AFGRI OPERATIONS LIMITED

Dryden Rendering Facility Expansion and Licensing EIA

Locality: Dryden, Mpumalanga

Departmental Ref No: 17/2/3 N-192

SHANGONI
Management Services (Pty) Ltd

FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT

AFGRI OPERATIONS LTD

Dryden Rendering Facility

Expansion and Licensing EIA

Locality: Dryden, Mpumalanga

Departmental Ref No: 17/2/3 N-192

Date: 11 February 2015

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SHANGONI
Management Services (Pty) Ltd

PROJECT DETAILS

Mpumalanga Department of Economic Development, Environment and Tourism

Reference No.: 17/2/3 N-192

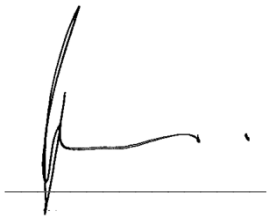
Project Title: Expansion of the AFGRI Rendering Facility in Dryden, Mpumalanga

Project Number: AFG-REN-12-05-09

Compiled by: Ms Lizette Crous

Date: 11 February 2015

Technical Reviewer: Mr. Brian Hayes



R.B. Hayes (Pr.Eng.)

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DEFINITIONS

Environment

The surroundings (biophysical, social and economic) within which humans exist and that are made up of

(i) the land, water and atmosphere of the earth;

(ii) micro-organisms, plant and animal life;

(iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and

(iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Environmental Aspects

Elements of an organisation's activities, products or services that can interact with the environment.

Environmental Degradation

Refers to pollution, disturbance, resource depletion, loss of biodiversity, and other kinds of environmental damage; usually refers to damage occurring accidentally or intentionally as a result of human activities.

Environmental Impacts

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.

Environmental Impact Assessment

A study of the environmental consequences of a proposed course of action.

Environmental Impact Report

A report assessing the potential significant impacts as identified during the environmental impact assessment.

Environmental impact

An environmental change caused by some human act.

Land use

The various ways in which land may be employed or occupied. Planners compile, classify, study and analyse land use data for many purposes, including the identification of trends, the forecasting of space and infrastructure requirements, the provision of adequate land area for necessary types of land use, and the development or revision of comprehensive plans and land use regulations.

Pollution Prevention

Any activity that reduces or eliminates pollutants prior to recycling, treatment, control or disposal.

Public Participation Process

A process of involving the public in order to identify needs, address concerns, in order to contribute to more informed decision making relating to a proposed project, programme or development.

Topography

Topography, a term in geography, refers to the "lay of the land" or the physio-geographic characteristics of land in terms of elevation, slope and orientation.

Vegetation

All of the plants growing in and characterising a specific area or region; the combination of different plant communities found there.

Waste

Waste is unwanted or undesired material left over after the completion of a process. "Waste" is a human concept: in natural processes there is no waste, only inert end products.

Water Resource

- a river or a spring;
- a natural channel in which water flows regularly or intermittently;
- a wetland, lake or dam into which, or from which, water flows;
- any collection of water which the Minister may declare to be a watercourse; and
- surface water, estuaries and aquifers (underground water).

All water bodies in the hydrological cycle, including underground water, are regarded as water resources.

Water Course

- a river or spring;
- a natural channel or depression in which water flows regularly or intermittently;
- a wetland, lake or dam into which, or from which water flows; and
- any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998).

Water Use

Water use includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation.

Wastewater

Wastewater is water containing waste, or water that has been in contact with waste material.

- Wastewater includes
  - domestic wastewater
  - biodegradable industrial wastewater
  - industrial wastewater.

Wetland

Means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

ABBREVIATIONS

BID	-	Background Information Document
CRR	-	Comments and Responses Report
DEDET	-	Mpumalanga Department of Economic Development, Environment and Tourism
DWA	-	Department of Water Affairs
EAP	-	Environmental Assessment Practitioner
EIA	-	Environmental Impact Assessment
EIR	-	Environmental Impact Report
EMP	-	Environmental Management Programme
GN	-	Government Notice
I&AP	-	Interested and Affected Party
IWWMP	-	Integrated Water and Waste Management Plan
OHSA	-	Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
NEMA	-	National Environmental Management Act, (Act No. 107 of 1998), as amended
NEM:AQA	-	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEM:WA	-	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	-	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
R	-	Regulation
SWMP	-	Stormwater Management Plan

EXECUTIVE SUMMARY

The Applicant

AFGRI Animal Feeds, AFGRI Milling, AFGRI Poultry and Nedan form part of the AFGRI Operations Limited group. At AFGRI Animal Feeds, grain, seeds, oil and other protein and energy elements (such as high-protein poultry by-product meal) are combined to produce feed for the dairy and livestock industries, amongst others. AFGRI Animal Feeds has seven feed mills across the country (www.afgri.co.za).

Background description

A common challenge in the poultry industry is how to dispose of poultry waste such as mortalities from chicken farms and blood produced in the slaughtering process, such as at the AFGRI Poultry abattoirs in Delmas. A responsible and economically viable option is to process the poultry waste into a high-protein poultry by-product meal at a rendering facility. The meal can then be used as an additive in the production of animal feeds, such as livestock feed. This thinking resulted in the establishment of the Dryden rendering facility, allowing abattoir waste from the AFGRI Poultry Delmas and Daybreak abattoirs to be processed into a high-protein poultry by-product meal at the facility.

Project description

The Dryden rendering facility has been operational since 1983 and has a Sterilisation License in terms of the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947) for its poultry by-product meal. The facility was built and started operating prior to the commencement of the Environmental Conservation Act, 1989 (Act No. 73 of 1989) and as such did not require Environmental Authorisation at this stage. Proposed expansions and upgrades to the facility do, however, require Environmental Authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended. This Environmental Impact Assessment process has therefore been initiated. A separate Waste Management License Application process is also underway at the National Department of Environmental Affairs.

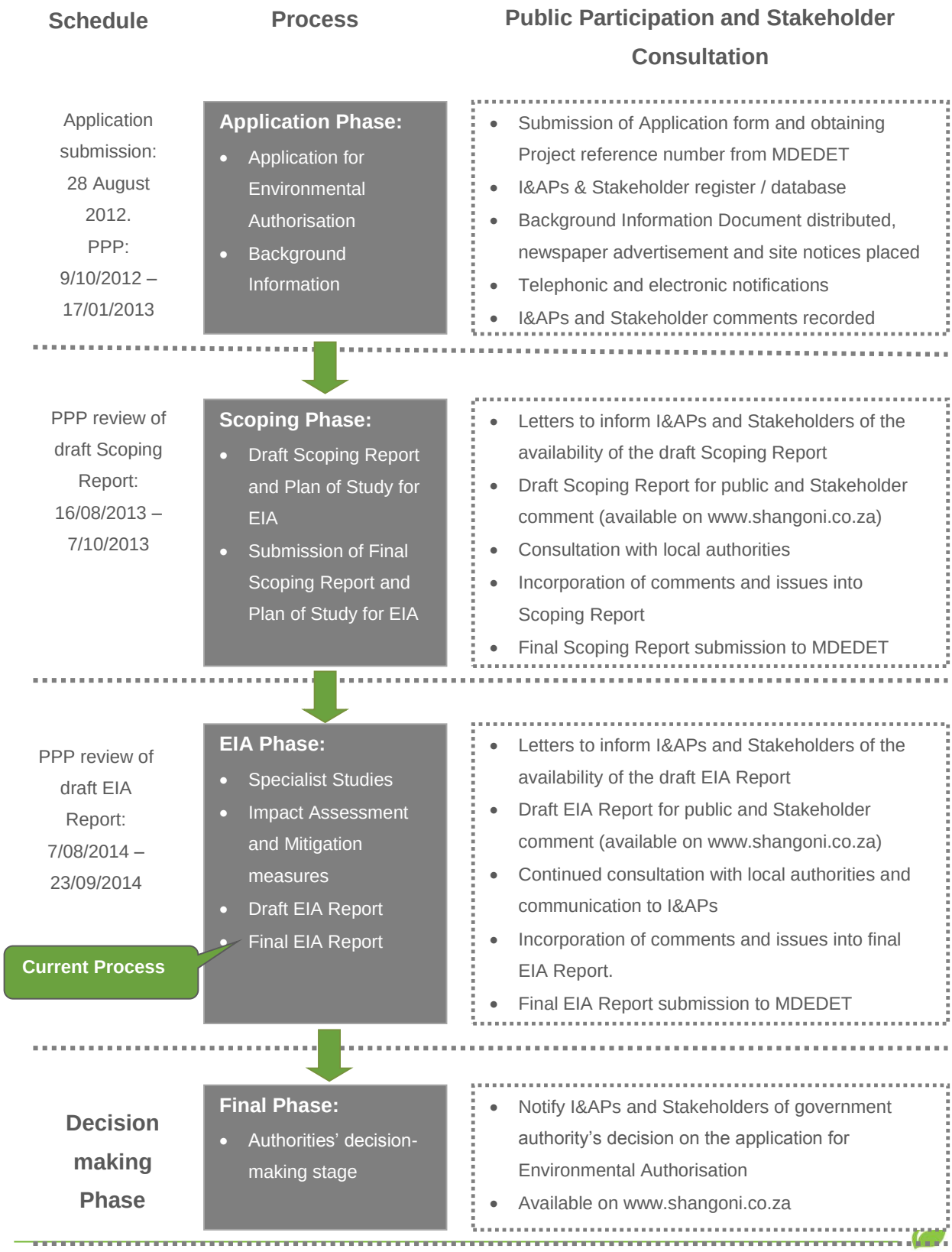
Legal requirements and legislative process

Proposed expansions and upgrades to the Dryden rendering facility trigger listed activities defined under the National Environmental Management Act, Act No. 107 of 1998 (NEMA, 1998) and its regulations. The relevant listed activities are described further in this final Environmental Impact Assessment Report (refer to Part 1.5).

It is the intention of this final Environmental Impact Assessment Report to provide the necessary information pertaining to the activities associated with the proposed project, as required in terms of the Environmental Impact Assessment Regulations (EIA Regulations R543: EIA Regulations in terms of

Chapter 5 of the NEMA, 1998, dated 18 June 2010). This final Environmental Impact Assessment Report intends to highlight all information relevant to the rendering facility project.

The diagram below provides a visual representation of approach followed for the Scoping- and EIA in terms of NEMA, 1998, and the Environmental Impact Assessment Regulations, dated 2010.



Identified Impacts

The purpose of this document is to supply the Mpumalanga Department of Economic Development, Environment and Tourism with the requested information pertaining to the National Environmental Management Act (NEMA), as amended, and Regulation 31 of the Environmental Impact Assessment Regulations, dated 2010. Contained in this document is a detailed investigation of the activity and potential site-specific impacts associated with the proposed expansion of the rendering facility.

The application for environmental authorisation of the triggered listed activities entails conducting a Scoping and Environmental Impact Assessment process. During the Scoping phase, the baseline, potential impacts related to the proposed activities were identified.

Regulation 31 (of Regulation 543) of the EIA Regulations, 2010, under the NEMA, 1998, requires that an Environmental Impact Assessment Report (EIR) includes an assessment of the status; extent; duration; probability; reversibility; replaceability of resources; and mitigatory potential of the major potential environmental impacts of the proposed project be undertaken. Refer to Part 7 for a detailed risk assessment of these identified impacts.

Potential significant impacts that were identified during the scoping process are:

Construction Phase

- Potential harm to the environment due to workers or contractors being unaware of how their activities may impact the environment or due to unauthorised access to the site;
- Potential loss of vegetation during site clearance;
- Potential disturbance of vegetation on No-Go Areas;
- Potential disturbance of a wetland;
- Potential loss of topsoil;
- Potential erosion of cleared areas;
- Potential disturbance of natural vegetation surrounding the site as a result of runaway veld fires caused by workers or contractors;
- Potential water- and/or soil- pollution due to incorrect management of concrete;
- Potential soil-, surface water- and ground water- contamination due to contaminated wash water;
- Potential pollution of soil, surface water and ground water due to hazardous waste spills;
- Potential soil-, surface water- and ground water- contamination due to general waste generated;
- Potential nuisance due to dust generated;
- Potential wear of access roads, accidents on access roads, unpermitted transport of materials and loss of materials being transported on access roads;
- Potential unsanitary conditions on site causing soil-, surface- and groundwater contamination;
- Potential hazardous chemical spills, resulting from incorrect management of resources, can cause soil-, surface water- and ground water- pollution;

- Potential disturbance or nuisance to neighbours as a result of the increase in ambient noise from construction vehicles and machinery; and
- Potential wastage of valuable resources due to inefficient or redundant usage.

Operational Phase

- Potential atmospheric pollution due to emissions and odours generated at the rendering facility;
- Potential social impact (nuisance) due to odours and noise generated;
- Potential air quality degradation as a result of the accumulation of dust;
- Potential soil-, surface water- and/or ground water- contamination due to chemical usage;
- Potential soil-, surface water- and/or ground water- contamination due to the generation and storage of waste (general and hazardous);
- Potential soil-, surface water- and/or ground water- contamination due to the generation and treatment of wastewater;
- Potential harm to a wetland and downstream watercourse due to the release of inefficiently treated wastewater;
- Potential soil-, surface water- and/or ground water- contamination due to unsanitary conditions onsite;
- Potential soil-, surface water- and/or ground water- contamination due to fuel spillages;
- Potential outbreak of diseases;
- Potential wastage of valuable resources due to inefficient or redundant use; and
- Potential stormwater contamination.

Appropriate mitigation measures will assist in minimising the potential impacts on the surrounding environment during the construction and operational phases of the development. A draft Environmental Management Programme (EMP) has been compiled with the aim of serving as a working document in order to manage and/or mitigate the identified potential impacts. Refer to Addendum A for a copy of the draft EMP.

1. INTRODUCTION

This final Environmental Impact Assessment Report forms part of an application for environmental authorisation for the upgrading and expansion of the AFGRI Animal Feeds Dryden rendering facility. Application is also being made for a Water Use- and Atmospheric Emission License for the facility. The rendering facility is situated on the remaining extent of Portion 33 of the farm Weltevreden 227 IR. The application process is undertaken on behalf of the applicant, AFGRI Operations Limited, by Shangoni Management Services (Pty) Ltd. Shangoni was appointed, as independent environmental practitioner, to assist the applicant in complying with the 2010 EIA Regulations in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), the National Water Act, 1998 (Act No. 36 of 1998) and the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).

An application to undertake an Environmental Impact Assessment (Scoping and Environmental Impact Reporting) process was submitted to the identified competent authority, the Mpumalanga Department of Economic Development, Environment and Tourism. The Department subsequently registered the project and the formal Scoping and Environmental Impact Reporting (S&EIR) process was thereby initiated.

All the findings from the Environmental Impact Assessment process are included in this report.

1.1 Applicant

Name of Applicant	AFGRI Operations Limited
Contact Person	Mr. Peet Venter
Postal Address	PO Box 11054, Centurion, 0046
Telephone No.	011 977 7700
Fax No.	086 564 6297
Farm name and portion on which the activities take place	The remaining extent of Portion 33 of the farm Weltevreden 227 IR
Co-ordinates of operation	26° 6'56.52"S; 28°45'1.54"E

1.2 Appointed 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	• 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	• MSc Environmental Management (University of London) • More than 3 years' experience conducting Environmental Impact Assessments and Waste Management License Applications	Environmental Assessment Practitioner

Detailed CVs for the project team are appended (Appendix F).

1.3 Background

The rendering industry has a positive impact on the environment by converting highly-perishable poultry waste that cannot be consumed by humans, into a valuable commodity (COWI Consulting Engineers and Planners AS, 2000) that can be used in the production of animal feeds. This decreases the amount of waste that needs to be disposed of at local landfill/hazardous waste disposal sites and also eliminates the possibility of decomposing waste polluting the soil, surface- and ground- water of the area.

Rendering facilities may, however, also produce negative environmental impacts such as:

- Atmospheric pollution;
- Water pollution;
- Soil degradation; and
- Resource consumption.

1.4 Current situation

The AFGRI Animal Feeds Dryden rendering facility is an independent rendering facility situated on the remaining extent of Portion 33 of the farm Weltevreden 227 IR. The facility is an inedible rendering plant, i.e. it produces a product that is not intended for human consumption. The facility currently receives chicken waste [blood, feathers, chicken pieces and intestines (mala)] from the AFGRI Poultry Delmas and Daybreak abattoirs on a daily basis and also receives feathers from an external source. The facility operates 24/7 (in three shifts) and processes the poultry waste into a high-protein poultry by-product meal (PBPM). The facility has a Sterilisation License in terms of the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947) for its poultry by-product meal. The meal is used as a protein source in the production of animal feed at AFGRI feed mills. The current by-product meal production process, a batch rendering process, at the existing rendering plant (Plant 1), is shown in Figure 1 and is summarised below:

- The facility has two sections separated by a concrete partition. The “dirty” area is from the waste unloading area to where the waste is loaded into the pressure cooking vessels. The “clean” area is from where the cooked product is loaded out of the cooking vessels to where the finished product is bagged. Moving from one area to the other requires a person to walk around the concrete partition and through foot baths containing disinfectant.
- Chicken waste (feathers, chicken pieces and intestines) from the AFGRI Poultry Delmas and Daybreak abattoirs, and additional feathers from an external source, are brought to the rendering facility in skips. The waste is stored in a covered, concrete storage bunker.
- Blood is brought from the abattoirs in a tanker and is pumped into a holding tank at the rendering facility. The blood is pre-treated to decrease its moisture content. This is done through live steam injection which causes the blood to coagulate. A vibrating sieve is then used to separate the coagulated blood meal and a screen is used to filter the excess water (serum water). Once the desired moisture content is obtained, the blood meal is added to the other waste in the storage bunker. The excess serum water is taken to a sump and screen where remaining solids are removed from the water. The solids are taken back to the coagulator and the water is pumped into the current treatment ponds (an improved treatment system is being proposed, but will not require environmental authorisation, as less than 2 000m^3 of wastewater will be treated in the system per day).
- Waste from the storage bunker is loaded into a self-dumping hopper and is taken to three pressure cooking vessels via a conveyor system. Steam is generated in a coal-fired boiler for use in the sterilisation process. There are also two back-up boilers. Each of the three boilers has its own stack. Boiler ash is currently stored on site and this practice is being revised.
- Within the cooking vessels, a vacuum is created and the waste is cooked and sterilised using pressure and high temperatures. Steam is vented from the cooking vessels and passes through a condenser. Water from the condenser flows to the treatment ponds while non-condensibles are emitted as VOC emissions.

- The sterilised product is removed from the cooking vessels when the moisture content has decreased to the required percentage. It is then further dried and this steam is also sent to the condenser.
- The product passes through a hammermill and screen. In this step any unwanted solids, such as stones, are removed from the product.
- In the cooler the temperature of the product is lowered. The product is then placed into bags and removed from the site to be used in the production of animal feeds.

The rendering facility obtains electricity from Eskom, but also has a backup generator on site. There is also a substation at the neighbouring AFGRI Animal Feeds silos that can be used if necessary.

All chemicals used at the rendering facility, such as those for disinfection, are biodegradable and are stored in designated areas. There is a 23 000l above-ground diesel storage tank as well as an underground diesel storage tank that is no longer in use.

Water used at the facility for the boilers, washing, toilets and showers, is obtained from one on-site borehole. The borehole water is not used for drinking purposes. The toilets and showers are linked to a french drain. Wastewater is produced from the following:

- Raw material liquids;
- Cooking and drying condensate;
- Blood coagulation that generates serum water;
- Washing and sanitation of the plant; and
- Boiler water usage (Sindt, 2006).

Per day, approximately 80m^3 of wastewater passes through a pre-filtration process and is then partially treated in two treatment ponds (one anaerobic pond and one settling pond) prior to its discharge into a wetland area to the west of the rendering facility. An upgrade and expansion of the current wastewater treatment system is being proposed to effectively treat the wastewater to a quality that complies with the Department of Water Affairs' general limit standard for discharge into a water resource. The applicant is also considering treating the wastewater to such a quality that will allow re-use at the rendering facility. A separate Waste Management License application is being conducted for all waste related activities onsite.

The facility currently employs 62 people, most of which are semi-skilled labourers that live in the nearby informal settlement.

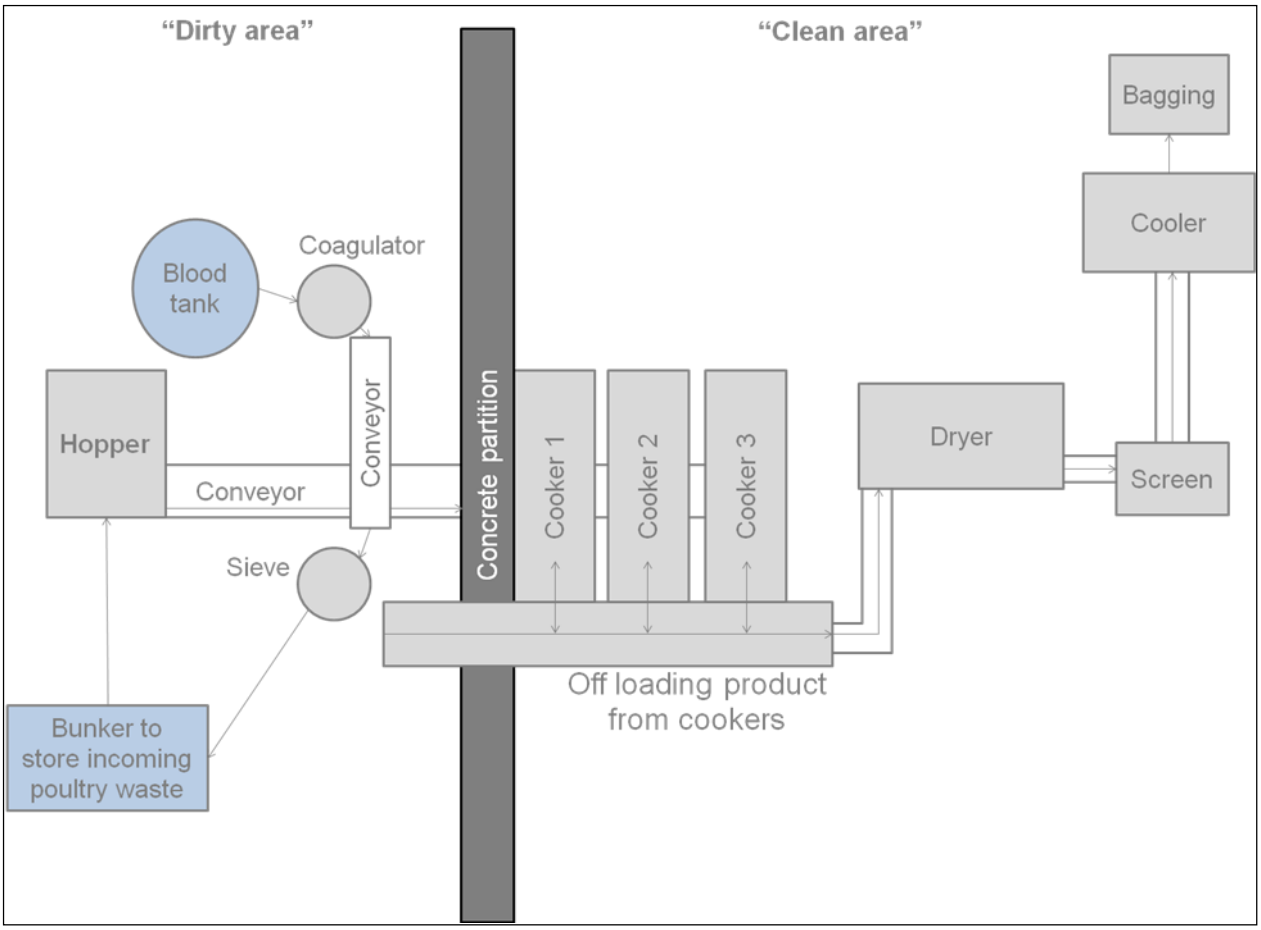


Figure 1: Rendering process flow

1.5 Proposed Activity

The proposed activity is the upgrading and expansion of the AFGRI Dryden rendering facility from a processing capacity of approximately 22 000 tons of raw material per annum to 80 000 tons of raw product per annum. An Atmospheric Emission License application will also be submitted to the Nkangala District Municipality or Mpumalanga Provincial authority and an Integrated Water Use License application will be submitted to the Department of Water Affairs.

The following listed activities in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) are being applied for:

- R544, Listing Notice 1 of 18 June 2010, Activity No. 35: The expansion of facilities for agri-industrial purposes outside industrial complexes, where the development footprint of the facility will be increased by a 1 000 square metres or more, with the exception of hatcheries, where activity 36 in this Notice applies.
- R544, Listing Notice 1 of 18 June 2010, Activity No. 40: The expansion of
  - (i) jetties by more than 50 square metres;
  - (ii) slipways by more than 50 square metres; or

(iii) buildings by more than 50 square metres
(iv) infrastructure by more than 50 square metres

within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, but excluding where such expansion will occur behind the development setback line.

- R545, Listing Notice 2 of 18 June 2010, Activity No. 5: The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.
- R545, Listing Notice 2 of 18 June 2010, Activity No. 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.

1.6 Design

1.6.1 Upgrading and Expansion of the rendering facility

The upgrading of the rendering plant includes constructing of roofs over the raw material intake area and finished product dispatch area so that birds cannot gain access to the raw materials or the finished products. Each roof will cover an area of approximately 1 000m^2. There will also be re-cementing of areas, the construction of facilities for bulk deliveries of incoming waste and the installation of conveyors. This was a requirement from the Mpumalanga Department of Agriculture, Rural Development and Land Administration.

The proposed expansion of the rendering facility will entail the construction of a second processing plant (Plant 2) adjacent to the existing plant (Plant 1). The existing plant will continue to function and operate as it currently does. Two existing steel storage sheds will be demolished to make space for the second plant and an existing warehouse will be used to store the finished products. The second plant will also extend into an undisturbed area to the west of the two storage sheds.

The second plant will utilise new technology and will process four separate waste streams. The waste streams will not only come from poultry abattoirs, but will also include waste from other kinds of abattoirs. The waste streams are as follows:

- Feathers;
- Blood;
- Intestines; and
- Whole chickens.

The second plant will have a common waste receiving area and from there the waste will be separated into the four previously mentioned waste streams. Each waste stream will be sterilised and a different type of high protein meal will be produced from each stream. The location and footprint area of the second plant is shown in the figure below. The footprint area of the second plant will be approximately 6 000m^2.

