

**Goldi – A Division of Astral
Operations Limited**

**Draft Environmental Management
Programme**

Locality: Standerton

Departmental Ref No: 17/2/3 GS-198

SHANGONI
Management Services (Pty) Ltd



DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME (EMP)

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of Astral Operations Limited**
**Draft Environmental Management
Programme**

Locality: Standerton

Departmental Ref No: 17/2/3 GS-198

MARCH 2015

Unit C8

Block @ Nature

472 Botterklapper Street

Pretoria

SHANGONI
Management Services (Pty) Ltd

PROJECT DETAILS

Mpumalanga Department of Economic Development, Environment and Tourism

Reference No.: 17/2/3 GS-198 (Formerly 17/2/3 GS-145)

Project Title: Atmospheric emission license application for Goldi Standerton abattoir and its on-site rendering facility.

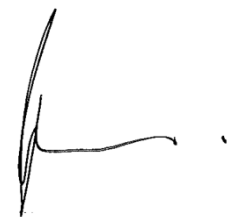
Project Number: EAR-STA-12-05-15

Compiled by: Lizette Crous

Date: 27 March 2015

Location: Pretoria

Technical Reviewer: Brian Hayes



RB Hayes (Pr.Eng.)



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LIST OF ABBREVIATIONS

AEL	-	Atmospheric Emission License
AIR	-	Atmospheric Impact Report
APPA	-	Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965)
AQMP	-	Air Quality Management Plan
AQO	-	Air Quality Officer
GLCs	-	Ground Level Concentrations
EAP	-	Environmental Assessment Practitioner
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Programme
GLC	-	Ground Level Concentration
GN	-	Government Notice
I&AP	-	Interested and Affected Party
NAAQS	-	National Ambient Air Quality Standards
NEMA	-	Environmental Management Act, 1998 (Act No. 107 of 1998) as amended
R	-	Regulation
S&EIR	-	Scoping and Environmental Impact Reporting
VOCs	-	Volatile Organic Compounds

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Refer also to Part 4 regarding relevant environmental legislation.



1. INTRODUCTION

Goldi is a Division of the Astral Operations Limited group. Astral is a leading poultry producer in South Africa and consists of a number of business units, including Poultry, National Chicks, Ross Poultry, Meadow Feeds, Tiger Chicks and Tiger Feeds. Goldi has three chicken abattoirs (Standerton, Camperdown and Olifantsfontein) in South African and also own a number of chicken farms. A large number of contract growers are also used to produce chickens for slaughter at Goldi's abattoirs (www.astralfoods.co.za).

The Goldi Standerton abattoir and its on-site rendering facility are located on Portion 0 of Erf 279 Stanfield Hill. The site is approximately 3km north-west of the centre of Standerton. The abattoir is supplied with live chickens from Goldi broiler farms or contract growers under the control of Goldi. All blood, feathers and other condemned material from the abattoir, including mortalities from the Goldi broiler farms, are processed at an onsite rendering facility.

The on-site rendering of animal matter (blood, feathers and other condemned material from the abattoir, including mortalities from the Goldi broiler farms) triggered the activity listed in Category 10, Animal Matter Processing in terms of Government Notice No. 248 as contemplated in Section 21(1) (a) of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM: AQA). In terms of the new List of Activities which result in atmospheric emission which have or are may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage [Government Notice No. 893 of 22 November 2013 in terms of Section 21(1)(b) of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)], the on-site rendering of animal matter still triggers the activity listed in Category 10, Animal Matter Processing. Refer to the table below for the description, application and minimum emission standards for this listed activity.

Category of Listed Activity	Description of the Listed Activity	Application of the Listed Activity
Category 10: Animal matter processing.	Processes for the rendering cooking, drying, dehydrating, digesting, evaporating or protein concentrating of any animal matter not intended for human consumption.	All installations handling more than 1 ton of raw materials per day.

The following special arrangement applies for this activity:

“Best practice measures intended to minimise or avoid offensive odours must be implemented by all installations. These measures must be documented to the satisfaction of the Licensing Authority”.



In terms of Section 22 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), no person may conduct a listed activity without a Provisional Atmospheric Emission License or an Atmospheric Emission License. A person must apply for an AEL with the licensing authority of the area in which the activity is to be carried out.

Section 24 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and Section 22 of the Environmental Conservation Act, 1989 (Act No. 73 of 1989) apply to all AEL applications. The rendering of animal matter therefore also requires environmental authorisation in terms of Activity 26 listed in Government Notice R545 Listing Notice 2 (EIA regulations of 10 December 2010) of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

1.1 GOVERNMENT NOTICE NO. R545 (LISTING NOTICE 2) - ACTIVITY 26

“Commencing of an activity, which requires an atmospheric emission license in terms of section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), except where such commencement requires basic assessment in terms of Notice of No. R544 of 2010”.

