

Basic Assessment Report



KZN Agriculture and Environmental Affairs

Mnyango: eZolimo neZemvelo

SIFUNDAZWE SAKWAZULU-NATALI

Basic Assessment Report

in terms of the

Environmental Impact Assessment Regulations, 2006

Kindly note that:

1. This **basic assessment report** meets the requirements of regulation 23 of the EIA Regulations, 2006 and is meant to streamline applications.
2. The report may be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
3. Where applicable **cross** the boxes that are applicable or **black out** the boxes that are not applicable in the report.
4. An incomplete report will be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by this department for assessing the application, it may result in the rejection of the application as provided for in the regulations.
6. The report must be compiled by an independent environmental assessment practitioner.
7. Unless protected by law, all information in the report will become public information on receipt by this department. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
8. This department may require that for specified types of activities in defined situations only parts of this report need to be completed. In addition, if it is clear to the EAP that because of the particular circumstances of the case it is not sensible to complete any of the sections indicated under paragraph 3 of this report, he or she may apply for exemption from completing that part of the report in the spaces provided in the report. It must however be noted that if the application for exemption is turned down, the report may have to be resubmitted.
9. No faxed or e-mailed reports will be accepted.
10. This application must be handed in or posted to the appropriate Regional Office of the KwaZulu-Natal Department of Agriculture and Environmental Affairs at one of the following addresses:

- **FOR APPLICATIONS IN NORTHERN KWAZULU-NATAL** (Amajuba, Umkhanyakude, Uthungulu, Umzinyathi and Zululand District Municipalities)

Environment: North Region
KwaZulu Natal Department of Agriculture and Environmental Affairs
Private Bag X1048
RICHARDS BAY
3900

4th Floor ABSA Building
Lakeview Terrace
RICHARDS BAY

Contact Person: Ms Zama Mbanjwa
Telephone No.: (035) 780 6765

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- **FOR APPLICATIONS IN SOUTHERN KWAZULU-NATAL** (Ethekwini Metro, Ilembe, Sisonke, Ugu, Umgungundlovu and Uthukela District Municipalities):

Environment: South Region
KwaZulu-Natal Department of Agriculture and Environmental Affairs
Private Bag X6005
HILTON
3245

A Block
4 Pin Oak Avenue
HILTON

Contact Person: Ms Mavis Padayachee
Telephone No.: (033) 343 8428

COMPLETION OF THIS REPORT

Please indicate the numbers of the sections of this report that have not been completed:

Section C:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Section D:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Section E:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Provide detailed reasons for not completing the sections indicated:

Section	N/A
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SECTION A: APPLICATION FOR EXEMPTION

Please provide details regarding any application for exemption from the requirements of the EIA Regulations, 2006:

Has an application for exemption been submitted to the Department?		NO
Has an Exemption Notice in respect of an application for exemption been issued?		NO
Is a copy of the Exemption Notice attached to this report?		NO

SECTION B: DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER AND SPECIALISTS

1. NAME AND CONTACT DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Name and contact details of the EAP who prepared this report:

Business name of EAP:	SRK Consulting Engineers & Scientists		
Physical address:	Suite 201 Sinodale Centre, 345 Burger Street, Pietermaritzburg		
Postal address:	P. O. Box 460, Pietermaritzburg		
Postal code:	3200	Cell:	083 609 7783
Telephone:	033 345 6311	Fax:	033 345 6403
E-mail:	kking@srk.co.za		

2. NAMES AND EXPERTISE OF REPRESENTATIVES OF THE EAP

Names and details of the expertise of each representative of the EAP involved in the preparation of this report:

Name of representative of the EAP	Educational qualifications	Experience at environmental assessments (yrs)
Nick Holdcroft	B. Soc. Sci, Masters, 1997	12 years
Kirsten King	B. Soc. Sci, Hons, 1995	10 years
Phillipa Harrison	BA Doctorate, 2006	1 year

3. NAMES AND EXPERTISE OF SPECIALISTS

Names and details of the expertise of each specialist that has contributed to this report:

Name of specialist	Educational qualifications	Experience in field of expertise
Mr. Lance Coetzee, Ecoserv	HDip(ChemEng)	over 10 years
Mr. Chris Liebenberg, Kwezi V3	BSc (Hons)(Civil Eng), Pr Eng, PrCPM	33 years
Mr. Jacque Rossouw	BSc., BEng (Electrotechnical)	34 years
Dr. Willie van Niekerk, Infotox	PhD QEP (USA) Pr Sci Nat (Env. Sci.)	39 years

SECTION C: ACTIVITY INFORMATION

1. PROJECT INFORMATION

a. Project title

Fugitive Fume and Dust Emission Control Project at Assmang Manganese Cato Ridge Works, KwaZulu-Natal.

b. Project description

Describe your project in detail:

Background

In November 2007, Assmang Manganese Cato Ridge Works (Assmang) submitted an application for environmental authorisation (DM/0220/07) to the KwaZulu-Natal Department of Agriculture and Environmental Affairs (DAEA) for improvements to the current operation at the Cato Ridge Works which included the following activities:

- The Fugitive Fume and Dust Emission Control Project (Fugitive Dust Project); and
- Upgrading of the existing water and sewage treatment plants on site.

Although only a Basic Assessment process is required for the Fugitive Dust Project, upgrading of the waste water and sewage treatment plants require a full EIA process (i.e. Scoping and Assessment Phases). As such, a combined application for a full EIA process for all three proposed activities was submitted.

The *Draft Scoping Report for the Proposed Improvements to Current Operations at Assmang Manganese Cato Ridge Works* (SRK, January 2008) was distributed for public review and comment from 21 January to 27 February 2008. During the comment period all interested and affected parties (IAPs) indicated their support for the Fugitive Dust Project given the project will result in positive impacts by reducing the potential exposure of employees at Assmang to fumes and dust containing manganese at the existing operation (Refer to Appendix E – Public Involvement Report). The primary concern raised by key IAPs regarding the project was the time schedule for project implementation in that it was considered lengthy due to the need to undertake the EIA process. In addition, correspondence was received from the Department of Environmental Affairs and Tourism (DEAT) on 25 February 2008 recommending that a Basic Assessment process be undertaken for the project.

Further to the above, a meeting was convened with the DAEA, DEAT and the eThekweni Municipality Environmental Health Department on 27 February 2008 to discuss possible options to prioritise the EIA process for the Fugitive Dust Project. At this meeting it was agreed that SRK Consulting (SRK), as the independent Environmental Assessment Practitioner appointed by Assmang, submit a letter to the DAEA outlining proposed recommendations for the way forward. SRK submitted a letter to the DAEA, dated 05 March 2008, recommending that the Fugitive Dust Project be withdrawn from the full EIA process and a Basic Assessment process be undertaken. In response, the DAEA provided correspondence on 11 April 2008 noting acceptance of SRK's recommendation (Refer to Appendix E – Public Involvement Report for copies of the various letters). Therefore, a Basic Assessment process was initiated for the Fugitive Dust Project.

The information contained in the Basic Assessment Report (this document) has therefore been based on information contained in the Draft Scoping Report (*Proposed Improvements to Current Operations at Assmang*, SRK, January 2008) and includes comments received from IAPs on the proposed project to date, as well as the latest information for the project, as received from Assmang.

Other Processes Currently Taking Place On-site

Other processes and procedures currently taking place at the Cato Ridge Works, of which cognizance must be taken during this EIA process; are as follows:

- A Section 32 public enquiry under the Occupational Health and Safety Act (No. 85 of 1993) is currently being undertaken by the Department of Labour to investigate the incidents of manganese at the Cato Ridge Works;
- The national Department of Environmental Affairs and Tourism (DEAT) has identified various alleged contraventions of, and non-compliances with environmental legislation, including those relating to waste disposal and atmospheric emissions. Assmang is currently addressing these issues in co-operation with DEAT, and it is understood that these issues will be resolved to the satisfaction of the Department. Consultants have been appointed to assist Assmang in addressing the issues raised (Mr. Chris Liebenberg of Kwezi V3 for the water and waste aspects and Mr. Jan Potgieter of EnviroNgaka for the air quality issues) and remedial action plans have been submitted to DEAT for approval;
- Assmang propose upgrading the existing industrial effluent and sewage treatment plants on site which is currently subject to a full EIA process (DM/0220/07); and

- Assmang propose expanding production at the Cato Ridge Works through the construction and operation of two new furnaces (Furnaces No. 7 & 8) which are subject to separate full EIA processes (DM/0079/07 and DM/0080/07).

Description of Current Operations

Site Layout and Infrastructure

The Assmang Cato Ridge Works (Assmang) occupies an industrial site of approximately 40 hectares (ha) surrounded by approximately 200 ha of vacant land owned by Assmang in the Cato Ridge area. The Assmang Works produces ferromanganese alloys (high, medium or low carbon) and silico manganese alloys, in various grades and sizes to customers, both locally and internationally, through the operation of six submerged electric arc furnaces, a refinery operation known as Cato Ridge Alloys (CRA) Pty Ltd. and a Metal Recovery Plant.

The manganese smelting process occurs in the six electric arc furnaces located on site. Furnaces No. 1 to 4 are referred to as the "South Plant" while Furnaces No. 5 to 6 constitute the "North Plant". Three of the furnaces (Furnaces No. 1, 2 and 5) are open furnaces while Furnaces No. 3, 4 and 6 are closed furnaces. Ancillary to the furnaces are the offices, workshops, the CRA Refinery Plant, the laboratory, clinic and the Metal Recovery Plant.

The slagheaps are located to the north of the site, while the baghouse dust stockpiles, waste water treatment plant (Candy Filter Plant) and scrubber settlement dams (slimes dams) occupy a large part of the southern portion of the site. A small on-site sewage treatment plant also services the Works.

Both Eskom and Assmang have electrical sub-stations on the site near the furnace complex and Umgeni Water supplies potable water from a point of supply located on Eddie Hagan Drive. A 23 ton bulk liquid petroleum gas (LPG) installation, which is defined as a Major Hazard Installation (MHI) in terms of the MHI Regulations promulgated in terms of the Occupational Health and Safety Act (No. 85 of 1993), is located to the north of the site adjacent to the slag dumps.

The six furnaces at the Assmang Works and the converter at the CRA Plant are all served by gas cleaning plants to remove particulates from the off-gas streams before the gas is emitted / flared to the atmosphere. Two different gas-cleaning technologies are currently employed at Assmang, namely baghouse cleaning plants are utilized for the open furnaces (Furnaces No. 1, 2 and 5) while wet scrubber cleaning plants are utilized for the closed furnaces (Furnaces No. 3, 4 and 6). Waste water from the scrubbers is treated at the Candy Filter Plant, the clean water recycled for use in the scrubbers and the thickened sludge settled in the slimes dams.

Production Process

The primary inputs utilised at Assmang in the manufacture of ferromanganese alloys include:

- Manganese ore;
- Sinter;
- Reductants: Anthracite and Coke;
- Fluxes: Quartz and Limestone;
- Electrode paste;
- Carbon-steel electrode casings;
- Water; and
- Electricity.

The electricity used to power the furnaces is provided by Eskom while water utilised in the wet scrubber gas plants that clean the off-gas released during the smelting process as well as cooling water and water for dust suppression and other uses (i.e. domestic) is provided by Umgeni Water.

The other raw materials listed above are transported to the site, mainly by rail and also via road transport.

Transport of Raw Materials

The manganese ore is railed to the site from Assmang's Nchwaning and Gloria manganese ore mines situated near Black Rock in the Northern Cape. Mammattwan Sinter (sintered manganese ore) is also railed in from the Northern Cape, which is supplied to Assmang by Samancor. The reductants (i.e. substances "*capable of bringing about the reduction of another substance as it itself is oxidized*" WordWeb, 2008) of metallurgical coke and anthracite are railed to the Assmang Works from sources located within KwaZulu-Natal. Metallurgical coke is also imported from China. These reductants, in conjunction with the Soderberg electrodes, form the source of carbon units required for the smelting operation.

The other inputs of quartz, electrode paste and electrode casings are transported by road to the Cato Ridge Works. The carbon-steel casings around the electrodes melt during the smelting process and add small quantities of ferrous material into the product. Therefore these have to be continuously replaced.

Approximately 708 327 tons per annum of raw input materials are transported to Assmang via rail transport while approximately 23 500 tons per annum of raw input materials are transported to Assmang via road transport.

Raw Materials Handling and Storage

The raw materials of ferromanganese ore, sinter, coke, anthracite, quartz and limestone are transported to the site by rail and road and are off-loaded at the off-loading section and stockpiled. The raw input materials are stored in raw material bunkers located adjacent to the furnace buildings. Two tipplers are used to transfer the raw materials from the rail wagons onto the raw material stockpiles, via conveyors and overhead tripper cars. Tippler one services

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Furnaces No. 1 to No. 4, while tippler two services Furnaces No. 5 and No. 6. From the raw material bunkers, the raw materials are transferred to 24-hour bins. In the South Plant (Furnaces No. 1 to No. 4) the raw material is loaded into the 24-hour bins via an ore bridge, while in the North Plant (Furnaces No. 5 and No. 6) the raw material is loaded into the 24-hour bins via a series of conveyors.

The raw materials are then drawn from the 24-hour bins via vibrators and transferred to the Batching Plant via a series of conveyors. In the Batching Plant the raw materials are weighed in a weigh flask. The raw material is then batched, according to product specification, via sandwich layer discharge from the weigh flasks and transported pre-mixed to 8-hour bins (furnace day bins) positioned above the furnaces, to be fed into the furnaces as required. At Furnaces 3 and 4 the raw material is transported from the Batching House to the 8-hour bins via a conveyor to an ore bucket which is hoisted via crane to fill the 8-hour bins.

The Smelting Process

Each of Assmang's six submerged electric arc furnaces utilise three Soderberg electrodes. The furnaces are filled with raw materials from the 8-hour bins located above the furnaces. An arc is continually struck between the electrodes which provide the necessary heat for the smelting process. The bottom sections of the three electrodes and the arcs are submerged in the raw materials and the carbon in the raw materials, in combination with the heat, allows for the furnace to reduce the ore to an iron/manganese alloy. The smelting process therefore produces a molten mixture of high carbon ferromanganese product (consisting of manganese, iron, carbon and silicon) and slag (consisting of calcium oxide, manganese oxide, aluminium oxide, magnesium oxide, silica and amorphous iron oxide). The molten mixture of metal and slag is tapped (released) from the furnaces into ladles. On average the furnaces are tapped every two hours.

Once in the ladle, the molten metal and slag separate as a result of density differences. The slag is decanted into slag bells which are transported to the on-site slag dumps located in the northern section of the site. At this point the slag is tipped into "ponds" for further cooling. Once sufficiently cooled, the slag is recovered from the ponds via an excavator and placed onto the slag stockpiles. The stockpiled slag is then reprocessed at the Metal Recovery Plant to recover high carbon ferromanganese.

