants<br><br>VCM Safety Scrubber – removal of HCl from gaseous vent streams during incinerator off-line time. | Continuous<br><br>Batch |
| Tanks – spheres | PVC Plant Storage Spheres – storage of VCM  | Continuous              |

|                            |  |               |
|----------------------------|--|---------------|
| Reactors                   | PVC autoclaves – manufacture of poly (vinyl chloride) (PVC) from VCM                                 | Batch         |
| Separation - recovery      | PVC Plant Vinyl Chloride Recovery Unit – recovery of unreacted VCM from the manufacture of PVC       | Continuous    |
| Drying                     | PVC Plant Drying Unit – remove moisture from raw PVC polymer   | Continuous    |
| Separation - recovery      | PVC Plant Multigrade Recovery Unit (sludge plant) – recovers PVC polymer from effluent water streams | Batch         |
| <b>Cyanide</b>             |  |               |
| Mixing Station             | Mixing of Ammonia and Natural gas in preparation to feed to the reactor                              | Continuous    |
| Coke handling              | Screening of coke particles into different sizes and feed into the reactors as required              | When required |
| Reaction                   | Conversion of ammonia and natural gas to hydrogen cyanide  | Continuous    |
| Gas Cooling and Filtration | Cooling and cleaning of reactor exit gas in preparation for the downstream absorption process        | Continuous    |
| Absorption                 | Absorbing hydrogen cyanide gas into caustic to produce the sodium cyanide final product              | Continuous    |
| Storage                    | Storage of crude and final product   | Batch         |
| Stack and seal pot         | Exhausting waste gas mainly hydrogen and nitrogen into atmosphere                                    | Continuous    |
| Dissolving                 | Dissolving of solid NaCN during periods of high demand   | When required |
| Loading facility           | Dispatch of final product to customers via road tankers  | Batch         |
| <b>Chlorine</b>            |  |               |
| Chlorine production        | To produce chlorine , hydrogen, sodium hydroxide   | Continuous    |
| Calcium Chloride           | Produce calcium chloride   | Batch         |
| Hydrochloric Acid          | Hydrochloric acid  | Continuous    |
| Tank farm                  | Storage and dispatch of caustic soda, hydrochloric acid and sulphuric acid.                          | Continuous    |
| <b>AAA/Butanol</b>         |  |               |
| Oxidation                  | Raw material to crude product  | Continuous    |
| Distillation               | Purification of crude product  | Continuous    |
| Esterification             | Reaction of crude product with specific alcohol  | Continuous    |
| Refrigeration unit - NH3   | Cooling in process   | Continuous    |
| Cryogenic separation       | Conditioning of synthesis gas  | Continuous    |
| Chemical Dosing            | In-process requirement   | Continuous    |
| Flare system               | Process gas  | Continuous    |
| Pit flare                  | Combustion liquid waste stream   | Batch         |
| Off gas incineration       | Incineration of process and tank waste gas   | Continuous    |

|                      |                |            |
|----------------------|----------------|------------|
| Catalytic combustion | VOC combustion | Continuous |
|                      |                |            |

| Unit Process                       | Function of Unit Process   | Batch or Continuous Process |
|------------------------------------|--|-----------------------------|
| <b>Poly 2</b>                      |  |                             |
| Purification                       | Purification of feed streams to remove trace poisons before use in the Catalyst and LLDPE manufacturing processes  | Continuous                  |
| Catalyst Manufacturing             | Manufacture of Ziegler Natta, silica based catalyst for the polyethylene manufacture process   | Batch                       |
| Reaction                           | Produce polyethylene in the fluidized bed reactor  | Continuous                  |
| Degassing and Monomer Recovery     | Degassing of reactor polymer to remove hydrocarbons from the polymer and recovering the liquid hydrocarbons back to the reactor  | Continuous                  |
| Flare                              | <ul style="list-style-type: none"> <li>- Flaring of hydrocarbons not recovered at the monomer recovery unit</li> <li>- Flaring of reactor inventory during reactor shutdown / purging</li> </ul> | Continuous<br>When required |
| Blending and Extrusion             | Intermediate storage and feed of reactor polymer to the extruder where the polymer is pelletised   | Batch                       |
| Packaging and Storage              | Bagging of polymer into 25kg bags and 1.25ton semi bulk bags and storage of polymer before being transported to customers  | Batch                       |
| <b>Poly 3</b>                      |  |                             |
| Ethylene Compression               | Compress Ethylene feed from the battery limit supply to the required reaction pressure   | Continuous                  |
| Reaction                           | Produce Polyethylene in the tubular reactor  | Continuous                  |
| Separators and Recycle Gas Systems | Separate the unconverted hydrocarbons and polymer from the exit of the reactor and recycle the unconverted raw material back to the reactor via the ethylene compressors                         | Continuous                  |
| Extrusion                          | Pelletise polymer  | Continuous                  |
| Pellet degassing and blending      | Remove residual hydrocarbons from polymer pellets and homogenise the polymer batches   | Continuous                  |
| Flare system                       | Flaring ethylene or propylene during reactor shutdown / purging  | When Required               |
| Packaging and Storage              | Bagging of polymer into 25kg bags and 1.25ton semi bulk bags and storage of polymer before being transported to customers  | Batch                       |
| <b>VCM and PVC</b>                 |  |                             |

|                       |   |            |
|-----------------------|---|------------|
| Reactor               | Direct Chlorination reactor – manufacture of 1,2-dichloroethane (EDC) from ethylene and chlorine.                                 | Continuous |
| Cracker               | EDC Cracker – cracking of EDC to form vinyl chloride monomer (VCM) and hydrogen chloride (HCl)                                    | Continuous |
| Reactor               | Oxychlorination reactor – manufacture of EDC by oxychlorination of ethylene   | Continuous |
| Incinerator           | Incineration of liquid and gas byproducts from VCM and PVC plant.   | Continuous |
| Scrubbers             | By-product recovery unit: hydrochloric acid recovery from mixed gaseous and liquid plant streams from both the VCM and PVC Plants | Continuous |
|                       | VCM Safety Scrubber – removal of HCl from gaseous vent streams during incinerator off-line time.                                  | Batch      |
| Tanks – spheres       | PVC Plant Storage Spheres – storage of VCM  | Continuous |
| Reactors              | PVC autoclaves – manufacture of poly (vinyl chloride) (PVC) from VCM  | Batch      |
| Separation - recovery | PVC Plant Vinyl Chloride Recovery Unit – recovery of unreacted VCM from the manufacture of PVC                                    | Continuous |
| Drying                | PVC Plant Drying Unit – remove moisture from raw PVC polymer  | Continuous |
| Separation - recovery | PVC Plant Multigrade Recovery Unit (sludge plant) – recovers PVC polymer from effluent water streams                              | Batch      |

#### Cyanide

|                            |   |               |
|----------------------------|---|---------------|
| Mixing Station             | Mixing of Ammonia and Natural gas in preparation to feed to the reactor                       | Continuous    |
| Coke handling              | Screening of coke particles into different sizes and feed into the reactors as required       | When required |
| Reaction                   | Conversion of ammonia and natural gas to hydrogen cyanide                                     | Continuous    |
| Gas Cooling and Filtration | Cooling and cleaning of reactor exit gas in preparation for the downstream absorption process | Continuous    |
| Absorption                 | Absorbing hydrogen cyanide gas into caustic to produce the sodium cyanide final product       | Continuous    |
| Storage                    | Storage of crude and final product  | Batch         |
| Stack and seal pot         | Exhausting waste gas mainly hydrogen and nitrogen into atmosphere                             | Continuous    |
| Dissolving                 | Dissolving of solid NaCN during periods of high demand  | When required |
| Loading facility           | Dispatch of final product to customers via road tankers                                       | Batch         |

#### Chlorine

|                     |  |            |
|---------------------|--|------------|
| Chlorine production | To produce chlorine , hydrogen, sodium hydroxide | Continuous |
| Calcium Chloride    | Produce calcium chloride                         | Batch      |
| Hydrochloric Acid   | Hydrochloric acid                                | Continuous |

|                          |   |            |
|--------------------------|---|------------|
| Tank farm                | Storage and dispatch of caustic soda, hydrochloric acid and sulphuric acid. | Continuous |
| <b>AAA/Butanol</b>       |   |            |
| Oxidation                | Raw material to crude product   | Continuous |
| Distillation             | Purification of crude product   | Continuous |
| Esterification           | Reaction of crude product with specific alcohol                             | Continuous |
| Refrigeration unit - NH3 | Cooling in process  | Continuous |
| Cryogenic separation     | Conditioning of synthesis gas   | Continuous |
| Chemical Dosing          | In-process requirement  | Continuous |
| Flare system             | Process gas   | Continuous |
| Pit flare                | Combustion liquid waste stream  | Batch      |
| Off gas incineration     | Incineration of process and tank waste gas                                  | Continuous |
| Catalytic combustion     | VOC combustion  | Continuous |
|                          |   |            |