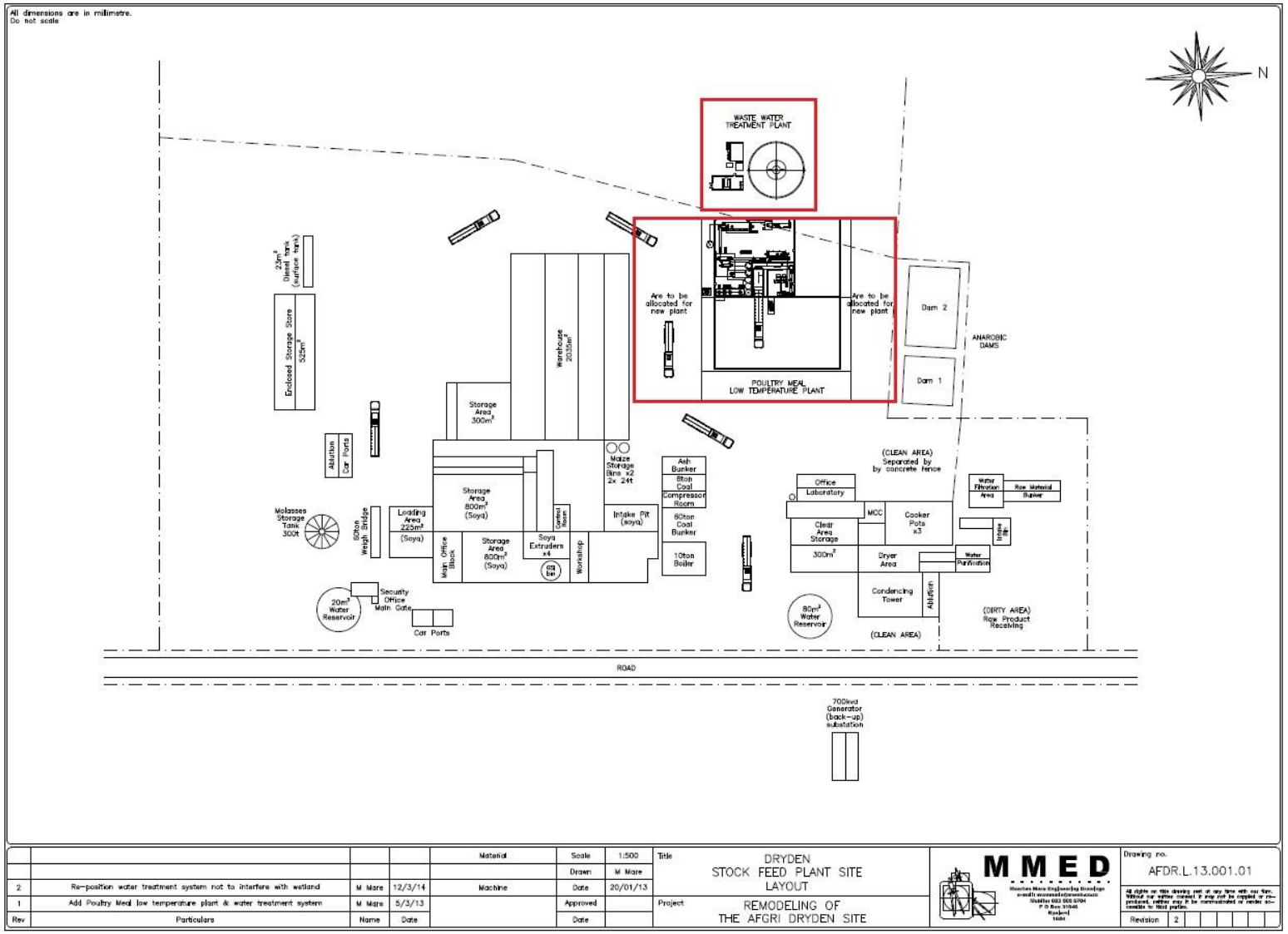


Figure 2: Site layout plan for the rendering facility with proposed expansions shown in red

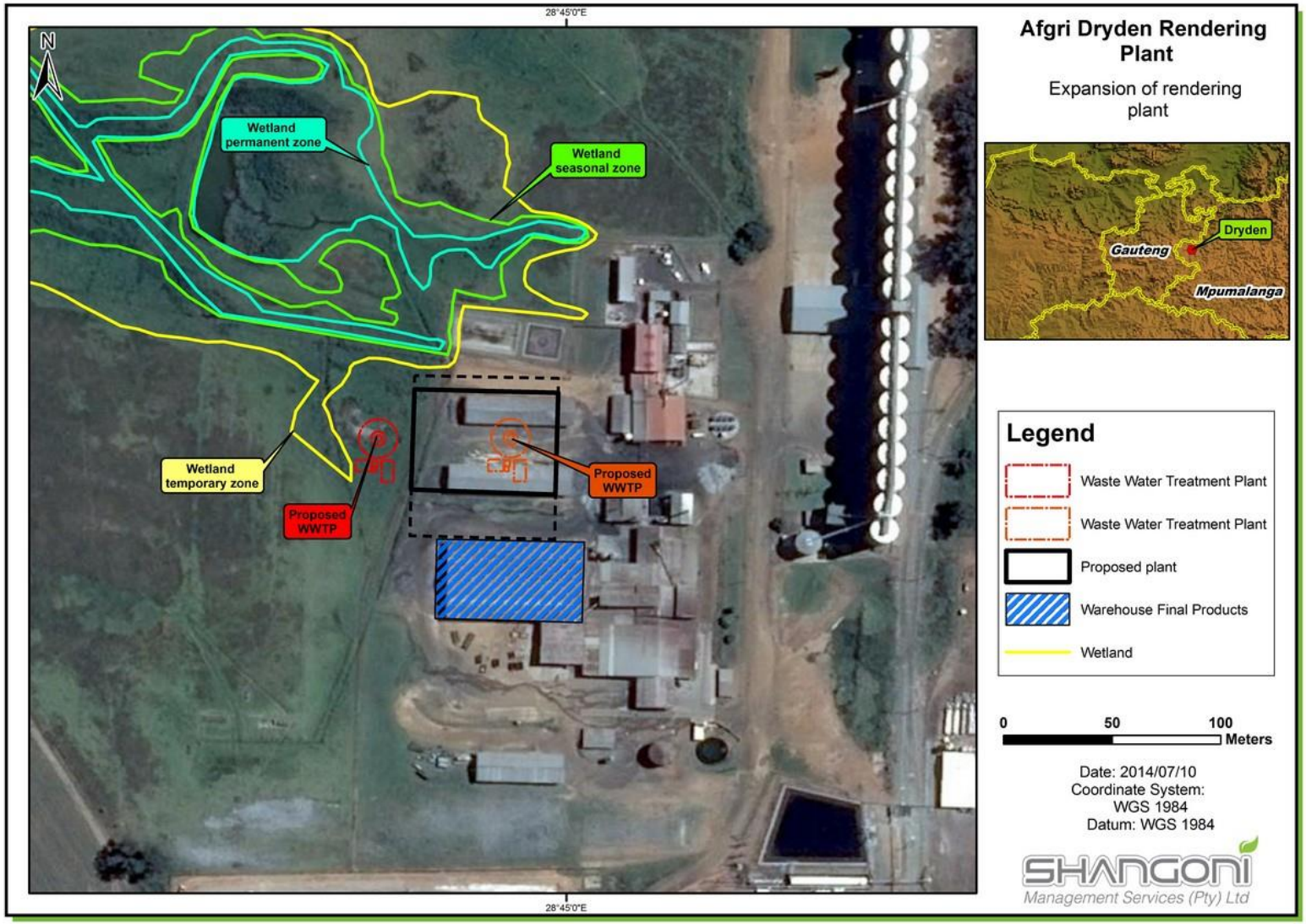


Figure 3: Proposed second rendering plant and wastewater treatment works

Approximately 270m^3 of wastewater will be generated per day during the waste sterilisation process after the expansions. This wastewater will first be treated by reverse osmosis (RO) within the second plant and will thereafter exit the plant area for further treatment in the upgraded wastewater treatment system. The upgraded wastewater treatment system will service the existing and new plant and will have another RO system at the end of the treatment process. The two existing treatment ponds will also form part of this process, and will be upgraded through the addition of concrete floors to prevent wastewater seepage and the second, anaerobic dam will be split in two. The first pond has a volume of 504m^3 and the second a volume of 371m^3. These ponds provide a buffer capacity for the treatment of the wastewater and will act as a contingency storage facility should breakdowns be experienced at the proposed reverse osmosis plants. The wastewater will be treated to a quality that complies with the Department of Water Affairs' general limit standards for discharge into a water resource and will be discharged into the environment. If possible, the applicant intends to treat the wastewater to a quality that will enable the water to be re-used at the rendering facility.

To treat odourous emissions from the plant, a new air treatment system is being proposed. This system will consist of an air cooled condenser with ozone treatment at the system outlet. One such system will be installed at the existing rendering plant and another system will be installed at the second, proposed plant.

1.6.2 Atmospheric Emission License application

An Atmospheric Emission License application will be submitted to the Nkangala District Municipality or Mpumalanga Provincial authority to license the atmospheric emissions that are generated at the rendering facility. The following activity is triggered by the rendering facility in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), 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 (GN 893 of 22 November 2013):

19. Category 10: Animal matter processing

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

a) The following special arrangement shall apply:
   (i) Best practice measures intended to minimised or avoid offensive odours must be implemented by all installations. These measures must be documented to the satisfaction of the Licensing Authority.

1.6.3 Integrated Water Use License application

An integrated water use license application was submitted to the Department of Water Affairs for the following water use license activities:

- Section 21(a): Taking water from a water resource;
- Section 21(c): Impeding or diverting the flow of water in a watercourse;
- Section 21(f): Discharge of waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit
- Section 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource; and
- Section 21(i): Altering the bed, banks, course or characteristics of a watercourse.

1.7 Proposed Locality

The AFGRI Dryden rendering facility is situated within the Victor Khanye Local Municipalities' jurisdiction. This local municipality forms part of the Nkangala District Municipality, located within the Western Highveld of the Mpumalanga province.

The rendering facility is situated on the remaining extent of Portion 33 of the farm Weltevreden 227 IR, approximately 7.7km north-east of Delmas. A Google Earth image of the site is given in the Figure 4. Figure 5 and Appendix A show the location of the site together with the area immediately surrounding the site. A number of residential dwellings lie to the east of the site, on the other side of the train tracks, and there are many informal settlements to the north-west of the facility. General site photographs are given as Figures 6 to 29. The area for the proposed expansion is given as Figures 30 to 39.

Table 1: Direction and distance to the nearest town

Closest town	Distance from site	Direction from site
Botleng	5.25km	West
Delmas	7.76km	South-west

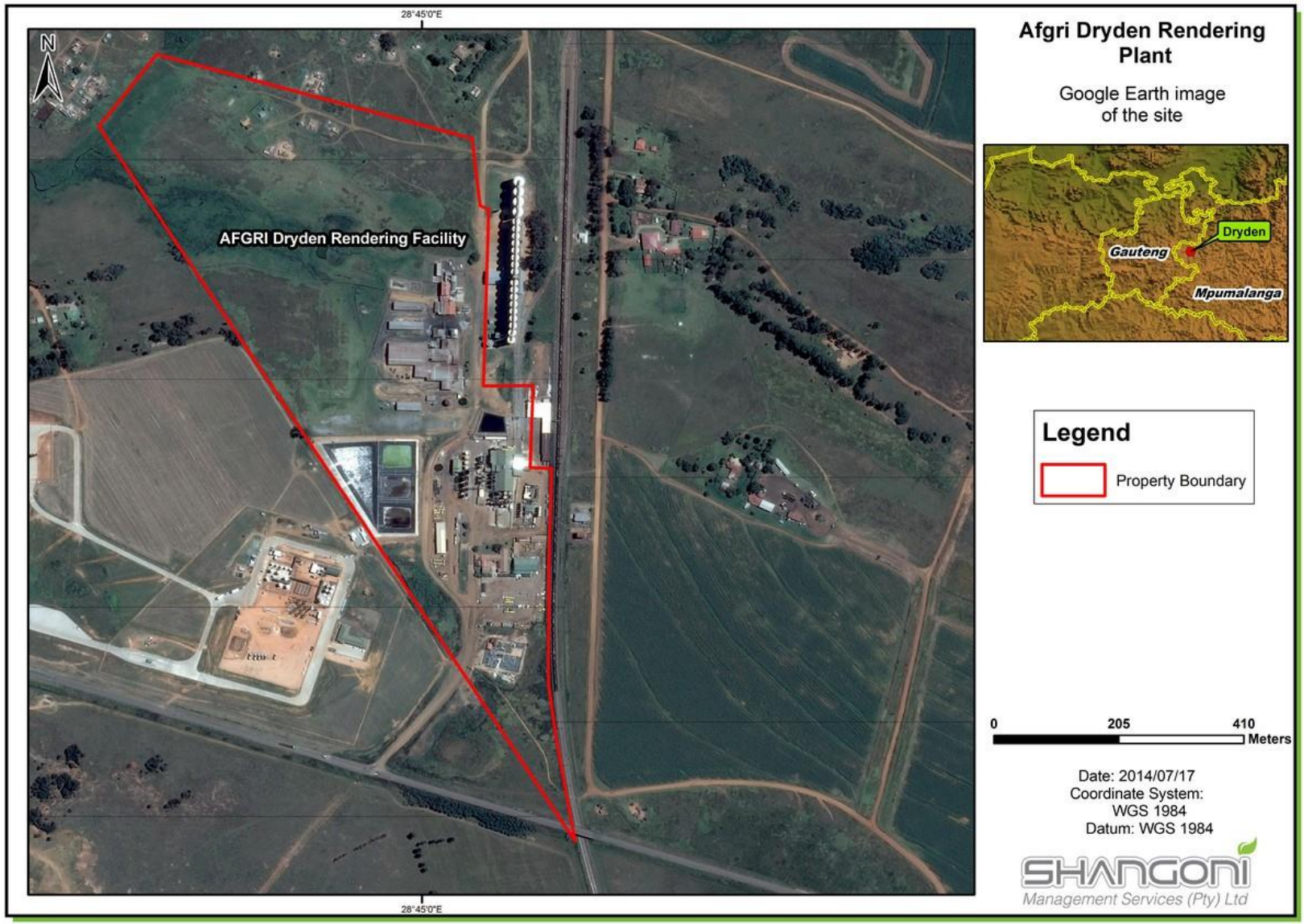


Figure 4: Google Earth image of the site

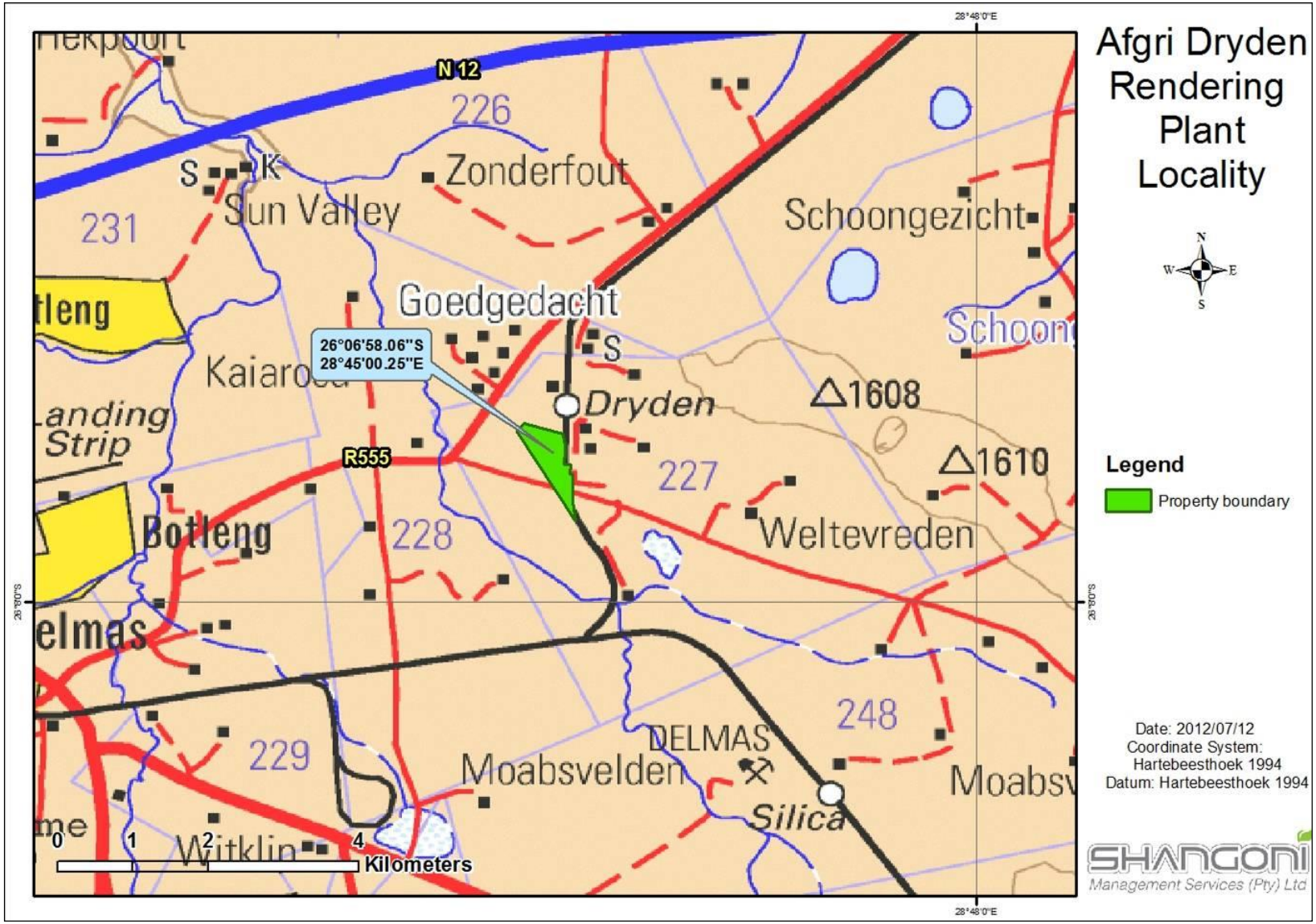


Figure 5: Site locality map

Figure 6: View of the current rendering facility from the south-west

Figure 7: View of the current rendering facility from the east

Figure 8: The borehole used to supply water to the rendering facility

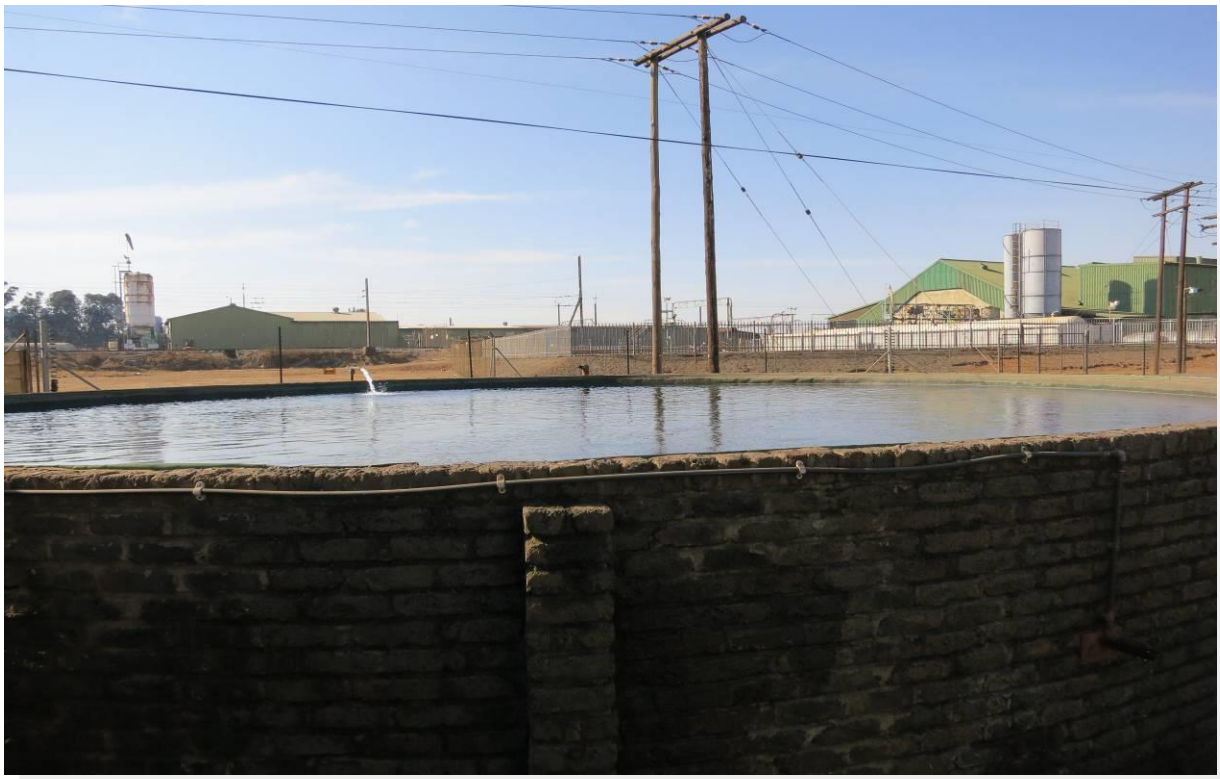


Figure 9: The water reservoir used to store water from the borehole before it is pumped to the JoJo tanks

Figure 10: The JoJo tanks where water from the reservoir is stored

Figure 11: The three coal-fired boilers on site (10 ton on the left, 6 ton in the middle and 3 ton on the right)

Figure 12: The 6 ton (left) and 3 ton (right) back-up coal-fired boilers

Figure 13: The 10 ton coal-fired boiler

Figure 14: Skips are used to bring condemned material from the abattoirs to the rendering facility

Figure 15: The current poultry waste storage area (bunker)

Figure 16: The current poultry waste storage area (2)

Figure 17: The wastewater collection sump and press (pre-filtration). Solids from the press are taken back to the storage bunker

Figure 18: The current hopper into which the poultry waste is loaded

Figure 19: The current blood storage tank

Figure 20: The current blood coagulator where the blood is coagulated before it is added to the poultry waste in the bunker

Figure 21: The current cooking vessels where the poultry waste is cooked

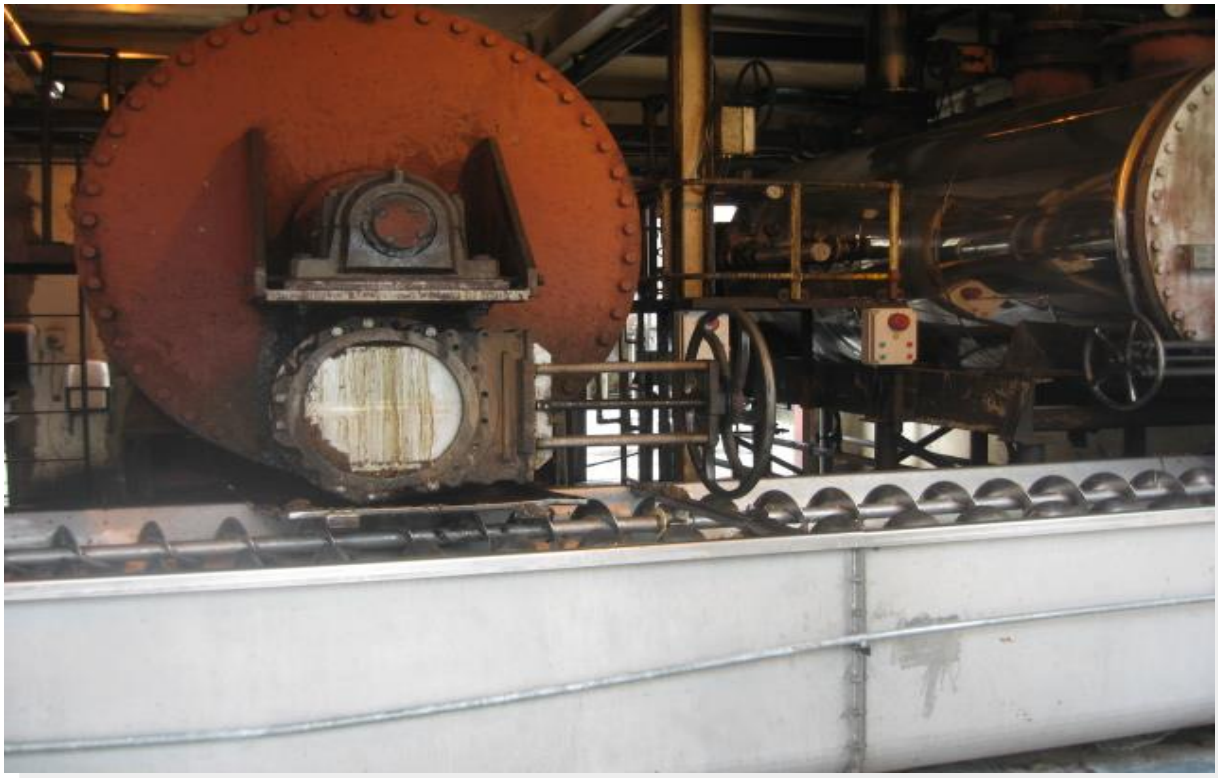


Figure 22: The current cooking vessels and offloading area (where the product is removed from the cooking vessels)

Figure 23: The current condensers

Figure 24: The current dryer where the product is dried to further decrease its moisture content

Figure 25: Dried product exiting the drier and passing through the sieve

Figure 26: The current bagging area

Figure 27: The anaerobic pond into which wastewater from the rendering facility flows

Figure 28: Wastewater overflowing from the anaerobic pond flows into this settling pond

Figure 29: Wastewater from the settling pond is currently released into the environment (through irrigation) to the west of the rendering facility

Area for the proposed expansion of the rendering facility

Figure 30: The first storage shed that will be removed to make room for the second plant

Figure 31: The second storage shed that will be removed to make room for the second plant

Figure 32: Panorama from the approximate centre point for the expansion (1)

Figure 33: Panorama from the approximate centre point for the expansion (2)

Figure 34: Panorama from the approximate centre point for the expansion (3)

Figure 35: Panorama from the approximate centre point for the expansion (4)

Figure 36: Panorama from the approximate centre point for the expansion (5)

Figure 37: Panorama from the approximate centre point for the expansion (6)

Figure 38: Panorama from the approximate centre point for the expansion (7)

Figure 39: Panorama from the approximate centre point for the expansion (8)

Figure 40: The current warehouse where finished products from the second plant will be stored

2. NATURE AND EXTENT OF THE ENVIRONMENT AFFECTED BY ACTIVITY

2.1 Geology

As can be seen on the figure below, the site is underlain by siliciclastic rocks of the Pretoria Group, Transvaal Supergroup.

The Pretoria Group comprises the following formations: At the base is the Rooihoogte Formation followed by the Timeball Hill-, Boshoek-, Hekpoort-, Dwaalheuwel-, Strubenkop-, Daspoort-, Silverton-, and Magaliesberg- Formations (as shown in Figure 41). The group consists mostly of shale and quartzitic/quartzite sandstone with minor conglomerate and siltstone. The strata generally have strikes of between N 40° W in the northeast and N 75° W in the south. They dip toward the northeast and north-northeast at angles of between 13° and 25° (Laubscher & Lubbe, 2009).

According to the Council of Geoscience (letter attached under Appendix F), the site is not situated on any dolomite or limestone formations and the area is mainly underlain by shale with breccia, conglomerate, chert and quartzite near the base of the Timeball Hill Formation, Pretoria Group, Transvaal Supergroup. A map from the Council of Geoscience showing dolomite areas and the location of the site outside of the dolomite areas is given in Figure 43.

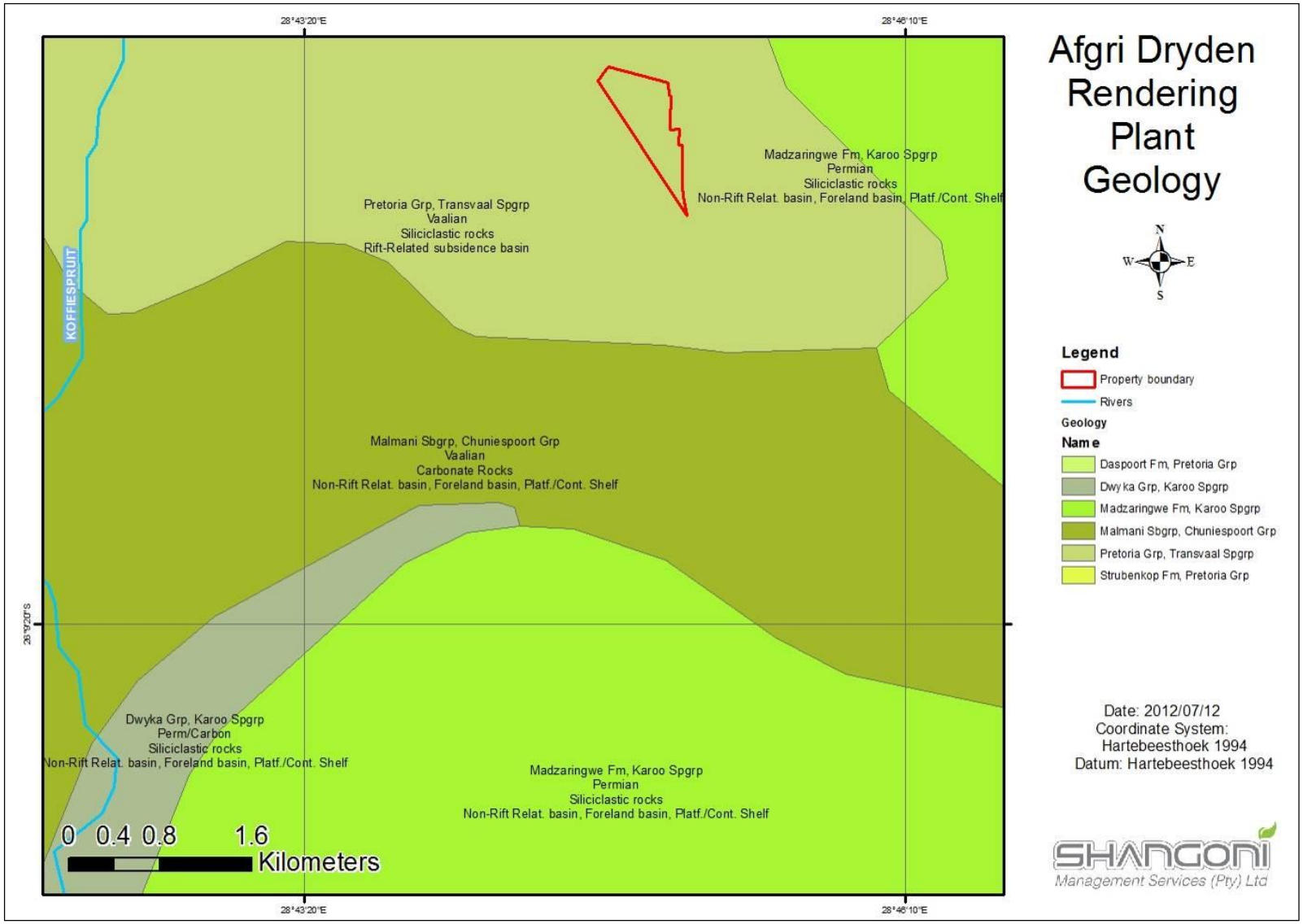


Figure 41: Geology of the site

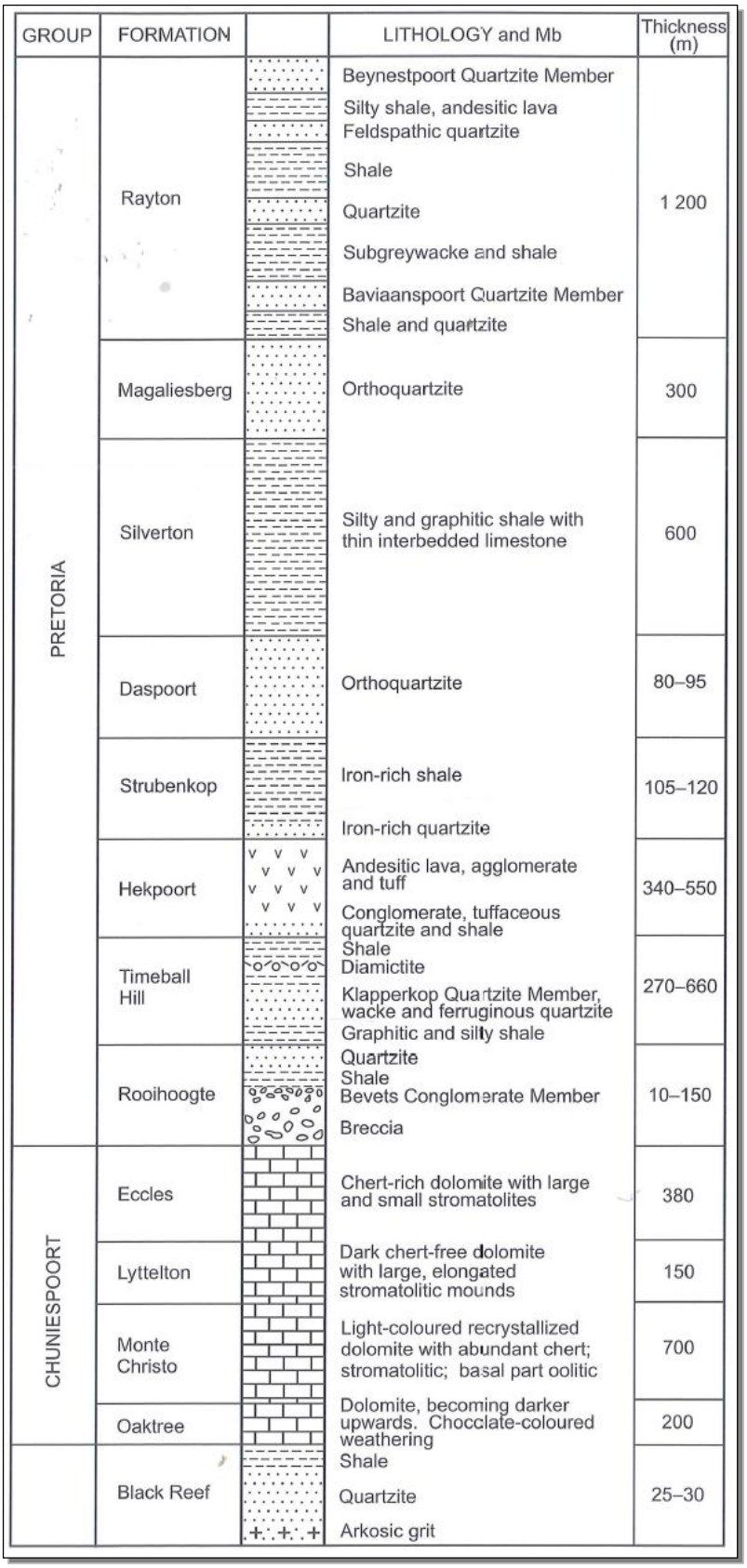


Figure 42: The lithostratigraphic subdivisions of the Transvaal Supergroup (Laubscher & Lubbe, 2009)