The ferromanganese alloy is poured from the ladle into shallow moulds consisting of metal fines, where it solidifies. Some of the high carbon ferromanganese alloy is transferred from the furnace to the CRA Refinery Plant for reprocessing into medium or low carbon ferromanganese. The solidified ferromanganese ingots from the moulds are transferred via a hot metal crane from the furnace area onto tractors and moved to the ingot laydown area where they are cooled for approximately 48-hours. The furnace building is equipped with a common crane bay and six overhead hot metal cranes.

Once the ferromanganese alloy at the ingot laydown area has sufficiently cooled it is transferred via front-end loader to the High Carbon Crushing and Screening Plant where it is crushed and screened and separated into various size fractions. The product is then collected by tractor and taken to the respective product stockpiles pending dispatch by road or rail.

Cato Ridge Alloys Refinery Plant

At the CRA Refinery Plant some of the high carbon ferromanganese produced in the furnaces is refined, through the use of oxygen, to medium carbon and low carbon ferromanganese, dependent on client specifications. Production of refined ferromanganese is carried out in a converter by preferential oxidation of carbon. The hot metal (high carbon ferromanganese) is supplied mainly from the Work's No. 5 and No. 6 Furnaces, with Furnaces No. 3 and No. 4 utilised as backup when required. The ferromanganese production capacity of the Refinery Plant is approximately 60 000 tons per annum.

Within the CRA Plant the metal from the converter is tapped into a ladle and cast into fine metal beds from where it is removed by crane to a laydown area and allowed to cool. It is then removed and transported to the CRA Crushing and Screening Plant, where it is allowed to cool further and then crushed and sized to customer requirements. The slag generated from the CRA Plant's operations is utilised as an ore feed to the furnaces due to its high manganese content.

The converter is equipped with a gas cleaning plant consisting of a baghouse. The baghouse minimises the exposure to the atmosphere of airborne pollution generated during the charging, blowing and tapping operations. The entire operation is 'interlocked' to the gas cleaning plant and as such cannot operate without it. The dust from the baghouse is sold directly for use as a pigment in the brick/ceramic industry or stockpiled for future use. Although the actual operation of the CRA Plant is run separately from production operations associated with the other six furnaces, the CRA utilises common support services as required by the Assmang Works i.e. engineering, finance and administration, quality control, human resources, etc.

Metal Recovery Plant

The Metal Recovery Plant was commissioned in 2005 to recover high carbon ferromanganese from the slag that is produced during the manufacture of manganese alloys. The operation of the Metal Recovery Plant is outsourced to Recmix. The Plant recovers approximately 18 500 tons of ferromanganese metal from the slag dumps every year and some of the processed slag is crushed and sold as an aggregate. As at the end of 2007, the monthly volume of slag sold was greater than the monthly production of slag resulting in a net reduction in the quantity of slag on site. The plan is to increase these sales in the longer term.

Outputs

The primary outputs at Assmang include:

- High, medium and low carbon ferromanganese product;

- Slag;
- Atmospheric emissions including Carbon Monoxide (CO), Carbon Dioxide (CO₂), Oxygen (O₂), Hydrogen Dioxide (H₂), Particulate Matter (PM), Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂) and Methane;
- Fugitive emissions: manganese laden dust and fumes;
- Waste water from the wet scrubbers and furnaces;
- Wet scrubber sludge;
- Baghouse dust;
- Stormwater;
- Heat; and
- Noise.

Products

Assmang Furnaces No. 1 and No. 2 can produce either silico manganese or high carbon ferromanganese, while Furnaces No. 3 to No. 6 produce high carbon ferromanganese. The current total production capacity of Assmang's six furnaces is approximately 250 000 tons per annum of high carbon ferromanganese and approximately 200 000 tons per annum of slag. All six furnaces are currently producing high carbon ferromanganese, with the bulk of the production from Furnaces 5 and 6 being converted into either low carbon or medium carbon ferromanganese at the Refinery Plant.

Transport of Product

The ferromanganese metal is generally loaded onto trains in bulk and is railed to the dedicated manganese alloy storage area at Richards Bay port where it is loaded onto vessels. A facility also exists to containerise ferromanganese, either in bulk or in one metric ton bags, for export via the Port of Durban's container terminal. Approximately 252 500 tons of ferromanganese alloy per annum is exported from Assmang via rail transport, while approximately 12 500 tons of ferromanganese alloy per annum is exported from Assmang via road transport.

Atmospheric Emissions Handling

Atmospheric emissions comprise of both point source (stack) emissions as well as fugitive and secondary emissions.

Point Source (Stack) Emissions

In accordance with the Air Pollution Prevention Act (APPA) No 45 of 1965, registration certificates were issued by the Chief Air Pollution Control Officer for Assmang's six furnaces and the CRA Plant.

Two different gas-cleaning technologies are currently employed at Assmang, namely baghouse cleaning plants are utilized for the open furnaces (Furnaces No. 1, 2, 5 and the CRA Refinery Plant) while wet scrubber cleaning plants are utilized for the closed furnaces (Furnaces No. 3, 4 and 6). Standby gas plants are available on Furnaces 3, 4 and 6 should the primary gas cleaning plant fail or be shut-down for maintenance purposes.

Dry Baghouse Cleaning Plants

Furnaces No. 1, 2, and 5, which are open furnaces, and the CRA Plant converter utilise baghouse cleaning plants. These plants use a fabric type bag with a fine weave, through which the off-gas is drawn and the particulate filtered out before being emitted to the atmosphere through a stack. The baghouse dust from the three furnaces is removed by trailer to the baghouse dust stockpile on site. The baghouse dust from the CRA Plant converter is sold as a by-product or stored on-site. These plants are highly efficient and consistently comply with their design standards and permit conditions. Collection of the used baghouse filters is undertaken by Waste Tech for disposal at the Shongweni Landfill Site.

Wet Scrubber Cleaning Plants

Furnaces No. 3, 4 and 6, which are closed furnaces, are fitted with wet scrubbers. These plants use a venturi type arrangement with water as a scrubbing medium. Within a venturi scrubber system, fans draw the dust produced in the smelting process into ducts, which narrow dramatically, increasing the velocity of the dust particles. Water is then sprayed onto the dust particles, increasing their weight. As the ducts change direction, the heavy dust particles are unable to change direction with the ducts, due to their increased weight, and are drawn into a catchment area, leaving behind only the lighter, finer dust particles in the ducts. This process is then repeated, in the second venturi, on the remaining finer dust particles. The cleaned off-gas is then emitted to the atmosphere through a stack, while the resultant dust-laden waste water from the scrubbers is transferred to an on-site waste water treatment plant (Candy Filter Plant).

Fugitive and Secondary Emissions

Fugitive emissions are primarily the fumes emitted during tapping, casting, material conveying, crushing and storage while secondary dust sources are primarily non-grassed areas, as well as concreted areas that have been contaminated via dust, spills, etc. Various measures have been implemented over the years to reduce fugitive and secondary emissions i.e. concreting of roads and grassing of selected areas as well as measurement of dust levels in the air (mg/m³) by static and personal duct monitoring and ambient air quality monitoring. The proposed project constitutes an engineering control / mitigation measure designed to reduce fugitive fume and dust emissions during existing operations.

Waste Water Handling

The current water treatment plant on site is a Candy Filter Plant located in the south-western portion of the Works. The three closed furnaces on site (Furnaces No. 3, 4 and 6) utilise wet scrubber gas cleaning equipment, while the open furnaces and CRA Refinery Plant utilise dry gas cleaning equipment, which has no link to the Candy Filter Plant. The wet scrubbers scrub the furnace fumes with water to remove solids and to cool the fumes before releasing the clean off-gas to the atmosphere. Dirty scrubber water is discharged from each of the furnace scrubbers into a common flume where it is directed by gravity to the candy filter feed pumps. A number of other water streams are

also directed to the flume including stormwater runoff from selected areas, as well as plant washings which can be contaminated with oil.

The water in the flume behind the furnace building is pumped via a pipeline to the Candy Filter Plant. A second standby pump is available as a backup. If both of feed pumps are faulty or offline for scheduled maintenance, then the flume can overflow into an emergency flume, which directs the overflow to the backup pumps located at the candy filters.

Feed pumps at the Candy Filter Plant direct the water into dirty water feed compartments. Two chemicals (flocculent) are dosed at low quantities to the dirty water feed compartments to disperse any oil and to flocculate (settle) the suspended solids. The oil dispersant breaks down any oil allowing it to flocculate together with the suspended solids. The entire chemical dosing system is supplied, maintained and monitored by Buckman Laboratories. Buckman also conducts weekly spot sampling and analysis, keeping records of performance and adjusting dosing rates when necessary. The flocculated dirty water then flows from the feed compartments into the settling area of the candy filters, where the flocculated suspended solids and dispersed oil settle to the bottom (as thickened sludge) aided by a series of internal inclined plates. The clear water rises to the surface and overflows into a clean water compartment, is dosed with descalant and is then pumped back to the furnace scrubbers.

At the Candy Filter Plant the thickened sludge is discharged by gravity via an adjustable manual valve into a sump, and then pumped to one of two lined slimes dams for pre-settlement of particulates. The clean slimes dam overflow is pumped back to the clean water compartment of the candy filter together with any surplus water from the downstream holding dam and returned to the scrubbers.

Assmang has a waste disposal site permit for the on-site slimes dams in terms of Section 20(1) of the Environmental Conservation Act No. 73 of 1989.

An emergency stormwater containment dam located adjacent to the Candy Filter Plant previously collected stormwater from high rainfall events as well as discharge from the Candy Filter Plant. Since December 2007 the contents of the dam has been reduced such that no water is contained therein. This was achieved after a change in the chemistry and dosing regime of the dirty water feed streams in the candy filters to improve the liquid-solid separation rate, consequently improving the return water quality to the gas plants. This has yielded positive and sustainable results, enhancing the dust removal efficiency of the water in the gas plants for Furnace No. 3, 4 and 6. A rehabilitation plan is being developed for the area where the containment dam was situated and designs are to be prepared for a new emergency stormwater containment dam to meet the requirements of the relevant authorities.

Disposal of Slag

The existing slag dump has developed as a landbuild operation with limited control applied in the development resulting in a non-uniform footprint area covering a total area of approximately 15 ha located to the immediate north of the processing plant. The slag dump has a total in-place volume of approximately 1.7 million cubic metres (m³) or 5 million tons. The footprint area is unlined and there is no formal drainage system to capture surface run-off or subsoil leachate generated within the waste body.

As at the end of 2007, the monthly volume of slag sold from the Metal Recovery Plant was greater than the monthly production of slag resulting in a net reduction in the quantity of slag on site. The plan is to increase these sales in the longer term and gradually reduce the volumes of slag stored at this facility until the entire existing unlined slag heap is reworked and the site is rehabilitated and closed. However, in the interim Assmang identified the need to develop a new slag disposal facility to accept both the slag produced during the normal smelting process and stockpiled aggregate generated by the slag recycling process.

Assmang commissioned Geomeasure Group in 2005 to undertake an EIA for the proposed expansion of the existing slag dump to incorporate a new area for the stockpiling of slag (*Scoping Report for the Proposed Expansion of the Assmang Slag Dump*, EIA/6804, February 2006). Authorisation for the expansion was granted by the KwaZulu-Natal Department of Agriculture and Environmental Affairs (DAEA) in January 2007, and the issue of a waste disposal permit from the Department of Environmental Affairs and Tourism (DEAT) for the operation of the existing and new slag stockpiling areas is awaited.

Employment and Social Responsibility

Assmang currently employs approximately 650 permanent employees and 100 contractors. The latter varies depending on demand and projects. The Works operates for 365 days per year and 24 hours per day. A day shift operates from 07h00 to 16h30 Monday to Thursday and 07h00 to 13h30 on a Friday. Production and technical departments are covered by four shifts covering the periods 07h00 to 15h00, 15h00 to 23h00 and 23h00 to 07h00. The fourth shift is a relief shift. Management and office staff operate from 07h00 to 16h00 Monday to Thursday and 07h00 to 13h00 on a Friday. Solidarity and the National Union of Metalworkers of South Africa (NUMSA) represent the Assmang employees.

A staff hostel is located north of the site beyond the Works fenceline where some staff members reside, while the remaining employees reside primarily in the surrounding residential areas, namely the KwaXimba Traditional Authority, Cato Ridge, Pietermaritzburg and Durban. Assmang provides housing support to some of its employees and also sponsors community projects such as building a school and development projects in the KwaXimba area.

Assmang's Safety, Health, Environment and Quality Policy

The Assmang Cato Ridge Works is ISO 9001: 2000 (Quality Management), ISO 14001: 2004 (Environmental Management) and OHSAS 18001: 1999 (Occupational Health and Safety) certified. In an attempt to achieve effective quality, environmental and occupational health and safety management at Assmang, and in order to ensure

compliance with the relevant legislation and regulations governing Assmang's operations, Assmang have formulated and implemented a Safety, Health, Environment and Quality (SHEQ) Policy at the Cato Ridge Works. The SHEQ Policy incorporates three management systems, namely a Quality Management System, an Environmental Management System (EMS) and an Occupational Health and Safety Management System.

The aim of Assmang's EMS is to coordinate the management of activities relevant to actual and potential Safety, Health and Environmental (SHE) impacts. The following monitoring programmes are in place as part of the EMS:

- Air quality monitoring;
- Water quality monitoring;
- Site specific waste management; and
- Land capability.

A series of factors relating to environmental and quality issues are measured on a regular basis to confirm efficiency and legal compliance. These measurements are defined by the Operational Procedures/Work Instructions under the EMS. The regular measurements are:

- Pollution;
- Clean stack particulate measurements;
- Surface water quality;
- Sewage discharge quality;
- Weight of non-hazardous solid waste;
- Weight of hazardous solid waste;
- Noise;
- Illumination;
- Ventilation;
- Air quality;
- Hazardous chemical substance;
- Resource-use;
- Electrical power consumption;
- Water consumption; and
- Raw material consumption.

In terms of air and water quality and waste management, the current monitoring and management plans have been reviewed and new monitoring and management programmes have been submitted to the relevant authorities for approval and are in the process of implementation.

Description of the Proposed Project

The operational areas at the Assmang Works, including the furnace building (Furnaces No. 1 to No. 6), the crushing plants and the materials handling plants are sources of fugitive dust and fume emissions. There are insufficient secondary dust and fume capture systems installed at the Works and, as a result, the levels of emissions are generally high. Refer to Ecoserv (August 2006) *Fugitive Dust Emissions Assessment prepared for Assmang Manganese and PSM* (December 2007) *Static Air Sampling Assmang Cato Ridge* in Appendix D – Specialist Reports for results of air quality monitoring of fugitive fume and dust emissions at the Cato Ridge Works.