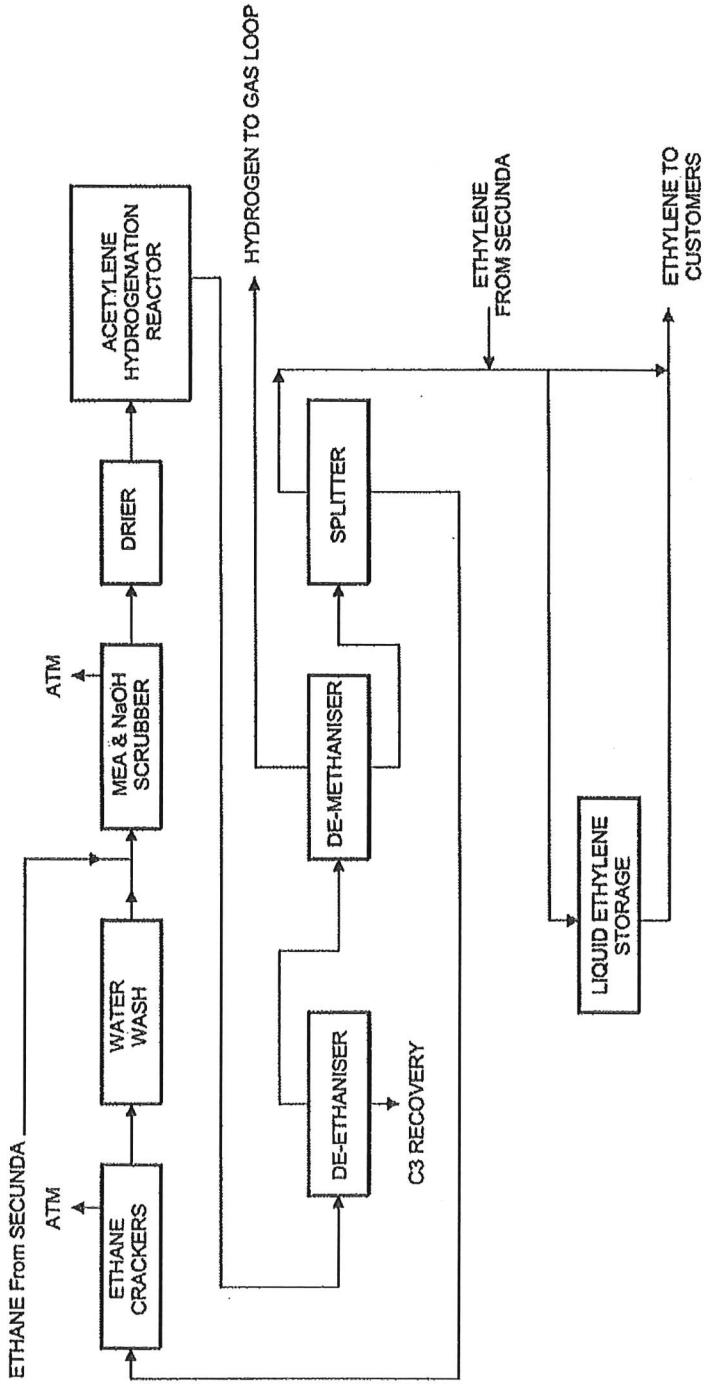
#### 5.4. HOURS OF OPERATIONS

| Unit Process / Plant   | Operating Hours<br>(e.g. 07h00 – 17h00) | No. Days Operation per Year |
|--|---|-----------------------------|
| <b>Poly 2 &amp; Poly 3</b>                                   |   |                             |
| All the above operation units                                | 24hrs                                   | 365                         |
| <b>VCM and PVC</b>   |   |                             |
| Direct Chlorination Reactor                                  | 24 hours                                | 365                         |
| EDC Cracker  | 24 hours                                | 365                         |
| Oxychlorination Reactor                                      | 24 hours                                | 365                         |
| EDC and VCM Purification - Distillation                      | 24 hours                                | 365                         |
| Scrubbers – Safety Scrubber and Byproduct recovery scrubbers | 24 hours                                | 365                         |
| Incinerator  | 24 hours                                | 365                         |
| Tanks – VC spheres   | 24 hours                                | 365                         |
| Reactors – PVC autoclaves                                    | 24 hours                                | 365                         |
| Separation – VC Recovery                                     | 24 hours                                | 365                         |
| Drying   | 24 hours                                | 365                         |
| Separation – Sludge plant                                    | 24 hours                                | 365                         |
| <b>Cyanide</b>   |   |                             |
| All operation units  | 24 hours                                | 365                         |
| <b>Chlorine</b>  |   |                             |

|                          |               |        |
|--------------------------|---------------|--------|
| Chlorine cells           | 24 hours      | 365    |
| Calcium Chloride         | When required | 365    |
| <b>AAA/Butanol</b>       |               |        |
| Oxidation                | 24 hours      | 365    |
| Distillation             | 24 hours      | 365    |
| Esterification           | 24 hours      | 365    |
| Refrigeration unit - NH3 | 24 hours      | 365    |
| Cryogenic separation     | 24 hours      | 365    |
| Chemical Dosing          | 24 hours      | 365    |
| Flare system             | 24 hours      | 365    |
| Pit flare                | Ad Hoc        | Ad hoc |
| Off gas incineration     | 24 hours      | 365    |
| Catalytic combustion     | 24 hours      | 365    |
| Off-loading facility     | When required | 365    |
| Loading Facilities       | When required | 365    |
| Final product tanks      | When required | 365    |