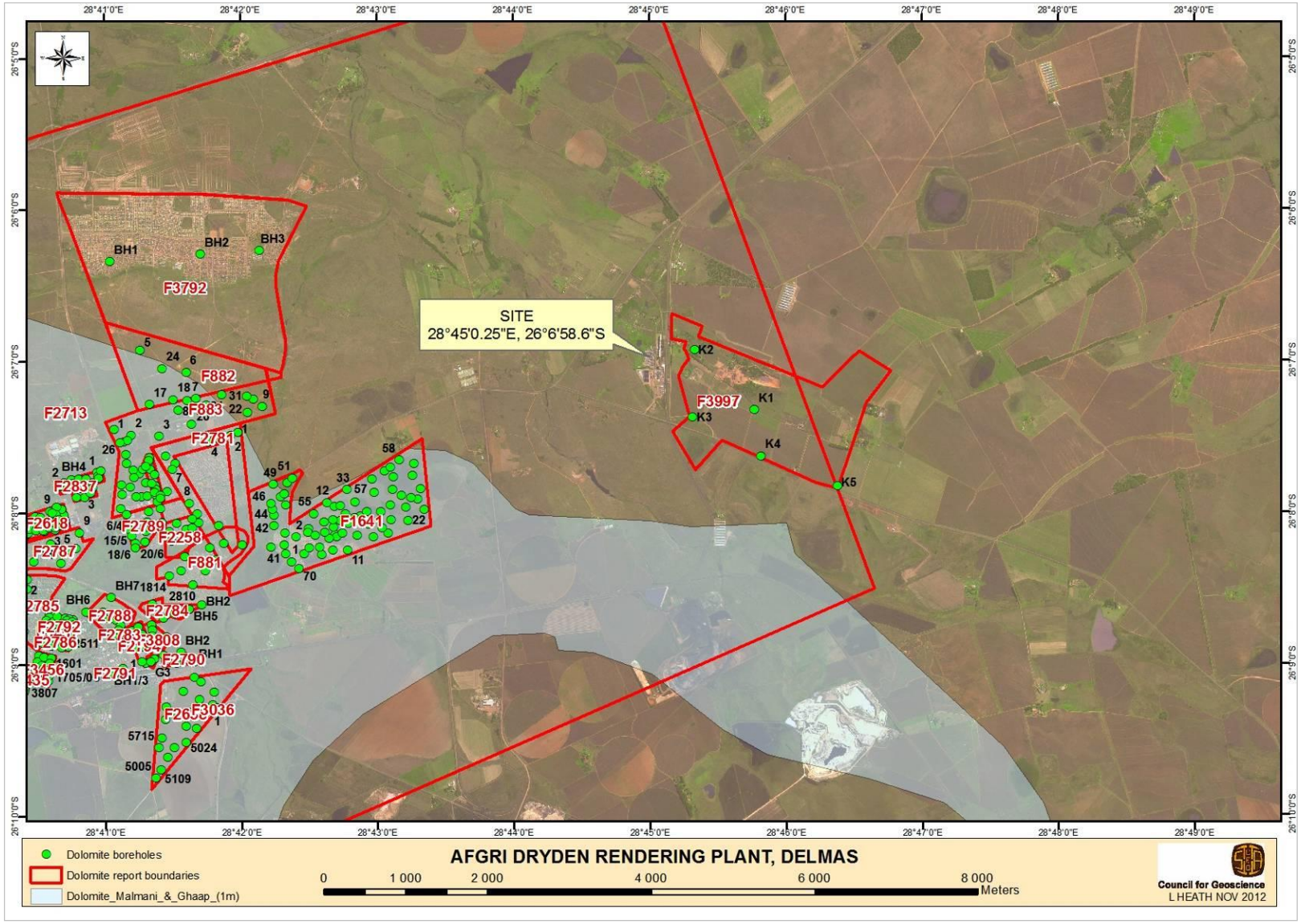


Figure 43: Dolomite occurrence in the Delmas area (Council for Geoscience, 2012)

2.2 Regional climate

The climate of the site is typical of Highveld conditions with relatively warm to hot summers and fairly high rainfall, and moderate to cool winters with little or no rain. Valleys and wetlands are much cooler at night and more prone to frost than higher lying areas. The area experiences thunderstorms during the summer months, which usually occur in the late afternoons.

2.2.1 Rainfall

The site occurs in a summer rainfall area receiving a mean average annual rainfall of 426.3 mm. The average precipitation (taken over a period of 5 years from 2005 to 2009) is 127 mm in January and 6mm in July. The relative humidity varies between 12% as minimum and 93% as maximum.

The variability of rainfall as well as high intensity events will affect the construction phase of the project. It could hinder construction activities with potential soaking of cement mixtures or foundation concrete during the early phases of the construction process.

Construction should preferably be planned for the winter months to avoid construction delays that might have a negative socio-economic impact on the development.

Figure 44 shows the average monthly rainfall of Delmas, Figure 45 shows the average yearly rainfall of Delmas (www.weathersa.com) and Figure 46 shows the Mean Annual Precipitation for Mpumalanga.

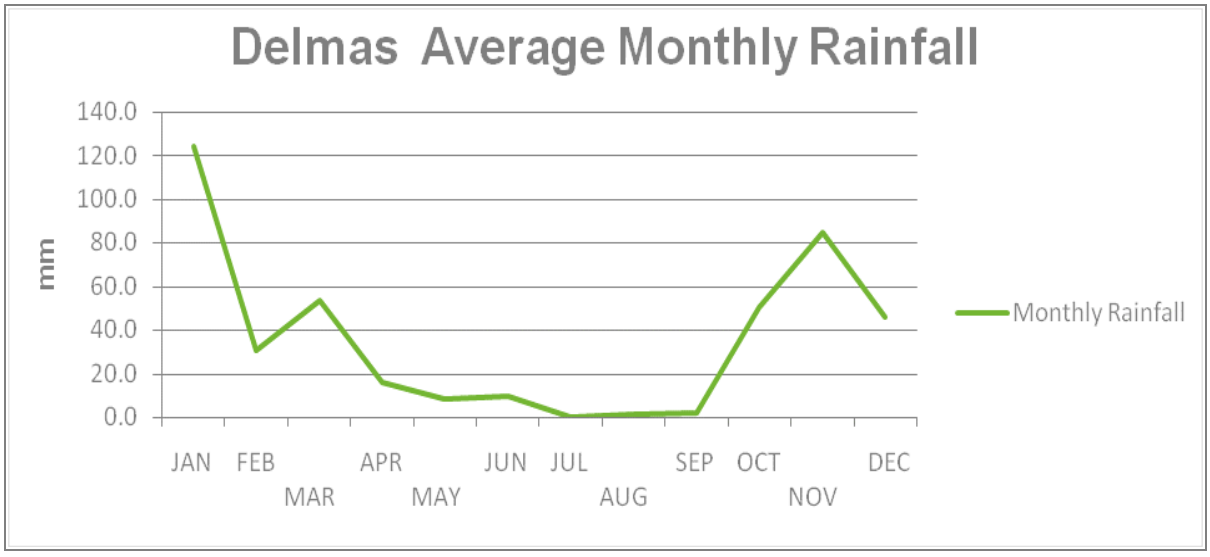


Figure 44: Delmas average monthly rainfall

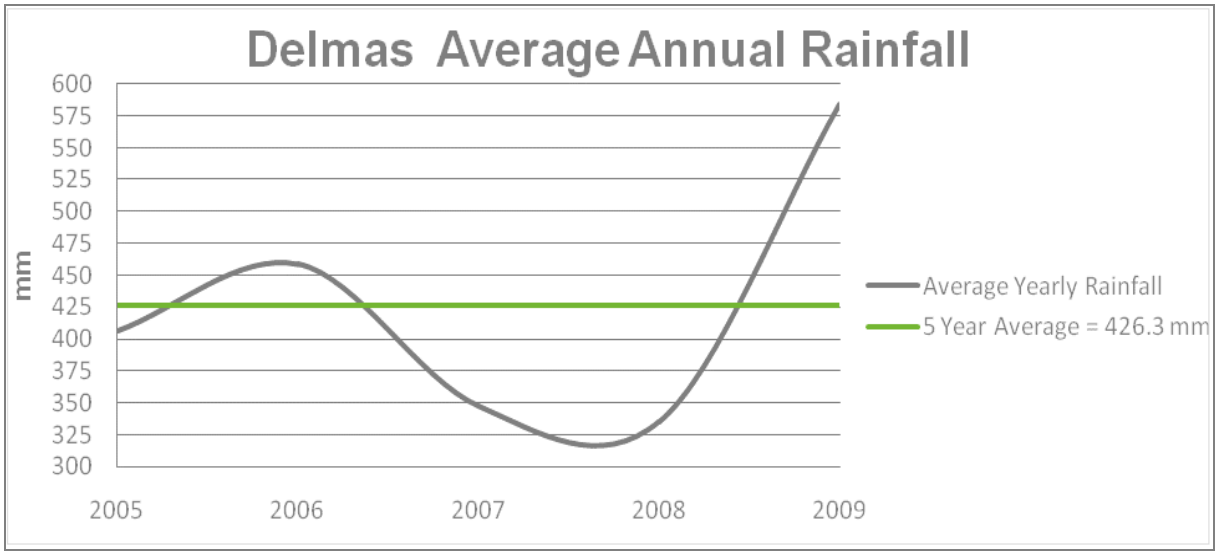


Figure 45: Delmas average annual rainfall

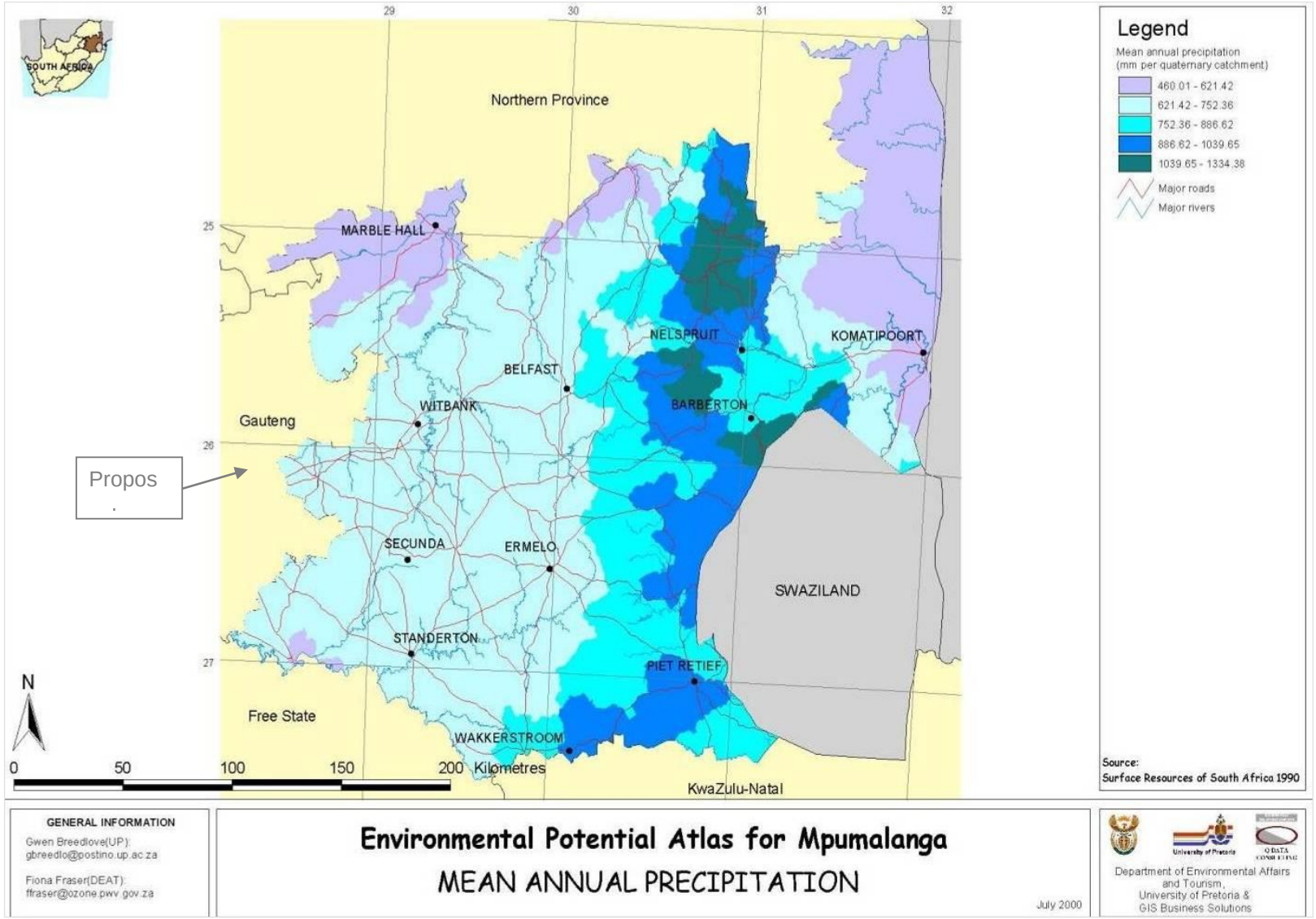


Figure 46: Mean annual precipitation for Mpumalanga

2.2.2 Temperature

The maximum and minimum temperatures for the closest weather station, Delmas, are between 12°C and 27°C during the summer months. In winter the temperatures may vary between 2°C and 18°C.

The occurrence of frost during winter months results in the grasslands being very dry, which contributes to veld fires.

Figure 47 shows the average daily temperatures of Delmas as provided by www.weathersa.com.

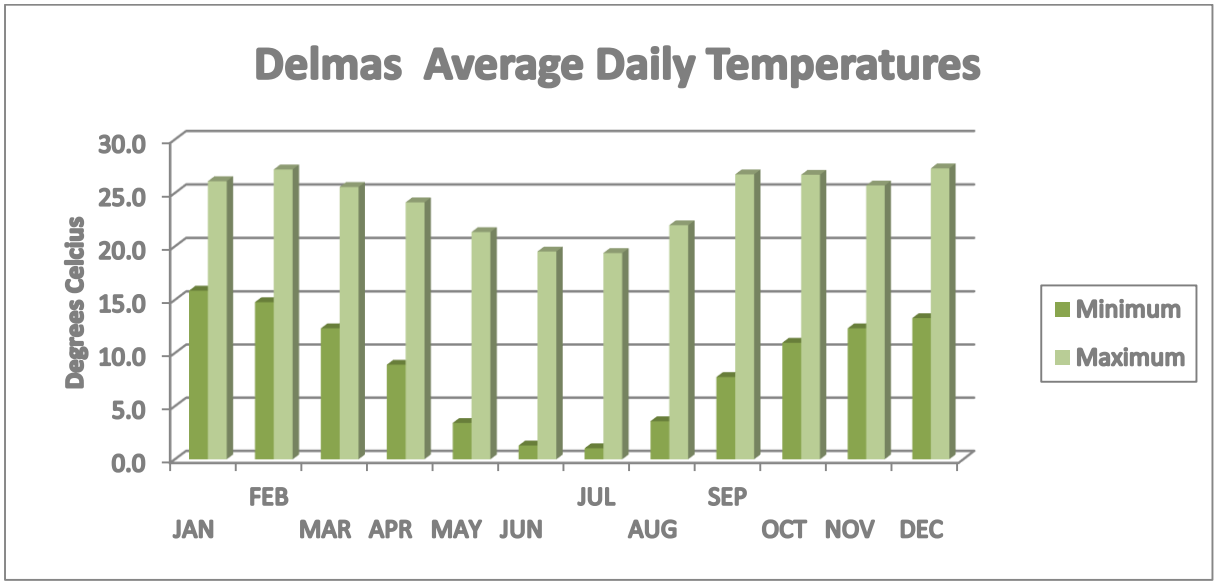


Figure 47: Maximum and minimum average daily temperatures in Delmas

2.2.3 Wind

The AFGRI Dryden rendering facility is situated approximately 7.76km northeast of Delmas. The wind roses below give an indication of wind direction distributions across the Delmas area.

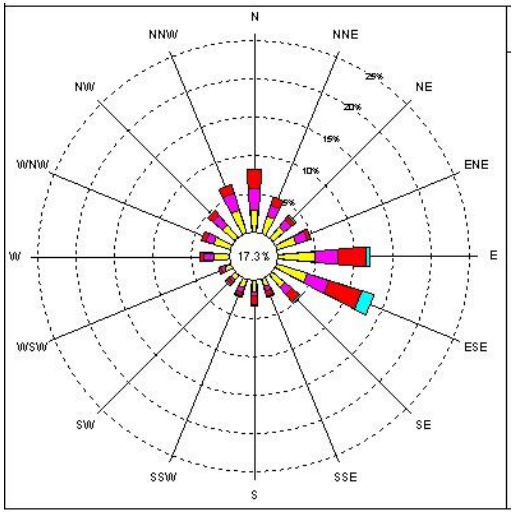


Figure 48: Wind Rose - January

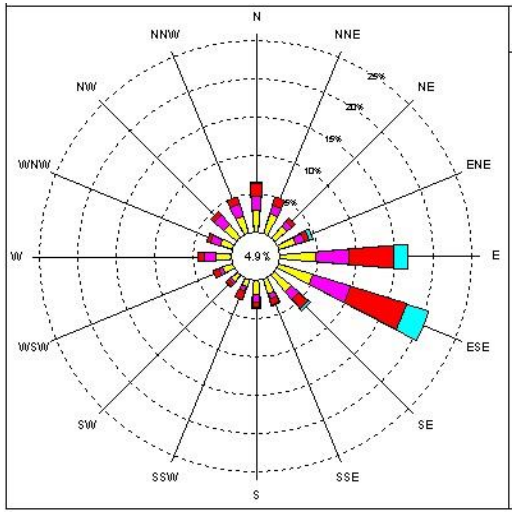


Figure 49: Wind Rose - February

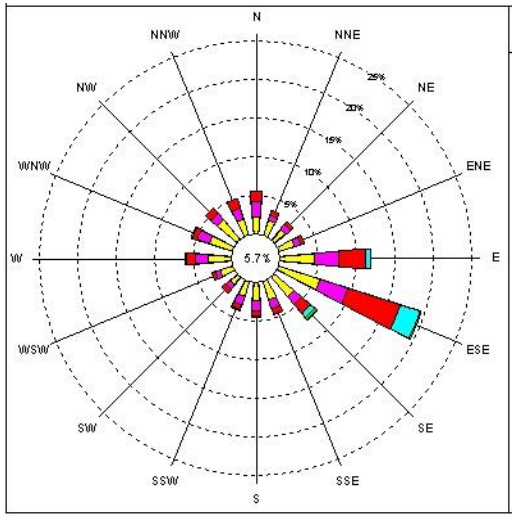


Figure 50: Wind Rose – March

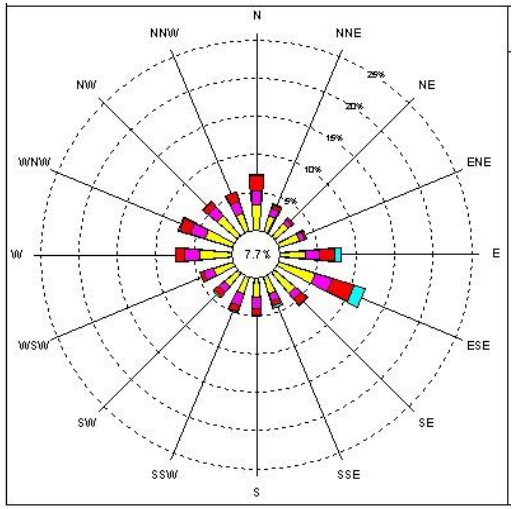


Figure 51: Wind Rose – April

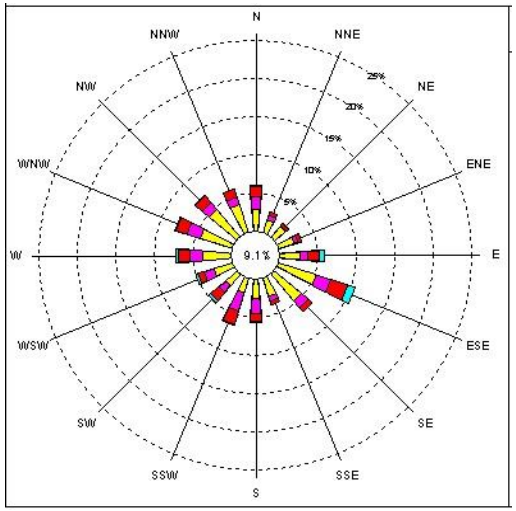


Figure 52: Wind Rose – May

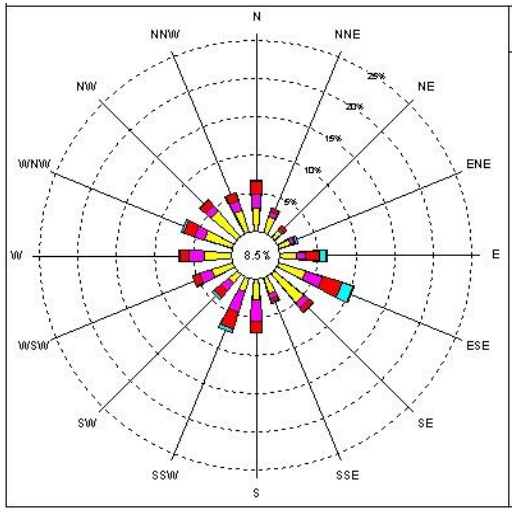


Figure 53: Wind Rose - June

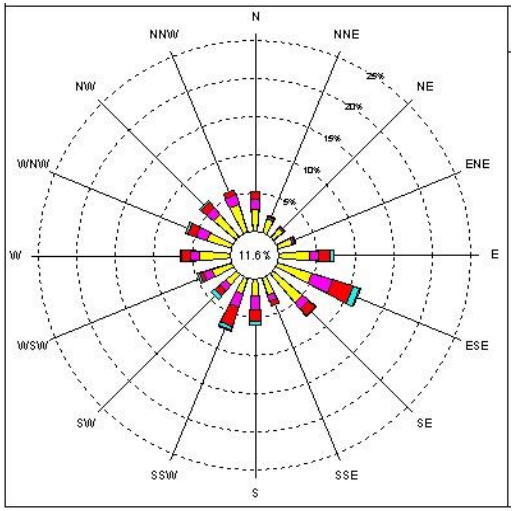


Figure 54: Wind Rose – July

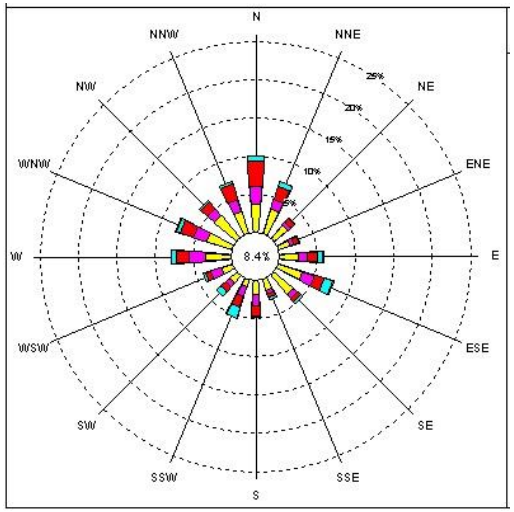


Figure 55: Wind Rose - August

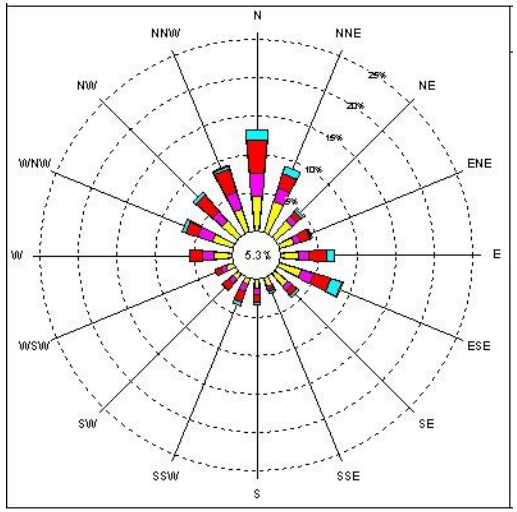


Figure 56: Wind Rose – September

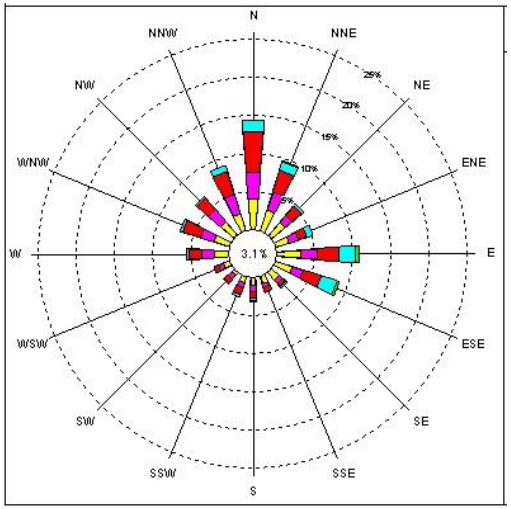


Figure 57: Wind Rose – October

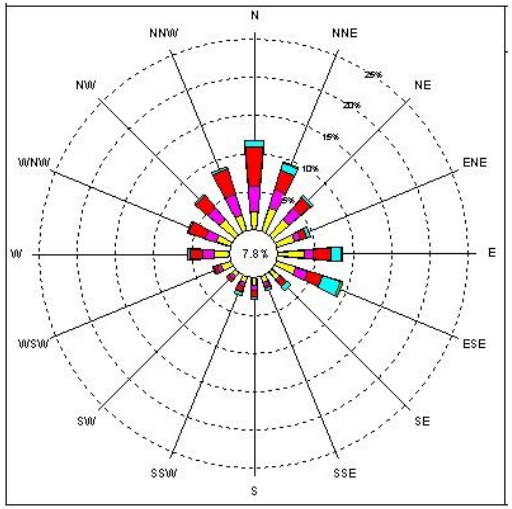


Figure 58: Wind Rose – November

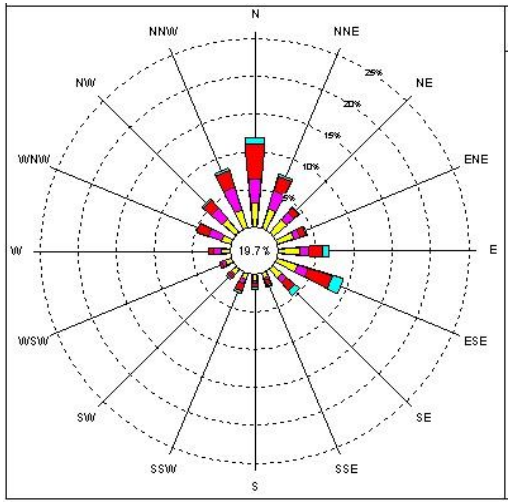


Figure 59: Wind Rose - December

2.3 Topography

The site slopes from high in the eastern part of the site to low in the western part of the site with a slope of up to 20% according to the AGIS Comprehensive Atlas (2007). The area is located at approximately 1 560 metres above mean sea level. A topographical map of the site is given in the figure below.