In light of this, Assmang commissioned GLPS Project Management and Engineering Services in 2006 to conduct a feasibility study to develop and evaluate options for improvement to fugitive emission levels at the Assmang Works (Refer to the GLPS 2006 Report in Appendix D – Specialist Reports). The GLPS study was subsequently reviewed by Environmental Control Engineering (ECE) in March 2007 (Refer to the ECE 2007 Report in Appendix D). The results of the study and the review concluded that environmental conditions at the Assmang Works could be improved by implementing fume extraction at the furnace tap holes, by improving ventilation inside the furnace building, by providing dust extraction at the crusher plants and by installing dust suppression systems at the materials handling plant areas.

Assmang has therefore identified the need to design and implement a fugitive emission reduction programme at the Works to address the high levels of fugitive emissions released during routine operations, reduce the potential exposure of the Assmang employees and the surrounding environment to manganese containing fumes and dust, and to bring their operating procedure in-line with international best practice.

The proposed project therefore involves the installation of equipment and infrastructure and the utilisation of alternative production methods to capture, control and reduce fugitive fumes and dust released during existing operations at the Assmang Manganese Cato Ridge Works.

Specifically the following issues, which have been categorized into four phases, are to be addressed by the project, namely:

- Phase 1: Extraction of dust and fumes containing manganese during tapping operations within the existing furnace building;
- Phase 2: Extraction of dust containing manganese at the High Carbon and Low Carbon Ferromanganese Crushing and Screening Plants;
- Phase 3: Dust suppression at the Raw Material Handling system; and
- Phase 4: Improvement of ventilation inside the furnace building (if necessary).

The design and selection of the proposed solution has been undertaken in co-operation with similar industries in

terms of safety, health and environmental issues in order to ensure a credible solution to the process improvements. The Assmang projects team visited various sites with similar installations and similar processes. Some of the sites visited include Columbus Steel in Middleburg, Scaw Metal in Germiston, Non-Ferrous Metal (NFM) Works in Durban, Mittal Steel in Vanderbijlpark Xstrata Lion Project in Steelpoort, One Steel in Sydney, Australia and Temco in Tasmania. In addition, international experts Hatch Africa (Hatch), who have world-wide experience in terms of project execution with similar projects, have been appointed for the design study for Phase 1 (the tap hole, launder and ladle dust and fume extraction system) which is the phase requiring the bulk of the work. In addition, various suppliers have been contacted for the design and supply of the dust extraction system for the Crushing and Screening Plants.

The four phases of the proposed Fugitive Fume and Dust Emission Control Project are outlined below and explained in further detail in Section 2.

Phase 1 – Tapping Fume Treatment System

This phase of the project involves implementation of a dust and fume extraction system at the tap holes, launder and ladle for Furnaces No. 1 – 6. This is seen as the most critical phase in reducing the emissions inside the furnace buildings and limiting exposure of personnel to manganese containing dust and fumes. Assmang has commissioned the consulting firm Hatch to undertake detailed designs for a new tap hole, launder and ladle dust and fume extraction system. The extraction system is to contain dust and fume canopy hoods for the tap holes, launders and ladle for all six furnaces. Furnaces No. 1 - 4 will have a common ducting that will join with the common ducting for Furnaces No. 5 - 6 prior to entering a proposed new baghouse.

Phase 2 – Crushing and Screening Plants

This phase of the project deals with implementation of a dust extraction system at the Low Carbon Ferromanganese Crushing and Screening Plant (LC FeMn C&S) located at the Cato Ridge Alloys (CRA) Refinery Plant as Phase 2A, as well as a dust extraction system at the High Carbon Ferromanganese Crushing and Screening Plant (HC FeMn C&S) as Phase 2B.

Due to the fact that small aperture screens are utilized in both the LC FeMn C&S Plant and the HC FeMn C&S Plant, the risk of clogging the small aperture screens with a wet dust suppression system poses an unacceptable risk to a production facility such as Assmang. Therefore control of dust at the C&S plants is proposed to be addressed through the use of enclosures and dust extraction systems, with new baghouses proposed for each C&S plant.

Due to the casting process, ingots to be processed at both C&S plants contain a percentage of fines. However, the fines delivered to the static grizzly at the two plants differ due to the respective cooling areas. This means that the enclosures envisaged at the HC FeMn C&S Plant static grizzly could not be utilized at the LC FeMn C&S Plant, and hence different technologies have been proposed for the two C&S plants as detailed in Section 2 below.

Phase 3 – Raw Material Handling System

This phase of the project involves dust suppression throughout the raw material handling areas. It is proposed to reduce dust emissions from the raw material system through the use of a combination of enclosures and suppression systems. The major sources of dust in the raw material handling areas are the transfer chutes. As such, the following remedial actions have been proposed for the raw material handling areas:

- The installation of an enclosure around the transfer point and the suppression of dust through the spraying of atomized water and air into the enclosure;
- The use of an enclosure around the conveyor belt transfer points, thus reducing spillage and eliminating dust emissions at transfer points; and
- The use of Discrete Element Modelling to re-design the chutes so that the material flows minimize the ingress of air thereby reducing dust and spillage at the transfer points.

Phase 4-Building Ventilation

This phase of the project focuses on the ventilation inside the furnace buildings. This phase is currently on hold pending the successful completion of Phase 1, as the efficiency of the extraction system at the tap holes will give a clear indication of what modifications to the furnace building ventilation systems are required.

2. ACTIVITY DESCRIPTION

Describe the activity / activities which is / are being applied for in detail:

The four phases of the proposed Fugitive Fume and Dust Emission Control Project are explained in further detail below.

Phase 1 - Tapping Fume Treatment System

Introduction

The Tapping Fume Treatment System (Phase 1 of the Fugitive Dust Project) involves the proposed installation and operation of a fume treatment system to capture dust and fume generated during slag and metal tapping at existing Furnaces No. 1 – 6 at Assmang.

Hatch were appointed to undertake the design of the equipment and infrastructure required for the tap hole, launder and ladle dust and fume extraction system and the description provided below has been extracted from the *Tapping Fume Treatment System Specification* (Hatch, December 2007) prepared for tender purposes.

Objectives

The fume treatment system is designed to capture more than 90% of the dust and fume generated during slag and metal tapping from the tap-holes, launders and hot metal ladles. The objective is to achieve an ambient air quality level of below 1 mg/m³ (New Assmang Strategic Objectives) for manganese dust and fumes inside the furnace building after the extraction system is operational and to ensure availability of the fume treatment system at 99%. The current design figures for the extraction system at the tap-hole, launder and ladle from Hatch indicate approximately 700 000 m³/hour of fugitive dust and fumes for four furnaces tapping at the same time (the norm is to tap two furnaces at the same time, which implies extraction of 350 000 m³/hour).

Modelling

Hatch has undertaken Computational Fluid Dynamic (CFD) modelling to assess and optimise fume capture efficiencies to inform the design of the system. The CFD model geometry was created from the 3D CAD model developed by Hatch in Brisbane and analysis of video recorded at the site was used to determine source fume release velocities and to compare stimulated and actual fume behaviour. Capture efficiencies were calculated by determining mass flow rate at the common duct outlet and the total mass flow rate entering the domain from fume release sources. Capture efficiencies were progressively improved in the modelling on the basis of the analysis of flow fields and recommended modifications being implemented as an iterative process until the project design criteria of 90% ladle, launder and taphole fume capture was achieved. Refer to Appendix C - Facility Illustrations for diagrams indicating the modelling undertaken by Hatch and hood design.

Infrastructure

The tap hole extraction system will require the installation of the following infrastructure:

- A set of fume capture hoods, including support structures and mechanisms for moving hoods (jib cranes) for operator and / or crane access at all six furnaces;
- Duct work and switching dampers to allow selective extraction depending on the tapping furnace combination;
- Installation of a fabric filter bag-house to remove dust / fume from extracted air / gas volumes;
- Installation of a bag cleaning system (including compressor)
- Induced draft fans to provide extraction flow and suction pressure;
- A stack to discharge cleaned air / gases to atmosphere; and
- An online stack analyzer to continuously monitor cleaned gas/dust emission.

Fume Capture Hoods

Refer to Appendix C – Facility Illustrations.

Tapping fume capture can only occur on four (4) out of six (6) furnaces simultaneously. Generally, the number of furnaces tapping together is determined by the tapping schedule, with tapping occurring on four (4) furnaces – two (2) from the north plant and two (2) from the south plant - every two (2) hours, and the remaining two south plant furnaces tapping every two (2) hours but off-set by 30 minutes from the tapping time of the other four.

At each tap-hole, there will be a motorised jib crane to move the ladle hood into and out of position for tapping, a main damper which is either fully closed or fully open for extraction of fume from the launder and ladle into the duct, and a tap-hole damper which is either fully closed or fully open for extraction of fume from the tap-hole only.

The control system will monitor the number of tap-holes with dampers open, and provide an audible alarm in each control room and/or flashing light at the local control console at each furnace tap-hole indicating “low fume suction” in the event that more than four (4) furnace tap-holes have dampers open.

The ladle hood on each furnace tap-hole will be suspended from a pillar-mounted jib crane. A motor on the jib crane will allow movement of the ladle hood from a “parked position” (away from the ladle in its tapping position) to a “tapping position” where it is situated directly above the ladle in its tapping position (ready to receive slag and metal from the launder). Operation of the jib crane slewing motor will be via a pair of push-buttons which will be mounted in a control desk/console adjacent to the tap-hole. It is expected that it will be most convenient to locate these buttons in the existing local control console for the mud-gun and tap-hole drill on each furnace.

When a furnace is ready for tapping, the operator will move the ladle hood from its parked position towards the

tapping position. As soon as the parked position limit switch opens, the main and tap-hole dampers on the selected tap-hole will open together automatically. On furnaces with more than one tap-hole (i.e. Furnaces 3 and 6), the control system will interlock the dampers such that both sets of tap-hole dampers cannot be open simultaneously. To move the ladle hood, the operator will be required to press and hold the button marked "Ladle hood to tapping position". Releasing the button will stop the movement of the hood jib crane motor. The intention of this safety feature is to minimise the likelihood of an operator slewing the hood into position while there is a crane and bridle still connected to the ladle.

Similarly, when tapping is complete and before the crane and bridle can move into position to pick up the ladle, the operator will be required to press and hold the button marked "Ladle hood to parked position". As soon as the ladle reaches its parked position and the limit switch closes, the main fume damper will close, followed by the tap-hole damper after a five minute delay.

Duct-work

All duct-work associated with the Tapping Fume Treatment System will contain clean-out points located on the underside of the ducts at every 6 metres and adjacent to bends (except where the duct runs along the furnace roof) to provide for the cleaning out of dust and accretions. In addition, accessible sampling points will be provided which are suitable for isokinetic sampling of the gas stream, in compliance with South African standards.

Baghouse

Refer to Appendix C – Facility Illustrations.

The following specifications have been provided for the supply and installation of the proposed new baghouse:

- The total particulate concentration at the baghouse outlet must be less than or equal to 15 mg /Nm³;
- The baghouse bags must provide a guaranteed minimum life of three full years under the specified operating conditions;
- The baghouse is to be a negative pressure pulse jet type;
- The baghouse shall be of proven design, demonstrated to be effective and reliable in heavy industrial service;
- The baghouse is to be complete with spark arrester, inlet air manifolds, bag cleaning system, and collected dust handling system including dust silo and truck loading discharge system; and
- The baghouse shall be divided into separate compartments/modules – each capable of isolation from the gas flow and sized to maximise pre-assembly at the Contractor's fabrication facilities.

Filter bags and Bag cleaning system

Since the fume collection system only operates with an intermittent dust load, the bag cleaning cycle for each compartment shall be performed off-line, activated by differential pressure. The pressure differential will be monitored by a differential pressure switch and the signal sent to the baghouse bag cleaning controller.

Dust Hoppers

The dust hopper of each compartment shall be provided with a pair of temperature transmitters to detect rising temperature in the hopper, which may be indicative of self-heating or combustion of the pyrophoric dust collected. The output signal from these transmitters shall be used to activate an emergency nitrogen or carbon dioxide blanketing system via a fast-acting valve on a piped connection to each hopper, which will deliver inert gas at a rate sufficient to quench any fire that may have started in the hopper. Nitrogen or carbon dioxide is to be supplied by a stand-alone bank of gas bottles piped to the hopper delivery system. The bottle bank will be located adjacent to the bag-house.

Dust Handling System

The dust handling system is to be rated for a maximum of 3.5 tons per hour (tph) of dust, and a nominal rate of 0.7 tph of dust.

Baghouses should act as filters for the gas stream only, and are not to be designed for long-term storage of collected dust. Dust cleaned from the bags will fall via a rotary valve into the screw conveyor at the bottom of each bag-house compartment for conveying to the dust silo. The screw conveyors and rotary valves shall operate continuously while the DP-based bag cleaning is activated, unless the high level alarm in the dust silo is activated.

An ultrasonic level transmitter mounted in the dust silo will provide local and remote indication of the percentage level of dust in the silo. High levels in the dust silo will activate a remote alarm in the control room/s. The operator will then initiate dust out-loading by contacting the truck driver, who will position his truck beneath the truck filling spout and lower the spout onto the truck filling port/opening by manually activating the spout-lowering motor. Once lowered, the spout will close a proximity switch which will then start the rotary valve on the silo discharge. The fugitive dust vent valve will also open at this time to draw dust from the out-loading spout to the baghouse inlet.

Very high levels in the dust silo will trip the baghouse dust hopper rotary valves and screw conveyors, and activate an audible alarm and flashing light at the silo, and in the control room/s, while high level in the baghouse dust hopper will isolate that compartment from the main gas flow and also activate an alarm in the control room/s.

The dust handling system will be located within a bunded concrete area underneath and adjacent to the baghouse. The bund wall is to be sufficient to prevent ingress of molten slag to the concrete area in the event of an accidental spillage of the contents of a slag bell/pot on-board the slag haulers which will drive past the bag-house and dust handling area along the new slag hauler road.

Dampers

Dampers will be provided on all bag-house compartment inlets. These dampers will be used as automatic isolating devices for inspection and maintenance. Limit switches will also be provided to wire back to the operators' console panel showing when each damper is 'fully opened' or 'fully closed'. Similar design dampers will be provided for the reverse air duct manifold.

Controls and Instrumentation

The bag-house controls will be via a stand-alone Programmable Logic Controller (PLC), which will provide critical alarm signals to the existing Assmang plant control system.

Dust Fire Suppression

Tapping fume dust could cause a fire in the baghouse due to its propensity to self-heat in the presence of moisture and oxygen if left to accumulate in dust hoppers or dust silo in sufficient quantities at sufficient temperature for sufficient time. Therefore it will be imperative that operators respond to any bag-house dust handling system alarms in a prompt manner, to prevent the accumulation of sufficient hot dust to initiate a self-heating reaction and resultant bag fire.