2. ENVIRONMENTAL ASSESSMENT PRACTITIONER

Name of firm	Shangoni Management Services (Pty) Ltd.	
Postal address	PO Box 74726, Lynwood Ridge, Pretoria, 0040	
Telephone No.	(012) 807 7036	
Fax	(012) 807 1014/086 643 5360	
E-mail	lizette@shangoni.co.za	
Team of Environmental Assessment Practitioners on project		
Name	Qualifications and experience to conduct the EIA	Responsibility
Mr. H.L. de Villiers	<ul style="list-style-type: none"> • MSc.(UP) • Bsc. (Hons) (PU for CHE) • More than 12 years' experience conducting Environmental Impact Assessments and Waste Management License Applications 	EIA Project Leader and Co-ordinator
Ms. Lizette Crous	<ul style="list-style-type: none"> • MSc Environmental Management (University of London) • More than 3 years' experience conducting Environmental Impact Assessments and Waste Management License Applications 	EAP



Ms. Patricia van der Walt	<ul style="list-style-type: none"> • B.Sc. (Hons) (Applied Science in Environmental Technology) • 3 years' experience conducting Environmental Impact Assessments 	EAP
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3. SITE DOCUMENTATION

The following documentation must be available at the site office at all times:

- A copy of the Environmental Impact Assessment (EIA) Report;
- A copy of this Environmental Management Programme (EMP);
- A copy of the Environmental Authorisation; and
- A copy of the Provisional Atmospheric Emissions License and later on, the Atmospheric Emissions License.

4. LEGISLATION

4.1 LAWS OF GENERAL APPLICATION

- Constitution of the RSA, 1996 (Act No 108 of 1996);
- National Environmental Management Act, 1998 (Act No 107 of 1998);
- Environment Conservation Act, 1989 (Act No 73 of 1989); and
- Promotion of Access to Information Act, 2000 (Act No 2 of 2000).

4.2 AIR QUALITY AND NOISE

- The National Environmental Management: Air Quality Act, 2004 (Act No 39 of 2004);
- Government Notice No. 893 of 22 November 2013 (List of Activities which result in Atmospheric Emissions which have or may have a significant detrimental effect on the Environment, including Health, Social Conditions, Economic Conditions, Ecological Conditions or Cultural Heritage);
- Government Notice No. 1123 of 23 November 2007 (Declaration of the Highveld as a Priority Area in terms of Section 18(1) of the National Environmental Management: Air Quality Act, 2004 (Act No 39 of 2004); and
- Government Notice No. 144 of 2 March 2012 (Highveld Priority Area Air Quality Management Plan).

4.3 WATER MANAGEMENT

- National Water Act, 1998 (Act No 36 of 1998); and



- Government Gazette Notice No 399 of 26 March 2004, Department of Water Affairs and Forestry – Revision of general authorisations in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998).

4.4 WASTE MANAGEMENT

- National Environmental Management: Waste Act, 2008 (Act No 59 of 2008);
- Government Notice No. 921 of 29 November 2013: List of waste management activities that have, or are likely to have, a detrimental effect on the environment;
- Government Notice No. 926 of 29 November 2013: National Norms and Standards for the Storage of Waste;
- Government Notice No. 634 of 23 August 2013: Waste Classification and Management Regulations; and
- Government Notice No. 635 of 23 August 2013: National Norms and Standards for the assessment of waste for landfill disposal.

4.5 PLANNING OF NEW ACTIVITIES

- National Environmental Management Act, 1998 (Act No 107 of 1998); and
- National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).

4.6 BIODIVERSITY

- National Environmental Management Biodiversity Act, 2004 (Act No 10 of 2004);
- Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983);
- National Veld and Forest Fire Act, 1998 (Act No 101 of 1998);
- Agricultural Pest Act, 1983 (Act No 36 of 1983, as amended) – GN R276 of 5 March 2004
- National Fencing Act, 1963 (Act No 31 of 1963, as amended); and
- National Forest and Fire Laws Amendment Act (Act No 12 of 2001).

4.7 LAND AND SOIL MANAGEMENT

- National Environmental Management Act, 1998 (Act No 107 of 1998); and
- Environment Conservation Act, 1989 (Act No 73 of 1989).

4.8 HERITAGE RESOURCES

- National Heritage Resources Act, 1999 (Act No 25 of 1999).



4.9 PROTECTED AREAS

- National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003, as amended).

During the course of the project phases, the applicant and its contractors must comply with all other relevant legislation (including the bylaws of the local municipality).



5. ENVIRONMENTAL MANAGEMENT PROGRAMME FOR POTENTIAL IMPACTS

Refer to the tables below for the EMP. Responsibility is assigned to the relevant parties, keeping in mind that Goldi is ultimately still responsible for ensuring implementation of the EMP. The EMP must be updated should any significant changes occur to the operations with regards to the abattoir and its on-site rendering plant.