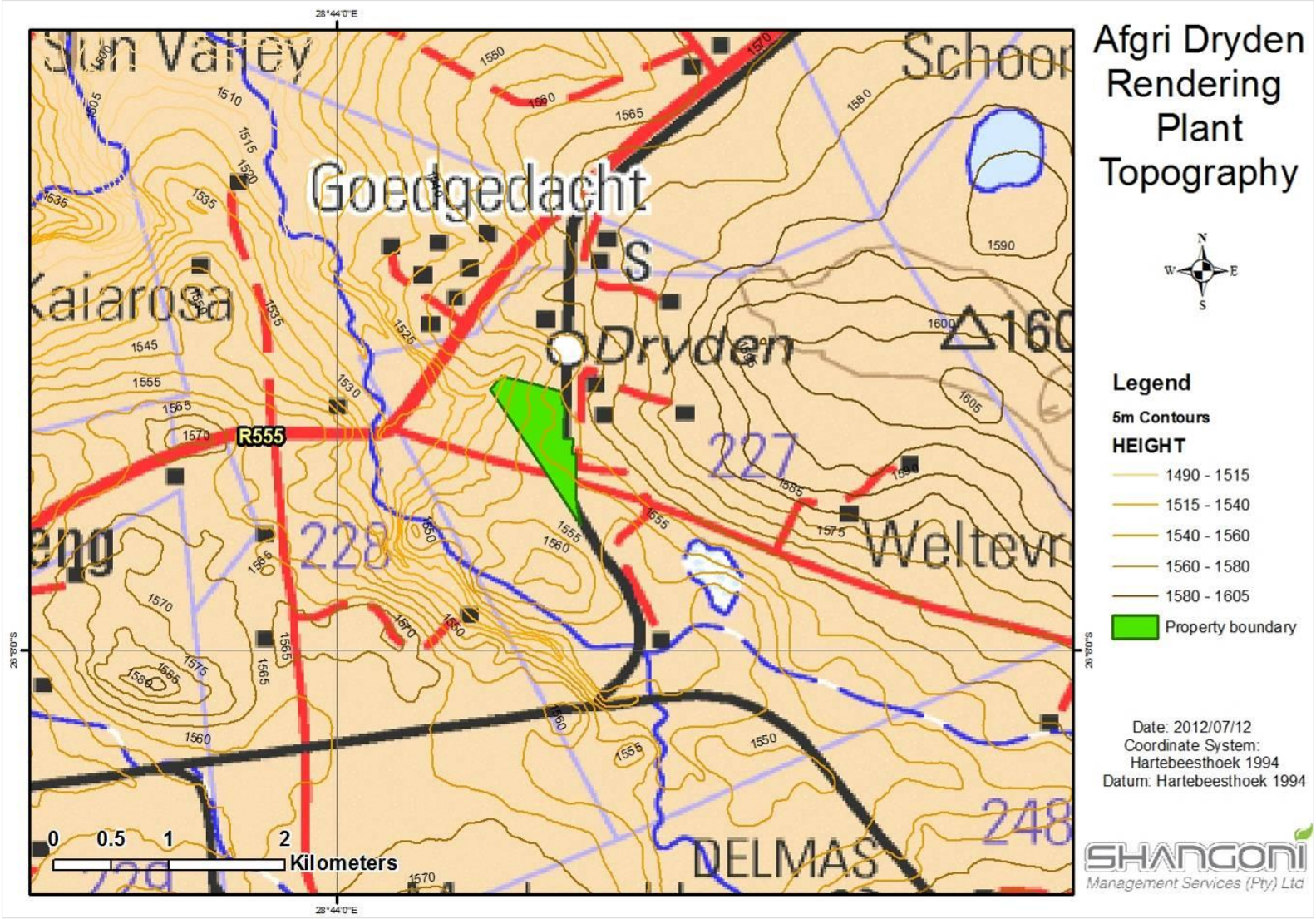


Figure 60: Topography of the site

2.4 Soils

Red, yellow and/or greyish, mesotrophic to eutrophic soils, with low to medium base status are generally found in the area. These soils are between 450mm and 750mm deep with a clay content of between 15 and 35% (AGIS, 2007). The property is characterised by two soil types, namely S2 in the west and S3 in the east where the rendering facility is situated (as shown in the figure below). S2 soils are freely drained, structureless soils with favourable physical properties. They may, however, have restricted soil depth, high erodibility, low natural fertility and excessive drainage. S3 soils are red or yellow, structureless soils with a plinthic horizon. These soils have favourable water-holding properties, but the imperfect drainage is unfavourable in high rainfall areas.

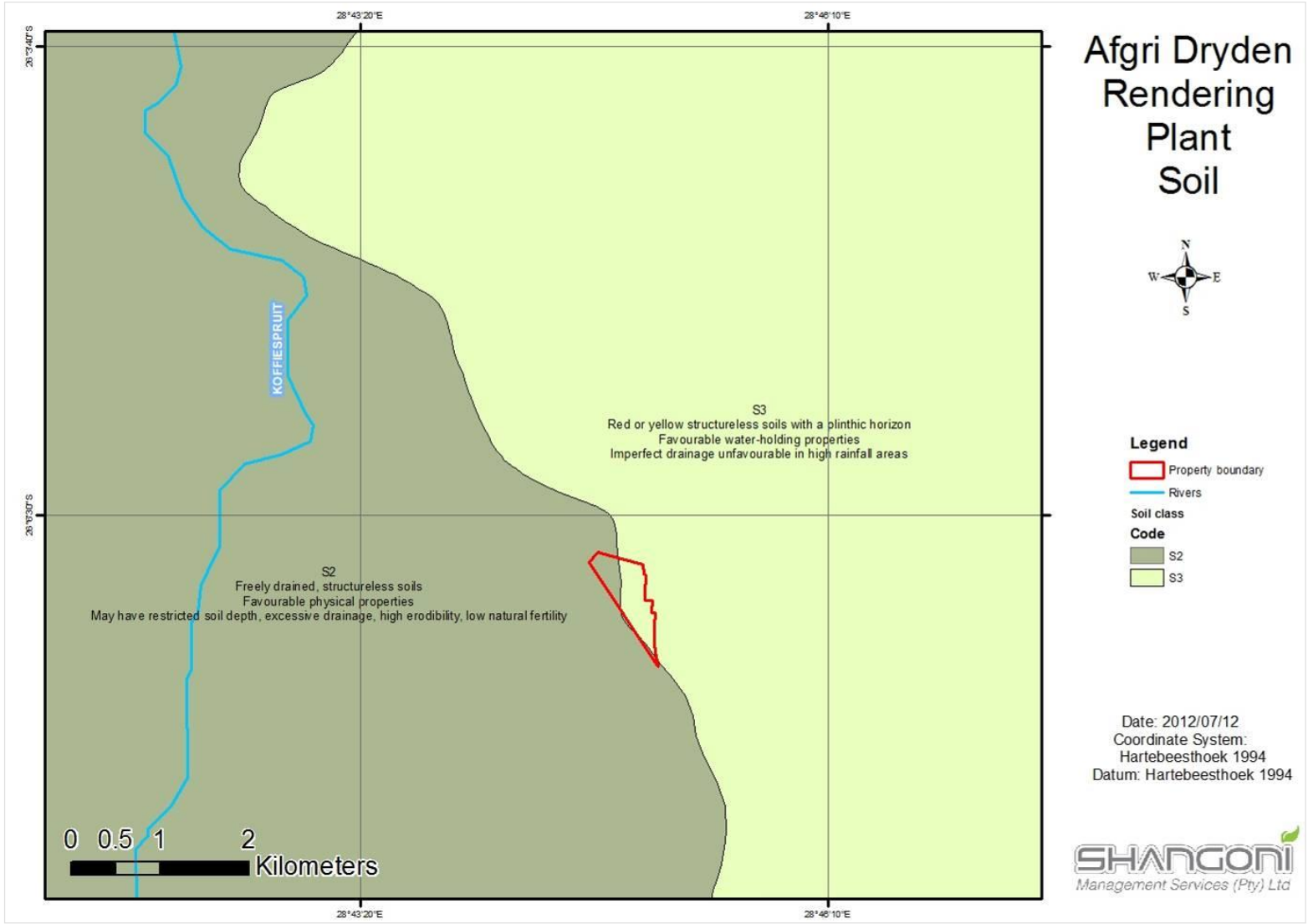


Figure 61: Soil cover of the site

2.5 Land use and land capability

The property is zoned as agricultural land and the AFGRI Dryden rendering facility is situated on the property. An application for re-zoning of the property to “Industrial 1” was submitted to the Victor Khanye Local Municipality on the 17th of January 2014. On the 16th of July 2014, the Victor Khanye Local Municipality resolved per item B01/06/2014 that the application for the rezoning of the Remainder of Portion 33 of the farm Weltevreden 227 IR, from “Agriculture” to “Industrial 1” with the inclusion of a rendering plant be approved subject to the conditions from the Department of Water Affairs.

At the rendering facility itself, no natural areas remain. Omnia Fertilizer also rents a part of the property (in the south). They have a manufacturing plant and a number of dams on the property. There is an informal settlement with a land claim on the northern part of the property (beyond the rendering facility boundary).

According to the AGIS Comprehensive Atlas (2007) the property is divided into two land capability classes. The western part of the property is moderate potential arable land whereas the eastern part, where the rendering facility is situated, is high potential arable land.

The dominant land use surrounding the site is cultivated land, built-up land and land for which the land use is vacant or unspecified (as shown in the figure below).

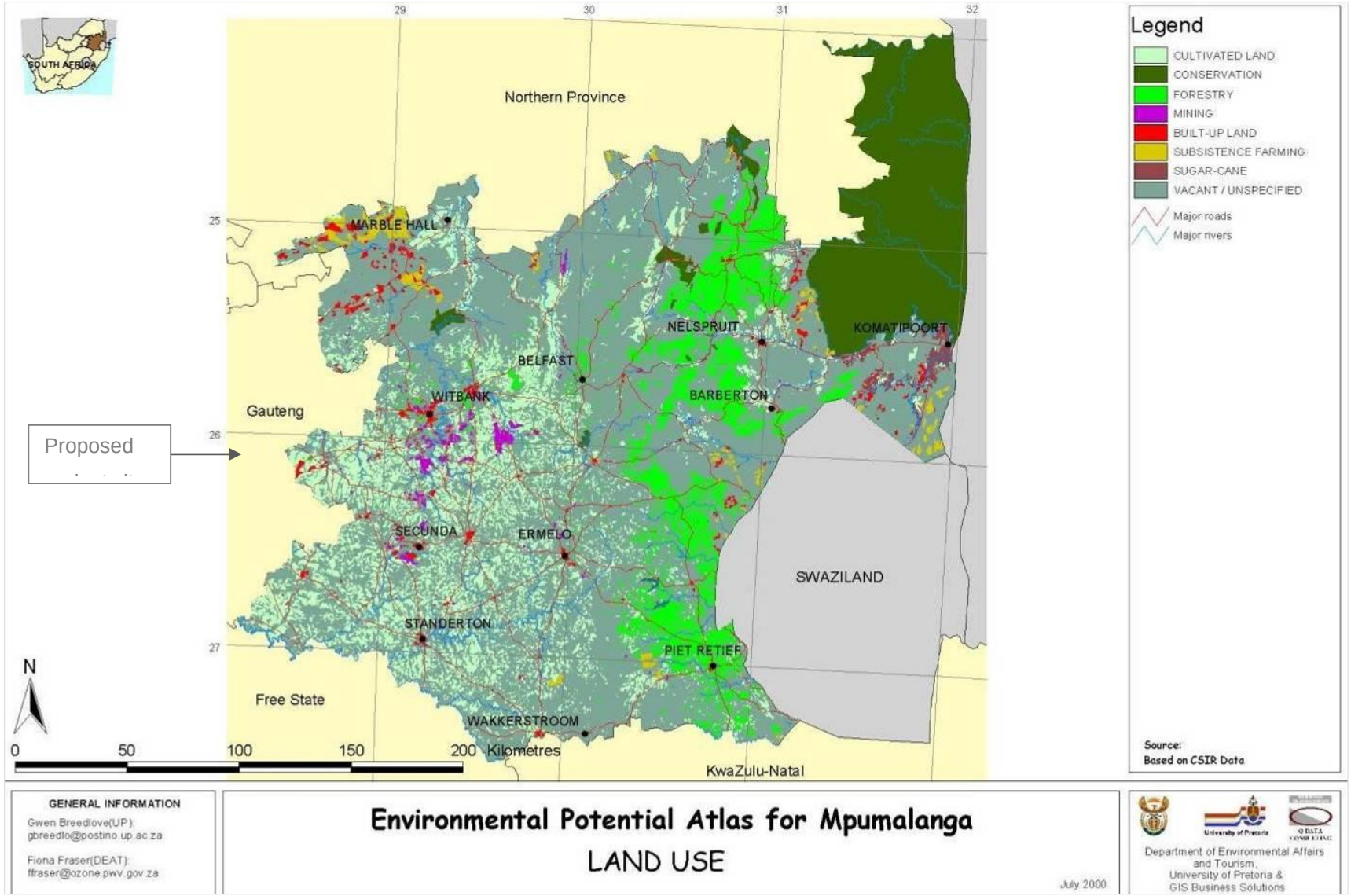


Figure 62: Land use in the Mpumalanga Province

2.6 Flora

The property lies within the Grass Land biome region with the northernmost part of the property being Eastern Highveld Grassland (GM 12) and the rest of the property being Rand Highveld Grassland (GM11).

The Grassland Biome is found mainly on the high central plateau of South Africa and the inland regions of KwaZulu-Natal and the Eastern Cape. Frost, fire and grazing maintain the dominance of grasses and prevent the establishment of trees. Fire is a natural factor caused by lightning and regular burning is essential for maintaining the structure and biodiversity of this biome. Grasslands are unique ecosystems with rich and often highly specialised animal life, both above and below ground. Formerly, native grasslands supported vast herds of ungulates such as blesbok, black wildebeest and springbok. Bird densities range from 50 to 380 birds per 100 ha, and include a wide range of species.

South African grasslands essentially comprise of a simple, single-layered herbaceous community of tussocked (or bunch) grasses. It is not generally known that the majority of plant species in grasslands are non-grassy herbs, most of which are perennial plants with large underground storage structures that can live for several decades. The Grassland Biome has an extremely high biodiversity, second only to the Fynbos Biome. At a 1 000 square metre scale, the average species richness of the Grassland Biome is even higher than those of most Fynbos communities, being surpassed only by Renosterveld.

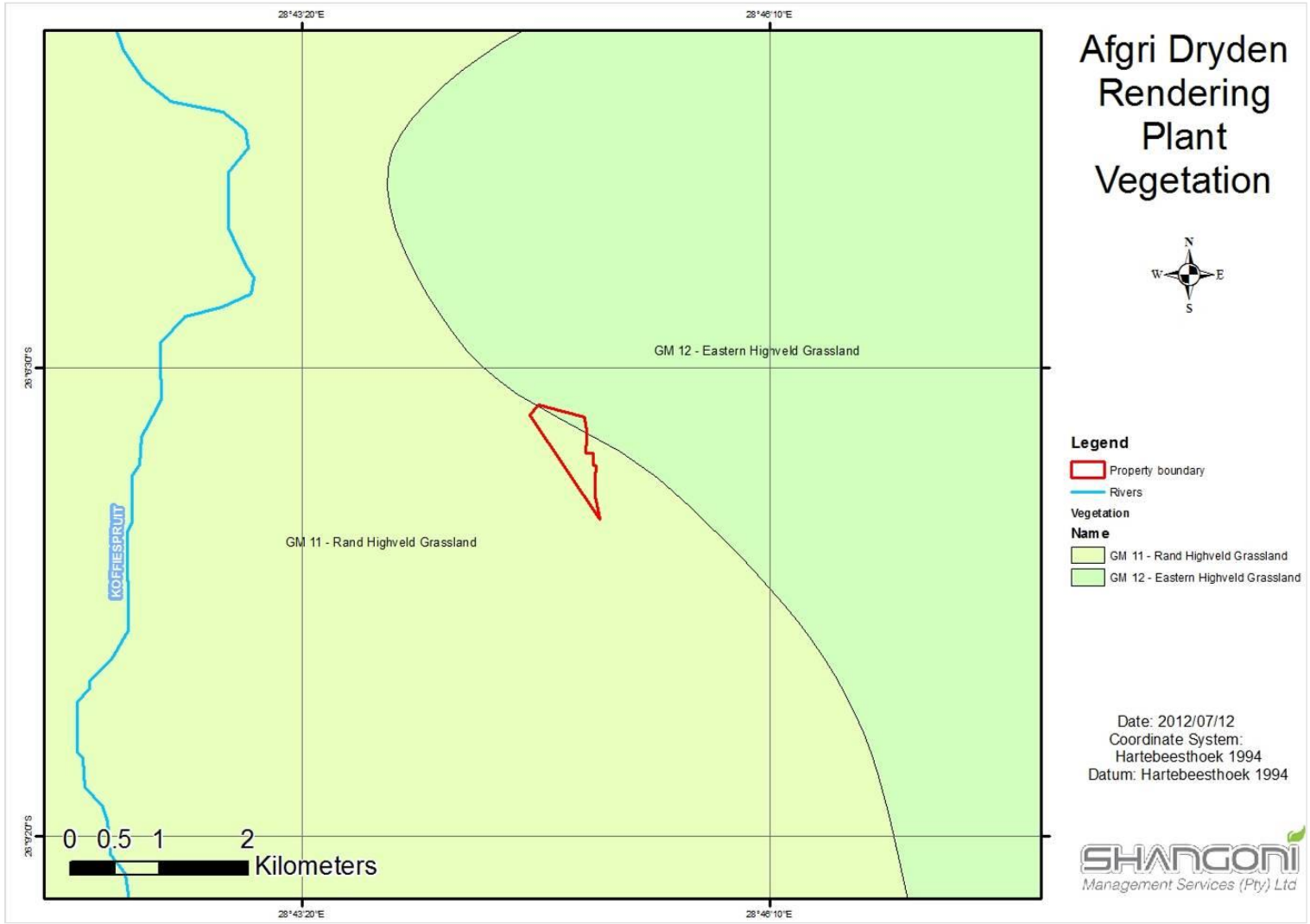


Figure 63: Vegetation of the site

2.6.1 Eastern Highveld Grassland

Eastern Highveld grasslands occur in the Gauteng and Mpumalanga Provinces at an altitude of 1 520 to 1 780 metres above mean sea level, but can occur as low as 1 300 metres above mean sea level. The short dense grassland is dominated by species commonly found in grasslands (*Aristida, Digitaria, Eragrostis, Tristachya* and *Themeda,* among others). There are small rocky outcrops scattered throughout the grassland where some woody species and wiry, sour grasses occur (*Celtis africana, Acacia caffra, Parinari capensis, Diospyros lycioides* subsp. *lycioides, Protea caffra, Protea welwitschii* and *Rhus magalismontanum).*

Important taxa within the Eastern Highveld grasslands are given in the table below. The natural grasslands are considered endangered with only a small percentage conserved in statutory and private reserves. The target for conservation is 24% (Mucina & Rutherford, 2006).

Table 2: Important taxa within Eastern Highveld grasslands (Mucina & Rutherford, 2006)

Taxa	Species
Graminoids	Graminoids: *Digitaria monodactyla, D. tricholaenoides, Brachiaria serrata, Aristida aequiglumis, A. junciformis* subsp. *galpinii, A. congesta, Cynodon dactylon, Eragrostis chloromelas, E. plana, E. sclerantha, E. curvula, E. racemosa, Heteropogon contortus, Microchloa caffra, Monocymbium ceresiiforme, Loudetia simplex, Setaria sphacelata, Themeda triandra, Sporobolus africanus, S. pectinatus, Alloteropsis semialata* subsp. *eckloniana, Andropogon appendiculatus, A. schirensis, Trachypogon spicatus, Bewsia biflora, Tristachya leucothrix, T. rehmannii, Diheteropogon amplectens, Ctenium concinnum, Eragrostis capensis, E. patentissima, E. gummiflua, Rendlia altera, Harpochloa falx, Schizachyrium sanguineum, Panicum natalens, Setaria nigrirostris* and *Urelytrum agropyroides.*
Herbs	*Haplocarpha scaposa, Berkheya setifera, Justicia anagalloides, Acalypha angustata, Pelargonium luridum, Chamaecrista mimosoides, Euryops gilfillanii, E. transvaalensis* subsp. *setilobus, Dicoma anomala, Ipomoea crassipes, Senecio coronatus, Pentanisia prunelloides* subsp. *latifolia, Helichrysum aureonitens, H. callicomum, H. caespititium, H. rugulosum, H. oreophilum, Selago densiflora, Wahlebergia undulata* and *Vernonia oligocephala.*
Geophytic Herbs	*Haemanthus humilis* subsp. *hirsutus, Ledebouria ovatifolia, Gladiolus crassifolius* and *Hypoxis rigidula* var. *pilosissima.*
Succulent Herbs	*Aloe ecklonis.*
Low Shrubs	*Stoebe plumosa* and *Anthospermum rigidum* subsp. *pumilum.*

2.6.2 Rand Highveld Grassland

Rand Highveld grasslands occur in Gauteng, North-West, Free State and Mpumalanga at an altitude of 1 300 to 1 635 metres above mean sea level, but can occur as high as 1 760 metres above mean sea level. The species-rich, sour, wiry grasslands alternate with low, sour shrubland on steeper slopes and rocky outcrops. On the plains, the genera *Themeda, Eragrotis, Heteropogon and Elionurus* are most common. A typical feature is the high diversity of herbs, many of which belong to the Asteraceae. Rocky ridges and hills have sparse (savannoid) woodlands with *Protea caffra* subsp. *caffra*, *P. welwitschii, Acacia caffra* and *Celtis africana*, together with a rich suite of shrubs, among which the genus *Rhus* (especially *Rhus magalismonata*) is prominent.

Important, biologically important and endemic taxa within the Rand Highveld grasslands are given in the table below. The natural grasslands are considered endangered with only 1% conserved in statutory and private conservation areas. The target for conservation is 24% (Mucina & Rutherford, 2006).

Table 3: Important taxa within Rand Highveld grasslands (Mucina & Rutherford, 2006)

Taxa	Species
Graminoids	*Ctenium concinnum, Cynodon dactylon, Digitaria monodactyla, Diheteropogon amplectens, Eragrotis chloromelas), Heteropogon contortus, Loudetia simplex, Monocymbium ceresiiforme, Panicum natalense, Schizachyrium sanguineum, Setaria sphacelata, Themeda triandra, Trachypogon spicatus, Tristachya biseriata, T. rehmannii, Andropogon schirensis, Aristida aequiglumis, A. congesta, A. junciformis* subsp*. galpinii, Bewsia biflora, Brachiaria nigropedata, B. serrata, Bulbostylis burchelli, Cymbopogon caesius, Digitaria tricholaenoides, Elionurus muticus, Eragrostis capensis, E. curvula, E. gummiflua, E. plana, E. racemosa, Hyparrhenia hirta, Melinis nerviglumis, M. repens* subsp*. repens, Microchloa caffra, Setaria nigrirostris, Sporobolus pectinatus, Trichoneura grandiglumis, Urelytrum agropyroides.*
Herbs	*Acanthospermum australe), Justicia anagalloides, Pollichia campestris, Acalypha angustata, Chamaecrista mimosoides, Dicoma anomala, Helichrysum caespititium, H. nudifolium* var*. nudifolium, H. rugulosum, Ipomoea crassipes, Kohautia amatymbica, Lactuca inermis, Macledium zeyheri* subsp*. argyrophylum, Nidorella hottentotica, Oldenlandia herbacea, Rotheca hirsuta, Selago densiflora, Senecio coronatus, Sonchus dregeanus, Vernonia oligocephala, Xerophtya retinervis.*
Geophytic Herbs	*Boophone disticha, Cheilanthes hirta, Haemanthus humilis* subsp*. humilis, Hypoxis rigidula* var*. pilosissima, Ledebouria ovatifolia, Oxalis corniculata.*
Succulent Herbs	*Aloe greatheadii* var*. davyana.*
Low Shrubs	*Anthospermum rigidum* subsp*. pumilum, Indigofera comosa, Rhus magalismontana, Stoebe plumosa.*
Succulent Shrub	*Lopholaena corii folia.*

Taxa	Species
Geoxylic Suffrutex	*Elephantorrhiza elephantina.*

Table 4: Biologically important taxa (Mucina & Rutherford, 2006)

Taxa	Species
Geophytic Herbs	*Agapanthus inapertus* subsp. *pendulus, Eucomis vandermerwei*.
Succulent Herb	*Huernia insigniflora.*
Low Shrub	*Melhania randii.*

Table 5: Endemic taxa (Mucina & Rutherford, 2006)

Taxa	Species
Herbs	*Melanospermum rudolfii, Polygala spicata*
Succulent Herbs	*Anacampseros subnuda* subsp. *lubbersii, Frithia humilis.*
Succulent Shrubs	*Crassula arborescens* subsp. *undulatifolia, Delosperma purpureum.*
Small Trees	*Encephalartos lanatus, E. middelburgensis.*

To determine the effect of the proposed development on flora present at the site, an ecological habitat survey was conducted by Mr. Terblanche of Anthene Ecological in December 2012 and January 2013. The following is an extract from his report. The full report is attached under Appendix D.

The grassland vegetation at the site was found to be extensively or completely degraded or transformed due to various historic and current impacts. Exotic kikiyu grass, *Pennisetum clandestinum*, was found in many places. The following exotic weed species were found along the drainage line and in the disturbed veld: *Datura* species, *Amaranthus* species, *Conyza* species, *Bidens* species, *Tagetes minuta* and *Cosmos bipinnatus*. Exotic trees present included the invasive Australian *Acacia* species and *Eucalyptus grandis* (bluegum). Remnant patches of natural grassland were noticeably disturbed. The following indigenous grass species were, however, present on the site: *Cynodon dactylon, Eragrostis curvula/chloromelas, Hyparrhenia hirta* and *Sporobolus africanus*. Indigenous herbaceous species present included *Berkheya setifera, Berkheya radula, Helichrysum rugulosum, Helichrysum nudifolium, Gazania krebsiana* and *Columbaria scabiosa.* A full list of the species found on the site is included in the Ecological Habitat Fauna Report (Appendix D).

No plant species of particular conservation importance (critically endangered, endangered, vulnerable, near threatened, critically rare, rare, declining, data deficient or protected) were found on the site. The onsite wetland and its vegetation is, however, part of a biodiversity corridor (Terblanche, 2013).

2.7 Fauna

To determine the effect of the proposed development on fauna present at the site, an ecological habitat survey was conducted by Mr. Terblanche of Anthene Ecological in December 2012 and January 2013. The following is a summary of the findings of his report. The full report is attached under Appendix D.

During the site assessments, no mammal, bird, reptile, amphibia, butterfly, damselfly, cicada, beetle or scorpion species of particular conservation concern (critically endangered, endangered, vulnerable, near threatened, critically rare, rare, declining, data deficient or protected) were found to be present (Terblanche, 2013).

2.8 Water

2.8.1 Surface water hydrology

The following is an extract from the Borehole Yield Testing and Impact Assessment report prepared by Shangoni AquiScience (Pty) Ltd. in 2012. The full report is attached under Appendix D.

Table 6: Quaternary catchment information

Attribute	Value	Unit
Quaternary Catchment	B20A	-
Area	574.3	km^2
Mean annual rainfall	661	mm/a
Mean annual runoff	38	mm/a
Baseflow	12	mm/a
Mean annual evaporation	1600 - 1700	mm/a
Climatic water balance	-989	-
Present Eco Status Category	C	-
Recharge	43.83	mm/a
	6.5	% of rainfall
Current use	1.52	Mm^3/a
Exploitation potential	>12	Mm^3/a

The surface drainage in the immediate vicinity of the rendering facility is predominantly west-northwest towards the Bronkhorstspruit. A tributary of the Bronkhorstspruit (unnamed) flows to the immediate north of the rendering facility in a north-westerly direction for approximately 1.5km, after which it joins the Bronkhorstspruit. The area is relatively flat, but undulating, with no significant high topographical points. The predominant direction of groundwater flow was calculated to be similar to the surface drainage, i.e. west to north-west. A contour map of the general directions of flow is given in the figure below.

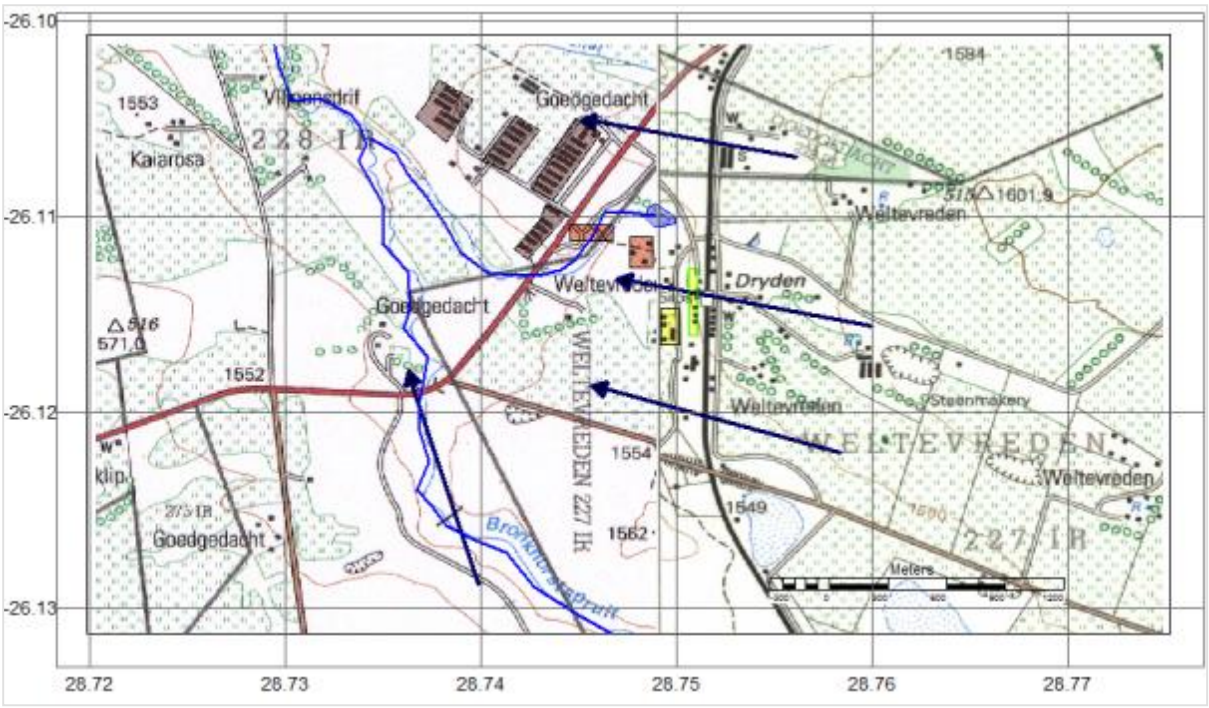


Figure 64: Surface water hydrology

2.8.2 Surface water quality

Currently, process and wash water from the rendering facility is discharged into the veld following partial treatment. This discharge enters a tributary of the Bronkhorstspruit downstream of the community, after which it joins with the Bronkhorstspruit, approximately 1.5km to the northwest. Six (6) surface water samples were taken to assess the inorganic, organic and bacteriological contribution of the rendering facility on the receiving surface environment according to the *background-source-pathway-receptor* model.