A pair of high temperature switches in each baghouse dust hopper will be provided to initiate an inert gas (nitrogen or carbon dioxide) fire suppression system in the event of a high dust temperature. The system will isolate that bag-house compartment from the main gas flow by closing the inlet (damper/louvre) valve to that compartment before releasing the inert gas (unless the compartment is already isolated as a result of a high dust level). One minute after release of the inert gas the outlet (poppet) valve to that compartment will close to allow time for displacement of compartment air by the inert gas.

Bag Over-temperature and Under-Temperature Protection

If the air temperature exceeds the bag maximum service temperature a shortened bag life will result. A temperature transmitter on the baghouse inlet duct will activate a dilution air damper on a duct branch open to atmosphere connected to the baghouse inlet duct, in the event of a temperature exceeding a preset maximum limit (TAH). When the baghouse inlet temperature drops below the trigger temperature by a pre-set margin, the damper will close again.

The same transmitter will also activate a low temperature alarm (TAL) in the event that the inlet temperature drops below the acid dew point of the gas stream. Operation of the baghouse at low temperatures in the presence of sulphur dioxide (SO₂) from the tap-hole fume for prolonged periods may result in short bag life due to acid attack. This will be strongly dependent on the level of moisture in the fume/air. Pre-coating of new filter bags with lime will minimise acid attack of the bags, and reduce the likelihood of premature blinding of the bags by fine fume particles at full system flow.

Induced Draft (ID) Fan

The following specifications apply to the ID fan:

- The fan casing noise shall not exceed 80 dBA at 1 metre; and
- A variable speed drive or variable inlet vanes or other efficient means of reducing fan motor power during low load periods of operation of the fume system shall be provided.

Stack

The following specifications apply to the bag-house stack:

- Gas velocity shall be less than (<) 18 m/s at the tip of the stack;
- The minimum flange thickness is to be 12 mm;
- The stack wall thickness shall be in accordance with relevant standards and calculated to support the design;
- Provision for removing dust and accretions is to be provided at the base of each stack. Suitable access shall be provided to this point without the use of scaffolding or ladders and clean out/access doors shall be 750 mm diameter;
- Provision shall be made for a drain point including an isolation valve at the stack base;
- Stacks shall be designed for the prevailing wind speeds present at the site;
- Potential vibration of the stack is to be investigated and if considered a significant issue, an appropriate method of vibration control, of standard design and proven in similar installations, will be installed;
- Lightning protection and earthing to South African standards shall be provided if required;
- Two sampling positions shall be provided to allow for isokinetic sampling of the stack gas; and

- The sampling points shall be positioned 10 stack diameters from the centre of the inlet duct and 5 stack diameters from the tip of the stack. The sampling points shall be at 90° to one another and shall comply with required standards. The stack shall be fitted with 4 inch sockets for sampling ports (Refer to Facility Illustrations in Appendix C).

Phase 2 - Crushing and Screening Plants

Introduction

Alliance Dust Control Services / Trema Manufacturing Processes (Pty) Ltd has been appointed to undertake the detailed design and installation for the HC FeMn C&S Plant dust extraction system. A similar technical specification will apply to the LC FeMn C&S Plant.

Objective

The aim of this phase of the project is to capture dust generated during crushing and screening of both low and high carbon ferromanganese. The primary objective is to ensure that dust levels at both crushing and screening plants are below 5 mg/m³ total dust and below 1 mg/m³ for inhalable manganese dust once the extraction system is operational and to ensure availability of the dust treatment system at 99%.

The current design figures from GLPS and ECE for the extraction system at the high and low carbon crushing and screening plants indicate that approximately 70 000 m³/hour of fugitive dust for each plant will need to be extracted.

Infrastructure

The dust extraction system at the crushing and screening plants will require the installation of the following infrastructure at each plant:

- A set of dust capture hoods, including removable screen covers;
- Duct work and switching dampers to allow selective extraction depending on the crushing and screening operation;
- Installation of a fabric filter baghouse to remove dust from extracted air / gas volumes;
- Installation of a bag cleaning system (including compressor);
- Induced draft fan to provide extraction flow and suction pressure;
- A stack to discharge cleaned air / gases to atmosphere;
- An online stack analyzer to continuously monitor cleaned gas/dust emission; and
- Rebuilding of enclosures at the HC FeMn C&S Plant to minimize cross drafts.

Baghouse filter

The bag filter is proposed to be a negative pressure, pulse jet type, divided into four (4) compartments to enable on-line maintenance and off-line cleaning. The bag filter is to be designed such that maintenance of the bag filter, and specifically bag changing, will be in fresh air and not in a confined space.

Specification and other infrastructure:

- All transfer points on conveyor bells will have new modified extraction hoods;
- Screens will be enclosed with special screen covers to allow for ease of removal, quick inspection and replacement of screens;
- A dust collection system will be provided;
- All ducting will have concrete 100 mm wear liners on the bends;
- The hopper will be manufactured from 5 mm plate;
- The air compressor will have a 22 kW motor;
- Fan noise level will be below 80 dBA; and
- A self supporting stack of 20 m with access to sampling points via service platforms will be provided..

Phase 2A - Low Carbon Ferromanganese Crushing and Screening Plant

The proposed dust extraction system for the LC FeMn C&S Plant is as follows:

- The primary crusher area:
 - The vibrating grizzly feeding into the primary crusher will be enclosed and dust extraction will be installed;
 - The outlet chute from the vibrating grizzly will be enclosed and dust extraction will be installed; and
 - The primary crusher inlet and discharge feeding onto the conveyor will be enclosed and dust extraction will be installed.
- The primary screening area:
 - The conveyor feeding the primary screen discharge will be enclosed and dust extraction will be installed; and
 - The primary screen will be enclosed and dust extraction will be installed.
- The secondary crushing area:
 - The conveyors feeding over-size material back to the secondary crusher will be enclosed at the change over points and dust extraction will be installed;
 - The secondary crusher will be enclosed and dust extraction will be installed; and
 - The secondary crusher discharge onto the primary screen feed conveyor will be enclosed and dust extraction will be installed.
- The product screening and bin area:
 - The conveyor feeding into the secondary screen will be enclosed and dust extraction will be installed;
 - The secondary screen will be enclosed and dust extraction will be installed; and
 - The tertiary screen will be enclosed and dust extraction will be installed.

Phase 2B – High Carbon Ferromanganese Crushing and Screening Plant

The proposed dust extraction system for the HC FeMn C&S Plant is as follows:

- The static grizzly / feed bin area:
 - Access for the front-end loader to load cooled ingots onto the static grizzly is to be limited to the southern side only;
 - A roof is to be erected over the static grizzly area, and sheeted to the grizzly level;
 - Water spays are to be installed at the eastern and western walls of the static grizzly building; and
 - The tunnel underneath the static grizzly housing with the feed conveyor will be enclosed with an industrial strip curtain.
- The vibrating grizzly and primary crusher area:
 - The vibrating grizzly will be enclosed and dust extraction will be installed; and
 - The primary crusher will be enclosed and dust extraction will be installed.
- The primary screening and secondary crusher area:
 - The primary screen will be enclosed and dust extraction will be installed; and
 - The secondary crusher will be enclosed and dust extraction will be installed.
- The secondary and tertiary screening area:
 - The secondary screen will be enclosed and dust extraction will be installed; and
 - The tertiary screen will be enclosed and dust extraction will be installed.
- The final product bin & load-out area
 - The final product bins will be enclosed and dust extraction will be installed; and
 - The load-out points from the vibrating feeders will be equipped with telescopic loader chutes.

Phase 3 – Raw Material Handling System

Introduction

This phase of the project involves dust suppression throughout the raw material handling areas. It is proposed to reduce dust emissions from the raw material system through the use of a combination of enclosures and suppression systems. The major sources of dust in the raw material handling areas are the transfer chutes.

Objective

The aim of this phase is to capture dust generated during the handling of raw material. The main objective is to ensure that the dust levels at all areas of raw material is below 5 mg/m³ of total dust and below 1 mg/m³ for inhalable manganese dust once the dust suppression system has been installed and is operational.

Infrastructure

A combination of two systems is recommended for the suppression of dust in and around the raw materials handling system, namely:

- The first system is a dust suppression system where an enclosure is installed around the transfer point and atomized water and air is sprayed into the enclosure to suppress the dust generated at the transfer point; and
- The second system is a patented type of enclosure around the conveyor belt transfer points. This system reduces spillage and eliminates dust emissions at transfer points.

Phase 4 - Building Ventilation

This phase of the project is highly dependent on Phase 1 (tap hole extraction). For this reason the scope of work will be fully defined once Phase 1 has been implemented. However, the following work will need to be undertaken inside the furnace building:

- Reduce exposure of crane drivers to fumes and dust during casting to sand ingots by either sealing the crane cabin or remotely operating the 40 ton cranes; and
- Investigate alternative casting methods that will result in low dust emission in the furnace building.

3. ALTERNATIVES

Describe alternatives that are considered in this application. Consideration of alternatives must not be limited to site and layout alternatives only. Alternatives assessed must include the consideration of alternative technologies, processes and activities by means of which the objectives of the proposed project may be achieved. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent for informed decision making.

3(a) Site alternatives:

Describe site alternative 1 (S1), (**selected site**) for the activity described above, or for any other activity alternative:

Site Alternative No. S1 is the selected site. Refer to Appendix A – Site Plan and Appendix B- Site Photographs.

The proposed new equipment and infrastructure is to be installed within the existing furnace building complex, at the crushing and screening plants and the raw material handling areas at the Assmang Works located at 1 Eddie Hagan Drive, Cato Ridge on Portion 39 of the farm Uitkomst and Doornrug No. 852.

Describe site alternative 2 (S2), **if any**, for the activity described above, or for any other activity alternative:

Site Alternative No. S2 - Not applicable.

As the project involves the reduction of fugitive dust and fume generated during existing operations at the Cato Ridge Works, i.e. retro-fitting of equipment to the existing furnace building, crushing and screening plants and raw material handling system, the assessment of alternative sites is not considered reasonable / feasible.

Describe site alternative 3 (S3), **if any**, for the activity described above, or for any other activity alternative:

Site Alternative No. S3 - N/A, as above.

3(b) Layout alternatives:

Describe layout alternative 1 (L1), **if any** for the activity described above, or for any other activity alternative:

Layout Alternative No. L1 is the preferred option. Refer to Appendix C – Facility Illustrations.

Phase 1: Tapping Fume Treatment System

This layout involves the installation of a single tapping fume treatment system to capture dust and fume generated during slag and metal tapping at Furnaces No. 1 - 6 at Assmang Manganese Cato Ridge Works. Equipment and infrastructure to be installed in the existing furnace building include fume capture hoods with associated cranes, support steel work and ducting as well as the installation of a new baghouse, dust handling system and associated fans and new stack.

Phase 2: Crushing and Screening Plants

The layout involves the installation of a single dust extraction system for each plant (Low carbon and High carbon) to capture dust generated during the crushing and screening processes. Equipment and infrastructure to be installed in the existing structures includes new sheeting for enclosures, dust capture hoods, ducting, new bag house, stack and dust handling system.

Phase 3: Raw Material Handling System

The layout involves the installation of a dust suppression system at the raw material handling areas where an enclosure is installed around the transfer point and atomized water and air is sprayed into the enclosure to suppress the dust generated at the transfer point.

Describe layout alternative 2 (L2), **if any**, for the activity described above, or for any other activity alternative:

Alternative No. L2 - Not applicable.

Due to the nature of the proposed project, namely the retro-fitting of equipment onto existing infrastructure, the consideration of layout alternatives is limited. Various layout options for the different project phases were investigated and dismissed for technical reasons and hence do not constitute viable / reasonable alternatives. Examples of layout options investigated are provided below.

Phase 1 – Tapping Fume Treatment System

Layout alternatives relating to the number of baghouses proposed for Phase 1 were investigated by various engineering consultants (GLPS, ECE, Hatch – Refer to Appendix D Specialist Reports) and dismissed for technical reasons as stated below.

Option 1 - Venting tap-hole fumes directly to atmosphere outside the furnace building complex without a dust/fume

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capture system. This option is considered unacceptable and does not deserve serious consideration.

Option 2 - Mixing of captured tap-hole fumes with the primary fume extract serving Furnaces No. 1 and 2 i.e. the tap-hole fumes would be included into the current furnace baghouse. However, modern practice is to provide two emission capture systems, not usually connected to the same gas cleaning device - one system for primary fume and the second for tap-hole extract. Introduction of tap-hole fumes into the primary fume system could result in erratic temperature variations and potential for condensation to occur which would negatively affect the dust extraction system. This alternative is therefore not considered feasible.

Option 3 - The construction of two identical tap-hole extraction systems – one extract system to serve Furnaces No. 1 - 4 and the other to serve Furnaces No. 5 - 6. However, based on the Computational Fluid Dynamic modeling (CFD) undertaken by Hatch to inform the design of the system, a single fume treatment system to capture dust and fume generated during slag and metal tapping for Furnaces No. 1 – 6 was recommended (L1).

Phase 2 – Crushing and Screening Plants

The option of utilizing dust suppression at the Crushing and Screening Plants was identified as unfeasible since this may cause blockages on the screen apertures which would lead to disruption in production and is unacceptable for a facility such as Assmang.

Describe layout alternative 3 (L3), **if any**, for the activity described above, or for any other activity alternative:

Layout Alternative No. L3 - N/A, as above.

3(c) Process (technology) alternatives:

Describe process alternative 1 (P1), if any for the activity described above, or for any other activity alternative:

Process Alternative No. P1 – Benchmarking & Preferred Design

The preferred process / technology alternative as described in Section 2 above has been informed through an assessment of international best practice and benchmarking against such. The design of the system has been undertaken in co-operation with similar industries in terms of safety, health and environmental issues in order to ensure a credible solution to the process improvements. The Assmang projects team visited various sites with similar installations and similar processes. Some of the sites visited include Columbus Steel in Middleburg, Scaw Metal in Germiston, Non-Ferrous Metal (NFM) Works in Durban, Mittal Steel in Vanderbijlpark, Xstrata Lion Project in Steelpoort, One Steel in Sydney, Australia and Temco in Tasmania.

In addition, international experts Hatch, who have world-wide experience in terms of project execution with similar projects, have been appointed for the design study of Phase 1 (identified as the most critical phase). The preferred design of the tapping fume treatment system was informed by CFD modeling undertaken by Hatch involving the implementation of modifications in an iterative process to optimize fume capture efficiencies until the project design criteria of 90% ladle, launder and taphole fume capture was achieved. For example, four series of modifications were implemented to the fume capture hood design. Refer to Appendix C – Facility Illustrations.