## 5.5. GRAPHICAL PROCESS INFORMATION

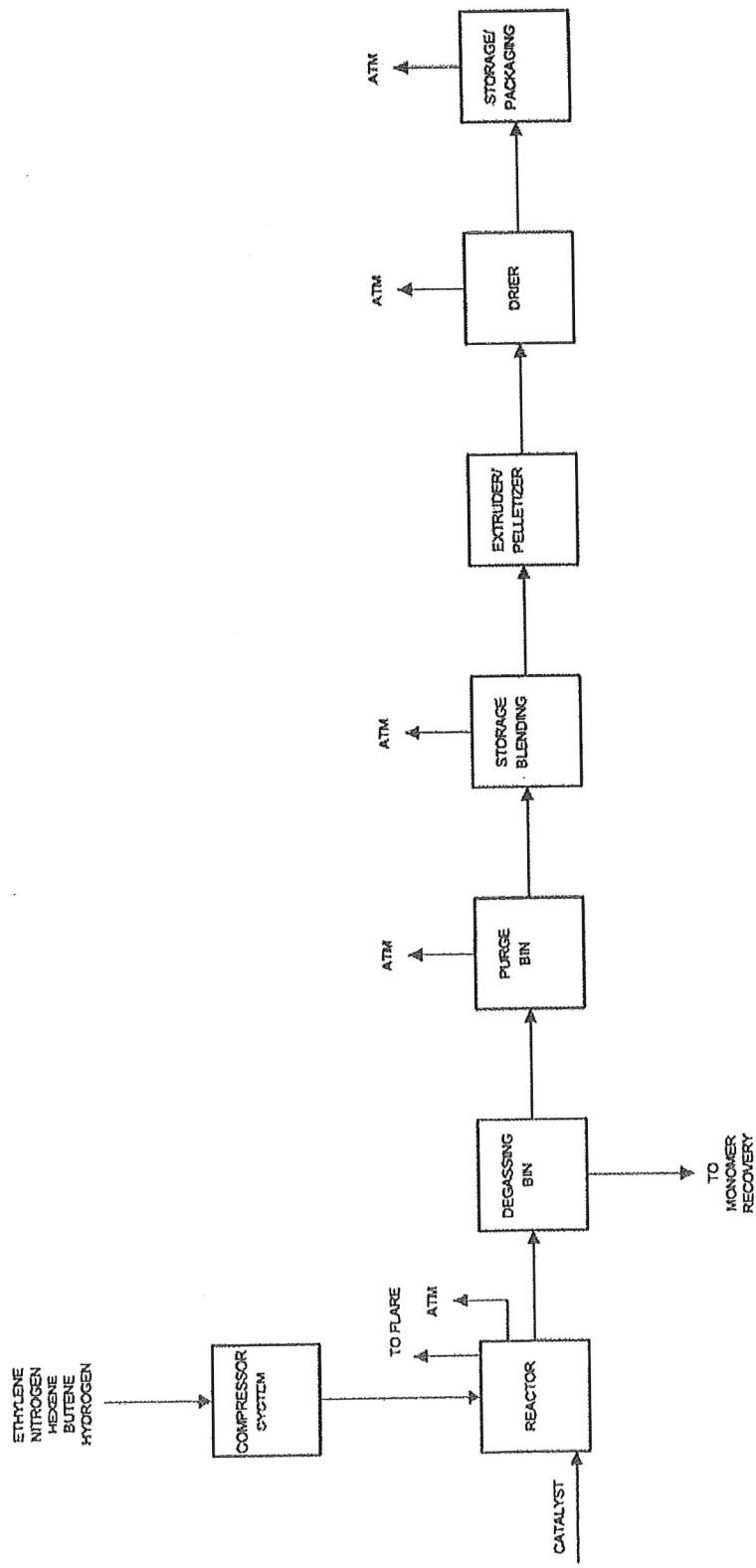
### Monomers plant



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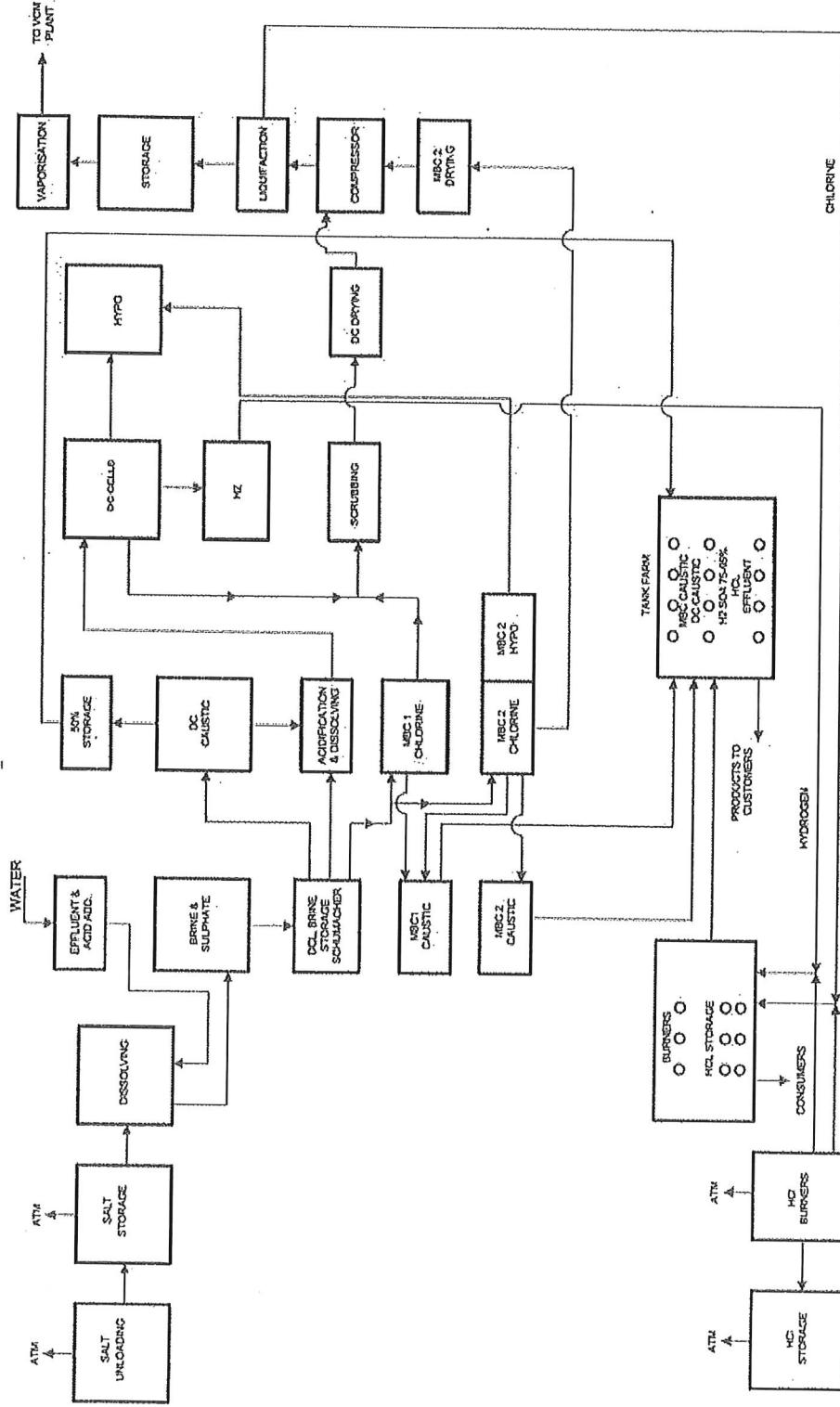
Poly 2 plant