The mitigation measures are set out in the tables below (per project phase), for processes occurring at the abattoir, in particular the rendering of animal matter at the rendering plant.

5.1 GOVERNMENT NOTICE NO. R545 (LISTING NOTICE 2) - ACTIVITY 26

5.1.1 Planning, Licensing, Administration, Operational and Decommissioning Phases

Table 1: EMP - Planning, Licensing, Administration, Operational and Decommissioning Phases - Atmosphere and Noise

Activity:					
<ul style="list-style-type: none"> Failing to identify suitable alternatives in terms of emission abatement technology. Development of inadequate maintenance, monitoring and management plans. Failing to identify and initiate relevant specialist studies. Operational activities at the abattoir. Burning of coal in three boilers to generate steam. Operational activities at the rendering plant. Vehicle movement on paved unpaved roads at the facility. Inadequate maintenance and management of the three coal-fired boilers. Inadequate maintenance and management of the rendering plant and its emission abatement technology. Inconsistent and incorrect point source emission monitoring. Operational activities at the facility in general (abattoir and its on-site rendering plant). 					
Aspect:					
<ul style="list-style-type: none"> Selection of the wrong emission abatement technology/technologies, resulting in ineffective emission reductions and/or equipment failures. An inability to identify and rectify aspects and potential impacts on the environment, especially with regards to the atmosphere. False representation of cumulative impacts from the abattoir and its on-site rendering plant on the surrounding environment. Ineffective management of fugitive atmospheric emissions generated at the abattoir. Ineffective management of point source emissions generated by the three coal-fired boilers. Ineffective management of emissions from the rendering plant. Generation of vehicle-entrained dust and particulate emissions as well as the generation of nuisance. Failure of coal-fired boiler equipment and resultant ambient air pollution. Failure of rendering plant abatement equipment and resultant ambient air pollution. False representation of monitoring results and therefore misrepresentation of the rendering plant's impact on ambient air quality and a delay in problem identification and corrective action implementation. Generation of noise and nuisance. 					
Applicable Alternatives: All alternatives					
Impact Description	Environmental Objective	Management / Mitigation Measures	Monitoring and Compliance Reporting	Timeframe	Responsibility
Planning, Licensing and Administration Phase					



<p>Aspect: Selection of the wrong emission abatement technology/technologies, resulting in ineffective emission reductions and/or equipment failures.</p> <p>Impact: Atmospheric emissions, resultant pollution of the environment and generation of nuisance conditions to receptors in the vicinity of the abattoir, such as residential areas (Stanfield Hill, Flora Park and Kosmos Park), the Vaalrivier School and the Gert Sibande FET Collage.</p>	<p>To select effective and appropriate emission abatement technologies so that emissions from the abattoir and rendering plant are kept to a minimum.</p>	<ul style="list-style-type: none"> According to the Air Quality Impact Assessment conducted by Airshed Planning Professionals, ozone oxidation and bio-filtration systems are considered to be two of the most effective odour removal technologies and should be installed at the rendering plant if not already installed. Both a bio-filter and ozone oxidation system are present at the rendering plant. It must be ensured that the specifications for both the ozone oxidation and bio-filter systems are adequate for the animal matter quantities that are currently processed at the rendering plant as well as the quantities that will be processed at the rendering plant once the abattoir has been expanded to slaughter 2 million chickens per week. The existing systems should be upgraded or expanded accordingly should they not be adequately designed to handle the increased throughput capacities. Consider fitting post-combustion control measures to the boilers. These include fabric filters (bag houses), electrostatic precipitators, wet scrubbers, side stream separators and cyclone or multicyclone collectors. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Planning, Licensing and Administration Phase</p>	<p>Facility Manager</p>
<p>Aspect: An inability to identify and rectify aspects and potential impacts on the environment, especially with regards to the atmosphere.</p> <p>Impact: Atmospheric emissions, resultant pollution of the environment and generation of nuisance conditions to receptors in the vicinity of the abattoir, such as residential areas (Stanfield Hill, Flora Park and Kosmos Park), the Vaalrivier School and the Gert Sibande FET Collage.</p>	<p>To develop adequate maintenance, monitoring and management plans so that emissions to the atmosphere can be avoided as far as possible.</p>	<ul style="list-style-type: none"> An Operational Maintenance and Monitoring Plan must be compiled and implemented. Such as plan has been incorporated into the Odour Management Plan (attached under Appendix D). An Odour Contingency Preparedness and Response Plan must be compiled and implemented. Such as plan has been incorporated into the Odour Management Plan (attached under Appendix D). 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Planning, Licensing and Administration Phase</p>	<ul style="list-style-type: none"> Facility Manager Air Quality Specialists
<p>Aspect: False representation of cumulative impacts from the abattoir and its on-site rendering plant on the surrounding environment.</p> <p>Impact: Atmospheric emissions, resultant pollution of the environment and generation of nuisance conditions to receptors in the vicinity of the abattoir that could have been mitigated to a certain extent through the correct specialist investigations.</p>	<p>To ensure that the correct specialist studies are conducted so that the impacts of the abattoir and rendering plant on the environment can be adequately quantified and mitigated.</p>	<ul style="list-style-type: none"> As this Environmental Impact Assessment forms part of an Atmospheric Emissions License application, the focus should be on the impact of emissions to the atmosphere. To accurately quantify the particulate and gaseous atmospheric emissions sources and the impacts of these emissions on the environment, an Air Quality Impact Assessment should be conducted. An Air Quality Impact Assessment has been conducted by Airshed Planning Professionals and is attached under Appendix D. As the main negative environmental impacts associated with rendering plants is the generation of odourous emissions, an Odour Management Plan should be compiled and implemented at the abattoir and its on-site rendering plant. An Odour Management Plan has been compiled and is attached under Appendix D. All mitigation and management measures given in the Air Quality Impact Assessment, the Odour Management Plan and the Environmental Management Programme (attached under Addendum A) must be implemented by Goldi at their Standerton facility. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Planning, Licensing and Administration Phase</p>	<ul style="list-style-type: none"> Facility Manager Air Quality Specialists
<p>Construction Phase</p>					
<p>As this Environmental Impact Assessment process is for the licensing of an existing, operational facility, no construction activities will occur and there are therefore no construction phase impacts.</p>	<p>N/A</p>				
<p>Operational Phase</p>					