Describe process alternative 2 (P2), **if any** for the activity described above, or for any other activity alternative:

Process Alternative No. P2 – Not Applicable

As with the consideration of layout alternatives, due to the nature of the proposed project, namely the retro-fitting of equipment onto existing infrastructure, consideration of process alternatives is also limited. Process options for the different project phases were investigated by various engineering consultants and were either dismissed for technical reasons and hence do not constitute viable / reasonable alternatives, or were improved through an iterative modeling process to achieve the project design criteria. Examples of process options investigated for Phase 1, as the most critical project phase, are provided below. Refer to Appendix D – Specialist Reports.

VAI Recommendations

In June 1999 VAI Engineers conducted a study to investigate secondary fume de-dusting systems for the furnace buildings. The proposed design was based on capturing fume/dust at the tap holes, launders, ladle, de-slagging stations, casting moulds and at the materials handling plant. In terms of the de-dusting plant, VAI recommended a single large bag house system with 16 compartments and offline cleaning similar to that recommended by Hatch (preferred option). This report was reviewed by GLPS in 2006 (refer below).

GLPS Recommendations

GLPS Project Management & Engineering Services undertook a “Fugitive Emission Study for Assmang Manganese Cato Ridge Works – Evaluation and Recommendation” in September 2006 to “develop and evaluate options for the improvement of fugitive emission levels in all operational areas.” In terms of the tap-hole extraction system, GLPS recommended the construction of two identical tap-hole extraction systems – one extract system to serve Furnaces No. 1 - 4 and the other to serve Furnaces No. 5 - 6. In addition, GLPS recommended mechanical extract for the tap-holes only, being the major fume source, as they determined that improvements to the building ventilation and changes to production would be adequate once the major fume source (tap-holes) had been eliminated through positive extract. This report was reviewed by ECE in 2007 (refer below).

ECE Recommendations

Environmental Control Engineering (ECE) provided a review of the GLPS study, “Review of Fugitive Emission Study

– *Assmang Manganese Cato Ridge Works, March 2007.*” In terms of the tap-hole extraction system, based on site observation and concerns expressed by Assmang production staff that fume emissions from the launder and ladle form a large portion of the total fume emissions that may not be adequately removed by the building ventilation system, ECE recommended that an extraction system based on capturing fumes at both the tap holes and the ladle be investigated. This report was reviewed by Hatch in 2007 (Refer to P1 above and Section 2).

Describe process alternative 3 (P3), **if any**, for the activity described above, or for any other activity alternative:

Process Alternative No. P3 – N/A, as above.

4. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Alternative:		Latitude (S):	Longitude (E):
Alternative S1 ¹ (preferred site alternative)		29° 42.012'	30° 36.015'
Alternative S2 (if any)	N/A	°	'
Alternative S3 (if any)	N/A	°	'

In the case of linear activities: **N/A**

Alternative:	Latitude (S):	Longitude (E):
Alternative S1 (preferred or only route alternative)		
• Starting point of the activity	°	'
• End point of the activity	°	'
Alternative S2 (if any)		
• Starting point of the activity	°	'
• End point of the activity	°	'
Alternative S3 (if any)		
• Starting point of the activity	°	'
• End point of the activity	°	'

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 500 meters along the route for each alternative alignment.

5. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the proposed activity as related to layout alternatives:

Alternative:	Size of the layout:
Alternative L1 ² (preferred layout alternative) - Phase 1 - Phase 2 - Phase 3 & 4 Total Area	New baghouse of +/- 19m x 49m 2 x new baghouses of +/- 4m x 5m N/A +/- 931m² +/-40m² 0m² +/- 971m²
Alternative L2, L3 & L4 (if any)	N/A
Alternative L5 (if any)	N/A

or, for linear activities: **N/A**

Alternative:	Length of the activity:
Alternative L1 (preferred layout alternative)	m
Alternative L2 (if any)	m
Alternative L3 (if any)	m

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:	Size of the site/servitude:
Alternative S1 (preferred site alternative)	Existing industrial footprint +/- 40 ha
Alternative S2 (if any)	N/A m ²
Alternative S3 (if any)	N/A m ²

6. SITE ACCESS

Does ready access to the site exist, or is access directly from an existing road?

If NO, what is the distance over which a new access road will be built

N/A

YES
m

Describe the type of access road planned:

There is an existing access road to the site off Eddie Hagan Drive. However, a new internal haul road is planned, as a separate project, within the existing industrial site, adjacent to the proposed new baghouse for Phase 1(Refer to Figure 326687-T002 Combined Duct Routes and Bag-house Location in Appendix C).

Include the position of the access road on the site plan.

¹ "Alternative S.." refer to site alternatives.

² "Alternative A.." refer to activity, process, technology or other alternatives.

7. WASTE, EFFLUENT AND NOISE MANAGEMENT

Please note that the following environmental issues must be described for each alternative site, layout and process.

(a) Solid waste management

Will the activity produce solid waste during the construction/initiation phase?

YES

If yes, what estimated quantity will be produced per month?

200 m³

How will the construction solid waste be disposed of (describe)?

General solid waste is to be collected by a registered waste disposal contractor for disposal at a permitted landfill site.

Where will the construction solid waste be disposed of (describe)?

Construction solid waste will be disposed of at a permitted waste disposal facility – either New England Road Landfill in Pietermaritzburg or the Shongweni Landfill in Hillcrest.

Will the activity produce solid waste during its operational phase?

YES

If yes, what estimated quantity will be produced per month?

480 m³

How will the solid waste be disposed of (describe)?

Solid waste to be produced during the operational life of the project will consist of baghouse dust and used baghouse filters. The used baghouse filters will be collected by Waste Tech and disposed of at the Shongweni Landfill Site. The baghouse dust will be stored at the proposed new dust storage facility to be located in the southern portion of the site. The dust storage facility is currently under preliminary design by Kwezi V3 Engineers as part of the implementation of the Integrated Water and Waste Management Plan for the site. Various options for recycling of the baghouse dust are also being investigated.

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

The baghouse dust will be stored at the proposed new dust storage facility to be located in the southern portion of the site which is currently under design by Kwezi V3 Engineers as part of the implementation of the Integrated Water and Waste Management Plan for the site. The used baghouse filters will be collected by Waste Tech and disposed of at the Shongweni Landfill Site.

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, this must be brought to the attention of the competent authority.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

YES

If yes, inform the competent authority and request a change to an application for scoping and EIA.

Is the activity that is being applied for, for that of a solid waste handling or treatment facility?

NO

If yes, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Describe the measures, if any, that will be taken to ensure the optimal reuse or recycling of materials:

Various options for recycling of the baghouse dust are being investigated such as sale of the dust to external companies i.e. the cement industry and investigation of various technologies such as a sinter plant to produce synthetic ore for re-use in the furnaces, which will not pose an increased risk of furnace explosion.

Has a specialist been consulted to assist with the completion of this section?

YES

If YES, please complete:

Name of the specialist:

Mr. Chris Liebenberg of Kwezi V3 Engineers

Qualification(s) of the specialist:

Pr Eng, PrCPM

Postal address:

PO Box 36155, Menlo Park

Postal code:

0102

Telephone:

012-425 6300

Cell:

082 469 8416

E-mail:

CLiebenberg@kv3.co.za

Fax:

012-460 1336

Are any further specialist studies recommended by the specialist?

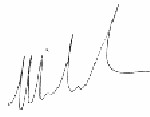
YES

If YES, specify: An Integrated Water and Waste Management Plan (including design for the dust storage facility) is currently being prepared for the site within the timeframes stipulated by DEAT.

If YES, is such a report(s) attached?

NO

Signature of specialist:



Date:

08 May 2008

(b) Liquid effluent

Will the activity produce effluent, other than domestic sewage? NO
 If yes, what estimated quantity will be produced per month? N/A m³
 If not, how will this effluent be disposed of?

N/A

Will the activity produce any effluent that will be treated and/or disposed of on site? NO
 If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility? NO

If yes, provide the particulars of the facility:

Facility name:	N/A		
Contact person:	N/A		
Postal address:	N/A		
Postal code:	N/A		
Telephone:	N/A	Cell:	N/A
E-mail:	N/A	Fax:	N/A

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

Although waste water will not be generated from the proposed project, Assmang do currently recycle their industrial waste water which is treated at Assmang's on-site Waste Water Treatment Plant and recycled back to the furnace scrubber system.

Has a specialist been consulted to assist with the completion of this section? YES

If YES, please complete:

Name of the specialist:	Mr. Chris Liebenberg of Kwezi V3 Engineers		
Qualification(s) of the specialist:	Pr Eng, PrCPM		
Postal address:	PO Box 36155, Menlo Park		
Postal code:	0102		
Telephone:	012-425 6300	Cell:	082 469 8416
E-mail:	CLiebenberg@kv3.co.za	Fax:	012-460 1336

Are any further specialist studies recommended by the specialist? NO

If YES, specify:

If YES, is such a report(s) attached? NO

Signature of specialist:  Date: 08 May 2008

(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES	<input checked="" type="checkbox"/>
YES	<input checked="" type="checkbox"/>

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

--	--

Has a specialist been consulted to assist with the completion of this section?

YES	<input checked="" type="checkbox"/>
-----	-------------------------------------

If YES, please complete:

Name of the specialist:

Mr. Lance Coetsee of Ecoserv

Qualification(s) of the specialist:

HDip(ChemEng)

Postal address:

PO Box 416, Pinetown

Postal code:

3600

Telephone:

086 123 0000

Cell:

083 399 1889

E-mail:

lance@ecoserv.com

Fax:

086 123 0001

Are any further specialist studies recommended by the specialist?

YES	<input checked="" type="checkbox"/>
-----	-------------------------------------

If YES, specify:

An Integrated Air Quality Management Plan (IAQMP) is being prepared for the site (including a complete site emission inventory and on-going monitoring of fugitive fume and dust emissions) by EnviroNgaka CC within the timeframes as stipulated by DEAT.
--

If YES, is such a report(s) attached?

NO	<input checked="" type="checkbox"/>
----	-------------------------------------

The IAQMP is being prepared for the site by EnviroNgaka within the timeframes stipulated by DEAT. However the following reports are attached:

- Ecoserv (2006) Fugitive Dust Emissions Assessment prepared for Assmang Manganese
- PSM (2007) Static Air Sampling Assmang Cato Ridge
- GLPS (2006) Fugitive Emission Study for Assmang Manganese Cato Ridge Works
- ECE (2007) Review of Fugitive Emission Study - Assmang Manganese Cato Ridge

Signature of specialist:



Date:

09 May 2008

(d) Generation of noise

Will the activity generate noise?

YES	
YES	

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

The sound pressure level of the proposed equipment to be installed will not exceed 80 dBA at 1m. To achieve this limit, it may be necessary to enclose the induced draft fans and motors in an acoustic enclosure/building. As the site is surrounded by open, undeveloped land owned by Assmang, any potential noise impact will be limited to within the existing operational area of the Assmang Works, and will therefore not impact significantly on existing ambient noise levels within the vicinity of the Works, or site neighbours. Various noise assessments have been undertaken at the facility and have concluded that there is currently no significant environmental noise impact from the existing plant.

Has a specialist been consulted to assist with the completion of this section?

YES	
-----	--

If YES, please complete:

Name of the specialist:

Mr. Jacques Rossouw, Consultant: Building Acoustics and Noise Control

Qualification(s) of the specialist:

BSc., BEng (Electrotechnical, Light current)

Postal address:

P. O. Box 905-739, Garsfontein, Pretoria

Postal code:

0042

Telephone:

012 361 5248

Cell:

E-mail:

jfr@swissmail.org

Fax:

012 348 4729

Are any further specialist studies recommended by the specialist?

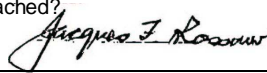
	NO
--	----

If YES, specify:

If YES, is such a report(s) attached?

	NO
--	----

Signature of specialist:



Date:

08 May 2008

8. WATER USE

Please note that the following issue must be described for each alternative site, layout and process.

Please indicate the source(s) of water that will be used for the activity by crossing the appropriate box(es)

Municipal X	water board	groundwater	river, stream, dam or lake	other	the activity will not use water
-----------------------	-------------	-------------	-------------------------------	-------	------------------------------------

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

N/A litres

Does the activity require a water use permit from the Department of Water Affairs and Forestry?

YES NO

If yes, please submit the necessary application to the Department of Water Affairs and Forestry and attach proof thereof to this application if it has been submitted.

9. ENERGY EFFICIENCY

Please note that the following issue must be described for each alternative site, layout and process.

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

Although the proposed new baghouses (3 No.) and induced draft (ID) fans shall operate continuously, the velocity of the fans will be capable of being reduced to save power. In terms of this, a variable speed drive or variable inlet vanes or other efficient means of reducing fan motor power during low load periods of operation of the fume system will be provided.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

Assmang are investigating long-term plans for potential co-generation of power on the site. However, in the short-term, alternative energy sources have not been taken into account or built into the design of the Fugitive Dust Project.

10. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document. The site or route plans must indicate the following:

- 10(a) the scale of the plan (appropriate to the extent of the development);
- 10(b) the property boundaries and erf or farm numbers of the adjoining properties;
- 10(c) the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- 10(d) the position of each element of the application as well as any other structures on the site;
- 10(e) the position of services (e.g. electricity supply cables, water supply pipelines, boreholes, sewage pipelines and storm water infrastructure) including servitudes and the purpose of such servitudes;
- 10(f) sensitive environmental elements on the site/s and within 100m of the site/s including (but not limited thereto):
 - Rivers, streams and drainage lines;
 - wetlands;
 - the 1:100 year flood line (where available or where it is required by DWAF);
 - ridges;
 - cultural and historical features;
 - areas with indigenous vegetation including protected plant species (even if it is degraded or invested with alien species);
- 10(g) contour intervals appropriate to the scale of the development must be indicated on the plan; and
- 10(h) the positions from where photographs of the site were taken must be indicated.
- 10(i) a detailed viewshed illustration (where appropriate)

Refer to Appendix A - Site Plans and Appendix C - Facility Illustrations.

11. SITE PHOTOGRAPHS

Colour photographs must include important features of the site and a description of each photograph must be provided. Photographs must be attached under Appendix B to this form.

Refer to Appendix B - Site Photographs.

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12. ACTIVITY MOTIVATION

12(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?
 What is the expected yearly income that will be generated by or as a result of the activity?
 Will the activity contribute to service infrastructure?
 Is the activity a public amenity?
 How many new employment opportunities will be created in the development phase of the activity?
 What is the expected value of the employment opportunities during the development phase?
 What percentage of this will accrue to previously disadvantaged individuals?
 How many permanent new employment opportunities will be created during the operational phase of the activity?
 What is the expected current value of the employment opportunities during the first 10 years?
 What percentage of this will accrue to previously disadvantaged individuals?