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### Chlorine plant

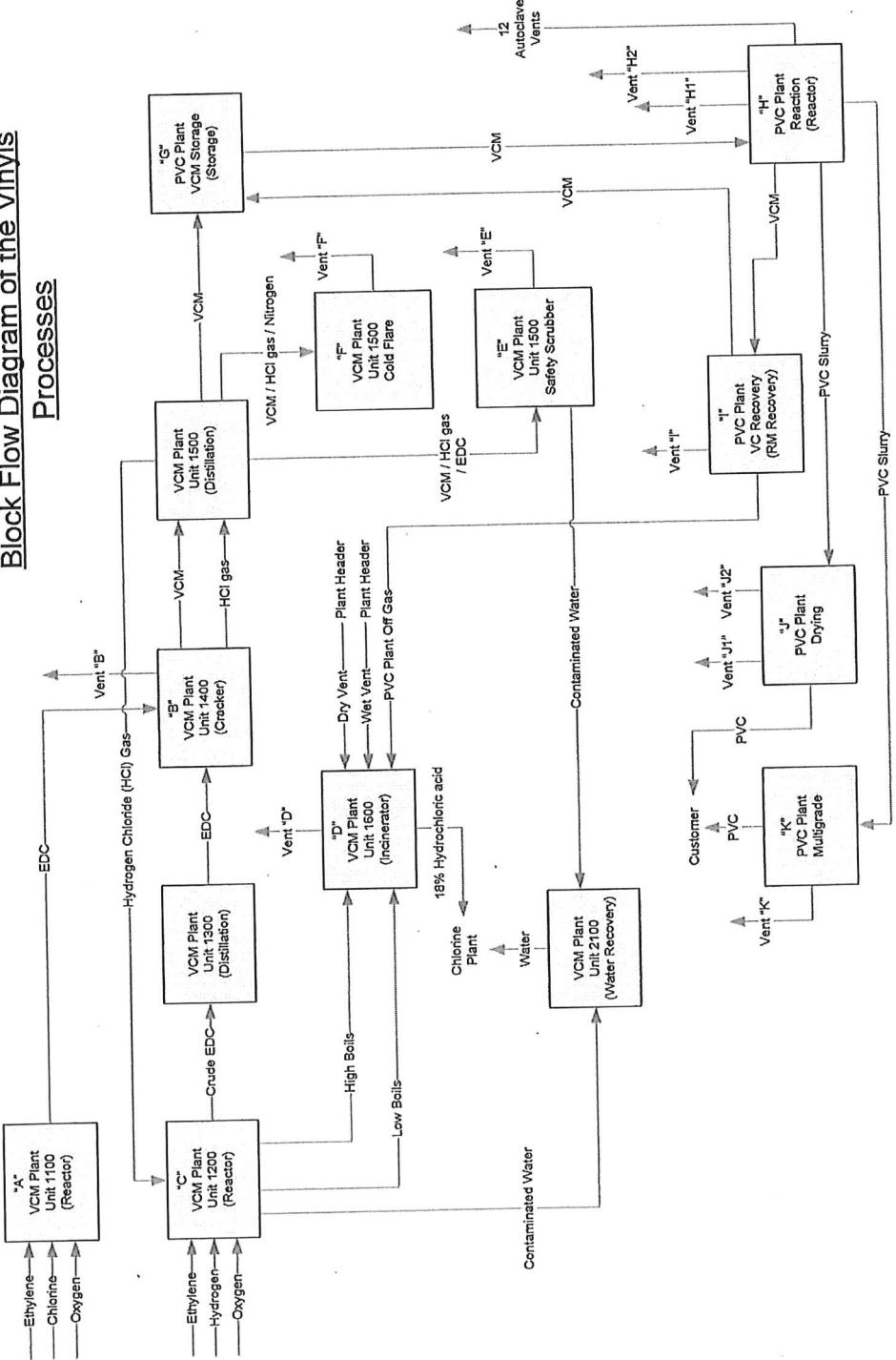


June 20

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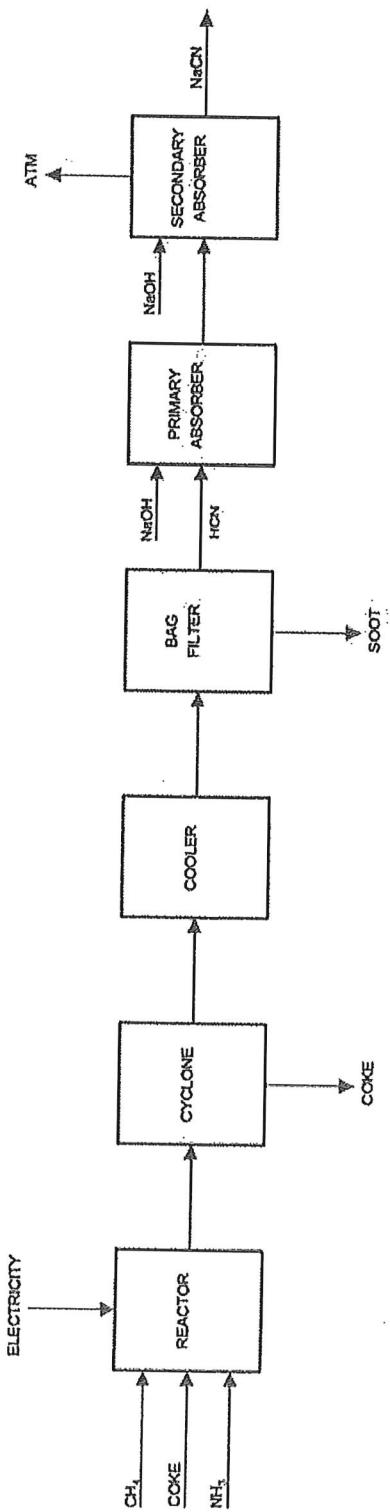
Vinyl's – VCM and PVC

## Block Flow Diagram of the Vinyl Chloride Processes



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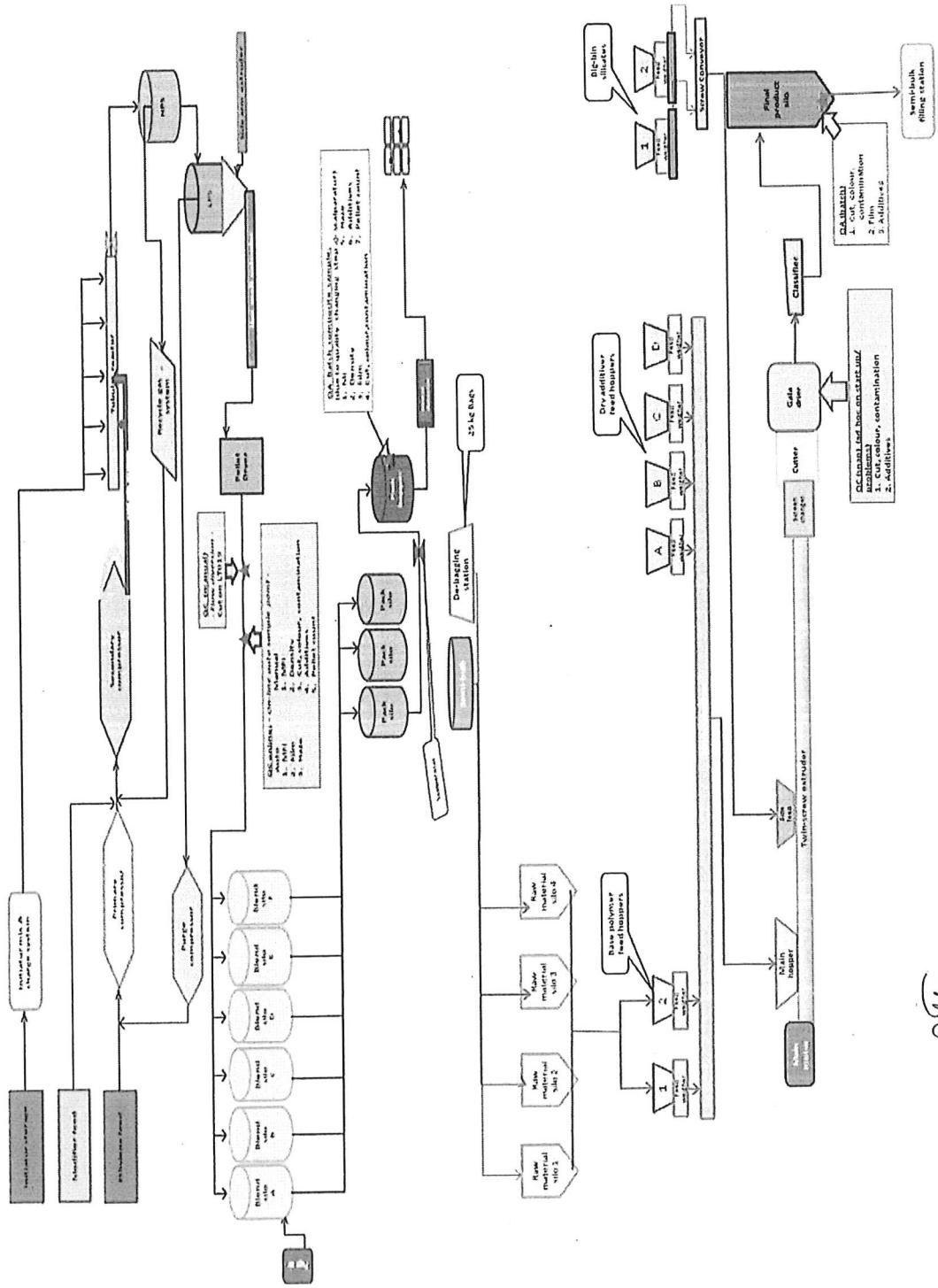
### Cyanide plant