<p>Aspect: Ineffective management of fugitive atmospheric emissions generated at the abattoir.</p> <p>Impact: Generation of fugitive odourous emissions and subsequent nuisance to receptors in the vicinity of the abattoir, such as residential areas (Stanfield Hill, Flora Park and Kosmos Park), the Vaalrivier School and the Gert Sibande FET Collage.</p>	<p>To minimise the generation of fugitive emissions from the abattoir buildings and surrounding areas on site.</p>	<ul style="list-style-type: none"> Scrape manure from the chicken off-loading bay and place into enclosed, vermin-proof containers or skips. Wash and sanitise the chicken offloading bay with a low volume, high pressure sprayer. After delivering chickens, the chicken delivery trucks must immediately enter the wash bay area to be washed and sanitised. Dead-On-Arrival (DOA) chickens must be placed into sealed DOA bins or containers. The number of DOAs must be recorded and the DOAs must then be sent to the rendering plant where they must be stored in the roofed intake area. Chicken modules and crates must be washed and sanitised before they are re-loaded onto the chicken transport trucks. Maintain good housekeeping and prevent build-up of abattoir waste such as feathers, condemned carcasses, floor waste and blood. Regular removal of waste materials to the rendering intake area should be scheduled according to shift demand. Regular and frequent removal of waste that cannot be rendered to a licenced landfill site. Maintain the structural integrity of the abattoir buildings (e.g. roofs, windows, doors, extraction fans and ventilation ducts) by carrying out scheduled maintenance. Install and maintain climate curtains at the dispatch areas. Ensure an effective ventilation system through engineering design and proper use thereof. The abattoir buildings should be well ventilated to provide a controlled working environment. Include an air quality achievement/requirement as part of all staff training programmes. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Life of operation</p>	<p>Facility Manager</p>
<p>Aspect: Ineffective management of point source emissions generated by the three coal-fired boilers.</p> <p>Impact: Generation of atmospheric emissions from the burning of coal. Coal-fired boilers produce suspended particulate matter (PM₁₀ and PM_{2.5}), Sulphur dioxide (SO₂) and oxides of Nitrogen (NO_x).</p> <p>Vehicles travelling on paved and unpaved roads also generate particulate matter emissions and the results below, extracted from the Air Quality Impact Assessment, are therefore applicable to vehicle entrainment emissions as well. The emission rates of the above listed particulate and gaseous emissions are given in Table 16.</p> <p>It was predicted that the annual average SO₂ NAAQS will not be exceeded anywhere in the study area. The highest predicted off-site SO₂ GLCs are below 15µg/m³ (38% of the NAAQS). No exceedances of the daily SO₂ NAAQS were predicted anywhere in the study area. Exceedances of the hourly SO₂ NAAQS were predicted along the R50 to the northwest of the site.</p> <p>It was predicted that the annual average NO_x NAAQS will not be exceeded anywhere in the study area. The highest predicted off-site NO_x GLCs are below 10µg/m³ (25% of the NAAQS). No exceedances of the hourly NO_x NAAQS are predicted anywhere in the study area.</p>	<p>To minimise the generation of particulate and gaseous emissions from the coal-fired boilers.</p>	<ul style="list-style-type: none"> Coal specifications must suit the boilers to minimise particulate and gaseous emissions. Operate the boilers within their recommended load ranges and ensure a steady, uniform feed of coal into the boilers. The Sulphur content of the coal used for the boilers should be monitored and limited. Consider fitting post-combustion control measures to the boilers. These include fabric filters (bag houses), electrostatic precipitators, wet scrubbers, side stream separators and cyclone or multicyclone collectors. Use high-grade coal where possible as lower grade coal may result in higher Sulphur emissions. Ensure adequate storage of coal to minimise dispersion of fine coal dust, i.e. a covered storage area. The coal storage area should be demarcated and Safety signage including "No Smoking", "No Naked Lights" and "Danger", are to be clearly displayed at the coal storage area. Fire extinguishers should be readily available at the coal storage area. Include an air quality achievement/requirement as part of all staff training programmes. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Life of operation</p>	<p>Facility Manager</p>