+/- R 177 million
R 0
NO
NO
+/- 50
+/- R 17 million
unknown %
0
R 0
0 %

12(b) Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

Assmang appointed Ecoserv in 2006 and PSM in 2007 to investigate fugitive dust emissions at the Works. Their findings indicate that the operational areas at the Assmang Works, including the furnace building (Furnaces No. 1 to No. 6), the crushing plants and the materials handling areas are sources of fugitive dust and fume emissions. In turn, there are insufficient dust and fume capture systems installed at the Works and, as a result, the levels of emissions are generally high.

In light of this, Assmang commissioned GLPS Project Management and Engineering Services in 2006 to conduct a feasibility study to develop and evaluate options for improvement of fugitive emission levels at the Assmang Works (GLPS, 2006). The GLPS study was subsequently reviewed by Environmental Control Engineering (ECE) in March 2007 (ECE, 2007). The results of the study and the review concluded that environmental conditions at the Assmang Works could be improved by implementing fume extraction at the furnace tap holes, by improving ventilation inside the furnace building, by providing dust extraction at the crusher plants and by installing dust suppression systems at the materials handling plant areas.

Based on these findings, Assmang has identified the need to design and implement a fugitive emission reduction programme at the Works to address the high levels of fugitive emissions released during existing operations, thereby reducing the potential exposure of the Assmang employees and the surrounding environment to manganese-containing fumes and dust, and to bring their operating procedure in-line with international best practice.

Indicate any benefits that the activity will have for society in general:

The proposed Fugitive Dust Project will result in a significant reduction in the levels of fugitive fumes and dust released into the atmosphere during existing operations at the Assmang Works. This will decrease the volume of atmospheric pollutants released from the Assmang Works and will aid in the reduction of current atmospheric pollution levels in the Cato Ridge area.

Indicate any benefits that the activity will have for the local communities where the activity will be located:

The proposed project will address the high levels of fugitive emissions released during existing operations, reduce the potential exposure of the Assmang employees and the surrounding environment to manganese-containing fumes and dust, and bring Assmang's operating procedure in-line with international best practice

13. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline:	Administering authority:	Date:
The Constitution of the Republic of South Africa, Act 108 of 1996;	Constitutional Court	1996
National Environmental Management Act (NEMA), No. 107 of 1998;	National and provincial Departments of Environmental Affairs	1998
Environmental Conservation Act (ECA), No. 73 of 1989;	National and provincial Departments of Environmental Affairs	1989
National Environmental Management Air Quality Act, No. 39 of 2004;	National and provincial Departments of Environmental Affairs	2004
Atmospheric Pollution Prevention Act (APPA), No. 45 of 1965;	National and provincial Departments of Environmental Affairs	1965
National Water Act, No. 36 of 1998;	Department of Water Affairs and Forestry (DWAF)	1998
Health Act, No. 63 of 1977 (which will be replaced shortly by the National Health Act, No. 61 of 2003);	Department of Health	1977
Occupational Health and Safety Act (OHSA), No. 85 of 1993;	Department of Labour	1993
Hazardous Substances Act No. 15 of 1973;	Department of Labour	1973
National Road Traffic Act, No. 93 of 1996;	Department of Transport	1996
KwaZulu-Natal Provincial Roads Act, No. 4 of 2001;	KwaZulu-Natal Department of Transport	2001
National Heritage Resources Act No. 25 of 1999;	Amafa	1999
KwaZulu-Natal Heritage Act No. 10 of 1997;	Amafa aKwaZulu-Natali	1997
Local by-laws (eThekweni Municipality) - Scheduled Trade Permit, Environmental Health, Water Supply, Solid Waste and Sewage bylaws.	eThekweni Municipality	

SECTION D: SITE/AREA DESCRIPTION

Important note: For linear activities (pipelines etc) as well as activities that cover very large sites, it may be necessary to complete Section C for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A): N/A
(complete only when appropriate)

1. GRADIENT OF THE SITE

Indicate the general gradient of the sites (Please cross the appropriate box).

Alternative S1 (preferred site):

Flat X	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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Alternative S2 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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Alternative S3 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site (Please cross the appropriate box).

Alternative S1 (preferred site):

Ridgeline	Plateau X	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------------------	-----------------------------	---------------	-------------	-------	----------------------------	------	-----------

Alternative S2 (if any):

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	-------------	-------	----------------------------	------	-----------

Alternative S3 (if any):

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	-------------	-------	----------------------------	------	-----------

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following (cross the appropriate boxes)?

	Alternative S1 (preferred site):		Alternative S2 (if any):		Alternative S3 (if any):	
	YES	NO	YES	NO	YES	NO
Shallow water table (less than 1.5m deep)	X					
Dolomite, sinkhole or doline areas	YES	NO X	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	YES	NO X	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO X	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO X	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO X	YES	NO	YES	NO
Any other unstable soil or geological feature	YES	NO X	YES	NO	YES	NO
An area sensitive to erosion	YES	NO X	YES	NO	YES	NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where available / they exist, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

Has a specialist been consulted to assist with the completion of this section?

YES

If YES, please complete:

Name of the specialist:

Mr. Chris Liebenberg of Kwezi V3 Engineers

Qualification(s) of the specialist:

Pr Eng, PrCPM

Postal address:

PO Box 36155, Menlo Park

Postal code:

0102

Telephone:

012-425 6300

Cell:

082 469 8416

E-mail:

CLiebenberg@kv3.co.za

Fax:

012-460 1336

Are any further specialist studies recommended by the specialist?

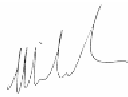
YES

An Integrated Water and Waste Management Plan is currently being prepared for the site by KV3 and geotechnical investigations are currently being undertaken for the proposed sites for the three new baghouses by MSJ.

If YES, is such a report(s) attached?

NO

Signature of specialist:



Date:

08 May 2008

4. GROUNDCOVER

Cross the types of groundcover present on the site.

Alternative S1:

Natural veld - good condition ^E	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface X	Building or other structure X	Bare soil X

If any of the boxes marked with an "E" are crossed, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise. The environmental assessment practitioner or specialist must provide reasons for their selection above in the following box:

The project is to be undertaken within the existing industrial footprint of the Assmang Manganese Cato Ridge Works, within and adjacent to the existing furnace building complex. The areas proposed for the installation of the additional equipment and infrastructure associated with the proposed activity consist of existing paved surfaces and buildings.

Has a specialist been consulted? YES NO

If YES, please complete the following:

Name of the specialist:

Qualification(s) of the specialist:

Postal address:

Postal code:

Telephone: Cell:

E-mail: Fax:

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites? YES NO

If YES, specify and explain:

Are there any special or sensitive habitats or other natural features present on any of the alternative sites? YES NO

If YES, specify and explain:

Are any further specialist studies recommended by the specialist? YES NO

If YES, specify:

If YES, is such a report(s) attached? YES NO N/A

Signature of specialist: Date:

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Alternative S2: N/A

Natural veld - good condition ^E	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an "E" are crossed, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise. The environmental assessment practitioner or specialist must provide reasons for their selection above in the following box:

Has a specialist been consulted? YES NO

If YES, please complete the following:

Name of the specialist:

Qualification(s) of the specialist:

Postal address:

Postal code:

Telephone: Cell:

E-mail: Fax:

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites? YES NO

If YES, specify and explain:

Are there any special or sensitive habitats or other natural features present on any of the alternative sites? YES NO

If YES, specify and explain:

Are any further specialist studies recommended by the specialist? YES NO

If YES, specify:

If YES, is such a report(s) attached? YES NO

Signature of specialist: Date:

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Alternative S3: N/A

Natural veld - good condition ^E	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an "E" are crossed, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise. The environmental assessment practitioner or specialist must provide reasons for their selection above in the following box:

Has a specialist been consulted? YES NO

If YES, please complete the following:

Name of the specialist:

Qualification(s) of the specialist:

Postal address:

Postal code:

Telephone: Cell:

E-mail: Fax:

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites? YES NO

If YES, specify and explain:

Are there any special or sensitive habitats or other natural features present on any of the alternative sites? YES NO

If YES, specify and explain:

Are any further specialist studies recommended by the specialist? YES NO

If YES, specify:

If YES, is such a report(s) attached? YES NO

Signature of specialist: Date:

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

5. LAND USE CHARACTER OF SURROUNDING AREA

Cross the land uses and/or prominent features that currently occur within a 500m radius of the site.

Alternative S1 (preferred site):

Natural area X	Low density residential	Medium density residential	High density residential	Informal residential ^A
Retail	Commercial & warehousing	Light industrial	Medium industrial ^{AN}	Heavy industrial ^{AN} X
Power station ^A	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam ^A X	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center/clinic	School/creche	Tertiary education facility	Church	Old age home
Sewage treatment plant ^A	Train station or shunting yard ^N	Railway line ^N X	Major road (4 lanes or more) ^N	Airport ^N
Harbour	Sport facilities	Golf course	Polo fields	Filling station ^H
Landfill or waste treatment site ^A X	Plantation	Agriculture X	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archeological site
Other land uses (describe):				

If any of the boxes marked with an ^{AN} are crossed, please consult an appropriate noise specialist to assist in the completion of this section.

Has a specialist been consulted? YES

If YES, please complete the following:

Name of the specialist:	Mr. Jacques Rossouw, Consultant: Building Acoustics and Noise Control		
Qualification(s) of the specialist:	BSc., BEng (Electrotechnical, Light current)		
Postal address:	P. O. Box 905-739, Garsfontein, Pretoria		
Postal code:	0042		
Telephone:	012 361 5248	Cell:	
E-mail:	jfr@swissmail.org	Fax:	012 348 4729
Will the ambient noise level have a negative impact on the proposed activity?			NO
If YES, specify and explain:	N/A		
Are any further specialist or studies recommended by the specialist?			NO
If YES, specify:	N/A		
If YES, is such a report(s) attached?	N/A		NO

Signature of specialist:  Date:

Cross the land uses and/or prominent features that currently occur within a 500m radius of the site.

Alternative S1 (preferred site):

Natural area X	Low density residential	Medium density residential	High density residential	Informal residential ^A
Retail	Commercial & warehousing	Light industrial	Medium industrial ^{AN}	Heavy industrial ^{AN} X
Power station ^A	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam ^A X	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center/clinic	School/creche	Tertiary education facility	Church	Old age home
Sewage treatment plant ^A	Train station or shunting yard ^N	Railway line ^N X	Major road (4 lanes or more) ^N	Airport ^N
Harbour	Sport facilities	Golf course	Polo fields	Filling station ^H
Landfill or waste treatment site ^A X	Plantation	Agriculture X	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archeological site
Other land uses (describe):				

If any of the boxes marked with an ^{“A”} are crossed, please consult an appropriate air quality specialist to assist in the completion of this section.

Has a specialist been consulted?

YES

If YES, please complete the following:

Name of the specialist: Mr. Lance Coetzee of Ecoserv

Qualification(s) of the specialist: HDip(ChemEng)

Postal address: PO Box 416, Pinetown

Postal code: 3600

Telephone: 086 123 0000

Cell: 083 399 1889

E-mail: lance@ecoserv.com

Fax: 086 123 0001

Will the ambient air pollution level have a negative impact on the proposed activity?

YES

NO

If YES, specify and explain:

Are any further specialist studies recommended by the specialist?

YES

NO

If YES, specify:

If YES, is such a report(s) attached?

YES

NO

Signature of specialist:



Date:

09 May 2008

Cross the land uses and/or prominent features that currently occur within a 500m radius of the site.

Alternative S1 (preferred site):

Natural area X	Low density residential	Medium density residential	High density residential	Informal residential ^A
Retail	Commercial & warehousing	Light industrial	Medium industrial ^{AN}	Heavy industrial ^{AN} X
Power station ^A	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam ^A X	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center/clinic	School/creche	Tertiary education facility	Church	Old age home
Sewage treatment plant ^A	Train station or shunting yard ^N	Railway line ^N X	Major road (4 lanes or more) ^N	Airport ^N
Harbour	Sport facilities	Golf course	Polo fields	Filling station ^H
Landfill or waste treatment site ^A X	Plantation	Agriculture X	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archeological site
Other land uses (describe):				

If any of the boxes marked with an "H" are crossed, please consult an appropriate health assessment specialist to assist in the completion of this section.

Has a specialist been consulted?

YES

If YES, please complete the following:

Name of the specialist:

Dr. Willie van Niekerk

Qualification(s) of the specialist:

PhD QEP (USA) Pr Sci Nat (Environmental Science)

Postal address:

P O Box 98092, Waterkloof Heights

Postal code:

0065

Telephone:

012-346 4668

Cell:

082 416 5864

E-mail:

info@infotox.co.za

Fax:

012-460 0650

Will the surrounding land use pose any unacceptable health risk on the proposed activity?

NO

If YES, specify and explain:

Are any further specialist studies recommended by the specialist?

NO

If YES, specify:

If YES, is such a report(s) attached?

NO

Signature of specialist:



Date:

08 May 2008

Alternative S2 (if any): **N/A**

Natural area	Low density residential	Medium density residential	High density residential	Informal residential ^A
Retail	Commercial & warehousing	Light industrial	Medium industrial ^{AN}	Heavy industrial ^{AN}
Power station ^A	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam ^A	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center/clinic	School/creche	Tertiary education facility	Church	Old age home
Sewage treatment plant ^A	Train station or shunting yard ^N	Railway line ^N	Major road (4 lanes or more) ^N	Airport ^N
Harbour	Sport facilities	Golf course	Polo fields	Filling station ^H
Landfill or waste treatment site ^A	Plantation	Agriculture	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archeological site
Other land uses (describe):				

If any of the boxes marked with an ^{AN} "are crossed, please consult an appropriate noise specialist to assist in the completion of this section.

Has a specialist been consulted?

YES	NO
-----	----

If YES, please complete the following:

Name of the specialist:

Qualification(s) of the specialist:

Postal address:

Postal code:

Telephone: Cell:

E-mail: Fax:

Will the ambient noise level have a negative impact on the proposed activity?

YES	NO
-----	----

If YES, specify and explain:

Are any further specialist studies recommended by the specialist?

YES	NO
-----	----

If YES, specify:

If YES, is such a report(s) attached?

YES	NO
-----	----

Signature of specialist: Date:

If any of the boxes marked with an ^{AN} "are crossed, please consult an appropriate air quality specialist to assist in the completion of this section.

Has a specialist been consulted?

YES	NO
-----	----

If YES, please complete the following:

Name of the specialist:

Qualification(s) of the specialist:

Postal address:

Postal code:

Telephone: Cell:

E-mail: Fax:

Will the ambient noise level have a negative impact on the proposed activity?

YES	NO
-----	----

If YES, specify and explain:

Are any further specialist studies recommended by the specialist?