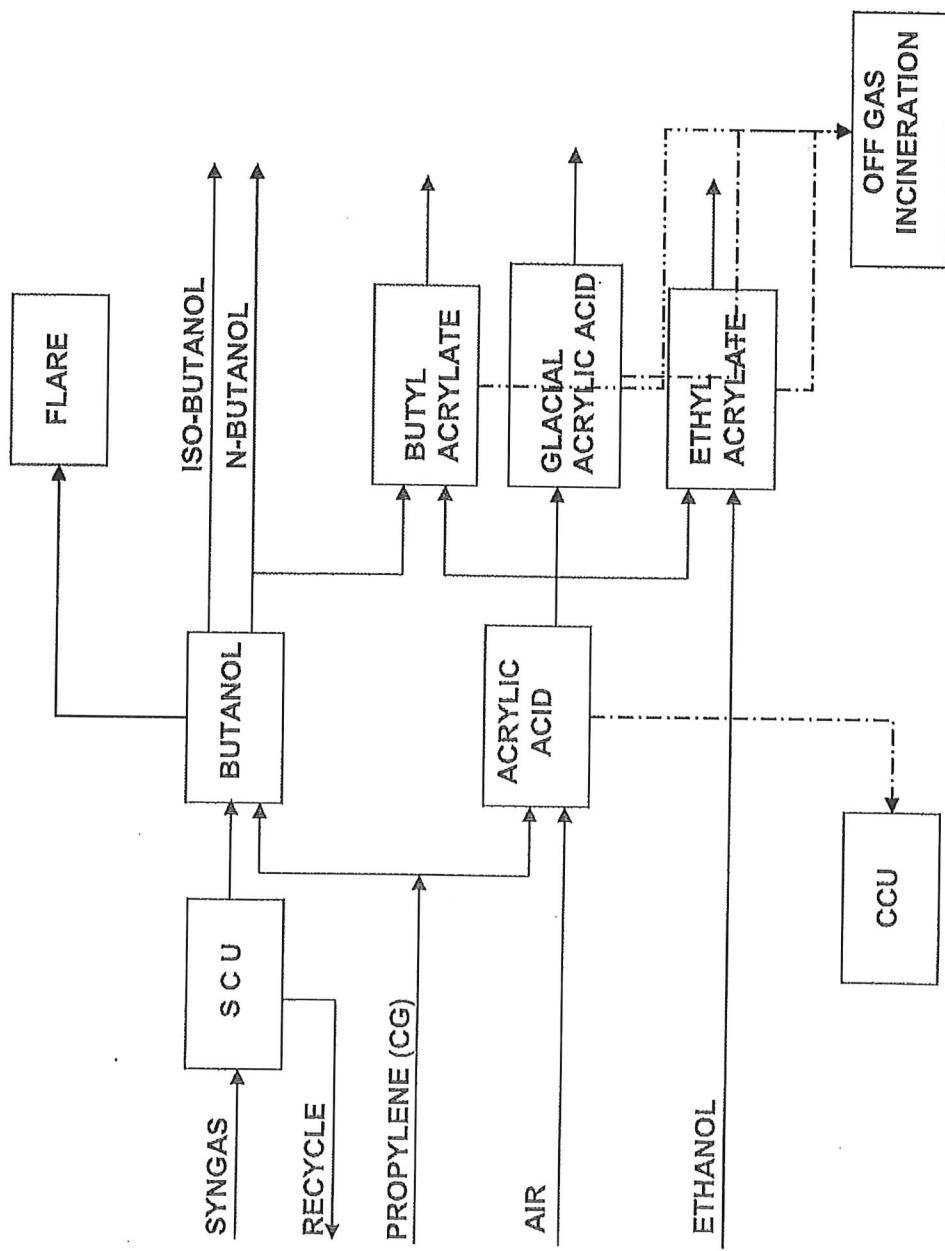
June 20

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Poly 3 plant

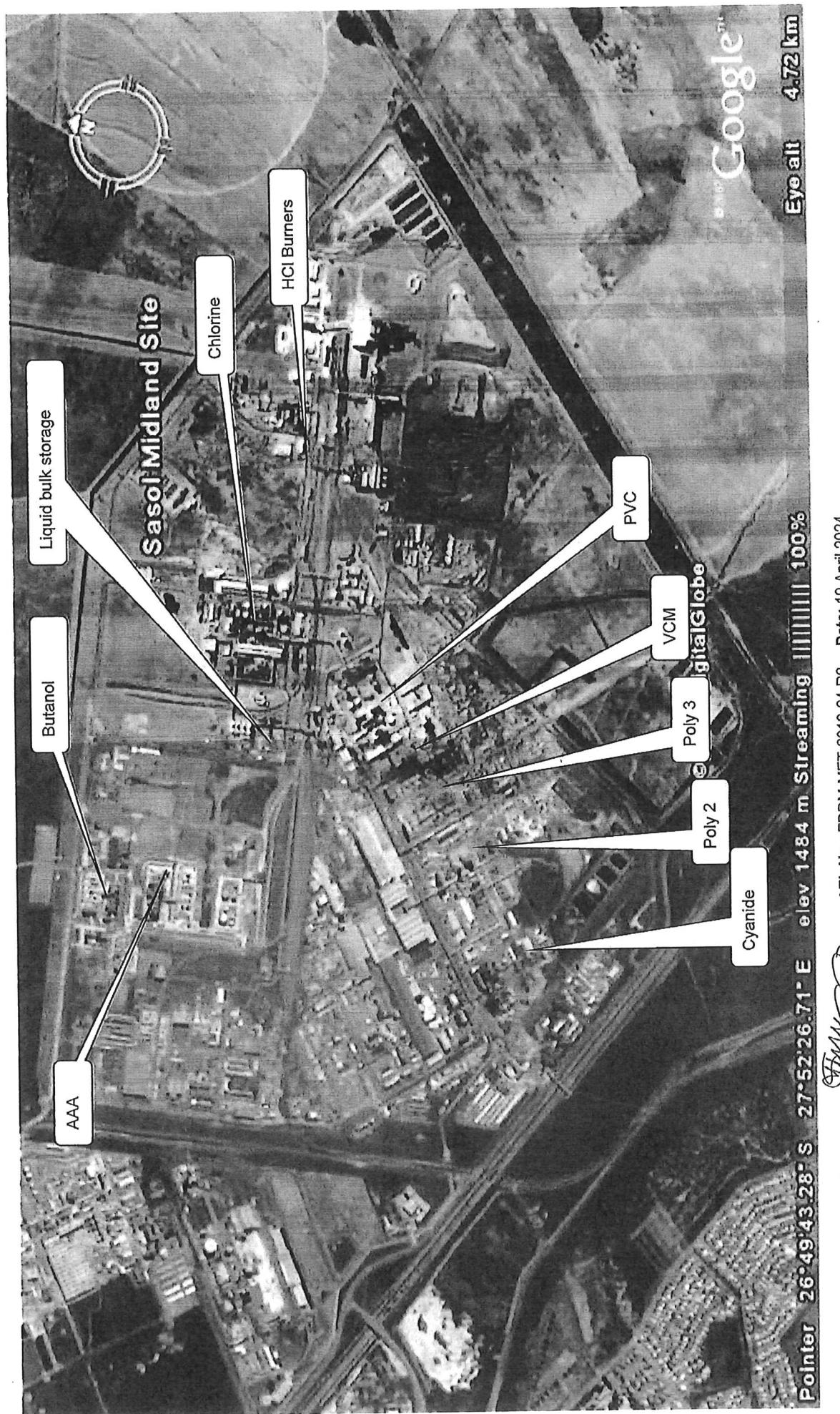


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*[Signature]*

-Air Quality Officer Signature: ..... AEL No.: FDDM-MET-2013-24-R2 Date: 19 April 2024



## 6. RAW MATERIALS AND PRODUCTS

### 6.1. Raw materials used

| Raw Material Type | Maximum Permitted Consumption Rate (Volume) | Units (quantity/period) |
|-------------------|---|-------------------------|
| Poly 2            |   |                         |
| ██████████        | ██████████                                  | t/annum                 |
| ██████████        | ██████████                                  | t/annum                 |
| Poly 3            |   |                         |
| ██████████        | ██████████                                  | t/annum                 |
| ██████████        | ██████████                                  | t/annum                 |
| VCM and PVC       |   |                         |
| VCM Plant         |   |                         |
| ██████████        | ██████████                                  | t/annum                 |
| ██████████        | ██████████                                  | t/annum                 |
| ██████████        | ██████████                                  | t/annum                 |
| PVC Plant         |   |                         |
| ████████████████  | ██████████                                  | t/annum                 |
| Butanol           |   |                         |
| ██████████        | ██████████                                  | t/a                     |
| ██████████        | ██████████                                  | Nm <sup>3</sup> /h      |
| ██████████        | ██████████                                  | Nm <sup>3</sup> /h      |
| AAA               |   |                         |
| ██████████        | ██████████                                  | t/a                     |
| ██████████        | ██████████                                  | t/a                     |
| ██████████        | ██████████                                  | t/a                     |
| Cyanide 1         |   |                         |
| ██████████        | ██████████                                  | Ton/annum               |
| ██████████        | ██████████                                  | GJ/annum                |
| ██████████        | ██████████                                  | Ton/annum               |
| Cyanide 2         |   |                         |
| ██████████        | ██████████                                  | Ton/annum               |
| ██████████        | ██████████                                  | GJ/annum                |
| ██████████        | ██████████                                  | Ton/annum               |

|            |            |           |
|------------|------------|-----------|
| Chlorine   |            |           |
| [REDACTED] | [REDACTED] | Ton/annum |

## 6.2. PRODUCTION RATES

| Product Name | Maximum Production Capacity Permitted (Volume) | Units (quantity/period)   |
|--------------|--|---------------------------|
| Poly 2       |  |                           |
| [REDACTED]   | [REDACTED]                                     | t/a                       |
| Poly 3       |  |                           |
| [REDACTED]   | [REDACTED]                                     | t/a                       |
| VCM and PVC  |  |                           |
| VCM Plant    |  |                           |
| [REDACTED]   | [REDACTED]                                     | t/annum                   |
| PVC Plant    |  |                           |
| [REDACTED]   | [REDACTED]                                     | t/annum                   |
| Cyanide 1    |  |                           |
| [REDACTED]   | [REDACTED]                                     | Ton/annum                 |
| Cyanide 2    |  |                           |
| [REDACTED]   | [REDACTED]                                     | Ton/annum                 |
| Chlorine     |  |                           |
| [REDACTED]   | [REDACTED]                                     | Ton/annum as 100%         |
| [REDACTED]   | [REDACTED]                                     | Ton/annum as 100%         |
| [REDACTED]   | [REDACTED]                                     | Ton/annum as 31% solution |
| [REDACTED]   | [REDACTED]                                     | Ton/annum as 34% solution |
| AAA/Butanol  |  |                           |
| [REDACTED]   | [REDACTED]                                     | Ton/annum                 |