<p>It was predicted that the annual average PM₁₀ NAAQS will only be exceeded inside the site boundary. The annual average PM₁₀ Ground Level Concentrations (GLCs) outside the site boundary are predicted to be below 10µg/m³ (25% of the NAAQS). It was predicted that the daily PM₁₀ NAAQS will be exceeded for up to 100m south and southeast of the site boundary, but no sensitive receptors are present in this area.</p> <p>It was further predicted that the annual average PM_{2.5} NAAQS will not be exceeded anywhere in the study area. The highest off-site PM_{2.5} GLCs are predicted to be below 4µg/m³ (20% of the NAAQS). No exceedances of the daily PM_{2.5} NAAQS were predicted anywhere in the study area (Airshed Planning Professionals, 2013).</p>					
<p>Aspect: Ineffective management of emissions from the rendering plant.</p> <p>Impact: Generation of atmospheric emissions [VOCs and Hydrogen Sulphide (H₂S)] due to operational activities at the rendering plant. These emissions are odour causing and result in subsequent nuisance to receptors in the vicinity of the plant, such as residential areas (Stanfield Hill, Flora Park and Kosmos Park), the Vaalrivier School and the Gert Sibande FET Collage.</p> <p>During the Air Quality Impact Assessment it was predicted that with current mitigation measures in place (the bio-filter and ozone oxidation system), the VOC emission rate from the rendering plant is 0.1tonnes per annum while the H₂S emission rate is 0.08tonnes per annum.</p> <p>The highest hourly VOC concentrations were predicted to exceed the odour detection limit up to 400m from the site in all directions. Predicted VOC concentrations exceed the 50% odour recognition threshold to the west and south west of the rendering plant. No exceedances of the (H₂S) odour detection limit or 50% recognition threshold were predicted with current control technologies in operation (Airshed Planning Professionals, 2013).</p>	<ul style="list-style-type: none"> • To minimise the generation of gaseous emissions at the rendering plant. • To minimise nuisance caused to receptors in the vicinity of the facility due to the odorous emissions generated at the rendering plant. 	<ul style="list-style-type: none"> • According to the Air Quality Impact Assessment conducted by Airshed Planning Professionals, ozone oxidation and bio-filtration systems are considered to be two of the most effective odour removal technologies and should be installed at the rendering plant if not already installed. Both a bio-filter and ozone oxidation system are present at the rendering plant. • It must be ensured that the specifications for both the ozone oxidation and bio-filter systems are adequate for the animal matter quantities that are currently processed at the rendering plant as well as the quantities that will be processed at the rendering plant once the abattoir has been expanded to slaughter 2 million chickens per week. • Proper maintenance of the ozone oxidation and bio-filtration equipment under normal and abnormal conditions. • All storage and processing areas must be kept clean. • Regular and frequent removal of waste material from the abattoir to the rendering plant for further processing (rendering). • Waste material from the abattoir should be transported to the rendering plant in enclosed systems wherever possible. Bins and skips containing waste material from the abattoir should be kept closed until such time as the material is taken into the rendering plant building. The bins and skips must also be leak proof. • All non-enclosed systems must be accessible for regular cleaning. • All conveyors and pipes should be capable of being dismantled for cleaning. • Prompt processing of incoming waste material, while still fresh and within 24 hours, at the rendering plant to avoid waste accumulation and odour generation due to bacterial degradation. Alternatively, the incoming waste material must be stored in a cool area prior to processing. • Storage bins need to be designed so that they can be cleaned with high pressure hot and/or cold water at least once a week. • Regular cleaning and good housekeeping of the rendering plant intake area to prevent residue build-up. • Goldi should develop a procedure to ensure that dead chickens from surrounding chicken farms, such as those owned by Goldi, are brought to the rendering plant while still fresh. The dead chickens must either be brought to the rendering plant on a daily basis or must be refrigerated at the farms until such time as their transport to the rendering plant. The dead chickens must not be frozen. • Regular and frequent removal of waste from the rendering plant to a licensed landfill site. • The rendering plant building must be enclosed/isolated so that all air within the plant must travel through the abatement technology before being released into the atmosphere. In other words, as 	<ul style="list-style-type: none"> • Regular site inspections. • Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Life of operation</p>	<p>Facility Manager</p>