YES	NO
-----	----

If YES, specify:

If YES, is such a report(s) attached?

YES	NO
-----	----

Signature of specialist: Date:

If any of the boxes marked with an ^{AN} "are crossed, please consult an appropriate health assessment specialist to assist in the completion of this section.

Has a specialist been consulted?

YES	NO
-----	----

If YES, please complete the following:

Name of the specialist:

Qualification(s) of the specialist:

Postal address:

Postal code:

Telephone: Cell:

E-mail: Fax:

Will the ambient noise level have a negative impact on the proposed activity? YES NO

If YES, specify and explain: _____

Are any further specialist studies recommended by the specialist? YES NO

If YES, specify: _____

If YES, is such a report(s) attached? YES NO

Signature of specialist: _____ Date: _____

Alternative S3 (if any): N/A

Natural area	Low density residential	Medium density residential	High density residential	Informal residential ^A
Retail	Commercial & warehousing	Light industrial	Medium industrial ^{AN}	Heavy industrial ^{AN}
Power station ^A	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam ^A	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center/clinic	School/creche	Tertiary education facility	Church	Old age home
Sewage treatment plant ^A	Train station or shunting yard ^N	Railway line ^N	Major road (4 lanes or more) ^N	Airport ^N
Harbour	Sport facilities	Golf course	Polo fields	Filling station ^H
Landfill or waste treatment site ^A	Plantation	Agriculture	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archeological site
Other land uses (describe):				

If any of the boxes marked with an ^{AN} "are crossed, please consult an appropriate noise specialist to assist in the completion of this section.

Has a specialist been consulted? YES NO

If YES, please complete the following:

Name of the specialist: _____

Qualification(s) of the specialist: _____

Postal address: _____

Postal code: _____

Telephone: _____ Cell: _____

E-mail: _____ Fax: _____

Will the ambient noise level have a negative impact on the proposed activity? YES NO

If YES, specify and explain: _____

Are any further specialist studies recommended by the specialist? YES NO

If YES, specify: _____

If YES, is such a report(s) attached? YES NO

Signature of specialist: _____ Date: _____

If any of the boxes marked with an ^{AN} "are crossed, please consult an appropriate air quality specialist to assist in the completion of this section.

Has a specialist been consulted? YES NO

If YES, please complete the following:

Name of the specialist: _____

Qualification(s) of the specialist: _____

Postal address: _____

Postal code: _____

Telephone: _____ Cell: _____

E-mail: _____ Fax: _____

Will the ambient noise level have a negative impact on the proposed activity? YES NO

If YES, specify and explain: _____

Are any further specialist studies recommended by the specialist? YES NO

If YES, specify: _____

If YES, is such a report(s) attached? YES NO

Signature of specialist: _____ Date: _____

If any of the boxes marked with an "X" are crossed, please consult an appropriate health assessment specialist to assist in the completion of this section.

Has a specialist been consulted?

YES	NO
-----	----

If YES, please complete the following:

Name of the specialist:

Qualification(s) of the specialist:

Postal address:

Postal code:

Telephone: Cell:

E-mail: Fax:

Will the ambient noise level have a negative impact on the proposed activity?

YES	NO
-----	----

If YES, specify and explain:

Are any further specialist studies recommended by the specialist?

YES	NO
-----	----

If YES, specify:

If YES, is such a report(s) attached?

YES	NO
-----	----

Signature of specialist: Date:

6. CULTURAL/HISTORICAL FEATURES

Alternative S1 (preferred site)

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?		NO
If YES, explain:	N/A	
If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.		
Briefly explain the findings of the specialist:		
Will any building or structure older than 60 years be affected in any way?		NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?		NO
If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.		

Alternative S2 (if any) N/A

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?	YES	NO
	Uncertain	
If YES, explain:		
If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.		
Briefly explain the findings of the specialist:		
Will any building or structure older than 60 years be affected in any way?	YES	NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	NO
If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.		

Alternative S3 (if any) N/A

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?	YES	NO
	Uncertain	
If YES, explain:		
If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.		
Briefly explain the findings of the specialist:		
Will any building or structure older than 60 years be affected in any way?	YES	NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	NO
If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.		

Are any further specialist studies recommended by the specialist?	YES	NO
If YES, specify:		
If YES, is such a report(s) attached?		
Signature of specialist:		Date:

SECTION E: PUBLIC PARTICIPATION

Please note that details of all components of this section must be included under Appendix E to this report.

1. ADVERTISEMENT

The environmental assessment practitioner must follow any relevant guidelines adopted by the competent authority in respect of public participation and must at least –

- 1(a) Fix a notice in a conspicuous place, on the property where it is intended to undertake the activity which states that an application will be submitted to the competent authority in terms of these regulations and which provides information on the proposed nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations on the application may be made.
- 1(b) inform landowners and occupiers of adjacent land of the applicant's intention to submit an application to the competent authority
- 1(c) inform landowners and occupiers of land within 100 metres of the boundary of the property where it is proposed to undertake the activity and whom may be directly affected by the proposed activity of the applicant's intention to submit an application to the competent authority;
- 1(d) inform the ward councillor and any organisation that represents the community in the area of the applicant's intention to submit an application to the competent authority;
- 1(e) inform the municipality which has jurisdiction over the area in which the proposed activity will be undertaken of the applicant's intention to submit an application to the competent authority; and
- 1(f) inform any organ of state that may have jurisdiction over any aspect of the activity of the applicant's intention to submit an application to the competent authority; and
- 1(g) place a notice in one local newspaper and any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of these regulations.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

Advertisements and notices must indicate that an application will be submitted to the competent authority in terms of the EIA regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made;

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for site alternatives where appropriate.

4. DETERMINATION OF APPROPRIATE MEASURES

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. **Please note** that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to this application. The comments and response report must be attached under Appendix E.

Refer to Appendix E – Public Involvement Report

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6. PARTICIPATION BY DISTRICT, LOCAL AND TRADITIONAL AUTHORITIES

District, local and traditional authorities (where applicable) are all key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least 30 (thirty) calendar days before the submission of the application.

Has any comment been received from the district municipality?

N/A

YES NO

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

The site is located in the eThekweni Metro, hence no District Municipality has jurisdiction.

Has any comment been received from the local municipality?

YES NO

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

The eThekweni Municipality supports the proposed project, subject to the necessary approvals being issued (Refer to Appendix E).

Has any comment been received from a traditional authority?

YES NO

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

The KwaXimba Traditional Authority supports the proposed project, subject to the necessary approvals being issued (Refer to Appendix E).

7. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application at least 30 (thirty) calendar days before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

YES NO

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

Stakeholders support the proposed project, subject to the necessary approvals being issued (Refer to Appendix E).

SECTION F: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2006, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

Please note that details of all components of this section must be included under Appendix F to this report.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the issues raised by interested and affected parties.

Issues raised by interested and affected parties relate to:

- Air Quality,
- Water Quality and Usage,
- Occupational Health,
- Community Health,
- Environmental Health,
- Waste Management,
- Energy Usage;
- Land / Soil Contamination,
- Noise Impact,
- Transport and Traffic,
- Visual / Aesthetic Impact, and
- Socio-economic Impacts

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report):

The proposed development would constitute an improvement to the existing situation, the major positive impact being an improvement in air quality, and associated benefits in terms of occupational, environmental and community health. As the project involves retro-fitting of air pollution abatement equipment onto existing infrastructure, relatively insignificant negative environmental impacts are anticipated. The major waste stream to be generated from the proposed project is solid waste in the form of baghouse dust. It should be noted that the quantity of baghouse dust to be generated from the proposed activity is relatively insignificant in relation to the current quantities of dust generated on the site from existing operations. The baghouse dust will be stored at the proposed new dust storage facility to be located in the southern portion of the site. The dust storage facility is currently under preliminary design by Kwezi V3 Engineers as part of the implementation of the Integrated Water and Waste Management Plan for the site. Various options for recycling of the baghouse dust are also being investigated, as well as the option for co-generation of electricity on the plant.

Refer to Appendix F Impact Assessment Report and Appendix E Public Involvement Report.

2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the planning and design phase:

Alternative S1 (preferred alternative)

Direct impacts:

Positive economic impact - new employment and income generation opportunities are associated with the appointment of staff and consultants to undertake the planning and design phase of the project.

Indirect impacts:

Skills development – improvement in knowledge and technical expertise of Assmang employees will contribute towards the on-going sustainable operation of the Cato Ridge Works and the public involvement component of the EIA will enhance the knowledge of IAPs.

Cumulative impacts:

Sharing of knowledge within the industry - the design of the programme has been undertaken in co-operation with similar industries in terms of safety, health and environmental issues and contributed towards sharing of knowledge in the ferro-manganese industry.

Alternative S2 (if any) **N/A**

Direct impacts: Not applicable

Indirect impacts: Not applicable

Cumulative impacts: Not applicable

Alternative S3 (if any) **N/A**

Direct impacts: Not applicable

Indirect impacts: Not applicable

Cumulative impacts: Not applicable

No-go alternative (compulsory)

Direct impacts:

Potential air quality and occupational health impacts - Assmang employees will continue to be exposed to potentially high levels of manganese dust and fumes in the workplace which may contribute to deterioration of ambient air quality.

Indirect impacts:

Economic impacts – potential ill-health could affect the productivity and income-earning potential of employees and the financial viability of continued production at the Works.

Cumulative impacts:

Poverty – potential ill-health and potential loss of jobs could contribute to increased poverty in Cato Ridge and surrounding areas.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1	Alternative S2	Alternative S3
Local consultants should be utilized when possible. Knowledge, skills and training must be passed on to Assmang employees and IAPs to build capacity in the local area and enhance on-going management of the site.	N/A	N/A

b. Process, technology, layout or other alternatives

List the impacts associated with any process, technology, layout or other alternatives that are likely to occur during the planning and design phase (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

Direct impacts:

Improvement of air quality – implementation of the preferred technological option will meet the specified targets for air quality.

Phase 1 of the project is designed to capture more than 90% of the dust and fume generated during slag and metal tapping from the tap-holes, launders and hot metal ladles. The objective is to achieve an ambient air quality level of below 1 mg/m³ for manganese dust and fumes inside the furnace building after the extraction system is operational and to ensure availability of the fume treatment system at 98%.

The primary objective of Phases 2 and 3 is to ensure that dust levels at both crushing and screening plants and the raw materials handling areas are below 5 mg/m³ total dust and below 1 mg/m³ for inhalable manganese dust and to ensure availability of the dust treatment system at 99%.

Design of the system is such that the majority of fabrication and pre-assembly can be undertaken off-site which will minimise site impacts associated with the construction phase such as an increase in noise, dust and traffic.

Indirect impacts:

Skills development – improvement in knowledge and technical expertise of Assmang employees will contribute towards the on-going sustainable operation of the Cato Ridge Works.

Cumulative impacts:

Sharing of knowledge within the industry - the design of the programme has been undertaken in co-operation with similar industries in terms of safety, health and environmental issues and contributed towards sharing of knowledge in the ferro-manganese industry.

Alternative A2 (if any) **N/A**

Direct impacts: Not applicable

Indirect impacts: Not applicable

Cumulative impacts: Not applicable

Alternative A3 (if any) **N/A**

Direct impacts: Not applicable

Indirect impacts: Not applicable

Cumulative impacts: Not applicable

No-go alternative (compulsory)

Direct impacts:

Potential air quality and occupational health impacts - Assmang employees will continue to be exposed to potentially high levels of manganese dust and fumes in the workplace.

Indirect impacts:

Economic impacts – potential ill-health could affect the productivity and income-earning potential of employees and the financial viability of continued production at the Works.

Cumulative impacts:

Poverty – potential ill-health and potential loss of jobs could contribute to increased poverty in Cato Ridge and surrounding areas.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1:	Alternative A2:	Alternative A3:
<ul style="list-style-type: none"> Local consultants should be utilized when possible. Knowledge, skills and training must be passed on to Assmang employees and IAPs to build capacity in the local area and enhance on-going management of the site; and Design of the system should be such that the majority of fabrication and pre-assembly can be undertaken off-site which will minimise site impacts associated with the construction phase such as an increase in noise, dust and traffic. 	N/A	N/A

3. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the construction phase:

Alternative S1 (preferred site)

Direct impacts:

IMPACTS WITH LOW SIGNIFICANCE RATING (POST-MITIGATION) Refer to Appendix F- Impact Assessment

- Air quality – Potential generation of secondary dust during construction, especially from use of the roads by construction vehicles;
- Water quality – Potential pollution of stormwater during construction (i.e. during use of cement, etc.);
- Water use – Use of additional water during construction;
- Waste generation – General solid waste will be generated and will require transport to a landfill site;
- Land use – The proposed sites for the baghouses are already extensively disturbed, are located adjacent to the existing industrial infrastructure (furnace building and crushing and screening plants) and are relatively small in size, hence loss of potential alternative land use is insignificant;
- Occupational health – Potential for accidents to occur during the use of heavy construction and electrical equipment on site;
- Energy usage – The electricity utilised during construction constitutes use of a non-renewable resource;
- Visual – Three additional stacks of 20m - 30m for the baghouses will be erected at the Works which will be visible from the surrounding areas;
- Noise - Potential increase in noise generation resulting from the construction, increased traffic and installation of the necessary equipment;
- Traffic - Potential increase in road traffic resulting from the transportation of construction materials and equipment to and from the Assmang Works; and
- Socio-economic – The creation of limited employment opportunities (positive) during construction.

Indirect impacts:

IMPACTS WITH LOW SIGNIFICANCE RATING (POST MITIGATION)

- Air – A short-term increase in dust levels may cause discomfort and irritation for staff and contractors and reduce visibility on the site which can increase the risk of accidents;
- Water - Contribution to deterioration of water quality, even if very low and for a short duration, may affect the aquatic health of rivers and streams downstream from the site;
- Waste - General solid waste produced will utilise air space at a landfill site;
- Energy usage - Increase utilisation of electricity from coal constitutes use of a non-renewable resource and contributes to air pollution at the source of generation (subject to a separate environmental authorisation);
- Traffic - Congestion and damage to the local and national road network, particularly along the N3 Highway and R103, resulting from the transportation of construction materials and equipment to and from the Assmang site; and
- Socio-economic - Generation of down-stream socio-economic activities associated with the income generated from the construction phase (positive).

Cumulative impacts:

IMPACTS WITH LOW SIGNIFICANCE RATING (POST MITIGATION)

- There are numerous existing industrial sites and several new industrial developments proposed in the Cato Ridge area, which will have a cumulative impact on air and water quality, generate waste, noise and traffic and utilise electricity. Existing residents of both the formal Cato Ridge residential areas and the KwaXimba Traditional Area are located in relative close proximity to the Cato Ridge industrial areas and the Umgeni Valley to the east constitutes an important watershed and biodiversity asset. There may be a need for an area-based Environmental Management Framework for the Cato Ridge area, although this is outside of the scope of this project. The proposed Fugitive Dust Project will assist in reducing the impact of Assmang on air quality, relative to the cumulative impact of existing and proposed industries (positive); and
- The KwaXimba Traditional Area is a relatively low-income area and the generation of down-stream socio-economic activities associated with income generated from the construction phase will contribute towards

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improving the livelihood of community members (positive).