### 6.3. MATERIALS USED IN ENERGY SOURCES

| Materials for Energy Source | Actual Consumption Rate (Quantity) | Units (quantity/period) | Materials Characteristics   |
|-----------------------------|------------------------------------|-------------------------|---|
| Steam from Coal             |                                    |                         | Information contained within the Sasol Sasolburg Operations Gas Loop, Utilities and Chemicals AEL |
| Electricity                 |                                    |                         |   |

| By-Product Name   | Maximum Production Capacity Permitted (Volume) | Design Production Capacity (Volume) | Actual Production Capacity (Volume) | Units (quantity/period) |
|---|--|-------------------------------------|-------------------------------------|-------------------------|
| VCM and PVC   |  |                                     |                                     |                         |
| <u>VCM Plant</u>  |  |                                     |                                     |                         |
| ██████████  | ***  | ██████████                          |                                     | t/annum                 |
| ██████████  | ██████████                                     | ██████████                          |                                     | t/annum                 |
| ***Maximum water generated can vary significantly based on upset conditions on the plant and is therefore not specified |  |                                     |                                     |                         |
| Chlorine  |  |                                     |                                     |                         |
| ██████████  | ██████████                                     | ██████████                          | ██████████                          | Ton/annum               |

## 6.4. SOURCES OF ATMOSPHERIC EMISSIONS

### 6.4.1. Point source parameters

| Point Source code                         | Source name                                  | Latitude (decimal degrees) | Longitude (decimal degrees) | Height of Release Above Ground (m) | Height Above Nearby Building (m) | Diameter at Stack Tip / Vent Exit (m) | Actual Gas Exit Temperature (°C) | Actual Gas Volumetric Flow (m <sup>3</sup> /hr) | Actual Gas Exit Velocity (m/s) |
|---|--|----------------------------|-----------------------------|------------------------------------|----------------------------------|---------------------------------------|----------------------------------|---|--------------------------------|
| 1   | ST6010                                       | 26.82331                   | 27.86686                    | 20                                 | -                                | 0.01                                  | 838                              | 345   | 10.18                          |
| 2   | ST1040                                       | 26.82297                   | 27.86811                    | 25                                 | -                                | 1.77                                  | 126.67                           | 74000   | 12.23                          |
| 3   | VGT VL6011                                   | -26.82642                  | 27.87342                    | 29                                 | -                                | 0.305                                 | 25                               | 4 200   | 16.0                           |
| <b>Vinyl Chloride Monomer (VCM) Plant</b> |  |                            |                             |                                    |                                  |                                       |                                  |   |                                |
| 4   | VCM incinerator                              | 26.82989                   | 27.87317                    | 30                                 | None in the vicinity             | 0.36                                  | 41                               | 9 830   | 26                             |
| 5   | VCM Cracker                                  | 26.82969                   | 27.87272                    | 40                                 | None in the vicinity             | 1.71                                  | 390                              | 112 300   | 3.2                            |
| 6   | VCM Safety Scrubber<br>- not continuous flow | 26.82833                   | 27.87253                    | 26.6                               | None in the vicinity             | 0.7                                   | 96                               | 18 500  | 13.5                           |
| <b>Poly Vinyl Chloride (PVC) Plant</b>    |  |                            |                             |                                    |                                  |                                       |                                  |   |                                |
| 7   | PVC Reaction Stack<br>North                  | 26.82758                   | 27.87408                    | 24                                 |                                  | 0.60                                  | 35                               | 8000  | 4.57                           |
| 8   | PVC Reaction Stack<br>South                  | 26.82717                   | 27.87353                    | 24                                 |                                  | 0.60                                  | 35                               | 8000  | 4.57                           |
| 9   | PVC Slurry Stock<br>Tank Stack               | 26.82717                   | 27.87442                    | 35                                 |                                  | 1.4                                   | 45                               | 60 000  | 7                              |
| 10  | PVC VCM Recovery<br>Stack                    | 26.828                     | 27.87408                    | 24                                 |                                  | 0.05                                  | (-20 to +20)                     | 5 000   | 3.0                            |

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| Point Source code  | Source name                              | Latitude (decimal degrees) | Longitude (decimal degrees) | Height of Release Above Ground (m) | Height Above Nearby Building (m) | Diameter at Stack Tip / Vent Exit (m) | Actual Gas Exit Temperature (°C) | Actual Gas Volumetric Flow (m³/hr)                                | Actual Gas Exit Velocity (m/s) |
|--|--|----------------------------|-----------------------------|------------------------------------|----------------------------------|---------------------------------------|----------------------------------|---|--------------------------------|
| 11   | PVC Multigrade (sludge plant) vent Stack | 26.82758                   | 27.87408                    | 6                                  |                                  | 0.5                                   | 106                              | 7 200   | 9.06                           |
| 12   | PVC Drier Stack North                    | 26.83                      | 27.87                       | 35                                 | -                                | 1.8                                   | 60-70                            | 180 000   | 15.0                           |
| 13   | PVC Drier Stack South                    | 26.83                      | 27.87                       | 35                                 | -                                | 1.8                                   | 60-70                            | 180 000   | 15.0                           |
| <b>Chlorine plant</b>  |  |                            |                             |                                    |                                  |                                       |                                  |   |                                |
| 14   | HCl burner stacks                        | 26.82419                   | 27.88142                    | 15                                 |                                  | 0.16                                  | 31                               | 1462  | 4.2                            |
| 15   | Chlorine hypo stacks                     | 26.82361                   | 27.87406                    | 40                                 | -                                | 0.25                                  | 23                               | 1142  | 3.7                            |
| <b>Cyanide plant</b>   |  |                            |                             |                                    |                                  |                                       |                                  |   |                                |
| 16   | Cyanide 1 stack                          | 26.82361                   | 27.86672                    | 28                                 | -                                | 0.2                                   | 35                               | Cannot be quantified due to hydrogen and the associated fire risk |                                |
| 17   | Cyanide 2 stack                          | 26.82361                   | 27.86672                    | 28                                 | -                                | 0.2                                   | 35                               | Cannot be quantified due to hydrogen and the associated fire risk |                                |
| <b>Polythene Business - Polythene 2 (LLDPE) and Polythene 3 (LDPE) plant</b> |  |                            |                             |                                    |                                  |                                       |                                  |   |                                |
| 18   | Poly 2 Flare                             | 26.83327                   | 27.87093                    | ±52                                | None in the vicinity             | 0.762 (OD)                            | Flame                            | Designed for max relief load of 163t/h                            | Above flashback velocity       |
| 19   | Poly 3 Flare                             | 26.83271                   | 27.87146                    | 52                                 | None in the vicinity             | 0.60 (ID)                             | Flame                            | Designed for max relief load of 120t/h                            | Above flashback velocity       |

The VGT VI6011, VCM Safety scrubber and PVC VCM Recovery unit is only in operations during upset conditions

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#### 6.4.2. Area and/or line source parameters

| Area Source code | Source name  | Source Description                 | Latitude (decimal degrees) of SW corner | Longitude (decimal degrees) of SW corner | Height of Release Above Ground (m) | Length of Area (m) | Width of Area (m) | Angle of Rotation from True North (°) |
|------------------|--------------|------------------------------------|---|--|------------------------------------|--------------------|-------------------|---------------------------------------|
| 1                | Tank TK219   | Toluene tank                       | -26.8213                                | 27.8674                                  | 11                                 | n/a                | n/a               | n/a                                   |
| 2                | Tank TK144   | OXO CAT tank                       | -26.8213                                | 27.8675                                  | 13                                 | n/a                | n/a               | n/a                                   |
| 3                | Tank TK254   | Spent CAT tank                     | -26.8214                                | 27.8675                                  | 9                                  | n/a                | n/a               | n/a                                   |
| 4                | Tank TK2009  | Toluene tank                       | -26.8238                                | 27.8672                                  | 7                                  | n/a                | n/a               | n/a                                   |
| 5                | Tank TK2003  | Acrylic Acid off spec tank         | -26.8237                                | 27.8674                                  | 12                                 | n/a                | n/a               | n/a                                   |
| 6                | TB1704       | Low boil storage tank              | -26.8293                                | 27.8724                                  | 5                                  | n/a                | n/a               | n/a                                   |
| 7                | TB1703       | High boil storage tank             | -26.8289                                | 27.8719                                  | 6                                  | n/a                | n/a               | n/a                                   |
| 8                | FB1701       | VCM Off spec tank                  | -26.8287                                | 27.8720                                  | 9                                  | n/a                | n/a               | n/a                                   |
| 9                | VCM Sphere A | Storage of VCM                     | -26.8263361                             | 27.8571944                               | 22                                 | n/a                | n/a               | n/a                                   |
| 10               | VCM Sphere B | Storage of VCM                     | -26.8265028                             | 27.87554722                              | 22                                 | n/a                | n/a               | n/a                                   |
| 11               | TB1701       | Storage of Ethylene Dichloride     | -26.8290167                             | 27.87220278                              | 9                                  | n/a                | n/a               | n/a                                   |
| 12               | TB1702       | Storage of wet Ethylene Dichloride | -26.8289028                             | 27.87205833                              | 9                                  | n/a                | n/a               | n/a                                   |
| 13               | TB1705       | Storage of Ethylene Dichloride     | -26.8291444                             | 27.87231944                              | 9                                  | n/a                | n/a               | n/a                                   |