		<p>little fugitive emissions must be allowed to escape the rendering plant through wall openings, damaged roofs and so forth.</p> <ul style="list-style-type: none"> • The existing rendering plant building must be vented to the atmosphere via a stack that allows for retrofitting odour control equipment. • Ensure even air distribution across the entire bed area of the bio-filter. • Ensure correct moisture control of the bed area of the bio-filter. Ponding of water must be avoided. • Ensure an effective ventilation system through engineering design and proper use thereof. • Maintain an appropriate air change rate to achieve both satisfactory working conditions and removal of remnant steam and odours. • Incorporate the use of indirect contact or low emission direct dryers that minimise the release of odours and particulates in the off gas streams. • Dryer exhaust gases from the indirect contact dryers should be treated through a condenser or ozone to remove vapours. • Non-condensable vapours should be handled through the odour treatment system. • Control and monitor dryer operations to eliminate the creation of offensive odours. • Adopt enclosed technologies where possible (for example the screw press). • Enclose static or rotary screens. • Minimise openings to atmosphere (for example worn roofs). • Equipment and machinery must be kept clean of raw material and residue build-up. • Bins for holding products from the rendering process (protein meal) need to be covered and grinding, processing and conveying equipment must be completely enclosed/roofed. • Include an air quality achievement/requirement as part of all staff training programmes. • The rendering plant must obtain an Atmospheric Emission License in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004). • The Odour Management Plan (attached under Appendix D) must be implemented. • A complaints register must be kept onsite and a protocol developed for the handling of complaints. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how concern was addressed. Complaint handling should be fast and co-operative. The facility should be the first point of complaint, rather than the relative authorities. 			
<p>Aspect: Generation of vehicle-entrained dust and particulate emissions as well as the generation of nuisance.</p> <p>Impact: Degradation of ambient air quality due to vehicle-entrained dust and particulate emissions from vehicles travelling on paved and unpaved roads at the abattoir and rendering plant.</p> <p>Stack emissions from the three on-site coal-fired boilers also generate PM₁₀ and PM_{2.5} emissions and the results given below, extracted from the Air Quality Impact Assessment, are therefore applicable to the boiler stack emissions as well. The emission rates of PM₁₀ and PM_{2.5} generated by vehicles travelling on paved and unpaved roads at the facility are given in Table 16.</p> <p>It was predicted that the annual average PM₁₀ NAAQS will only be exceeded inside the site boundary. The annual average PM₁₀ Ground Level Concentrations (GLCs) outside the side boundary</p>	<ul style="list-style-type: none"> • To minimise the negative impact on ambient air quality due to dust and particulate emission. • To minimise nuisance to surrounding receptors, such as businesses and residents. 	<ul style="list-style-type: none"> • All unpaved roads where main vehicle movements occur should preferably be sealed (for example, paved). • A dustcart should be present on site. Unsealed roads and areas should be regularly watered. • Speed bumps or traffic speed signs need to be erected to reduce speeding onsite that could result in the generation of dust. • Regular maintenance of vehicles to address wear of tyres and breaks. Optimal engine combustion will allow for “cleaner” exhaust emissions. • A complaints register must be kept onsite and a protocol developed for the handling of complaints. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how concern was addressed. Complaint handling should be fast and co-operative. The facility should be the first point of complaint, rather than the relative authorities. 	<ul style="list-style-type: none"> • Regular site inspections. • Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Life of operation</p>	<p>Facility Manager</p>