Background monitoring included upstream localities at the Bronkhorstspruit tributary (AFRSW02) and the Bronkhorstspruit (AFRSW04). Source monitoring included the wash and process water discharged (AFRSW01 'wash' & AFRSW01 'process'). The pathway in this instance is surface water flow and the receptors included downstream monitoring localities on both the Bronkhorstspruit tributary (AFRSW03) and the Bronkhorstspruit (AFRSW05).

Important to note is that the downstream locality at the Bronkhorstspruit (AFRSW05) is an "impact reference locality" to which various role players report and is not a downstream locality specific to the rendering facility. It therefore reflects a combined impact of the various role players. A conceptual model of the study area and surface water monitoring localities is given in Figure 65 (not to scale).

Source monitoring

Two samples (AFRSW01 'wash' and AFRSW01 'process') were taken to reflect the pollution source from the AFGRI rendering facility. These two samples were taken from the same locality, but at different

times. The 'wash' sample was taken during the weekly routine 'deep clean' and 'bloodwork' while the 'process' sample was taken during standard operations. The water quality data was evaluated according to the General Limits relating to discharge and irrigation as per Section 21 of the National Water Act (NWA, 1998). The results and guidelines are given in Table 7.

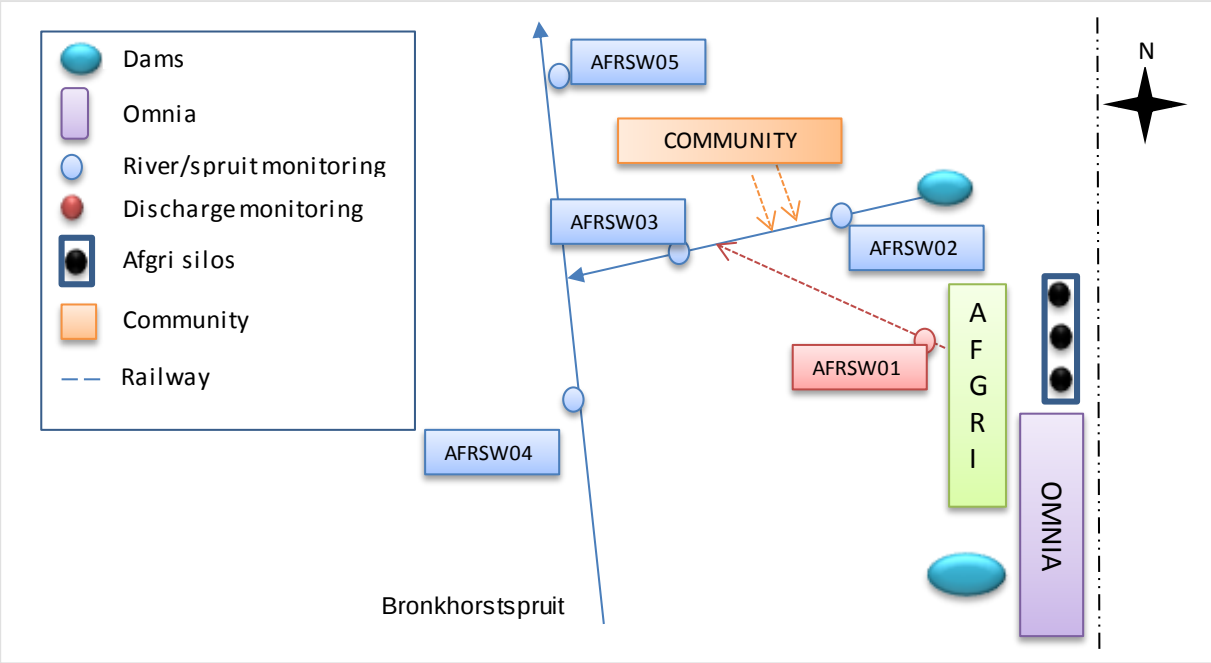


Figure 65: Graphical representation of the study area including drainage lines and surface water monitoring localities (not to scale)

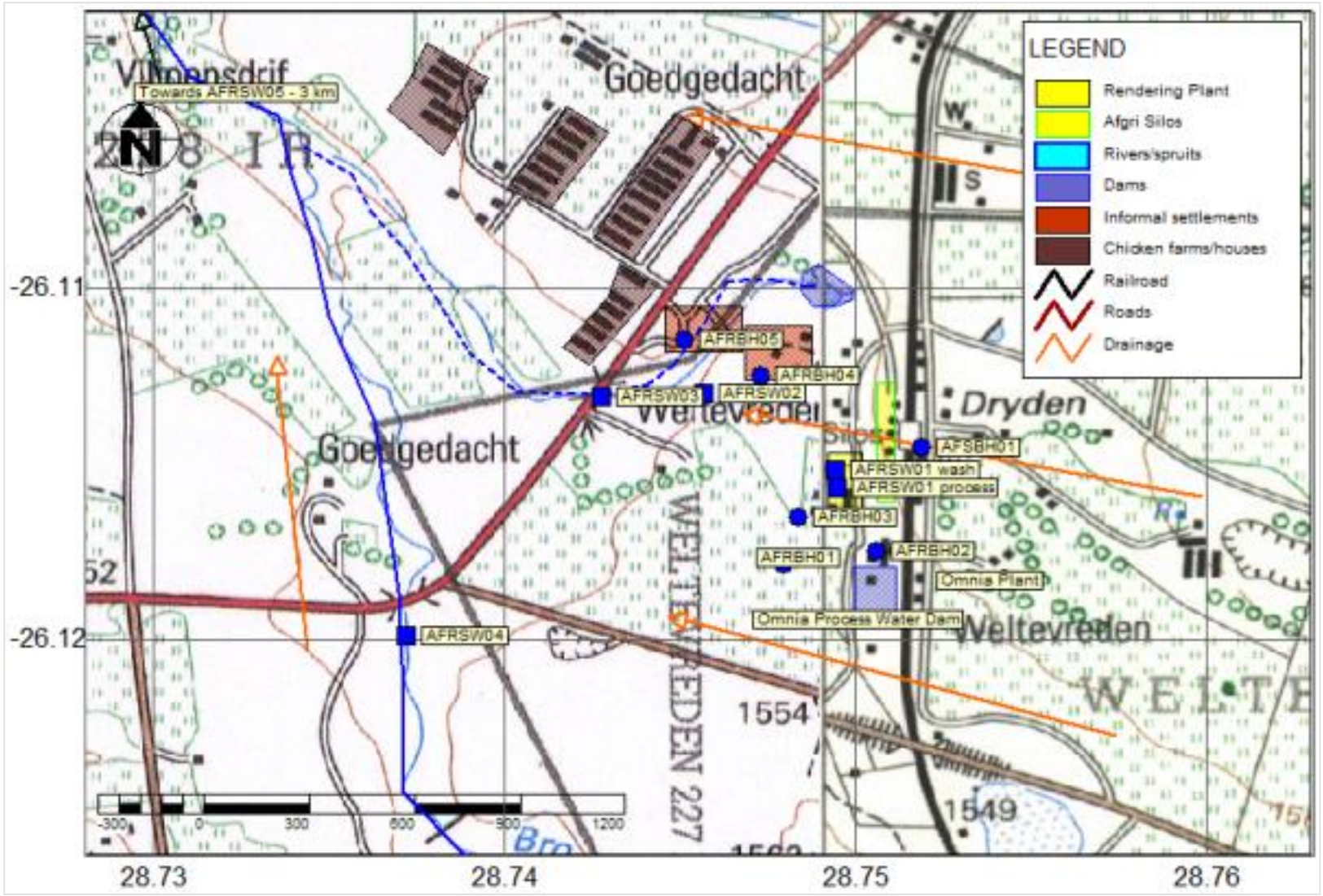


Figure 66: Locality map indicating surface and groundwater monitoring localities. Circles indicate borehole localities and squares indicate surface water localities

Table 7: Water quality results for the discharge localities on the AFGRI rendering facility as sampled on 20th of November 2012

Locality / Guideline Parameter	Unit	General Limit discharge	General Limit Irrigation	AFRSW01 Wash	AFRSW01 Process
pH		5.5-9.5	5.5-9.5	7.72	7.66
EC	mS/m	150	150	509	573
TDS	mg/l	-	-	2051	1951
Alk	mg/l	-	-	1629	1579
Cl	mg/l	-	-	275	283
SO_4	mg/l	-	-	<0.04	<0.04
NO_3-N	mg/l	15 (NO2 + NO3)	15 (NO2 + NO3)	0.262	0.262
NO_2 -N	mg/l	15 (NO2 + NO3)	15 (NO2 + NO3)	0.128	0.134
NH_4-N	mg/l	6	3	512	391
PO_4-P	mg/l	10	10	43.2	47
F	mg/l	1	1	0.753	0.711
Ca	mg/l	-	-	31.2	33
Mg	mg/l	-	-	13	11.2
Na	mg/l	-	-	140	163
K	mg/l	-	-	100	122
Al	mg/l		-	<0.003	<0.003
Fe	mg/l	0.3	-	<0.003	<0.003
Mn	mg/l	0.1	-	0.031	0.021
Cr	mg/l	-	-	<0.001	<0.001
Cu	mg/l	0.01	-	<0.001	<0.001
Ni	mg/l	-	-	<0.001	<0.001
Zn	mg/l	0.1	-	<0.002	<0.002
Co	mg/l	-	-	<0.001	<0.001
Cd	mg/l	0.005	-	0.005	0.002
Pb	mg/l	0.01	-	<0.004	<0.004
CN^-	mg/l	0.02	-	<0.02	<0.02
As	mg/l	0.02	-	0.04	0.048
Se	mg/l	0.02	-	<0.007	0.019
Hg	mg/l	0.005	-	<0.001	<0.001
U	mg/l	-	-	<0.003	<0.003
E. coli	CFU/100 ml	1000	1000	>100000	>100000
T.col	CFU/100 ml	-	-	>100000	>100000
Hardness	mg/l	-	-	131	128
COD	mg/l	75	75	2652	3819

Locality / Guideline Parameter	Unit	General Limit discharge	General Limit Irrigation	AFRSW01 Wash	AFRSW01 Process
SS	mg/l	25	25	1225	1205
SOG	mg/l	2.5	2.5	<0.1	<0.1
SAR	-	-	-	2.89	3.01

The quality of both 'wash' and 'process' water discharges were very similar and can be described as neutral, saline and relatively hard with high to elevated concentrations of NH_4 (N), PO_4 (P), *E. coli*, COD, suspended solids (SS), sodium (Na), potassium (K) and arsenic (As). The total absence of SO_4, the high percentage of NO_2 relative to NO_3, the high NH_4 and the high COD measurements are indicative of reducing conditions and very high organic loads. Currently, the irrigation and discharge standards are significantly exceeded for the following parameters: EC, NH_4, PO_4, *E. coli*, COD, Suspended solids and As.

The standards for irrigation water are less stringent if the land occupier or owner decreases the volume of wastewater irrigated per day, as shown in Table 8. However, even if the discharge volume is decreased to 50m^3 per day the limits will still be exceeded in terms of EC and F. coliforms.

Table 8: General wastewater standards per volume irrigation water

Parameter	Unit	2 000m^3/day	500m^3/day	50m^3/day
pH		5.5-9.5	6.0-9.0	6.0-9.0
EC	mS/m	150	200	200
F	mg/l	1	-	-
NO_3+NO_2 (N)	mg/l	15	-	-
NH_4-N	mg/l	3	-	-
SOG	mg/l	2.5	-	-
F. coliforms	CFU/100 ml	1000	100 000	100 000
SS	mg/l	25	-	-
COD	mg/l	75	400	5000
SAR	mg/l	-	5	5

Receiving surface water

Table 9 shows the water quality of the receiving surface water environment in the vicinity of the rendering facility. The quality was evaluated according the domestic use (SANS: 241-2011), livestock watering and aquatic ecosystem guidelines (DWA, 1996). The following localities were sampled:

- AFRSW02 - Tributary of the Bronkhorstspruit upstream from AFGRI's discharge and the impact from community;
- AFRSW03 - Tributary of Bronkhorstspruit downstream from AFGRI's discharge - impact of community and AFGRI;

- AFRSW04 - Bronkhorstspruit upstream of confluence with AFGRI and community contribution; and
- AFRSW05 - Bronkhorstspruit downstream of confluence with tributary from AFGRI and community and other contributors.

Table 9: Receiving surface water environment - Bronkhorstspruit tributary and Bronkhorstspruit

Locality / Guideline Parameter	Unit	Livestock Watering DWA[a]	Aquatic Ecosystems DWA[b]	Domestic Use SANS 241(1)[c]	AFRSW02	AFRSW03	AFRSW04	AFRSW05
pH		-	-	5-9.7	7.19	8.16	8.31	7.75
EC	mS/m	-	-	≤170	133	448	85.5	56
TDS	mg/l	≤2000	-	≤1200	785	2057	390	259
Ca	mg/l	≤1000	-	-	79	35	35.2	21.7
Mg	mg/l	≤500	-	-	72.7	19.4	12.4	13.3
Na	mg/l	≤2000	-	≤200[d]	38.7	153	13.7	32.4
K	mg/l	-	-	-	26.7	113	59.7	22.3
MALK	mg/l	-	-	-	125	1533	90.2	173
Cl	mg/l	≤3000	-	≤300[d]	148	299	66.4	32
SO_4	mg/l	≤1500	-	≤500	306	102	44.6	22.9
NO_3-N	mg/l	≤22	-	≤11	13.9	0.235	47.2	0.756
NO_2-N	mg/l	-	-	≤0.9	0.771	0.113	1.44	0.216
NH_4-N	mg/l	-	≤0.007 as NH_3	≤1.5[d]	24.1	414	55.7	8.98
PO_4	mg/l	-	-	-	0.144	15.3	11.1	2.7
F	mg/l	-	≤0.75	≤1.5	1.55	0.952	1.48	0.443
Al	mg/l	≤5	≤0.01	≤0.3[d]	-0.003	-0.003	-0.003	-0.003
Fe	mg/l	-	-	≤2	-0.003	-0.003	-0.003	-0.003
Mn	mg/l	≤10	≤0.18	≤0.5	7.08	0.445	0.012	0.148
Hardness	mg/l	-	-	-	497	167	139	109
SS	mg/l	-	-	-	2320	240	-1	-1
E. coli	CFU/100 ml	-	-	0	700	>100000	2000	1200

Locality / Guideline Parameter	Unit	Livestock Watering DWA[a]	Aquatic Ecosystems DWA[b]	Domestic Use SANS 241(1)[c]	AFRSW02	AFRSW03	AFRSW04	AFRSW05
T. coliform	CFU/100 ml	-	-	0	2600	>100000	3100	4200
As	mg/l	≤1	≤0.010	≤0.010	-0.007	0.057	-0.007	-0.007
Co	mg/l	≤1	-	≤0.5	0.455	0.008	-0.001	-0.001
Cu	mg/l	≤2	-	≤2	0.001	0.003	0.001	-0.001
Cr	mg/l	≤2	-	≤0.050	-0.001	-0.001	-0.001	-0.001
Pb	mg/l	≤0.1	≤0.0012	≤0.010	-0.004	-0.004	-0.004	-0.004
Se	mg/l	≤0.05	≤0.002	≤0.010	-0.007	0.009	-0.007	-0.007
Ni	mg/l	≤1	-	≤0.070	0.017	-0.001	-0.001	-0.001
Zn	mg/l	≤20	-	≤5[d]	-0.002	-0.002	-0.002	-0.002
Cd	mg/l	≤0.01	≤0.0004	≤0.003	-0.001	0.001	-0.001	-0.001
U	mg/l	-	≤0.0002	≤0.015	0.014	0.004	-0.003	-0.003
Hg	mg/l	≤0.001	≤0.00004	≤0.006	-0.001	-0.001	-0.001	-0.001
CN free	mg/l	-	≤0.001	≤0.070	-0.02	-0.02	-0.02	-0.02
SOG	mg/l	-	-	-	-0.1	-0.1	-0.1	-0.1
COD	mg/l	-	-	-	1655	682	83.8	39
SAR	-	-	-	-	1.96	2.90	1.09	1.77

a DWA (1996) Livestock Watering

b DWA (1996) Aquatic Ecosystems

c SANS 241: 2011

d Aesthetic concerns only

Bronkhorstspruit tributary quality

The Bronkhorstspruit tributary at AFRSW02 was sampled upstream of the rendering facility discharge, but downstream of the community and should therefore show only community related impacts. The quality can be described as neutral, non-saline and very hard with high to elevated levels of NO_3, NH_4, PO_4, F, Mn, COD, SS, total coliforms and *E. coli.* This profile is typical of sewage related water in a wetland environment, mixed with rainwater. The water quality is not fit for domestic consumption given the high to elevated levels of coliform and feacal bacteria, NH_4, F, and Mn. The high levels of Mn are most probably the effect of reducing or anoxic conditions in the wetland or marshy setting due to the high organic loads (COD of 1 655mg/l). The water is not suitable for domestic use and should not be used as such without effective treatment. The water is, however, fit for livestock watering.

The Bronkhorstspruit tributary at AFRSW03 was sampled downstream of the rendering facility contribution (AFRSW01 'wash' & 'process') and should therefore show the impact of the rendering facility on the Bronkhorstspruit tributary. The water quality profile at AFRSW03 can be described as neutral to slightly alkaline, saline and moderately hard with high to elevated levels of Na, alkalinity, Cl, NH_4, PO_4, As, COD, SS, total coliforms and *E. coli*. The quality profile at AFRSW03 is very similar to the discharge quality profile at AFRSW01 'wash' and AFRSW01 'process' as indicated by the Stiff diagrams in Figure 67 (all displaying Na-HCO_3^- water types). The Stiff diagrams also show a significant alteration of the profile compared to the upstream quality at AFRSW02. The impact on the tributary due to the rendering facility was quantified by subtracting the downstream quality from the upstream quality (Table 10), i.e. *Impact (mg/l) = downstream (mg/l) – upstream(mg/l).*

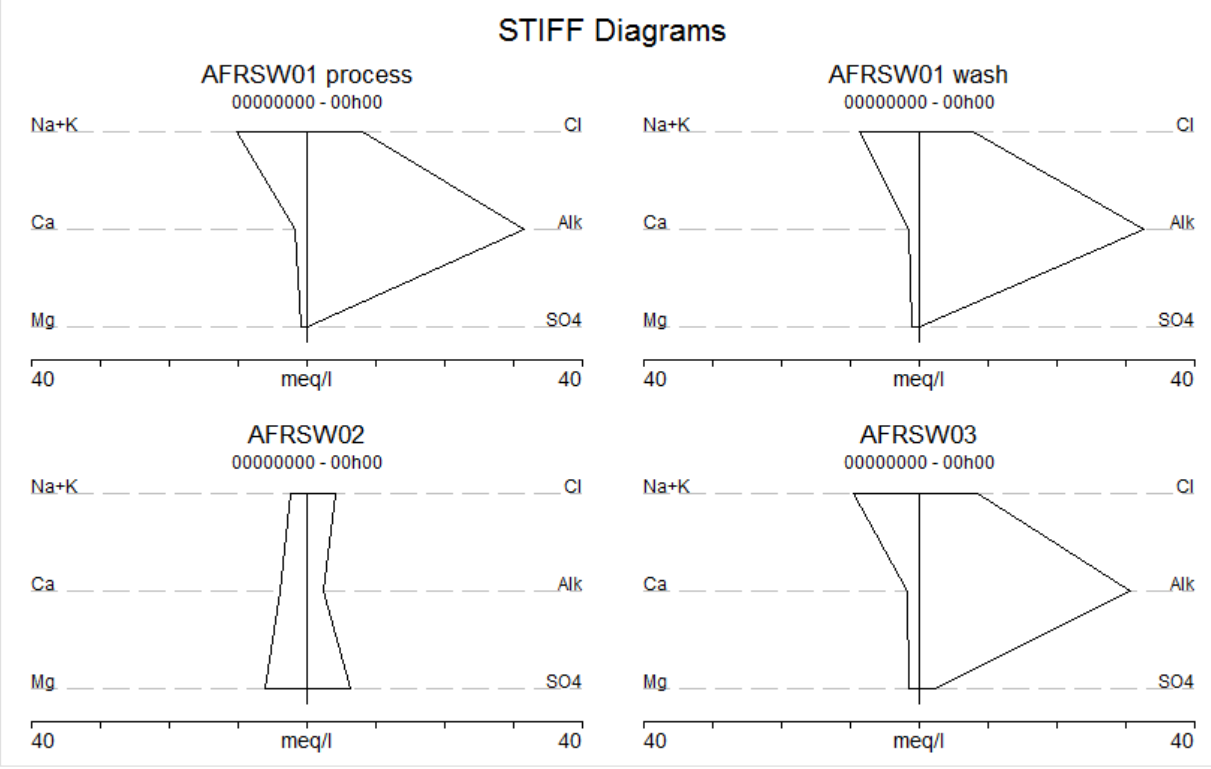


Figure 67: Stiff diagrams for the discharge at the rendering facility and upstream/downstream profiles on the Bronkhorstspuit tributary relative to the discharge

Table 10: Quantified impact on the Bronkhorstspruit tributary

Locality / Guideline Parameter	Unit	IMPACT Bronkhorstspruit tributary
pH		0.97
EC	mS/m	315
TDS	mg/l	1272
Ca	mg/l	-44
Mg	mg/l	-53.3
Na	mg/l	114.3
K	mg/l	86.3
MALK	mg/l	1408
Cl	mg/l	151
SO_4	mg/l	-204
NO_3-N	mg/l	-13.67
NO_2-N	mg/l	-0.658
NH_4-N	mg/l	389.9
PO_4	mg/l	15.16
F	mg/l	-0.598
Al	mg/l	0
Fe	mg/l	0
Mn	mg/l	-6.635
Hardness	mg/l	-330
SS	mg/l	-2080
E. coli	CFU/100 ml	99300
T. coliform	CFU/100 ml	97400
As	mg/l	0.05
Co	mg/l	-0.45
Cu	mg/l	0.002
Cr	mg/l	0
Pb	mg/l	0
Se	mg/l	0.02
Ni	mg/l	-0.016
Zn	mg/l	0
Cd	mg/l	0
U	mg/l	-0.01
Hg	mg/l	0
CN free	mg/l	0
SOG	mg/l	0
COD	mg/l	-973

Locality / Guideline Parameter	Unit	IMPACT Bronkhorstspruit tributary
SAR	-	0.94

Impact quantified = downstream - upstream

Red shading and font indicates negative impact and green shading and font indicates positive impact

Table 10 shows that the impact of the rendering facility on the Bronkhorstspruit tributary deteriorated the quality of the Bronkhorstspruit significantly. The most significantly negative impacts were quantified for salinity (contributed by Na, K, Cl), NH_4, PO_4, total coliforms, *E. coli*, As and SAR).

Bronkhorstspruit quality

The Bronkhorstspruit at AFRSW04 was sampled upstream of the Bronkhorstspruit tributary confluence and was used as an upstream reference locality for the rendering facility and other activities along the Bronkhorstspruit tributary. The quality of AFRSW04 can be described as neutral to slightly alkaline, non-saline and slightly hard with high to elevated levels of NO_3, NO_2, NH_4, PO_4, total coliforms and *E. coli*. The quality is not suited for domestic use or livestock watering and the ecosystem may not be functional as a healthy aquatic ecosystem. The high nutrient content may give rise to algal blooms during warmer months which will have detrimental consequences for fish during algae decay. Algae species that may proliferate include blue-green species such as *Microsystis*. These Cyanobacteria species secrete a neurotoxin known as Microcystine which is toxic to animals and humans. The poor quality of this stretch of the Bronkhorstspruit is not related to the rendering facility since it is situated upstream of their contribution and may be attributed to other activities including mining, sewage and/or agricultural activities.

The Bronkhorstspruit was sampled at AFRSW05 downstream of the Bronkhorstspruit tributary confluence which contains impacts not only from the rendering facility, but also from a variety of other contributors, including informal communities, other agricultural activities and possible mining activities. The impacts quantified (Table 11) therefore constitute *combined impacts* from these activities. A significant improvement in quality is noted in the water quality parameters compared to the upstream Bronkhorstspruit locality AFRSW04. Despite the improvement in quality at AFRSW05 it is still not suited for domestic use given the high *E. coli* count and may also be limiting to a productive aquatic ecosystem given the hypertrophic conditions. The improvement in quality may be the direct result of superior quality water introduced from the various role players in the drainage region of the Bronkhorstspruit. The profile for AFRSW05 can be described as neutral, non-saline and slightly hard with high to elevated concentrations of NH_4, PO_4, total coliforms and *E .coli*. Stiff diagrams shown in Figure 68 confirm the improvement in quality (specifically major cations and anions) with the upstream locality (AFRSW04) changing from a Na-(K)-HCO_3^--(Cl) water type to a Na-(Ca)-HCO_3^- water type.

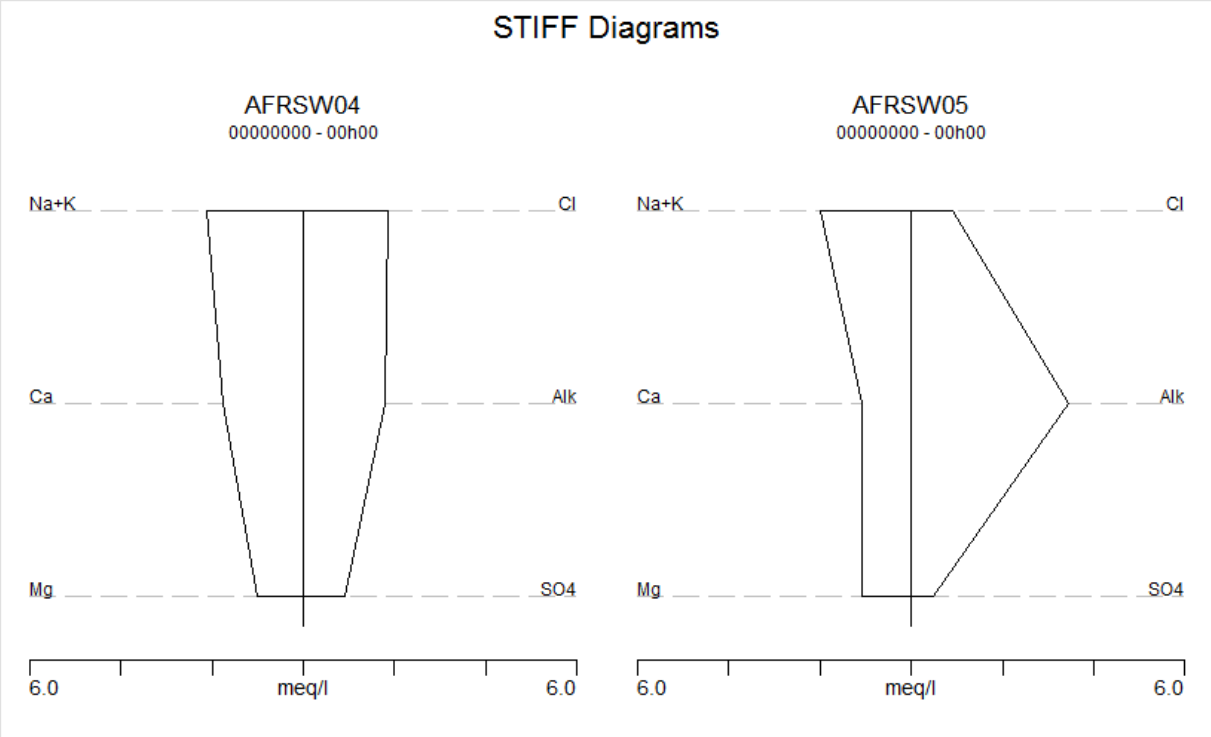


Figure 68: Stiff diagrams for the upstream and downstream profiles on the Bronkhorstspruit

Table 11: Quantified impact on the Bronkhorstspruit tributary

Locality / Guideline Parameter	Unit	IMPACT Bronkhorstspruit
pH	-	-0.56
EC	mS/m	-29.5
TDS	mg/l	-131
Ca	mg/l	-13.5
Mg	mg/l	0.9
Na	mg/l	18.7
K	mg/l	-37.4
MALK	mg/l	82.8
Cl	mg/l	-34.4
SO_4	mg/l	-21.7
NO_3-N	mg/l	-46.4
NO_2-N	mg/l	-1.22
NH_4-N	mg/l	-46.7
PO_4	mg/l	-8.4
F	mg/l	-1.04
Al	mg/l	0
Fe	mg/l	0
Mn	mg/l	0.14

Locality / Guideline Parameter	Unit	IMPACT Bronkhorstspruit
Tot Hardness	mg/l	-30
SS mg/l	mg/l	0
E. coli	CFU/100 ml	-800
T. coliform	CFU/100 ml	1100
As	mg/l	0
Co	mg/l	0
Cu	mg/l	-0.002
Cr	mg/l	0
Pb	mg/l	0
Se	mg/l	0
Ni	mg/l	0
Zn	mg/l	0
Cd	mg/l	0
U	mg/l	0
Hg	mg/l	0
CN free	mg/l	0
SOG	mg/l	0
COD	mg/l	-44.8
SAR	-	0.68

Impact quantified = downstream - upstream

Red shading and font indicates negative impact and green shading and font indicates positive impact

2.8.3 Mean annual runoff

The table below indicates the peak runoff volumes at the rendering facility (Shangoni AquiScience, 2012).

Table 12: Mean annual runoff

Return period (year)	1:5	1:10	1:50	1:100
Peak runoff (m3/s)	2.355	3.089	5.776	7.85

2.8.4 Water authority

The relevant Water Authority is the Department of Water Affairs (DWA), Bronkhorstspruit regional office.