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## 7. APPLIANCES AND MEASURES TO PREVENT AIR POLLUTION

### 7.1. Appliances and control measures

| Appliance / Process Equipment Number   | Appliances                   |                         |                            | Product Name and Model | Technology Type                  | Commission Date | Date of Significant Modification / Upgrade | Air Pollution Control Technology |  |                                   | Associated Source Code |
|--|------------------------------|-------------------------|----------------------------|------------------------|----------------------------------|-----------------|--|----------------------------------|--|-----------------------------------|------------------------|
|  | Appliance Type / Description | Appliance Serial Number | Appliance Manufacture Date |                        |                                  |                 |  | Nominal Capacity                 | Permitted Minimum Control Efficiency (%) | Permitted Minimum Utilization (%) |                        |
| All air pollution control technology must be available for more than 96% of the time |                              |                         |                            |                        |                                  |                 |  |                                  |  |                                   |                        |
| Not available  | Not available                | Not available           | Not available              | Not available          | Scrubbers                        | 2004            | None                                       | **                               | **                                       | -                                 | 3                      |
| Not available  | Not available                | Not available           | Not available              | Not available          | Scrubbers                        | 1996            | None                                       | **                               | **                                       | -                                 | 4                      |
| Not available  | Not available                | Not available           | Not available              | Not available          | Scrubbers                        | 1996            | None                                       | **                               | **                                       | -                                 | 6                      |
| Not available  | Not available                | Not available           | Not available              | Not available          | Non-thermal vapour recovery unit | 1977            | None                                       | **                               | **                                       | -                                 | 10                     |
| Not available  | Not available                | Not available           | Not available              | Not available          | Cyclone Filters                  | 2001            | None                                       | **                               | **                                       | -                                 | 11                     |
| Not available  | Not available                | Not available           | Not available              | Not available          | Cyclones                         | 1977            | None                                       | **                               | **                                       | -                                 | 12&13                  |
| Not available  | Not available                | Not available           | Not available              | Not available          | Scrubber                         | 1977            | 2014                                       | 15.3 t/h                         | **                                       | -                                 | 15                     |
| Not available  | Not available                | Not available           | Not available              | Not available          | Scrubber                         | 1964            | 2003                                       | **                               | **                                       | -                                 | 16                     |
| Not available  | Not available                | Not available           | Not available              | Not available          | Scrubber                         | 1983            | **   | **                               | **                                       | -                                 | 17                     |

## 7.2. POINT SOURCE – MINIMUM EMISSIONS STANDARDS (UNDER NORMAL WORKING CONDITIONS)

### Point source – operating requirements

| Point Source Code | Pollutant Name                  | Maximum Release Rate  |                        | Average Period | Duration of Emissions |
|-------------------|---------------------------------|-----------------------|------------------------|----------------|-----------------------|
|                   |                                 | (mg/Nm <sup>3</sup> ) | Date to be Achieved By |                |                       |
| 1                 | VOCs                            | 150                   |                        | Hourly         | Continuous            |
| 2                 | VOCs                            | 150                   |                        | Hourly         | Continuous            |
| 3                 | VOCs                            | 40 000                |                        | Hourly         | Continuous            |
| 4                 |                                 | 25                    |                        | Daily          | Continuous            |
|                   | Particulates                    | 10                    |                        | Daily          | Continuous            |
|                   | SO <sub>2</sub>                 | 50                    |                        | Daily          | Continuous            |
|                   | NO expressed as NO <sub>2</sub> | 200                   |                        | Daily          | Continuous            |
|                   | HF                              | 1                     |                        | Daily          | Continuous            |
|                   |                                 | 75                    |                        | Daily          | Continuous            |
|                   | CO                              | 50                    |                        | Daily          | Continuous            |
|                   |                                 | 30                    |                        | Daily          | Continuous            |
|                   | HCl                             | 10                    |                        |                |                       |
|                   | Pb+As+Sb+Cr+Co+Cu+Mn+Ni+V       | 0.5                   |                        | Hourly         | Continuous            |
|                   | Hg                              | 0.05                  |                        | Hourly         | Continuous            |
|                   | Cd+Tl                           | 0.05                  |                        | Hourly         | Continuous            |

  
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|     |                 |                          |  |  |        |            |
|-----|-----------------|--------------------------|--|--|--------|------------|
|     | TOC             | 10                       |  |  | Daily  | Continuous |
|     | NH <sub>3</sub> | 10                       |  |  | Daily  | Continuous |
|     | Dioxins         | 0.1ngTEQ/Nm <sup>3</sup> |  |  | Hourly | Continuous |
| 5   |                 | 120                      |  |  | Hourly | Continuous |
|     | Particulates    | 70                       |  |  | Hourly | Continuous |
|     |                 | 1 700                    |  |  | Hourly | Continuous |
|     | SO <sub>2</sub> | 1 000                    |  |  | Hourly | Continuous |
|     |                 | 1 700                    |  |  | Hourly | Continuous |
|     | NOX             | 400                      |  |  | Hourly | Continuous |
| 6   | VOCs            | 40 000                   |  |  | Hourly | Continuous |
| 7   | VOCs            | 40 000                   |  |  | Hourly | Batch      |
| 8   | VOCs            | 40 000                   |  |  | Hourly | Continuous |
| 9   | VOCs            | 40 000                   |  |  | Hourly | Continuous |
| 10  | VOCs            | 40 000                   |  |  | Hourly | Continuous |
| 11  | VOCs            | 40 000                   |  |  | Hourly | Continuous |
| 12  | Particulates    | 21 mg/Am <sup>3</sup>    |  |  | Hourly | Batch      |
| 13  | Particulates    | 21 mg/Am <sup>3</sup>    |  |  | Hourly | Continuous |
| 14a | HCl             | 10                       |  |  | Hourly | Continuous |
| 14b | HCl             | 10                       |  |  | Hourly | Continuous |
| 14c | HCl             | 10                       |  |  | Hourly | Continuous |
| 14d | HCl             | 10                       |  |  | Hourly | Continuous |
| 15  | Cl <sub>2</sub> | 50                       |  |  | Hourly | Continuous |

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|    |     |     |        |            |
|----|-----|-----|--------|------------|
| 16 | HCN | 0.5 | Hourly | Continuous |
| 17 | HCN | 0.5 | Hourly | Continuous |

7.2.1 In the case of a limit value exceedance of a parameter not monitored through online monitoring but via a third party, the following shall apply:

- The air quality officer shall be notified within 24-hours from the time that Sasol becomes aware of the exceedance
- Within 14 days after the notification of the air quality officer, a plan on how the facility will manage the upset condition and the plant be brought back into compliance, must be presented to the air quality officer together with a dispersion model for approval.
- On acceptance of the plan with its associated impact, the Air Quality Officer will issue a written approval for the implementation of the plan and the necessary reporting and tracking to bring the plant back into compliance
- Failing to adhere to the above mentioned under 7.2.9 or the plan will constitute non-compliance

7.2.2 The license holder must comply with the National Atmospheric Emission Reporting Regulations (Government Notice No.R. 283 of 2 April 2015) and also follow the guidelines provided in the NAEIS reporting guidelines to their annual emissions

### 7.3. POINT SOURCE OPERATING CONDITIONS (UNDER START-UP, MAINTENANCE AND SHUT-DOWN CONDITIONS)

The following conditions must be adhered to at minimum during start up, maintenance and shut down conditions:

Should normal start up, maintenance and shutdown conditions exceed a period of 48 hours, Section 30 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), shall apply.

Technical and Engineering testing work will be considered extraordinary maintenance to which conditions in Section 7.2 and normal start-up, shut down and maintenance/upset conditions do not apply. Prior notification must be given to the Air Quality Officer to confirm the start and end date of this testing work.