<p>are predicted to be below 10µg/m³ (25% of the NAAQS). It was predicted that the daily PM₁₀ NAAQS will be exceeded for up to 100m south and southeast of the site boundary, but no sensitive receptors are present in this area.</p> <p>It was further predicted that the annual average PM_{2.5} NAAQS will not be exceeded anywhere in the study area. The highest off-site PM_{2.5} GLCs are predicted to be below 4µg/m³ (20% of the NAAQS). No exceedances of the daily PM_{2.5} NAAQS were predicted anywhere in the study area (Airshed Planning Professionals, 2013).</p>					
<p>Aspect: Failure of coal-fired boiler equipment and resultant ambient air pollution.</p> <p>Impact: Generation of atmospheric emissions from the burning of coal. Coal-fired boilers produce suspended particulate matter (PM₁₀ and PM_{2.5}), Sulphur dioxide (SO₂) and oxides of Nitrogen (NO_x).</p>	<p>To ensure adequate maintenance and management of the coal-fired boilers so that atmospheric emissions, especially those caused due to failures, are minimised.</p>	<ul style="list-style-type: none"> Operate the boilers within their recommended load ranges and ensure a steady, uniform feed of coal into the boilers. Regular maintenance of the boilers. Optimal combustion will allow for 'cleaner' stack emissions. Ensure that all personnel are properly trained on all equipment, safety devices, controls, operating procedures and maintenance procedures relating to the boilers. Clear intakes and exhaust vents before boiler start-up. Regularly check for leaks and component deterioration. Utilise a preventative maintenance schedule based on operating log sheets, manufacturer's guidelines, operating conditions and previous maintenance records (US Department of Energy, unknown). 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Life of operation</p>	<p>Facility Manager</p>
<p>Aspect: Failure of rendering plant abatement equipment and resultant ambient air pollution.</p> <p>Impact: Generation of atmospheric emissions [VOCs and Hydrogen Sulphide (H₂S)]. These emissions are odour causing and result in subsequent nuisance to receptors in the vicinity of the plant, such as residential areas (Stanfield Hill, Flora Park and Kosmos Park), the Vaalrivier School and the Gert Sibande FET Collage.</p>	<p>To ensure adequate maintenance and management of the rendering plant and its emission abatement technologies so that atmospheric emissions, especially those caused due to failures, are minimised.</p>	<ul style="list-style-type: none"> Proper maintenance of the ozone oxidation and bio-filtration equipment under normal and abnormal conditions. Formalised contingency plans must be compiled for the failure of air emission control equipment and processes as these may result in an increase of gaseous emissions being released into the atmosphere. A backup ozone fan must be kept in stock in case of failure of the installed fan. Install a backup pump for the ozone oxidation system in case of breakages on the main pump that would require repairs. Maintain the structural integrity of the rendering plant building (e.g. roofs, windows, doors, extraction fans and ventilation ducts) through scheduled maintenance. Maintain the structural integrity of the emission abatement system. Where corrugated iron roofs have been damaged or worn through, they must be repaired or replaced. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Life of operation</p>	<p>Facility Manager</p>
<p>Aspect: False representation of monitoring results and therefore misrepresentation of the rendering plant's impact on ambient air quality and a delay in problem identification and corrective action implementation.</p> <p>Impact: Generation of excessive or elevated atmospheric emissions from the burning of coal. Coal-fired boilers produce suspended particulate matter (PM₁₀ and PM_{2.5}), Sulphur dioxide (SO₂) and oxides of Nitrogen (NO_x).</p>	<p>To ensure correct and consistent point source emission monitoring so that problem identification and corrective action implementation can be carried out in a timely manner.</p>	<ul style="list-style-type: none"> Monitoring should be focussed on criteria pollutants as stipulated by the National Ambient Air Quality Standards. Equip all point sources, such as the three boiler stacks, with monitoring equipment and recorders (permanent or as required) for monitoring key parameters. Ensure that monitoring is carried out according to the requirements of the Provisional Atmospheric Emission Licence, should this licence be granted. For example, SO₂, NO_x, PM₁₀ and PM_{2.5} emissions from the boilers could be measured on an annual basis. Ensure that the sampled stack gas is representative of the stack gas as a whole. Ensure that the measurement system is leak-tight. Ensure that the volume of gas that is sampled is accurately measured and corrected to standard conditions of pressure and temperature, if so required by the licensing authority. Ensure that monitoring equipment is calibrated at intervals as specified by the manufacturer's. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Life of operation</p>	<p>Facility Manager</p>



		<ul style="list-style-type: none"> Ensure that monitoring results are submitted to the licensing authority (Gert Sibande District Municipality) as stipulated in the Provisional Atmospheric Emission Licence, should this licence be granted. Ensure accurate record keeping of all monitoring results, conditions under which measurements were taken, reports submitted to the licensing authority as well as all malfunctions and incidents. Consider placement of monitoring stations for SO₂, NO_x, PM₁₀ and PM_{2.5} just outside of the site boundary to monitor compliance with the National Ambient Air Quality Standards. 			
<p>Aspect: Generation of noise and nuisance.</p> <p>Impact: Disturbance and nuisance to receptors surrounding the facility, such as businesses and neighbours, due to noise generated at the abattoir and its rendering plant. Receptors include residential areas (Stanfield Hill, Flora Park and Kosmos Park), the Vaalrivier School and the Gert Sibande FET Collage.</p>	To minimise the generation of noise at the facility and thereby the nuisance caused to receptors in the vicinity of the facility.	<ul style="list-style-type: none"> Schedule activities that will generate the most noise during times of the day that will result in least disturbance to neighbours. The site workers and contractors must adhere to the requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) regarding hearing protection and noise control measures. Regular maintenance of vehicles, back-up generators and equipment. All equipment and machinery should be fitted with adequate silencers. No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site. A complaints register must be kept onsite and a protocol developed for the handling of complaints. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how concern was addressed. Complaint handling should be fast and co-operative. The facility should be the first point of complaint, rather than the relative authorities. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
Decommissioning Phase					
Closure and decommissioning of the facility is not anticipated for the foreseeable future. Should the facility close, a detailed closure and rehabilitation plan will be submitted to the Mpumalanga Department of Economic Development, Environment and Tourism prior to decommissioning.	N/A				