2.8.5 Groundwater

Water is obtained from one on-site borehole for use at the rendering facility. In an emergency, water has in the past been obtained from the Omnia fertiliser plant that is located on the same property as the rendering facility (Omnia rent the land from AFGRI Animal Feeds). There is no municipal water supply at the facility. One tap, linked to a borehole on an adjacent property [to the east and owned by AFGRI Animal Feeds (silos)] provides a part of the drinking water supply, while the remainder is brought in bottled from Delmas.

At present, approximately 15m^3 of groundwater is used at the rendering facility per day for wash water and the boiler. Water is also brought the site as moisture in the incoming poultry waste. This moisture is removed from the poultry waste as steam during the cooking and drying processes and equates to approximately 65m^3 of water after the steam from the cooking and drying processes has passed through the condenser.

After the construction of the second plant, approximately 50m^3 of groundwater will be used per day for washing and boiler water usage. Approximately 220m^3 of water will be released from the waste that is brought to the site per day. The wastewater will be treated and re-used as wash water as far as possible. This could mean that less than 50m^3 of groundwater would need to be abstracted from the borehole per day.

Aquifer characteristics

The following is an extract from the Borehole Yield Testing and Impact Assessment report prepared by Shangoni AquiScience (Pty) Ltd in 2012. The full report is attached under Appendix D.

The rendering facility is situated on Vaalian era quartzite in the Timeball Hill Formation of the Pretoria Group and Transvaal Supergroup, sandwiched between shale and sandstone with an upper layer of quartz, arenite and carbonaceous mudrocks. The groundwater yield potential for boreholes drilled into the Timeball Hill Formation is classed as *low* since 70% of the boreholes yield less than 2l/s. The aquifer is classified as a B2 fractured aquifer with typical yields ranging between 0.1 and 2.0l/s. However, the site is situated close to or on the contact of the Malmani subgroup, consisting of dolomite). In addition, the stratigraphy of the Transvaal Supergroup indicates that the Timeball Hill Formation overlies the Rooihoogte Formation that developed on an eroded surface of the Malmani Subgroup carbonate rocks (dolomite). This suggests that boreholes drilled deep enough on highly weathered hard rock may intersect the dolomites. The predominant yields on record for boreholes drilled into the Malmani dolomites are in excess of 5l/s (18 000l/h) with a maximum yield of 126l/s (453 600l/h) recorded.

Borehole information and constant rate test results for the production borehole used at the rendering facility, AFRBH01, and the observation borehole, AFRBH03, are given in the tables 13 and 14. A constant rate test of 8 hours was performed on borehole AFRBH01 with drawdown and discharge

measured at frequent, stipulated intervals. Drawdown in the observation borehole, AFRBH03, was recorded for the duration of the test.

Table 13: Abstraction and observation borehole information

BH ID	Depth (m)	Test type	Pump depth	Pump type	RWL (m)	Discharge
AFRBH01	160	Constant rate	~150 m	7.5KW submersible	26.55	2.5l/s 9 000l/h
AFRBH03	50	Observation	N/A	N/A	8.06	N/A

Table 14: Constant rate and observation borehole data following an 8 hour constant rate pumping test

BH ID	Constant yield test (min)	Constant rate (l/s)	Drawdown (m)	Recovery (min)	Storativity	Tave (m^2/d)
AFRBH01	480	2.5	0-0.1	0	0.01-0.05	~2000
AFRBH03	N/A	N/A	0.1	0	-	-

Little or no drawdown was observed from the pumping test borehole while the observation borehole dropped 0.1m during the constant rate test, as shown in Table 14. This may suggest that the borehole, being 160m deep, was drilled into the dolomites of the Malmani subgroup with very high storage capacities (no borehole logs were available at the time of compiling the report). As drawdown values are necessary for input into the mathematical models, values of 0.1m drawdown were assigned to both the pumping and observation borehole. This yielded a transmissivity value 2 000m^2/d and a storativity value of between 0.01 and 0.05. These are typical values for dolomitic aquifers in South Africa. The characteristics indicate a significant storage capacity and ease-of-flow with abstraction most probably occurring from a dolomitic compartment, cavity or a highly fractured matrix.

As the aquifer could not be stressed it was difficult to assign a sustainable yield value to the production borehole. It can, however, be assumed that the current yield of 2.5l/s can be increased 10-fold without reaching the drawdown constraint of 5m (general constraint given for dolomitic aquifers). The time dependent drawdown in and around the well was simulated, estimating that with a 10-fold increase in abstraction (25l/s) together with highly conservative transmissivity and storativity values of 1 000m^2/d and 0.005, respectively, the drawdown constraint of 5m will not be reached even with a continuous pumping time of 2 years. Figures 69 and 70 indicate the cone of depression formed around the pumping well with current pumping (2.5l/s) and a 10-fold increase (25l/s) with continuous pumping of 2 years, respectively.

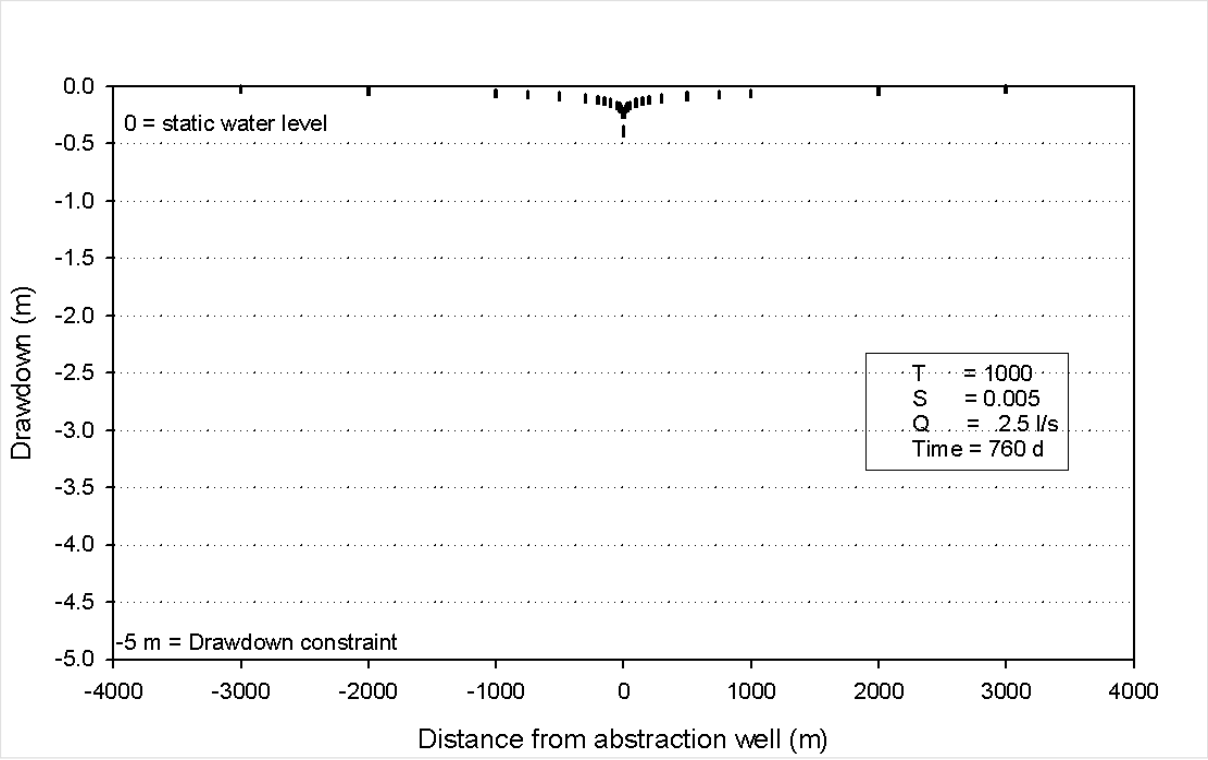


Figure 69: Simulating drawdown in AFRBH01 after continuous pumping for 2 years with current abstraction rate of 2.5l/s.

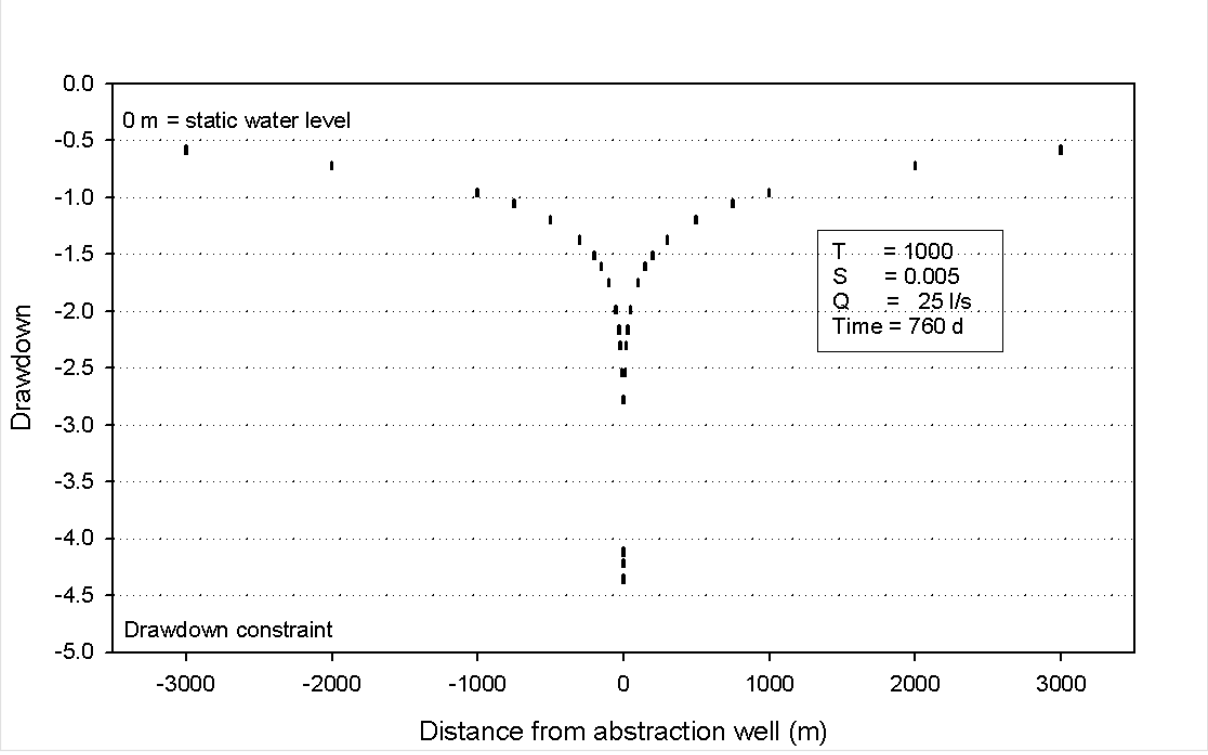


Figure 70: Simulating drawdown in AFRBH01 after continuous pumping for 2 years with a 10-fold increase in abstraction rate of 25l/s.

Groundwater quality

During the Borehole Yield Testing and Impact Assessment, four (4) groundwater samples were taken and analysed for their organic, inorganic and bacteriological content. This was done in order to assess the impact of the rendering facility on the receiving groundwater environment. Sampling was done according to the *background-source-receptor monitoring model*. The following sampling sites were used:

- **AFRBH02** – Omnia monitoring borehole used as a background/upstream borehole for the rendering facility;
- **AFRBH01** – AFGRI abstraction borehole used for process water and used as a downstream borehole for the rendering plant and the Omnia Dam;
- **AFSBH01** – AFGRI Silos borehole used as potable water source and background reference borehole for the AFGRI Rendering Plant and Omnia;
- **AFRBH04** – Community borehole used as potable water source in the community and downstream borehole for the AFGRI Rendering Plant and Omnia; and
- **AFRSW01 'wash'** and **AFRSW01 'process'** as main pollution source(s).

A conceptual model of the study area and the groundwater monitoring localities (not to scale) is given in Figure 71. Groundwater quality results, as sampled on the 19th of November 2012, were evaluated according to the SANS: 241-2011 Potable Standards and are given in Table 15.

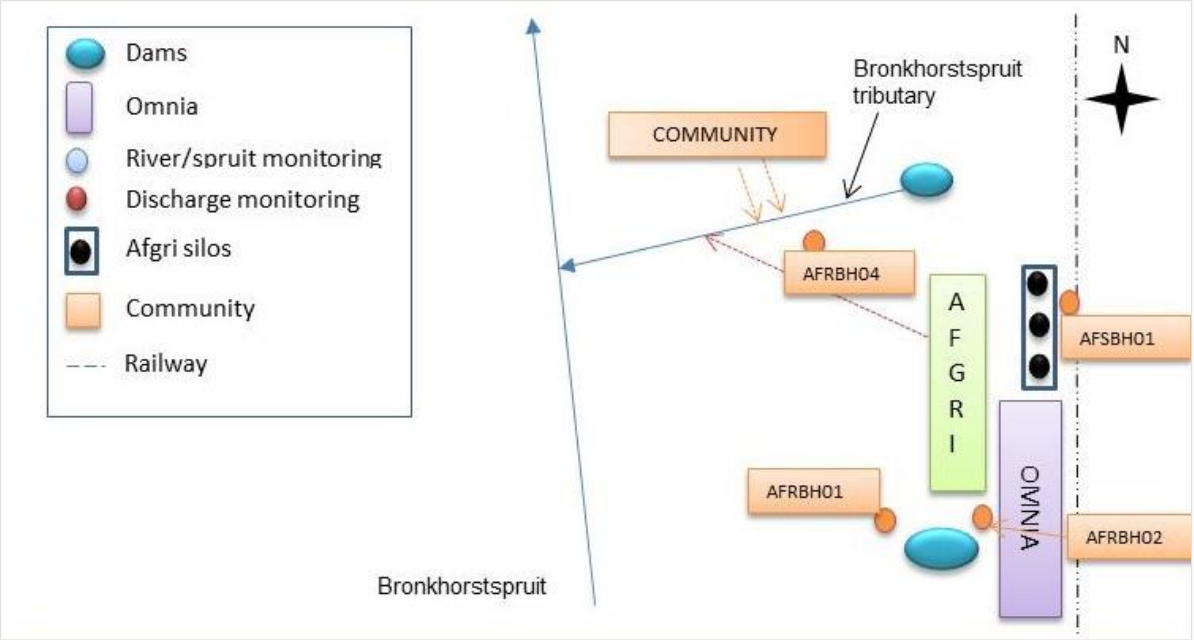


Figure 71: Graphical representation of the study area including main drainage and groundwater monitoring localities (not to scale)

Table 15: Groundwater quality results as sampled on the 19th of November 2012

Locality / Guideline Parameter	Unit	Domestic use SANS 241(1)[a]	AFRBH02	AFRBH01	IMPACT[c]	AFSBH01	AFRBH04	IMPACT[c]
pH		5-9.7	5.93	6.58	0.65	7.43	4.26	-3.17
EC	mS/m	≤170	97.6	122	24.4	12.7	176	163.3
TDS	mg/l	≤1200	365	497	132	57	1309	1252
Ca	mg/l	-	69.4	96.1	26.7	6.01	127	121.0
Mg	mg/l	-	68	89.7	21.7	5.5	115	109.5
Na	mg/l	≤200[b]	21.6	10.4	-11.2	9.59	59.3	49.7
K	mg/l	-	8.55	5.86	-2.69	0.67	49	48.3
MALK	mg/l	-	20.8	44.7	23.9	45.3	-2.48	-47.78
Cl	mg/l	≤300[b]	79	85.3	6.3	3.7	288	284.3
SO_4	mg/l	≤500	3.84	20.3	16.5	0.68	560	559.3
NO_3-N	mg/l	≤11	97.2	153	55.8	2.83	72	69.2
NO_2-N	mg/l	≤0.9	0.822	0.715	-0.11	0.086	0.088	0.002
NH_4-N	mg/l	≤1.5[b]	4.71	9.24	4.53	0.98	36.7	35.7
PO_4	mg/l	-	0.008	0.148	0.14	0.029	-0.008	-0.037
F	mg/l	≤1.5	0.117	0.332	0.22	0.174	0.98	0.81
Al	mg/l	≤0.3[b]	0.003	0.003	0	-0.003	2.28	2.28
Fe	mg/l	≤2	0.003	0.003	0	-0.003	0.921	0.92
Mn	mg/l	≤0.5	1.69	0.25	-1.44	0.004	9.88	9.88
Hardness	mg/l	-	453	609	156	38	791	753
E. coli	CFU/100 ml	0	-1	-1	0	64	-1	-65
T. coliform	CFU/100 ml	0	-1	-1	0	72	-1	-73

TVC	CFU/1 ml	≤1000	120	100	-20	1300	1780	480
As	mg/l	≤0.010	-0.007	0.14	0.13	-0.007	-0.007	0
Sb	mg/l	≤0.020	-0.001	-0.001	0	-0.001	-0.001	0
Co	mg/l	≤0.5	0.009	0.057	0.048	-0.001	0.74	0.74
Cu	mg/l	≤2	0.004	0.003	-0.001	-0.001	0.015	0.016
Cr	mg/l	≤0.050	-0.004	-0.004	0	-0.004	-0.004	0
Pb	mg/l	≤0.010	-0.007	-0.007	0	-0.007	-0.007	0
Se	mg/l	≤0.010	0.001	0.058	0.057	-0.001	0.33	0.33
Ni	mg/l	≤0.070	-0.001	-0.001	0	-0.001	-0.001	0
Zn	mg/l	≤5[b]	0.026	-0.002	-0.028	-0.002	0.623	0.63
Cd	mg/l	≤0.003	-0.001	-0.001	0	-0.001	-0.001	0
U	mg/l	≤0.015	0.004	0.006	0.002	-0.003	0.007	0.01
Hg	mg/l	≤0.006	-0.001	-0.001	0	-0.001	-0.001	0
CN^-	mg/l	≤0.070	-0.02	-0.02	0	-0.02	-0.02	0
Cr	mg/l	≤0.050	-0.001	-0.001	0	-0.001	-0.001	0
TOC	mg/l	≤10	-1	-1	0	-1	3.5	4.5
Phenol	mg/l	≤0.010[b]	0.03	0.02	-0.01	0.028	0.322	0.29
SAR	-	-	1.83	2.00	0.17	1.73	2.36	0.63

[a] SANS 241: 2011 - based on the consumption of 2L of water per day by a person of a mass of 60 kg over a period of 70 years

[b] Aesthetic concerns only

[c] Impact calculated by subtracting upstream value from downstream value

Blue shading indicates exceedance of SANS domestic standards for recommended use

Red shading and font indicates deterioration in quality and green shading and font indicates improvement

Table 15 shows the groundwater qualities evaluated according to the SANS standards for recommended domestic use. **The groundwater quality data indicates that none of the four sampled boreholes are suitable for domestic use.**

AFRBH02 is situated downstream of the Omnia Plant and upstream of the Omnia Dam and rendering facility. The water quality can be described as slightly acidic, non-saline and very hard with high to elevated levels of NO_3, NH_4 and Mn and with traces (above detection limits) of Co, Cu, Se, Zn and U. The NO_3 concentration of 97.2mg N/l is almost 10 times higher than the recommended guideline for NO_3 in potable water (SANS: 241-2011).

Nitrate (NO_3) in drinking water is primarily a health concern as it can be readily converted in the gastrointestinal tract to NO_2 as a result of bacterial reduction. Upon absorption, NO_2 combines with the oxygen-carrying red blood pigment, haemoglobin, to form methaemoglobin, which is incapable of carrying oxygen. This condition is termed methaemoglobinaemia. The reaction of NO_2 with haemoglobin can be particularly hazardous in infants under three months of age and is compounded when the intake of Vitamin C is inadequate (DWAF, 1996a). The DWA proposes a Target Water Quality Range of < 6.0mg N/l with values >20mg N/l being toxic to infants (Table 16).

Table 16: Effects of nitrate (NO_3) on human health (DWAF, 1996a)

Nitrate (as mg N/l)	Effects
Target Water Quality Range 0 - 6	**No adverse health effects.**
6 - 10	Rare instances of methaemoglobinaemia in infants. No effects in adults. Concentrations in this range generally well tolerated.
10 - 20	Methaemoglobinaemia may occur in infants. No effects in adults.
>20	Methaemoglobinaemia occurs in infants. Occurrence of mucous membrane irritation in adults.

The ammonia (NH_4) concentration of 4.71mg N/l does not pose any direct health concerns *per se*, but taste and odour complaints are likely to occur. High concentrations of NH_4 can also give rise to NO_2, which is potentially toxic, especially to infants, and may also compromise disinfection by chlorine.

No health effects are expected as a result of the Mn concentration of 1.69mg/l. The guideline given (<0.5mg/l) is primarily based on aesthetic effects. Human health effects are only evident at elevated concentrations (>20mg/l). The slightly raised Mn concentration may be due to the slightly acidic pH (acidic pH increases the solubility of metals) or reducing conditions (low oxygen content).

AFRBH01 is situated downstream of the Omnia Dam and the AFGRI Rendering Plant and was subsequently used to assess the impact of these facilities on the receiving groundwater environment. The quality can be described as slightly acidic, non-saline and very hard with high to elevated concentrations of NO_2, NO_3, NH_4, PO_4, As and Se and traces of Co, Cu and U. The water should not

be used as a domestic source given that NO_3, NH_4, As and Se concentrations exceed recommended domestic standards (SANS: 241-2011).

The **inorganic N** content in AFRBH01 remains a cause for concern with the NO_3 concentration being more than 15 times greater than the recommended limits, while NH_4 was also recorded at more than six times the recommended limits. The risk for methaemoglobinaemia is very high, especially in infants, and the water should not be used for domestic purposes.

Arsenic (As) was recorded at a concentration of 0.14mg/l, which is almost 15 times greater than the recommended domestic limit of <0.010mg/l. The main health concerns with As poisoning are skin lesions, hyperpigmentation and cancer while acute poisoning can result in death from upper respiratory, pulmonary, gastrointestinal and cardiovascular failure (DWA, 1996). The DWA indicates that the concentration of 0.14mg/l recorded for AFRBH01 is tolerable but that a low risk of skin cancer does remain for highly sensitive individuals over the long-term (Table 17).

Table 17: Effects of arsenic (As) on human health (DWAF, 1996a)

Arsenic (mg/l)	Effects
Target Water Quality Range 0 – 0.01	**No adverse health effects – ideal concentration range.**
0.01 – 0.2	Tolerable concentration, but low risk of skin cancer in highly sensitive individuals over long term.
0.2 – 0.3	Increasing possibility of mild skin lesions over long term. Slight possibility of skin cancer over the long-term.
0.3 – 0.6	Possible adverse, chronic effects in sensitive individuals. Brief exposure has no effect. Skin lesions, including hyperpigmentation, will begin to appear on long-term exposure.
0.6 – 1.0	Symptoms of chronic poisoning such as skin lesions, including hyperpigmentation, will appear on long-term exposure.
1 - 10	Cancer or death will result from chronic poisoning.
>10	Death will result from acute poisoning.

Selenium (Se) was recorded at a concentration of 0.058mg/l, which exceeds the recommended domestic limit of <0.001mg/l almost 6-fold. Toxic effects of Se become apparent with intakes 10 times or greater as compared with the recommended nutritional requirement. Effects include liver damage and impairment of hair and nail growth (DWA, 1996). At the recorded concentration of 0.058mg/l, no danger is expected with short-term use, but risk of liver toxicity with long-term use remains for children (Table 18).

Table 18: Effects of selenium (Se) on human health (DWAF, 1996a)

Selenium (mg/l)	Effects
Target Water Quality Range 0 – 0.02	**No adverse health effects – ideal concentration range.**
0.02 – 0.05	No adverse health effects with short to medium-term use. With lifelong use potential danger of selenium accumulation in individuals with a selenium-rich diet, for example a diet very rich in seafood.
0.05 – 0.1	No danger with short-term use, but a danger of liver toxicity with long-term use, particularly in children.
>0.1	Danger of selenium toxicity, with liver damage.

Table 15 also shows the impact of the Omnia Dam and the rendering facility quantified by subtracting the downstream groundwater quality parameters (AFRBH01) from the upstream parameters (AFRBH02). A slight salinity impact was found with EC increasing approximately 20% and similar increases found for Ca, Mg, Na, Cl and SO_4. Inorganic N increased significantly with NO_3 and NH_4 generally increasing by 50% or more, while inorganic P increased by more than 95%.

It was not possible to distinguish between impacts originating from Omnia and the rendering facility given the locations of the reference boreholes and as both may contribute to nutrients, including cation and anion activity. Water quality from the dam was also not available to compare with the water quality in the boreholes. It is therefore recommended that a sample from the Omnia Dam be analysed and compared to the downgradient quality in AFRBH01.

Arsenic (As), Co, Se and U increased by between 33% and 98%. The contributor(s) of these heavy metals and metalloids is uncertain, but may be due to leachate from the boiler coal ash located just upstream of AFRB01. This should be verified by conducting leachate tests on the coal ash. See Info Box #1 for information regarding coal ash.

Info Box #1: Coal Ash
Coal combustion residuals, commonly known as coal ash, are by-products of the combustion of coal. These residuals may contain heavy metals and metalloids like As, Pb and Se that are associated with cancer and other serious health effects. Without proper protection these contaminants can leach into groundwater, discharging at discharge zones into spruits, rivers and other drinking water sources. Coal ash should therefore be properly discarded and appropriately managed.

The Expanded Durov and Stiff diagrams in Figure 72 show similar groundwater quality profiles that plot in Field 8 of the Durov diagram. This field indicates Mg-(Ca)-(Na)-Cl as the predominant facies and is typical of a mixture of fresh and saline waters or possible influence of reverse ion exchange.

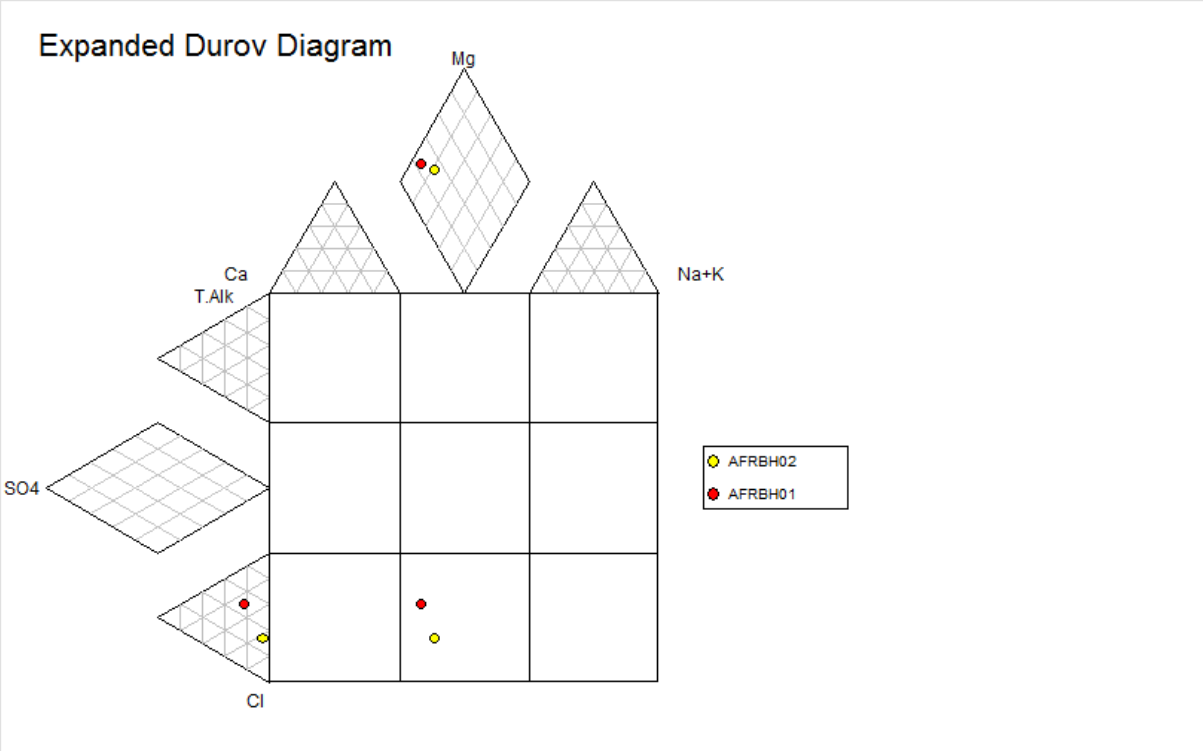


Figure 72: Expanded Durov and Stiff diagrams for boreholes AFRBH02 (upstream) and AFRBH01 (downstream)

AFSBH01 is situated at the AFGRI Silos and is used as a potable water source at the silos and rendering facility. It can be regarded as an upstream reference locality relative to the rendering facility. The quality of ASBH01 can be regarded as neutral, non-saline and soft with high total coliform and *E. coli* counts. The *E. coli* count of 64CFU/100ml significantly exceeds the recommended limit of 0CFU/100ml (SANS: 241-2011). Expected effects of faecal coliforms on human health are given in Table 19 and Info Box #2.

Info Box #2: Faecal coliforms

Faecal coliforms, and more specifically *Escherichia coli* (*E. coli*), are the most commonly used bacterial indicators of faecal pollution. This indicator group is used to evaluate the quality of wastewater effluents, river water and sea water at bathing beaches, raw water for drinking water supply, treated drinking water, water used for irrigation and aquaculture and recreational waters. The presence of *E. coli* is used to confirm the presence of faecal pollution by warm-blooded animals (often interpreted as human faecal pollution). Some organisms detected as faecal coliforms may not be of human faecal origin, but are almost definitely from warm-blooded animals (DWA, 1996).

Faecal coliforms are primarily used to indicate the presence of bacterial pathogens such as *Salmonella* spp., *Shigella* spp. *Vibrio cholerae*, *Campylobacter jejuni*, *Campylobacter coli*, *Yersinia enterocolitica* and pathogenic *E. coli.* These organisms can be transmitted by the faecal or oral route via contaminated or poorly-treated drinking water and may cause diseases such as gastroenteritis, salmonellosis, dysentery, cholera and typhoid fever (DWA, 1996).