Alternative S2 (if any)

Direct impacts: Not applicable

Indirect impacts: Not applicable

Cumulative impacts: Not applicable

Alternative S3 (if any)

Direct impacts: Not applicable

Indirect impacts: Not applicable

Cumulative impacts: Not applicable

No-go alternative (compulsory)

Direct impacts:

Potential air quality and occupational health impacts - Assmang employees will continue to be exposed to potentially high levels of manganese dust and fumes in the workplace.

Indirect impacts:

Economic impacts – potential ill-health could affect the productivity and income-earning potential of employees and the financial viability of continued production at the Works.

Cumulative impacts:

Poverty – potential ill-health and potential loss of jobs could contribute to increased poverty in Cato Ridge and surrounding areas.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1	Alternative S2	Alternative S3
<ul style="list-style-type: none"> • Dust suppression on roads to be utilized by construction vehicles must be implemented; • Measures must be taken to prevent pollution of ground and surface water sources; • Efficient and controlled usage of water must be ensured during the construction phase and water leaks should be identified and repaired immediately; • All general solid waste generated during the construction period by the contractor must be removed and disposed of at a registered landfill site; • Assmang's existing occupational and environmental health and safety conditions must be complied with; • Vehicles transporting the required equipment and construction materials to and from the Assmang Works must adhere to speed limits and all applicable road rules to limit impacts on the surrounding road network; • Noisy activities associated with the construction phase of the Fugitive Dust Project must be restricted to within normal working hours (8AM to 5PM); • Assmang employees and contractors installing the infrastructure must be issued with protective equipment; • The system should be designed such that the majority of fabrication and pre-assembly can occur off-site to reduce traffic, noise and dust impacts; • Local labour should be sourced, where possible, for the construction phase of the project; and • Installation of the equipment and infrastructure should involve, wherever possible, labour-intensive methods and practices. <p>Refer to the attached Environmental Management Plan (EMP) in Appendix G for a more comprehensive description of mitigation measures recommended for the construction phase.</p>		

b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the construction phase (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

Direct impacts:

The preferred design and layout is one in which the majority of fabrication and pre-assembly can be undertaken off-site in order to mitigate impacts associated with the construction phase such as traffic, noise and dust. In addition, the design and layout should be such that assembly of the system on-site during the construction phase will not interfere with continued production at the Works.

Indirect impacts: N/A

Cumulative impacts: N/A

Alternative A2

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

Alternative A3

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

No-go alternative (compulsory)

Direct impacts:

Potential air quality and occupational health impacts - Assmang employees will continue to be exposed to potentially high levels of manganese dust and fumes in the workplace.

Indirect impacts:

Economic impacts – potential ill-health could affect the productivity and income-earning potential of employees and the financial viability of continued production at the Works.

Cumulative impacts:

Poverty – potential ill-health and potential loss of jobs could contribute to increased poverty in Cato Ridge and surrounding areas.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1:

Alternative A2:

Alternative A3:

<ul style="list-style-type: none"> The preferred design and layout is one in which the majority of fabrication and pre-assembly can be undertaken off-site in order to mitigate impacts associated with the construction phase such as traffic, noise and dust. In addition, the design and layout should be such that assembly of the system on-site during the construction phase will not interfere with continued production at the Works. 		
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4. IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the operational phase:

Alternative S1 (preferred alternative)

Direct impacts:

IMPACTS WITH LOW SIGNIFICANCE RATING (POST-MITIGATION) Refer to Appendix F- Impact Assessment

- Water quality – Potential pollution of stormwater during operation i.e. should the dust from the baghouses not be not be adequately stored, controlled and managed;
- Visual / aesthetic – A reduction in fugitive dust emissions will lead to increased visibility on and around the site and improve aesthetics (positive). The proposed new baghouse stacks will be lower than the existing stacks and will not provide a significant visual impact;
- Noise - Potential increase in noise generation resulting from the operation of additional fans;
- Traffic – There may be a slight increase in traffic associated with potential sale of baghouse dust to external companies as the dust would require transport via truck from the site to the buyer; and
- Socio-economic – Limited employment opportunities (positive) for contractors in terms of monitoring and maintenance during operation.

IMPACTS WITH MEDIUM SIGNIFICANCE RATING (POST-MITIGATION)

- Waste generation – Baghouse dust will require storage at the proposed new on-site dust storage facility, currently under preliminary design by KV3. Assmang is further investigating alternative options in terms of re-cycling of dust; and
- Energy usage – The electricity utilised during operation constitutes use of a non-renewable resource.

IMPACTS WITH HIGH SIGNIFICANCE RATING (POST-MITIGATION)

- Air quality – Improvement in ambient air quality within the furnace building, on-site and surrounding the site.

Indirect impacts:

IMPACTS WITH LOW SIGNIFICANCE RATING (POST MITIGATION)

- Water - Contribution to deterioration of water quality, even if very low and for a short duration, may affect the aquatic health of rivers and streams downstream from the site;
- Noise - Three new baghouses with fans may potentially increase the ambient noise levels;
- Traffic - Congestion and damage to the local and national road network, particularly along the N3 Highway and R103, resulting from the potential transportation of baghouse dust from the Assmang Site; and

IMPACTS WITH MEDIUM SIGNIFICANCE RATING (POST-MITIGATION)

- Waste and Water Management – Increased stockpiles of baghouse dust, if not adequately engineering and managed may contribute to deterioration of the quality of surface and groundwater sources, contamination of soils and may affect the aquatic health of rivers and streams downstream from the site.
- Power - Increase utilisation of electricity from coal constitutes use of a non-renewable resource and contributes to air pollution at the source of generation (subject to a separate environmental authorisation);

IMPACTS WITH HIGH SIGNIFICANCE RATING (POST-MITIGATION)

- Air quality – Improvement in occupational and ambient air quality within the furnace building, on-site and surrounding the site will increase visibility and enhance the aesthetic qualities of the site as well as reduce the risk of occupational disease and health risks for both employees and the surrounding communities.

Cumulative impacts:

IMPACTS WITH HIGH SIGNIFICANCE RATING (POST MITIGATION)

There are numerous existing industrial sites and several new industrial developments proposed in the Cato Ridge area, which will have a cumulative impact on air and water quality, generate waste, noise and traffic and utilise electricity. Existing residents of both the formal Cato Ridge residential areas and the KwaXimba Traditional Area are located in relative close proximity to the Cato Ridge industrial areas and the Umgeni Valley to the east constitutes an important watershed and biodiversity asset. There may be a need for an area-based Environmental Management Framework for the Cato Ridge area, although this is outside of the scope of this project. The proposed Fugitive Dust Project will assist in reducing the impact of Assmang on air quality, relative to the cumulative impact of existing and proposed industries (positive).

The major objective of the project is to reduce the risk of occupational disease and health risks to employees who may be exposed to manganese laden fumes and dust for an extended period.

Alternative S2 (if any) N/A

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative S3 (if any) N/A

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Potential air quality and occupational health impacts - Assmang employees will continue to be exposed to potentially high levels of manganese dust and fumes in the workplace, specifically during tapping of the furnaces.

Indirect impacts:

Economic impacts – potential ill-health could affect the productivity and income-earning potential of employees and the financial viability of continued production at the Works.

Cumulative impacts:

Poverty – potential ill-health and potential loss of jobs could contribute to increased poverty in Cato Ridge and surrounding areas.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1

Alternative S2

Alternative S3

- On-going monitoring and maintenance of the equipment / infrastructure installed as part of the fugitive emission control project must be undertaken to ensure that the capture of fugitive fumes and dust is not compromised through equipment failure;
 - Continuous air quality monitoring must be undertaken;
 - Assmang employees must be issued with protective equipment, as required;
 - Assmang is in the process of developing and implementing a stormwater management system, including the capture and treatment of stormwater, to prevent contaminated stormwater from leaving the site and clean stormwater from entering the site. This will therefore prevent stormwater contaminated from the on-site baghouse dust and sludge stockpiles from leaving the Assmang site and impacting on downstream riverine ecosystems.
- Assmang's existing EMP's for the operations at the Works should be updated to included requirements relative to the proposed project.

b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the operational phase (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

Direct impacts:

No potential impacts relating to process, technology, layout or other alternatives have been identified.

Indirect impacts: N/A

Cumulative impacts: N/A

Alternative A2 – N/A

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative A3 – N/A

Direct impacts:

Indirect impacts:

Cumulative impacts:

No-go alternative (compulsory)

Direct impacts:

Potential air quality and occupational health impacts - Assmang employees will continue to be exposed to potentially high levels of manganese dust and fumes in the workplace.

Indirect impacts:

Economic impacts – potential ill-health could affect the productivity and income-earning potential of employees and the financial viability of continued production at the Works.

Cumulative impacts:

Poverty – potential ill-health and potential loss of jobs could contribute to increased poverty in Cato Ridge and surrounding areas.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1 – N/A**Alternative A2****Alternative A3**

5. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING OR CLOSURE PHASE**a. Site alternatives**

List the potential impacts associated with site alternatives that are likely to occur during the decommissioning or closure phase:

Alternative S1 (preferred alternative)

Direct impacts:

Decommissioning of the equipment and infrastructure associated with the proposed Fugitive Dust Project will form part of the larger decommissioning and closure plan for the Assmang Cato Ridge site as a whole (i.e. the air quality abatement equipment will not be decommissioned while the plant continues to operate, although the system may be shut-down temporarily for maintenance and upgrading) in relation to which it is insignificant and will have no impact. No decommissioning or closure is currently envisaged.

Indirect impacts: N/A

Cumulative impacts: N/A

Alternative S2 – N/A

Direct impacts:

Indirect impacts:

Cumulative impacts:

Alternative S3 - N/A

<p><i>Direct impacts:</i></p> <p><i>Indirect impacts:</i></p> <p><i>Cumulative impacts:</i></p>

No-go alternative (compulsory)

<p><i>Direct impacts:</i></p> <p>No impacts have been identified in terms of the no-go alternative for the decommissioning phase.</p> <p><i>Indirect impacts:</i></p> <p><i>Cumulative impacts:</i></p>

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1 - N/A

Alternative S2 Alternative S3

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b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the decommissioning or closure phase (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

<p><i>Direct impacts:</i></p> <p>No impacts associated with process, technology, layout or other alternatives were identified for the decommissioning phase.</p> <p><i>Indirect impacts:</i> - N/A</p> <p><i>Cumulative impacts:</i> - N/A</p>
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Alternative A2 – N/A

<p><i>Direct impacts:</i></p> <p><i>Indirect impacts:</i></p> <p><i>Cumulative impacts:</i></p>

Alternative A3 – N/A

<p><i>Direct impacts:</i></p> <p><i>Indirect impacts:</i></p> <p><i>Cumulative impacts:</i></p>

No-go alternative (compulsory)

<p><i>Direct impacts:</i></p> <p>No impacts associated with process, technology, layout or other alternatives were identified for the decommissioning phase.</p> <p><i>Indirect impacts:</i> - N/A</p> <p><i>Cumulative impacts:</i> - N/A</p>
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Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1 – N/A

Alternative A2 Alternative A3

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C. PROPOSED MONITORING AND AUDITING

For each phase of the project and for each alternative, please indicate how identified impacts and mitigation will be monitored and/or audited.

Alternative S1 (preferred site)	Alternative S2	Alternative S3
An Environmental Management Plan (EMP) has been prepared for the construction phase of the project (Refer to Appendix G) and Assmang's existing EMP's for the operations at the Works should be updated to included requirements relative to the proposed project This is to ensure practical measures are provided to mitigate and manage the identified impacts and assign responsibility to the relevant persons for the implementation of the specific activities. Audits must also be undertaken to monitor and ensure that the mitigation measures detailed in the EMP are implemented. The findings and observations from the audits will be documented in an audit report and forwarded to the relevant authorities.		
Alternative A1 (preferred alternative)	Alternative A2	Alternative A3
An Environmental Management Plan (EMP) has been prepared for the construction phase of the project (Refer to Appendix G) and Assmang's existing EMP's for the operations at the Works should be updated to included requirements relative to the proposed project This is to ensure practical measures are provided to mitigate and manage the identified impacts and assign responsibility to the relevant persons for the implementation of the specific activities. Audits must also be undertaken to monitor and ensure that the mitigation measures detailed in the EMP are implemented. The findings and observations from the audits will be documented in an audit report and forwarded to the relevant authorities.		

D. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that sums up the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account with specific reference to their type, likelihood, duration and the significance.

Alternative S1 (preferred site)

Please refer to Table 1 - Environmental Impact Statement in the Impact Assessment Report contained in Appendix F.

Alternative S2

N/A

Alternative S3

N/A

Alternative A1 (preferred alternative)

Please refer to Table 1 - Environmental Impact Statement in the Impact Assessment Report contained in Appendix F.

Alternative A2

N/A

Alternative A3

N/A

No-go alternative (compulsory)

Direct impacts:

Potential air quality and occupational health impacts - Assmang employees will continue to be exposed to potentially high levels of manganese dust and fumes in the workplace.

Indirect impacts:

Economic impacts – potential ill-health could affect the productivity and income-earning potential of employees and the financial viability of continued production at the Works.

Cumulative impacts:

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Poverty – potential ill-health and potential loss of jobs could contribute to increased poverty in Cato Ridge and surrounding areas.

E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner). YES NO

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

N/A

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

Should implementation of the Fugitive Fume and Dust Emission Control Project proceed, the following recommendations are provided:

- The EMP for the construction phase should be implemented, including the associated requirements for auditing by an independent environmental control officer to ensure compliance with the EMP;
- Assmang's existing EMP's for the operations at the Works should be updated to included requirements relative to the proposed project;
- The operational efficiencies and effectiveness of the proposed project should be subject to regular independent audits to confirm the objectives as defined in the design documentation for the project are being achieved;
- The method of disposal / reuse of the baghouse dust as to be generated by the project should be confirmed with the regulatory authority at least 3 months prior to commencement of the operational phase for Phase 1 of the project; and
- The project timing associated with the differing Project phases should be confirmed at least 3 months prior to commencement of the operational phase of Phase 1 so as to provide a time schedule against which implementation of the full project can be audited.

APPENDICES

The following appendixes must be attached as appropriate:

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix E: Details of the public participation process including the comments and responses report

Appendix F: Details of the impact assessment

Appendix G: Other information – (*Environmental Management Plan*)