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#### 7.4. POINT SOURCE – EMISSIONS MONITORING AND REPORTING REQUIREMENTS

| Point Source Code | Emissions Sampling / Monitoring Method  | Sampling Frequency        | Sampling Duration   | Parameters to be measured | Parameters to be reported | Conditions under which monitoring should be stopped | Reporting Frequency |
|-------------------|---|---------------------------|---|---------------------------|---------------------------|---|---------------------|
| 1                 | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | At least Annually         | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | VOCS                      | VOCs                      | Upon written approval by the Air Quality Officer    | Annually            |
| 2                 | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | At least Annually         | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | VOCS                      | VOCs                      | Upon written approval by the Air Quality Officer    | Annually            |
| 3                 | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and                                   | Annually – if operational | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and                                   | VOCS                      | VOCs                      | Upon written approval by the Air Quality Officer    | Annually            |



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|   | Regulations (Refer to Schedule A)   |  | Regulations (Refer to Schedule A)   |   |   |  |          |
|---|---|--|---|---|---|--|----------|
| 4 | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | Continuous emission monitoring as per Minimum Emission Standards | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | Particulates, SO <sub>2</sub> , NO <sub>x</sub> , CO, HCl, HF, NH <sub>3</sub> , Pb, As, Sb, Cr, Co, Cu, Mn, Ni, V, Hg, Cd, Tl, TOC, dioxins&furans | Particulates, SO <sub>2</sub> , NO <sub>x</sub> , CO, HCl, HF, NH <sub>3</sub> , Pb, As, Sb, Cr, Co, Cu, Mn, Ni, V, Hg, Cd, Tl, TOC, dioxins&furans | Upon written approval by the Air Quality Officer | Annually |
| 5 | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | All other parameters, at least annually                          | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | Particulates, SO <sub>2</sub> and NO <sub>x</sub>   | Particulates, SO <sub>2</sub> and NO <sub>x</sub>   | Upon written approval by the Air Quality Officer | Annually |
| 6 | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | Annually if operational  | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | VOCs  | VOCs  | Upon written approval by the Air Quality Officer | Annually |
| 7 | As Indicated in the National Environmental Management: Air Quality  | At least Annually  | As Indicated in the National Environmental Management: Air Quality  | VOCs  | VOCs  | Upon written approval by the Air Quality Officer | Annually |

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|    |   |  |   |      |  |  |
|----|---|--|---|------|--|--|
|    | Act (39 of 2004) Standards and Regulations (Refer to Schedule A)  | Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | VOCS  | VOCS | Upon written approval by the Air Quality Officer | Annually   |
| 8  | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | At least Annually  | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | VOCS | VOCS   | Upon written approval by the Air Quality Officer |
| 9  | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | At least Annually  | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | VOCS | VOCS   | Upon written approval by the Air Quality Officer |
| 10 | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | Annualy if operational   | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | VOCS | VOCS   | Upon written approval by the Air Quality Officer |
| 11 | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and                                   | At least Annually  | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and                                   | VOCS | VOCS   | Upon written approval by the Air Quality Officer |



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|           |   |                   |   |                 |                 |  |          |
|-----------|---|-------------------|---|-----------------|-----------------|--|----------|
|           | Regulations (Refer to Schedule A)   |                   | Regulations (Refer to Schedule A)   |                 |                 |  |          |
| 12        | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | At least Annually | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | Particulates    | Particulates    | Upon written approval by the Air Quality Officer | Annually |
| 13        | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | At least Annually | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | Particulates    | Particulates    | Upon written approval by the Air Quality Officer | Annually |
| 14a,b,c,d | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | At least Annually | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | HC1             | HC1             | Upon written approval by the Air Quality Officer | Annually |
| 15        | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | At least Annually | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | Cl <sub>2</sub> | Cl <sub>2</sub> | Upon written approval by the Air Quality Officer | Annually |

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|       |   |                   |   |     |     |  |          |
|-------|---|-------------------|---|-----|-----|--|----------|
| 16&17 | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | At least Annually | As Indicated in the National Environmental Management: Air Quality Act (39 of 2004) Standards and Regulations (Refer to Schedule A) | HCN | HCN | Upon written approval by the Air Quality Officer | Annually |
|-------|---|-------------------|---|-----|-----|--|----------|

### 7.5. AREA AND/OR LINE SOURCE – MANAGEMENT AND MITIGATION MEASURES

| Area and/or Line Source Code | Area and/or Line Source Description | Description of Specific Measures | Timeframe for Achieving Required Control Efficiency | Method of Monitoring Measures Effectiveness | Contingency Measures |
|------------------------------|-------------------------------------|----------------------------------|---|---|----------------------|
| N/A                          | N/A                                 | N/A                              | N/A   | N/A   | N/A                  |

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## 7.6. ROUTINE REPORTING AND RECORD-KEEPING

### Complaints register

The licence holder must maintain a complaints register at its premises, and such register must be made available for inspections. The complaints register must include the following information on the complainant, namely, the name, physical address, telephone number, date and the time when the complaint was registered. The register should also provide space for noise, dust and offensive odours complaints.

Furthermore, the licence holder is to investigate and, monthly, report to the licencing authority in a summarised format on the total number of complaints logged. The complaints must be reported in the following format with each component indicated as may be necessary:

- (a) Source code / name;
- (b) Root cause analysis;
- (c) Calculation of impacts / emissions associated with incidents and dispersion modelling of pollutants, where applicable;
- (d) Measures implemented or to be implemented to prevent recurrence; and
- (e) Date by which measure will be implemented.

The licensing authority must also be provided with a copy of the complaints register. The record of a complaint must be kept for at least 5 (five) years after the complaint was made.

## 7.7 ANNUAL REPORTING

The licence holder must complete and submit to the licensing authority an annual report. The report must include information for the year under review (i.e. annual year end of the company). The report must be submitted to the licensing authority not later than 60 (sixty) days after the end of each reporting period. The annual report must include, amongst others, the following items:

- (a) Pollutant emissions trend;
- (b) Compliance audit report(s);
- (c) Major upgrades projects (i.e. abatement equipment or process equipment); and
- (d) Greenhouse gas emissions: Reporting in terms of S43 (1)(i) shall be done in accordance with the Greenhouse Gas Reporting Regulations.

The holder of the licence must keep a copy of the annual report for a period of at least 5 (five) years.

## 8. DISPOSAL OF WASTE AND EFFLUENT ARISING FROM ABATEMENT EQUIPMENT CONTROL TECHNOLOGY

The disposal of any waste and effluent arising from the abatement equipment control technology must comply with the relevant legislation and requirements of the relevant authorities.

| Source Code / Name  | Waste / Effluent Type | Hazardous Components Present | Method of Disposal |
|---|-----------------------|------------------------------|--------------------|
| All scrubber liquor and water effluent are treated at the Sasol bio- and water works facility or recycled into plant processes during manufacturing |                       |                              |                    |

## 9. PENALTIES FOR NON-COMPLIANCE WITH LICENCE AND STATUTORY CONDITIONS OR REQUIREMENTS

Failure to comply with any of the licence and relevant statutory conditions and/or requirements is an offence, and licence holder, if convicted, will be subjected to those penalties as set out in section 52 of the AQA.

## 10. REPORTING OF ABNORMAL RELEASES AND EMERGENCY RESPONSES

The holder must prevent deviations from normal operating conditions that would result in pollution exceeding specified limit values. If any conditions exist that will result in excessive emissions or nuisance must be immediately reported to the Air Quality Officer. Section 30 NEMA incidence must also be reported to the Air Quality Officer within 24 hours. Where excessive emissions occur, which could cause adverse health and environmental impacts or nuisance, urgent corrective measures must be taken by the holder to contain or minimise the emissions through operational interventions.

Remediation, if required shall be carried out to the satisfaction of the licensing authority and/or any other government agencies.

## 11. APPEAL OF ATMOSPHERIC EMISSIONS LICENCE

11.1 The holder of the authorization must notify every registered interested and affected party, in writing and within five (5) working days of the date of issue, of the holder's receipt of this atmospheric emissions licence.

11.2 The written notification referred to in Condition 11.1 above must –

11.2.1 Specify the date on which the atmospheric emissions licence was issued;

11.2.2 Inform interested and affected parties of the appeal procedure provided for in Chapter 7 the GN No R543 of 18 June 2010; and

11.2.3 Advise interested and affected parties that a copy of the atmospheric emissions licence and reasons for the decision will be furnished on request

11.3 An appeal against the decisions contained in this atmospheric emissions licence must be lodged, in writing with the: Municipal Manager: Fezile Dabi District Municipality, PO Box 10, Sasolburg, 1949, Tel No:016 970 8600, Fax No: 016 973 1582

## 12. REVIEW

- 12.1 The authority shall have the right to review the licence continuously within the period as stipulated in clause 1 above or as and when such review is deemed necessary by the Air Quality Officer;
- 12.2 Such review shall be done as a result of amendments in legislation or by virtue of findings from regular inspections done by the Air Quality Officer;
- 12.3 The authority shall serve the license holder with a 30(thirty) day notice when such a necessity arises;
- 12.4 The authority shall under no circumstances be barred by license holder from reviewing the license upon receiving notice of review.