Table 19: Effects of faecal coliforms on human health (DWAF, 1996a)

***E. coli* (CFU/100 ml)**	**Effects**
Target Water Quality Range 0	**No adverse health effects – ideal concentration range.**
0 - 10	Slight risk of microbial infection with continuous short-term exposure. Negligible effects with occasional or short-term exposure.
10 - 20	Risk of infectious disease transmission with continuous exposure. Slight risk with occasional exposure.
>20	Significant and increasing risk of infectious disease transmission. As faecal coliform levels increase, the amount of ingested water required to cause infection decreases.

Due to the presence of faecal coliforms, the water at AFSBH01 is not suited for human consumption and should be disinfected prior to use.

AFRBH04 is situated downstream of the rendering facility and is utilised as a source of potable water in the informal settlement. The quality can be described as acidic with little or no buffer capacity, saline and extremely hard with high to elevated levels of SO_4, NO_3, NH_4, Al and Mn, medium levels of TOC, Co, Se and Zn and traces of Cu and U.

AFRBH04 has poor groundwater quality and is unsuitable for domestic use given the acidic pH and subsequently high concentrations of soluble Al, Mn, Co and Se, high salinity, SO_4, NO_3 and NH_4. Toxic effects are expected with use.

Info Box #3: pH

The pH of a solution is the negative logarithm to the base ten of the hydrogen ion concentration, given by the expression pH = $-\log_{10}$ [H^+] (DWA, 1996), where [H+] is the hydrogen ion concentration. A pH less than 7 is acidic, while a pH greater than 7 is alkaline.

The pH of water does not have direct health consequences, except at extremes. Adverse effects of pH result from the solubilisation of toxic heavy metals and the protonation or deprotonation of other ions. The pH of most raw water sources lies within the range of 6.5 - 8.5 (DWA, 1996).

The geology and geochemistry of the rocks and soils of a particular catchment area affect the pH and alkalinity of the water. Biological and anthropogenic activities such as nutrient cycling and industrial effluent discharge can give rise to pH fluctuations. Notably, acid mine drainage can have a marked effect on the pH. Acid-forming substances, such as oxides of sulphur and nitrogen released into the atmosphere, may ultimately alter the acid-base equilibrium in natural waters and result in reduced acid-neutralising capacity and therefore lowering of the pH (DWA, 1996).

Table 15 shows the impact on the groundwater regime of the rendering facility and Omnia. Given the locality of the reference boreholes, the Omnia plant and the community may have contributing effects to the deterioration in groundwater quality at AFRBH04. The low pH and subsequently high levels of soluble heavy metals and SO_4 may be an indication of coal leaching, while the high nutrients and measurable concentrations of organic carbon (TOC) may be indications of contributing effects by the rendering facility and Omnia. This should be confirmed with more detailed studies.

Expanded Durov and Stiff diagrams shown in Figure 73 indicate two distinct water types with AFSBH01 being of Mg-(Na)-HCO_3^- facies while AFRBH04 shows Mg-(Ca)-SO_4-(Cl) domination. AFSBH01 plots in Field 2 of the Expanded Durov diagram which is an indication of fresh, clean, relatively young groundwater that has started to undergo magnesium ion exchange and is often found in dolomitic terrain. AFRBH04 plots in Field 5 which is typical of a mix of different types. In this case it may be clean water from Fields 1 and 2 that has undergone SO_4 and NaCl mixing or contamination (Shangoni AquiScience, 2012).

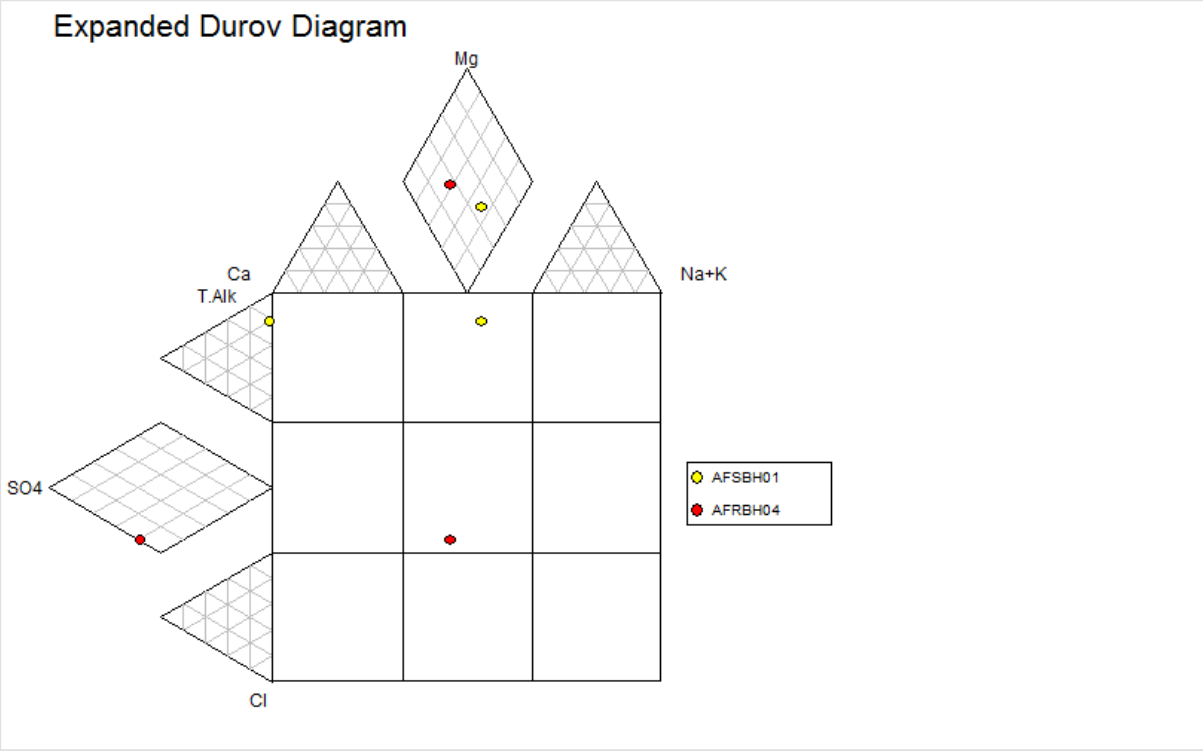


Figure 73: Expanded Durov and Stiff diagrams of AFSBH01 (upstream) and AFRBH04 (downstream)

2.8.6 Storage of water

Groundwater obtained from the on-site borehole is stored in a 120m^3 reservoir (shown in Figure 8). Water in the reservoir is treated with Aquatech. Aquatech is made up of two components (Compound A and B) that are mixed together with water before being added to the reservoir water once a week. Compound A is made of Sodium Chloride and Compound B is an acidifier and is made of 98% Monoamide of Sulphuric Acid. From the reservoir the water is pumped to ten 10m^3 JoJo tanks. From the JoJo tanks, water is pumped to the rendering facility for use in the rendering process.

2.8.7 Water Use License Application to the Department of Water Affairs

An application for registration and/or licensing of the following water use license activities was submitted to the Department of Water Affairs on the 22nd of January 2014:

- Section 21(a): Taking water from a water resource: Abstraction of groundwater from one borehole (registration and licensing);
- Section 21(c): Impeding or diverting the flow of water in a watercourse: The existing plant, wastewater treatment works and proposed second plant are or will be located within 500m of a wetland (registration and licensing);
- Section 21(f): Discharge of waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit: Discharge of treated wastewater into the environment (registration only);

- Section 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource: Treatment of wastewater in the current wastewater treatment works and proposed upgraded wastewater treatment system (registration and licensing); and
- Section 21(i): Altering the bed, banks, course or characteristics of a watercourse: The existing plant, wastewater treatment works and proposed second plant are or will be located within 500m of a wetland (registration and licensing).

The storage of clean water in the cement reservoir and JoJo tanks does not require registration or licensing in terms of the National Water Act, 1998 (Act No. 36 of 1998) as this water use is generally authorised.

2.8.8 Stormwater (clean and dirty water management)

Shangoni Management Services compiled a Stormwater Management Plan for the Dryden rendering facility. The main philosophy of the plan was to isolate dirty areas and affected stormwater so that clean stormwater runoff can exit the site without becoming contaminated. The following is a summary of the Stormwater Management Plan. The entire document can be found attached under Appendix D.

The plant area at the rendering facility is divided into two (2) separate sections, namely the “clean” and “dirty” areas, as illustrated in Figure 74. The facility has two sections separated by a concrete partition. The “dirty” area is from the poultry waste offloading area to where the waste is loaded into the cooking pots. The “clean” area is from the cooking pots to where the finished product is bagged. Moving from one area to the other requires a person to walk around the concrete partition and through foot baths containing disinfectant.

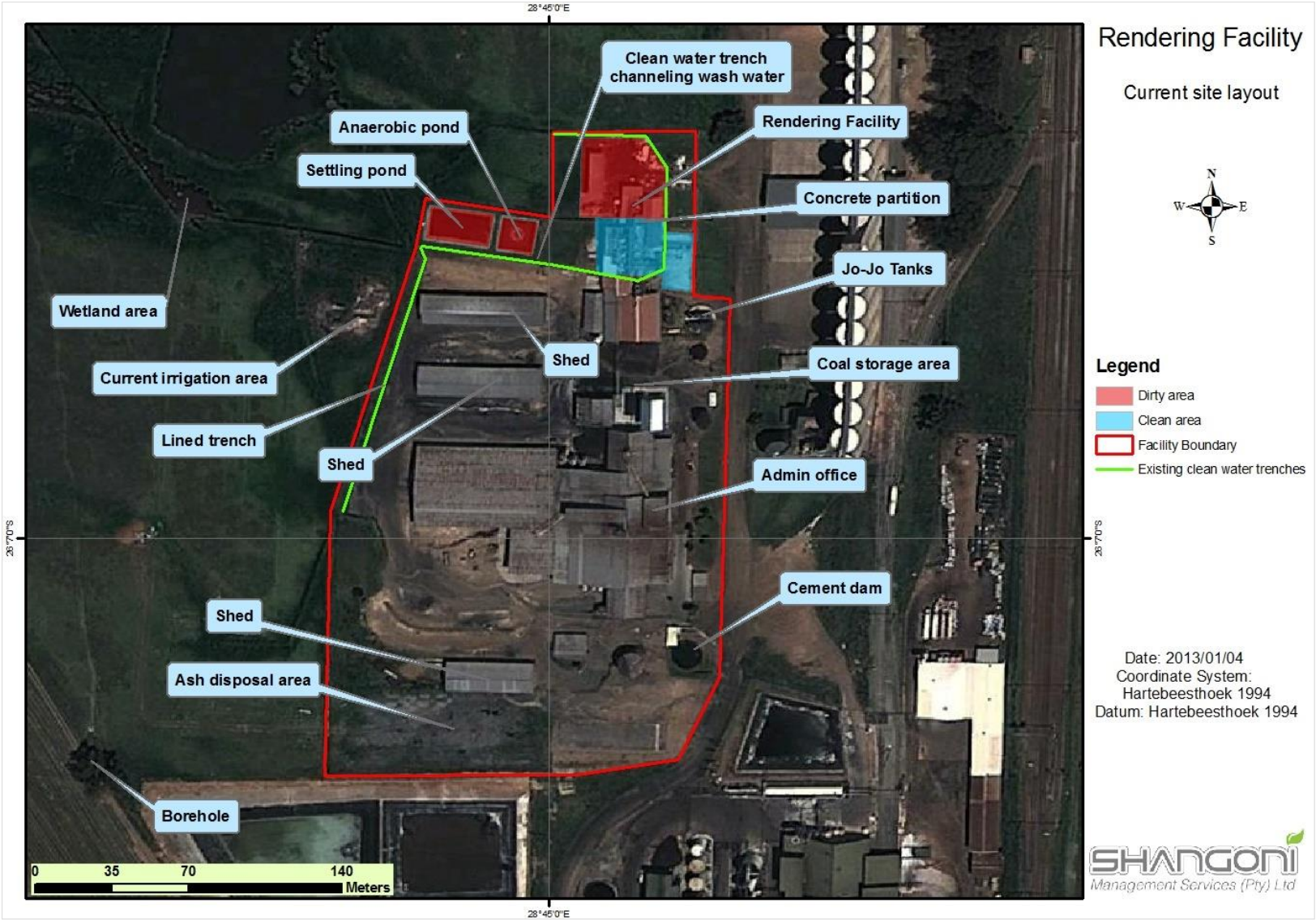
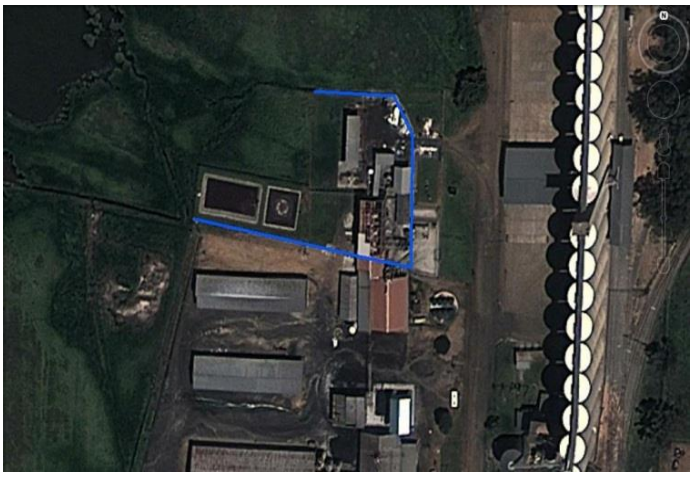


Figure 74: Current site layout of the rendering facility

At the rendering facility plant area an existing clean water separation system is in place (shown in the table below). The clean water trenches divert clean runoff around the dirty and clean areas at the plant. Clean water is discharged into the adjacent grassland.

Table 20: Existing clean water infrastructure

	Existing clean water trenches at the southern part of the plant area.
	Existing clean water trenches at the northern boundary of the plant area.
	The blue line represents the existing clean water trenches at the plant area.

Wash water and dirty process water from the dirty area is channelled within dirty water trenches to the collection sumps. The affected water is pumped from the collection sumps to the anaerobic and settling pond. Final discharge takes place into the adjacent grassland areas at a current rate of 80 m^3 per day. The discharged water flows down the adjacent area and joins a tributary of the Bronkhorstspruit.

Wash water from the clean area of the plant enters the clean water trenches during the cleaning process. Final discharge takes place into the adjacent grassland areas. Water can currently enter the coal storage bunker and this may contaminate clean runoff draining through the area. Existing stormwater trenches are located along the sides of the storage sheds. A lined trench along the western fence of the facility diverts runoff towards the adjacent veld. At present, clean runoff flows through the ash storage area at the southern part of the rendering facility before entering the adjacent veld. The existing dirty water separation system is shown in the table below.

Table 21: Existing dirty water separation system

	Dirty water canal at the existing bunker where poultry waste is stored before being processed.
	Dirty water sump at the existing poultry waste storage bunker.

	Dirty water sump after the blood screening process next to the existing poultry waste storage bunker. The dirty water from this sump is pumped to the treatment ponds.
	Existing treatment dams representing the final phase of the dirty water system.

The catchment of the rendering facility was found to be 21.54ha with a Mean Annual Precipitation (MAP) of 731.1mm. Flood peaks (peak runoff in m^3/second) were estimated for the rendering facility catchment for the 1:5, 1:10, 1:50 and 1:100 year floods. An estimated 1:100 year, 24 hour storm event will produce 136mm of rain. The current and proposed stormwater management measures for the rendering facility are given in the table below and a visual representation of the stormwater management plan is given in the figure thereafter.

Table 22: Current and proposed stormwater management measures

Reference to Figure 75	Current measures	Proposed measures
1	Wash water and dirty process water from the dirty area is channelled within dirty water trenches to the collection sumps. The affected water is pumped from the collection sumps to the	Wash water and dirty runoff must be prevented from entering the clean runoff trenches that convey clean runoff around the dirty area. A berm (height of two bricks) can be constructed on the inside edge of the current clean runoff trench running through

Reference to Figure 75	Current measures	Proposed measures
	wastewater treatment dams. Final discharge takes place into the adjacent grassland areas at a rate of 80m³ per day. The discharged water flows down the adjacent area and joins a tributary of the Bronkhorstspruit.	the clean and dirty areas at the plant. This will prevent affected water from entering the clean trench. The affected wash water must be contained within sumps that are connected to the dirty water system.
2	Currently, wash water from the clean area at the plant falls into the clean water trenches during the cleaning process. Final discharge takes place into the adjacent grassland areas.	Wash water should be prevented from entering the clean runoff trench located in this area. Additional sumps should be constructed to collect wash water from this area and divert it to the dirty area of the plant from where the affected water can be treated before irrigation or discharge.
3	Stormwater runoff flows freely down this area. Signs of erosion were visible between the sheds.	It is proposed to construct a lined trench through the rendering facility from the eastern fence to the western fence. Berms can also be constructed on the premises to divert clean runoff to the lined cement trench that will convey runoff towards the western boundary.
4	The current design of the coal storage area allows runoff to enter. This may contaminate clean runoff draining through the area.	Coal should be stored within the designated storage area. Spillages should be contained within the area. The entrance of the storage bunker should be lifted to prevent runoff water from entering.
5	Existing stormwater trenches are located along the sides of the storage sheds. A lined trench along the western fence of the facility diverts runoff towards the adjacent veld.	The discharge points of the existing trenches along the sides of the storage sheds must be modified to reduce the velocity of clean runoff during heavy rainfall events. It is suggested to flatten and line the discharge points with cement and rocks. The proposed measures should reduce runoff velocity and soil erosion.
6	No current measures are present.	It is proposed to construct a clean runoff diversion trench at the eastern boundary along the rendering facility fence. The canal will be constructed by digging a trench and

Reference to Figure 75	Current measures	Proposed measures
		lining it with concrete half-pipes. The cement trench will end at the corners of the eastern fence, from where the clean runoff will be channelled into unlined trenches away from the facility. The discharge points of the trench should be flattened and lined with cement and rocks to reduce runoff velocity, thus preventing erosion. A culvert will also be constructed at the main entrance of the facility to enable vehicles to move over the trench. The trench will connect with another proposed trench running from the eastern fence to the western fence.
7	At present, clean runoff flows through the ash storage area at the southern part of the rendering facility before entering the adjacent veld.	Ash must be removed from the current ash storage area as it poses a significant risk in terms of ground- and surface water pollution.
8	Treatment dams are present to treat affected runoff and process water from the dirty area at the rendering plant.	A minimum freeboard of 0.8 meters should be maintained to prevent overflow. The design of the treatment dams must be able to contain the 1:00 year flood. During such a storm event the water level within the treatment dams will rise approximately 0.3m. It is crucial that the water levels should be operated with sufficient freeboard to contain such a flood event.
9	No current measures are present.	It is proposed to construct a trench that prevents clean runoff from entering the treatment dams. The trench will connect with the existing stormwater trench located next to the treatment dams.

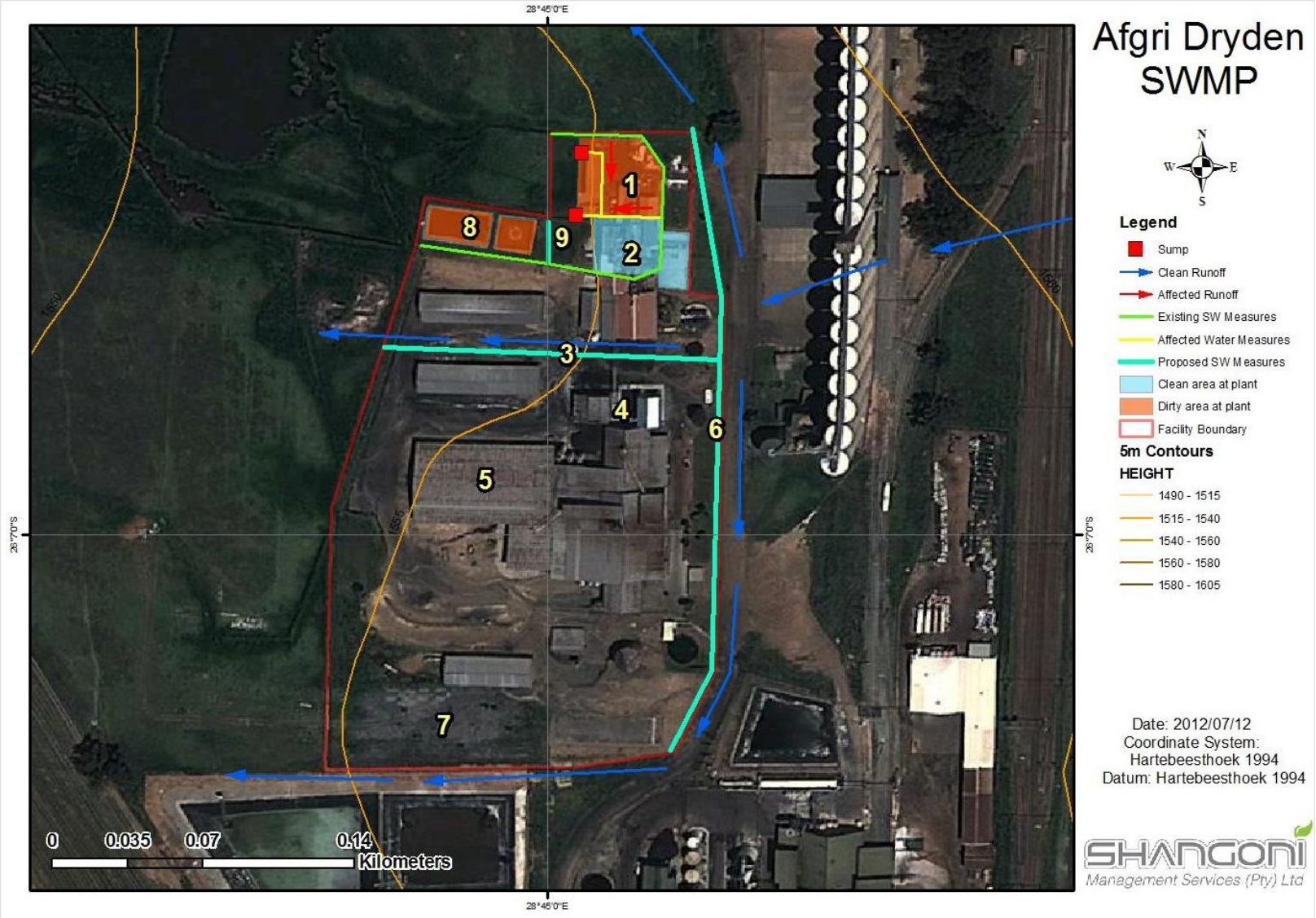


Figure 75: Stormwater management plan

2.9 Sensitive Landscapes

A wetland assessment and delineation was conducted at the site by Mr. Terblanche during May 2013. The study found that an artificial wetland system (shown in the figure below) is present at the site. The wetland system lies to the west-northwest of the rendering facility and consists of an artificial dam and two drainage lines.

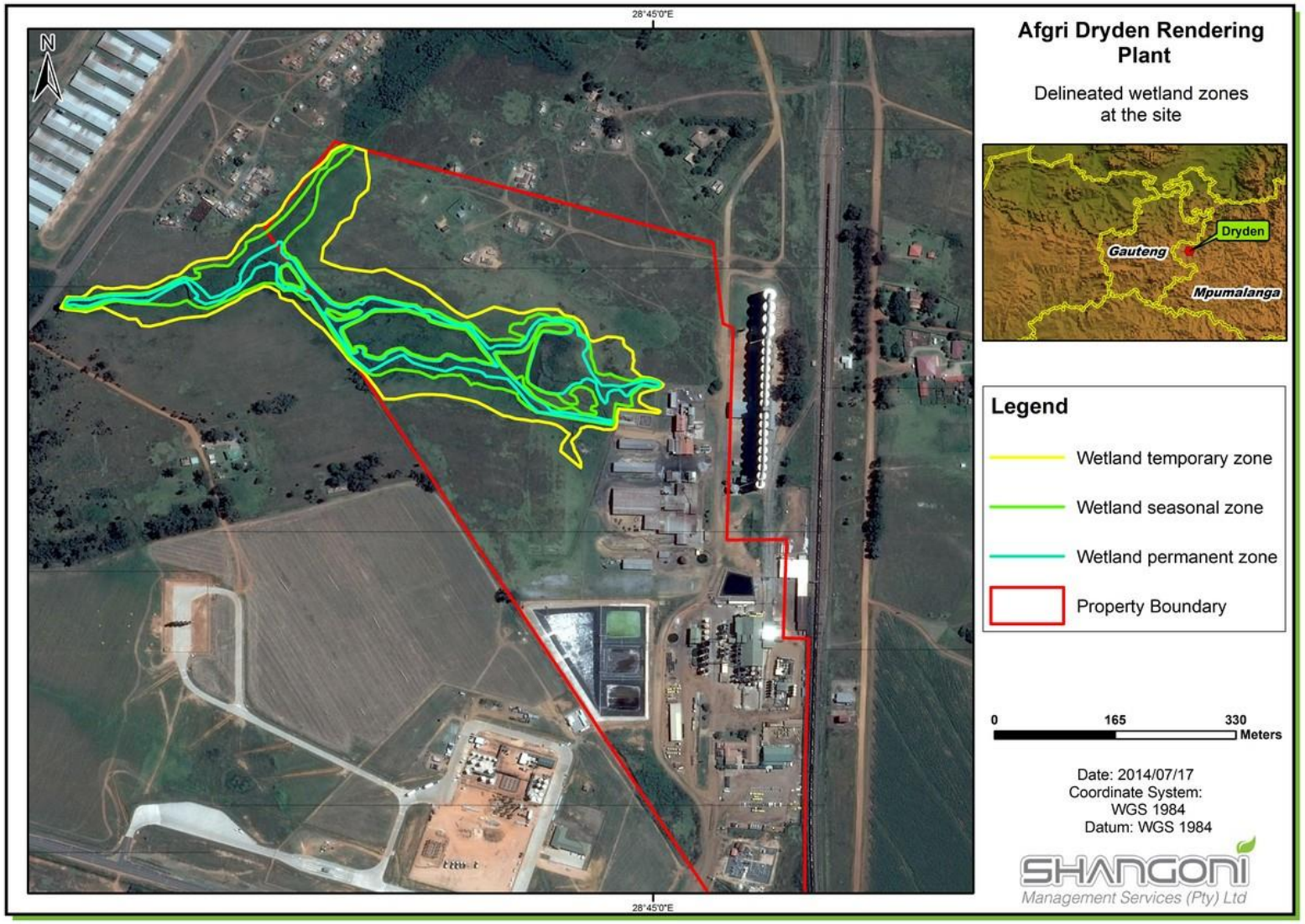


Figure 76: Delineated wetland zones at the site

**Yellow lines: Outer limits of the temporary zone; Green lines: Outer limits of the seasonal zone; Blue lines: Outer limits of the permanent zone*

The main characteristics as well as classifications of the wetland system, according to the guidelines from DWAF (2005) and the proposed National Wetland Classification System for South Africa (SANBI, 2009) are given in the tables below.

Table 23: Main features and functional aspects of the wetland system (Terblanche, 2013).

Feature	Description or Functional Role of the wetland
Type of wetland	A wetland system with a small artificial dam and drainage channels equivalent to a channelled valley bottom wetland (shallow and small).
Size of the wetland	The wetland area (all zones included) of the drainage and artificial dam system on site is 6.7ha.
Present ecological state	The wetland is surrounded and impacted on by cultivated areas, industrial areas and edge effects of some informal settlements. In general a very poor cover of indigenous, high ecological status vegetation is present at the site.
Current land-use	At present the wetlands are draining industrial and residential areas in a shallow valley bottom.
Upstream land-use	Grain silos, railway line and the rendering facility. The drainage system is at the head of a shallow valley.
Downstream land use	Wetlands, dams and channels within intensively cultivated areas.
Supporting services	This wetland has value to perform supporting services, such as nutrient cycling and primary production, that are basic to other ecosystem services provided by wetlands and other associated ecosystems.
Regulating services	This wetland plays an important role in collecting water and as a buffer for erosion in the cultivated, industrial and settlement areas.
Provisioning services	No particular provisioning service.
Cultural services	There is potential for the small artificial dam in the area to be of importance as a recreational area for appreciating the landscape with its aquatic and wetland biodiversity.
Presence or absence of threatened species	No threatened plant or animal species are likely to be resident at the wetland.
Biodiversity conservation	The wetland is not part of a particular identified irreplaceable, highly significant or important and necessary area according to the Mpumalanga Biodiversity Conservation Plan (MBCP).
Connectivity	This wetland is connected to wetland systems downstream so that its functionality and ecological health is important to conservation of the larger

Feature	Description or Functional Role of the wetland
	wetland network in this part of the Highveld region (part of a biodiversity corridor).

Table 24: Classification and outline of indicators of the wetland system according to the DWAF guidelines (2005) (Terblanche, 2013)

Wetland Indicator	Description
Soil wetness	The temporary and seasonal zones are narrow. The small artificial dam contains a permanent water body with very narrow seasonal and temporary zones. Along the drainage channels the permanent, seasonal and temporary zones are narrow with the seasonal zone spreading out where the slopes flatten out in wider areas.
Vegetation	Hydrophytes are confined to narrow zones along the drainage channels at the site. Megagraminoids are absent at these drainage lines and no extensive marsh vegetation is present. Considerable areas of exotic kikuyu grass, *Pennisetum clandestinum*, occur at and between the small water body and the terrestrial environment and along some parts of the drainage lines. Exotic weeds such as *Rumex crispus* and even terrestrial species such as *Datura* species are present in the wetland zones. The dwarf shrub, *Erythrina zeyheri,* occurs in some areas of the temporary zone of the drainage lines at the lower western parts of the site.