Table 2: EMP- Planning, Licensing, Administration, Operational and Decommissioning Phases - Soil, surface water, stormwater and groundwater pollution

Activity:					
<ul style="list-style-type: none"> Inconsistent and incorrect water quality- and wastewater disposal monitoring. Ineffective treatment and discharge of contaminated wastewater from the rendering facility. 					
Aspect:					
<ul style="list-style-type: none"> A false representation of the rendering facility's impact on the surrounding environment and a delay in problem identification and corrective action implementation. Surface- and groundwater contamination. 					
Applicable Alternatives: All alternatives					
Impact Description	Environmental Objective	Management / Mitigation Measures	Monitoring and Compliance Reporting	Timeframe	Responsibility
Construction Phase					
As this Environmental Impact Assessment process is for the licensing of an existing, operational facility, no construction activities will occur and there are therefore no construction phase impacts.	N/A				
Operational Phase					



<p>Aspect: A false representation of the rendering facility's impact on the surrounding environment and a delay in problem identification and corrective action implementation.</p> <p>Impact: Soil, surface water and groundwater pollution, as well as the possible disturbance of wetland zones on a separate property (remaining extent of the farm Rooikopjes 406 IS) that is also owned by Goldi.</p>	<p>To ensure adequate monitoring of treated wastewater prior to its discharge into the environment (earth dams on the farm Rooikopjes), so as to ensure timely problem identification and corrective action implementation.</p>	<ul style="list-style-type: none"> Regularly monitor the quality of the treated water exiting the wastewater treatment works before it is discharged into the environment. Monitoring must be in line with the requirements as set out in the Water Use License Application for the wastewater treatment works. Should the above water qualities not comply with the Department of Water Affairs' General Limit standards for discharge into a water resource, rectifying actions must immediately be taken. After these actions, the water must be sampled again to ensure that the rectification measures were effective. Regular monitoring of the future wastewater treatment work's pond conditions through regular monitoring and measurement of optimal treatment conditions. In the event of treatment pond failure, an appropriate starter culture or enzyme should be used to re-establish pond equilibriums. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Life of operation</p>	<p>Facility Manager</p>
<p>Aspect: Surface- and groundwater contamination.</p> <p>Impact: Soil, surface water and groundwater pollution, as well as the possible disturbance of wetland zones on a separate property (remaining extent of the farm Rooikopjes 406 IS) that is also owned by Goldi.</p>	<p>To ensure effective treatment of wastewater from the abattoir and rendering plant to a quality that complies with the Department of Water Affairs' General Limit standards for discharge into a water resource.</p>	<ul style="list-style-type: none"> The wastewater screening sump at the abattoir must be maintained regularly, with particular attention being paid to the integrity of the facility, pumps and pipes. Solids and fats must regularly be removed from the wastewater screening sump. The wastewater treatment works will treat the abattoir and rendering plant wastewater to a quality that complies with the Department of Water Affairs' General Limit standards for discharge into a water resource. All detergents used in the abattoir and rendering facility should be suitable for biological treatment at the wastewater treatment works. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Life of operation</p>	<p>Facility Manager</p>
<p>Decommissioning Phase</p>					
<p>Closure and decommissioning of the facility is not anticipated for the foreseeable future. Should the facility close, a detailed closure and rehabilitation plan will be submitted to the Mpumalanga Department of Economic Development, Environment and Tourism prior to decommissioning.</p>	<p>N/A</p>				



6. ENVIRONMENTAL AWARENESS PLAN

The following Environmental Awareness Plan must be implemented by Goldi in order to inform their employees and contractors of the environmental risk that may result from their work. The plan must be conducted as part of the induction process for all new employees (including contractors) that will perform work in terms of the proposed activities. Proof of all training provided must be kept on-site.

The Environmental Awareness Plan is referred to as the “SHE match” training programme. The training programme focuses on the following aspects:

1. Explaining clearly what the environment is and what the environment consist of namely: air, water, soil, fauna, flora and people.
2. Once participants have grasped the description of what the environment entails, the training focuses on the potential impacts that the operational activities may have on each one of these environmental components. This is done by making use of the aspect register, where each one of the environmental aspects and associated impacts has been identified.
3. To ensure that the training is effective, visual aids are used. Photos are taken of actual and potential impacts occurring on site and in some cases role-play is used to illustrate a potential impact.
4. The participants are then exposed to a poster that reflects the various environmental components. The various photos taken are posted on the poster on a rotational basis and the participants indicate (based on the visual component) what environmental component was or could have been affected by the activities portrayed on the photo.
5. By doing this the participants visualise the action as well as the potential consequence (environmental impact) of their action.
6. This general awareness training must be done before when new employees start work. The training should be done every two years during the Operational Phase. The poster is posted in the communal area where the impacts are visualised and the photos rotated on a monthly basis.