Table 25: Classification and outline of characteristics of the wetland system according to the proposed National Wetland Classification System guidelines (Terblanche, 2013)

Characteristic Type (Wetland Discriminators And Descriptors)	Description
System (Level 1)	Inland wetland
Regional setting (Level 2)	Highveld Ecoregion (Kleynhans *et al.,* 2005)
Landscape unit (Level 3)	Valley bottom (shallow and not large)
Hydrogeomorphic unit (Level 4)	Channelled valley bottom. As the wetland system is artificial to an extent (including the small dam), the fringe of wetland vegetation is narrow, especially where dam walls are present.
Hydrological regime (Level 5)	Unidirectional surface flow at the drainage channels and diffuse surface flow at the small artificial dam.
Additional descriptors (Levels 5 and 6)	Vegetation cover consists of narrow fringes of mostly a few hydrophytic herbs or dwarf shrubs and large patches of exotic kikuyu grass, *Pennisetum clandestinum,* and *Bromus catharticus* (rescue grass), which are terrestrial plants.

Characteristic Type (Wetland Discriminators And Descriptors)	Description
	Megagraminoids such as reeds and bulrush are largely absent at the drainage channels and associated narrow wetland zones. A number of exotic weeds, even terrestrial species, are present in the wetland zones.

The Present Ecological State (PES) of the wetland system was found to be a *Category E: Seriously modified* and the losses of natural habitats and basic ecosystem functions are extensive. This is due to alterations to the drainage system, a number of disturbances such as grazing, tracts and the historical building of the artificial dam, as well as the subsequent invasion of exotic plant species into the wetland area. The Ecological Importance and Sensitivity of the wetland was found to be *Low/marginal (Floodplains which are not ecologically important and sensitive at any scale)*. The biodiversity of these floodplains is ubiquitous and not sensitive to flow and habitat modifications. They play an insignificant role in moderating the quantity and quality of water of major rivers.

Conclusion

The proposed project with the effective Wastewater Treatment Works will likely improve the ecosystem services of the wetlands onsite and downstream of the site. The improved wetland system will also enhance the wetland's capacity to assimilate phosphates, toxins and nitrates that may be present in the system, provided that these are present at low quantities (Terblanche, 2013).

2.10 Sites of archaeological and cultural interest

The second plant will be constructed at an existing storage area (two open sided sheds as shown in Figures 30 and 31) and will also extend into an undisturbed piece of land to the west of the sheds.

The South African Heritage Resources Agency has indicated that no Heritage Impact Assessments are required for the site. Should any evidence of archaeological sites or artefacts, or other heritage resources be found, all construction must cease and the South African Heritage Resources Agency (SAHRA) must be notified.

2.11 Visual aspects

The rendering facility is visible from the R555 that runs past the property to the west, as well as from the two dirt roads that run past the south and east of the property (shown in white on the figure below). The rendering facility is approximately 690 metres away from the R555. This road carries most of the traffic that passes the property.

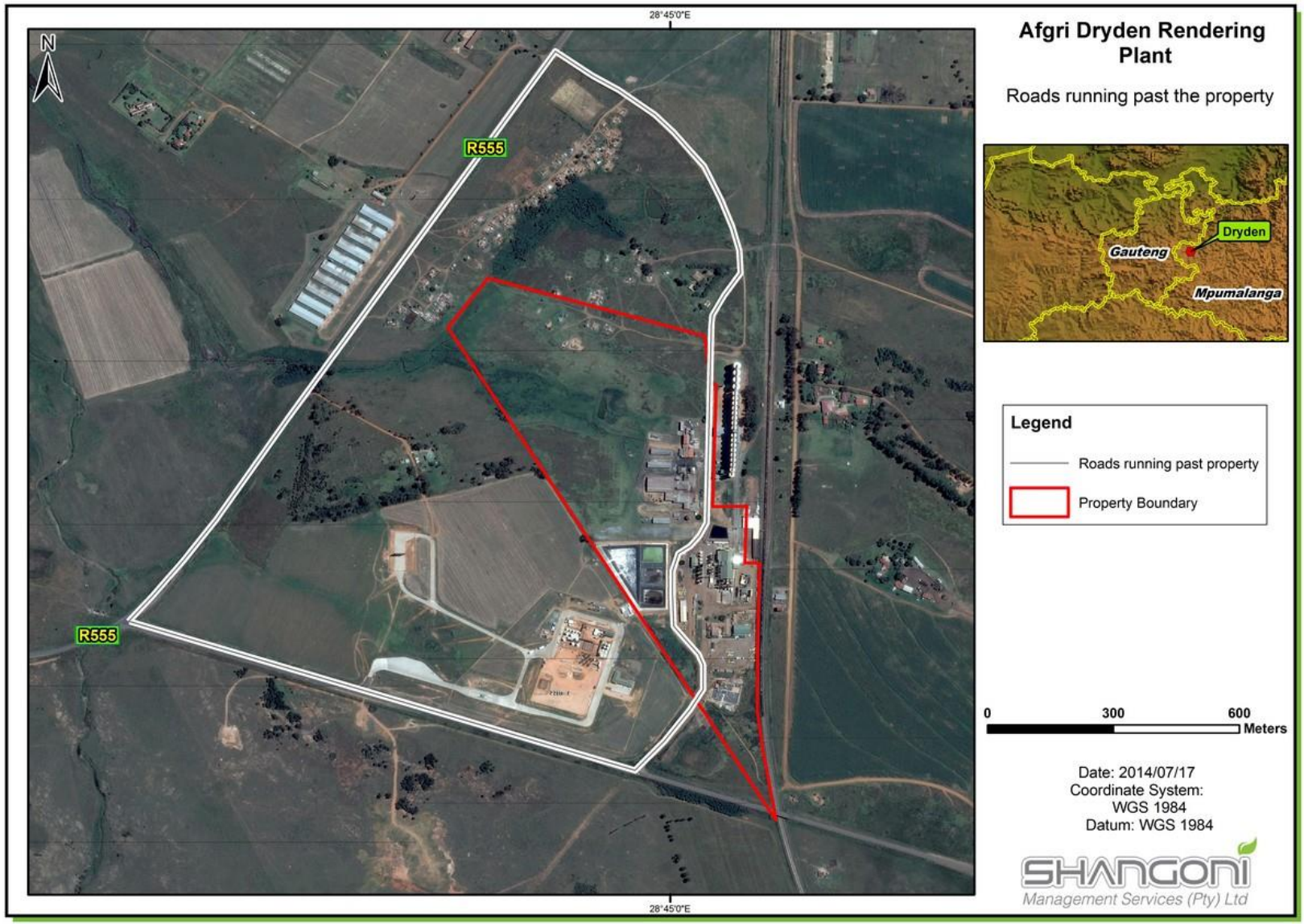


Figure 77: Roads running past the property (shown in white)

The facility is shielded from view from the east by the AFGRI Animal Feeds silos and from the south by the Omnia fertiliser plant. The facility is, however, visible from the north, west and south-west. To the north and west there are a number of houses and informal settlements as well as the R555. The figures below show the view of the rendering facility from the R555, from the north of the site and from the south-west. Construction is taking place on the property to the southwest of the facility. In future, this new development may shield the rendering facility from view.

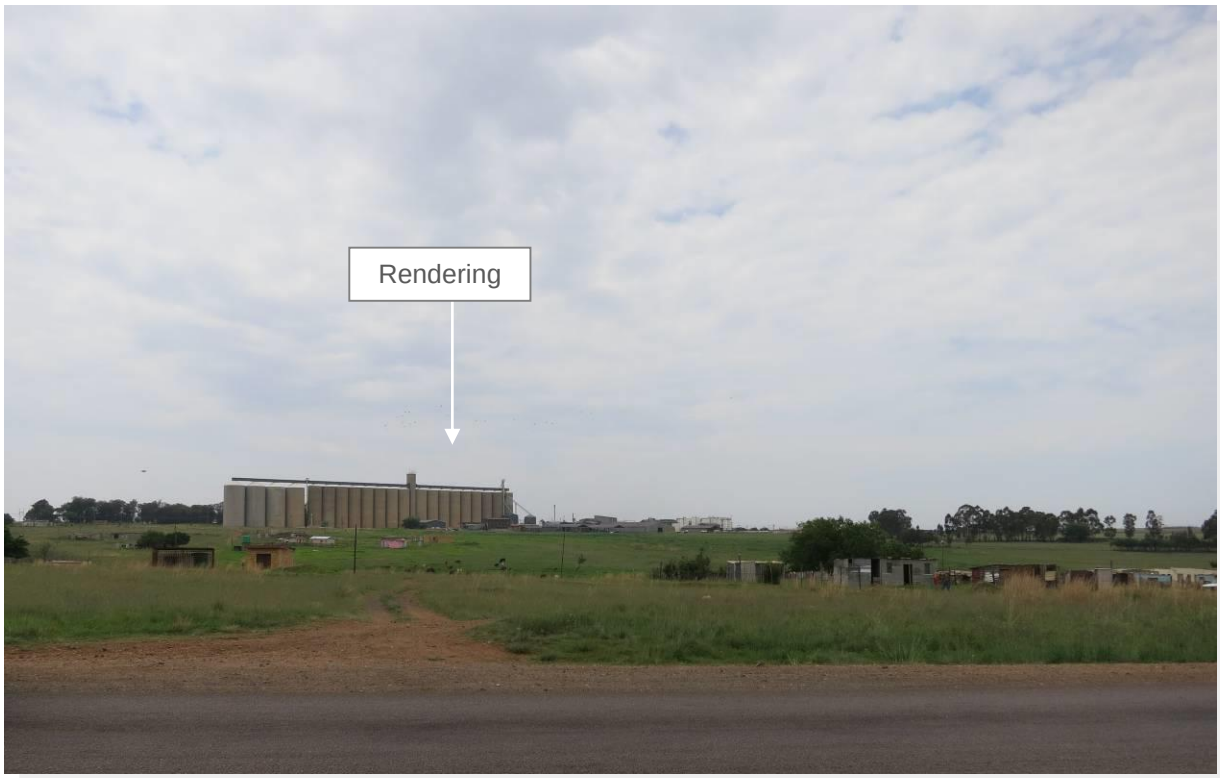


Figure 78: View of the rendering facility from the R555 (west of the facility)

Figure 79: View of the rendering facility from the north

Figure 80: View of the rendering facility from the south-west.

Two existing storage sheds will be removed to make space for the second plant. The expansion will increase the physical extent of the rendering facility and will make the facility more visible from the north, west and south-west.

2.12 Air Quality

2.12.1 Emissions and odours

The generation of odour emissions is generally the most significant air quality issue at a rendering facility (Sindt, 2006). Odours are mostly caused by volatile organic compounds (VOCs) and these are the main atmospheric emissions generated at rendering facilities. VOC emissions can be made up of all or some of the following compounds: ammonia, organic sulphides, particulates, hydrogen sulphide, trimethylamine, disulphides, quinoline, C-4 and C-7 aldehydes, C-4 amines, C-3 to C-6 organic acids, dimethyl pyrazine and other pyrazines. Small volumes of the following may also be emitted: ketones, aromatic compounds, C-4 to C-7 alcohols and aliphatic hydrocarbons. Many of the compounds have low odour detection thresholds, with some as low as one (1) part per billion (ppb). Quonoline is the only compound that is classified as a hazardous air pollutant (HAP).

At inedible rendering facilities, like Dryden, the main VOC sources are the cooking vessels and the screw press. Other sources include the loading hopper, blood processing area, dryers, percolator pans (Midwest Research Institute, 1995) and other processing areas that are not enclosed. Poultry waste stored at the facility may also generate VOC emissions, though this can be minimised by processing the waste in a timely manner. Particulate matter may also be produced at the dryers (Midwest Research Institute, 1995).

Coal-fired boilers produce suspended particulate matter; ammonia; nitrogen and sulphur oxides; greenhouse gases (Sindt, G.L.., 2006); and may also produce VOCs (Midwest Research Institute, 1995). Water vapour from the cooking vessels is condensed in the condenser and non-condensibles are emitted as VOC emissions (Midwest Research Institute, 1995).

Electricity usage at rendering facilities tends to be high, especially for the drying process. This usage results in indirect emissions (Scope 2 emission) from the generation of electricity by the power stations.

2.12.2 Atmospheric Emission License Application for the rendering facility

An Atmospheric Emission License Application will be submitted to the Nkangala District Municipality or the Mpumalanga Provincial authority for the following listed activity in terms of GN R. 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):

19. Category 10: Animal matter processing

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

a) The following special arrangement shall apply:

(i) Best practice measures intended to minimised or avoid offensive odours must be implemented by all installations. These measures must be documented to the satisfaction of the Licensing Authority.

The proposed second plant will utilise new technology to sterilise the incoming waste streams and an air treatment system is being proposed to treat odours that will be generated at the plant. This system will consist of an air cooled condenser with ozone treatment at the system outlet. One such system will be installed at the existing rendering plant and another system will be installed at the second, proposed plant.

2.12.3 Noise pollution

Noise in the area is generated mainly by activities at the rendering facility, activities at the AFGRI Animal Feed silos, fertiliser production activities at the Omnia plant, farming activities, vehicles travelling on nearby roads, such as the R555, construction activities on land to the southwest of the site, and general bird and animal life. The main sources of noise are shown in the figure below.

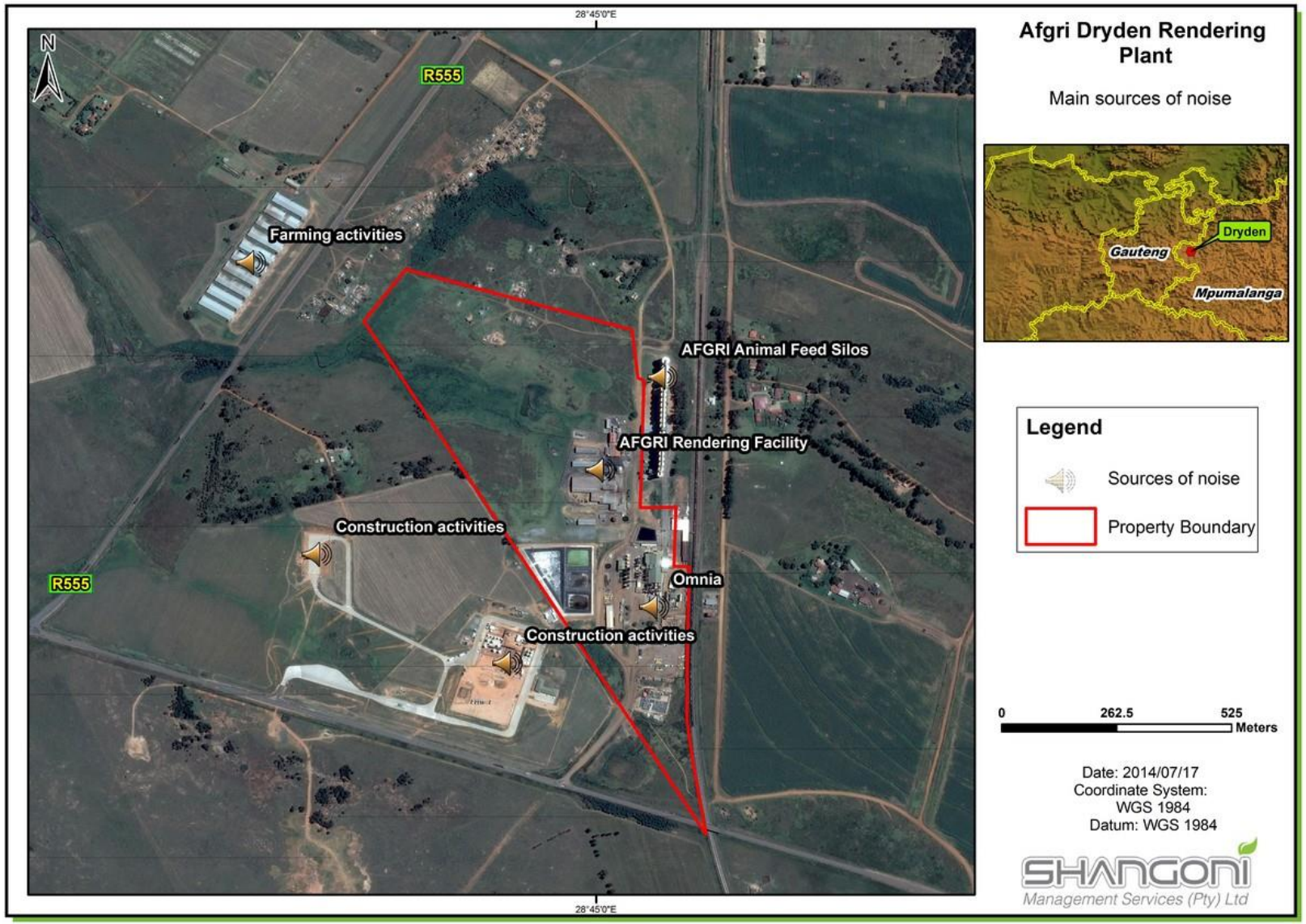


Figure 81: Main sources of noise

Noise is currently produced at the rendering facility from the vehicles that deliver poultry waste to the facility, those that deliver coal and other raw materials, and those that pick up finished product (high-protein feather meal) from the facility. Noise is also generated through the rendering activities, such as at the condensers. As the facility operated 24 hours per day, noise is continually generated to varying extents.

During construction of the second plant, additional noise will also be generated. Sound is inversely proportional to the distance from the source and can get absorbed by buildings and vegetation barriers. Noise intensities (dB) will be at their highest on site and will decrease as one moves away from their sources.

Operation of the proposed plant will also produce noise as previously described for the existing plant. The new plant will be situated slightly further west than the current rendering plant. This will make it closer to sound receptors to the west and further away from sound receptors to the east.

The distance to sensitive noise receptors (residences) from the rendering facility is more than 45 metres in all cases, as shown in the figure below.

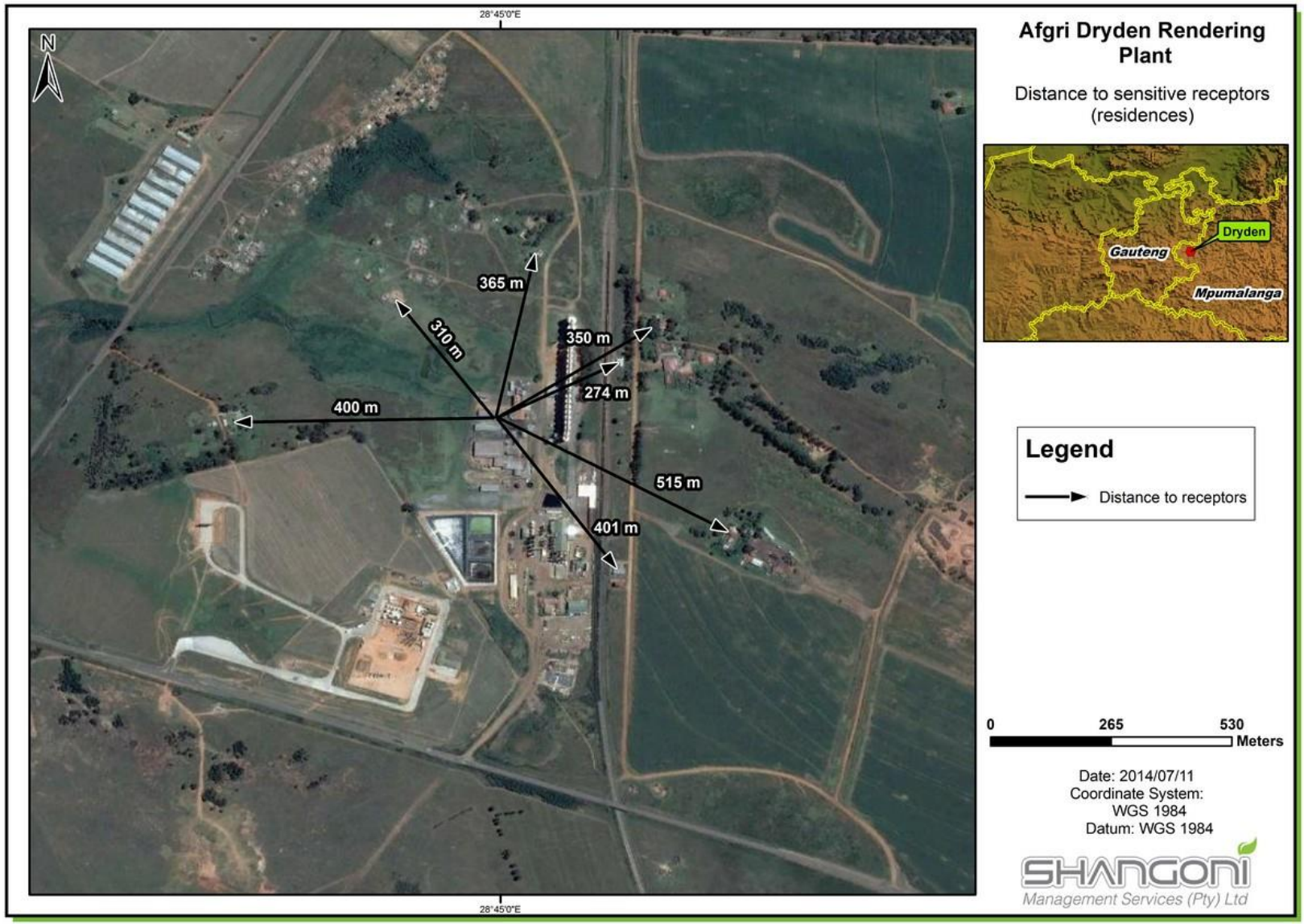


Figure 82: Distance to sensitive receptors (residences)

2.13 Socio-economic aspects

The site is located within the Victor Khanye Local Municipality.

2.13.1 Demography

According to 2011 census, 75 452 people formed part of the 20 548 households in the Victor Khanye Local Municipality. The average household size is 3.7 people per household. There are 106 men for every 100 women in the municipality and the table below shows the age structure of the municipality.

Table 26: Victor Khanye local municipality age structure -Census 2011 (Statistics South Africa, 2011).

Age Group	Percentage (%)
Under 15 years of age	28.2%
15 to 64 years of age	67.1%
Over 65 years of age	4.7%
Total population	**100**

2.13.2 Major economic activities

The Victor Khanye Local Municipality is strategically located between Johannesburg in the Gauteng province and Nelspruit in the Mpumalanga province and forms part of the Nkangala District Municipality.

Farming is the dominant economic activity in the municipality, occupying approximately 60% of the total physical area. However, in terms of output and proportional contribution to the local economy, the largest sector is trade, followed by agriculture and mining sectors.

2.13.3 Unemployment and employment

The 2011 census found that the official unemployment rate was 28.2% and the youth unemployment rate (15 to 34 years of age) was 35.80%. The dependency ratio is 49.1 per 100 people between the ages of 15 and 64 years (Statistics South Africa, 2011).

3. LEGISLATION AND GUIDELINES APPLICABLE

3.1 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 as amended)
- Promotion of Access to Information Act, 2000 (Act No. 2 of 2000 as amended)

3.2 Atmospheric emissions

- National Environmental Management: Air Quality Act (Act No. 39 of 2004)
- Environment Conservation Act, 1989 (Act No. 73 of 1989) – Noise Control Regulations in terms of Section 25 of the Environment Conservation Act, 1989

3.3 Water Management

- National Water Act, 1998 (Act No. 36 of 1998)

3.4 Waste management

- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
- GNR. 634 of 23 August 2013 – Waste Classification and Management Regulations;
- GNR. 926 of 29 November 2013 – National Norms and Standards for the Storage of Waste; and
- GNR. 921 of 29 November 2013 – List of Waste Management Activities that have, or are likely to have, a detrimental effect on the environment.

3.5 Planning of new activities

- National Environmental Management Act, 1998 (Act No. 107 of 1998)

3.6 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)
- National Forest and Fire Laws Amendment Act (Act No 12 of 2001)

3.7 Land and Soil Management

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

3.8 Heritage resources

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

3.9 Protected areas

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

During the course of the development, the developer and contractors must comply with all other relevant legislation (including the bylaws of the Local Municipality).

4. PUBLIC PARTICIPATION PROCESS

4.1 Introduction

A Public Participation Process (PPP) is a requirement in terms of the 2010 EIA Regulations of the National Environmental Management Act,1998 (Act No. 107 of 1998), the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), and the National Water Act, 1998 (Act No. 36 of 1998). It forms an integral part of any EIA process.

This section provides information pertaining to the PPP that was conducted by Shangoni Management Services during this particular assessment.

The purpose of this process is to gather information from the community and relevant stakeholders that could ultimately affect the decision-making process concerning the planning, construction and operational phases of the proposed expansion of the AFGRI Dryden rendering facility project. The community and public have been identified as I&APs and have been given the opportunity to participate in this process. Their comments, whether positive or negative, will influence the decision of the Authorities and the developer's final actions.

4.2 Objectives of the PPP

The PPP has the following objectives:

- To inform I&APs as well as all stakeholders of the proposed development;
- To provide an opportunity for I&APs and stakeholders to raise environmental issues or concerns and make suggestions;
- To promote transparency and an understanding of the project and its consequences; and
- To serve as a structure for liaison and communication with I&APs and stakeholders.

To summarise, the objective of the on-going PPP is to promote openness and transparency concerning the proposed expansion project for the duration of the project. The process should by no means be regarded as a vehicle to temper opposition or objections. Any conclusions agreed upon must be socially, financially and technically acceptable and feasible in order to meet the requirements of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), the National Water Act, 1998 (Act No. 36 of 1998) and the vision of AFGRI.

4.3 The Guidelines Followed for the PPP

The PPP for this project was conducted by Shangoni Management Services and undertaken strictly according to the guidelines in terms of the National Environmental Management Act (NEMA), No. 107 of 1998, Chapter 6:

4.4 Public Participation Process

54. (1) This regulation only applies in instances where adherence to the provisions of this regulation is specifically required.

(2) The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by-

(a) fixing a notice board at a place conspicuous to the public at the boundary or on the fence of -
  (i) the site where the activity to which the application relates is or is to be undertaken; and
  (ii) any alternative site mentioned in the application;

(b) giving written notice to -
  (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  (v) the municipality which has jurisdiction in the area;
  (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
  (vii) any other party as required by the competent authority;

(c) placing an advertisement in –
  (i) one local newspaper; or
  (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;

(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in sub regulation (c)(ii); and

(e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to
(i) illiteracy;
(ii) disability;
(iii) or any other disadvantage.

(3) A notice, notice board or advertisement referred to in sub regulation (2) must
(a) give details of the application which is subjected to public participation; and
(b) state-
(i) that the application has been submitted to the competent authority in terms of these Regulations, as the case may be;
(ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;
(iii) the nature and location of the activity to which the application relates;
(iv) where further information on the application or activity can be obtained; and
(vi) the manner in which and the person to whom representations in respect of the application may be made.

(4) A notice board referred to in sub regulation (2) must-
(a) be of a size at least 60cm by 42cm; and
(b) display the required information in lettering and in a format as may be determined by the competent authority.

(5) Where deviation from sub regulation (2) may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub regulation to the extent and in the manner as may be agreed to by the competent authority.

(6) Where a basic assessment report, scoping report or environmental impact assessment report as contemplated in regulations 22, 28 and 31 respectively is amended because it has been rejected or because of a request for additional information by the competent authority, and such amended report contains new information, the amended basic assessment report, scoping report or environmental impact assessment report must be subjected to the processes contemplated in regulations 21, 27 and 31, as the case may be, on the understanding that the application form need not be resubmitted.

(7) When complying with this regulation, the person conducting, the public participation process must ensure that-
(a) information containing all relevant facts in respect of the application is made available to potential interested and affected parties; and

(b) participation by potential interested and affected parties is facilitated in such a manner that all potential interested and affected parties are provided with a reasonable opportunity to comment on the application.

(8)Unless justified by exceptional circumstances, as agreed to by the competent authority, the applicant and EAP managing the environmental assessment process must refrain from conducting any public participation process during the period of 15 December to 2 January.

Register of interested and affected parties

55.(1) An EAP managing an application must open and maintain a register which contains the names, contact details and addresses of -

(a) all persons who, as a consequence of the public participation process conducted in respect of that application in terms of regulation 54, have submitted written comments or attended meetings with the applicant or EAP;

(b) all persons who, after completion of the public participation process referred to in paragraph (a), have requested the applicant or the EAP managing the application, in writing, for their names to be placed on the register; and

(c) all organs of state which have jurisdiction in respect of the *activity* to which the application relates.

(2) An EAP managing an application must give access to the register to any person who submits a request for access to the register in writing.

Registered interested and affected parties entitled to comment on submissions

56.(1) A registered interested and affected party is entitled to comment, in writing, on all written submissions, including draft reports made to the competent authority by the applicant or the EAP managing an application, and to bring to the attention of the competent authority any issues which that party believes may be of significance to the consideration of the application, provided that-

(a) comments are submitted within-

(i) the timeframes that have been approved or set by the competent authority; or

(ii) any extension of a timeframe agreed to by the applicant or EAP;

(b) a copy of comments submitted directly to the competent authority is served on the EAP; and

(c) the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

(2) Before the EAP managing an application for environmental authorisation submits a final report compiled in terms of these Regulations to the competent authority, the EAP must give registered interested and affected parties access to, and an opportunity to comment on the report in writing.

(3) The report referred to in sub regulation (2) include-

(a) basic assessment reports;

(b basic assessment reports amended and resubmitted in terms of regulation 24 (4);

(c) scoping reports;

(d) scoping reports amended and resubmitted in terms of regulation 30(3);
(e) specialist reports and reports on specialised processes compiled in terms of regulation 32;
(f) environmental impact assessment reports submitted in terms of regulation 31;
(g) environmental impact assessment reports amended and resubmitted in terms of regulation 34(4); and
(h) draft environmental management programmes compiled in terms of regulation 33.

(4) The draft versions of reports referred to in sub regulation (3) must be submitted to the competent authority prior to awarding registered interested and affected parties an opportunity to comment.

(5) Registered interested and affected parties must submit comments on draft reports contemplated in sub regulation (4) to the EAP, who should record it in accordance with regulations 21, 28 or 31.

(6) Registered interested and affected parties must submit comments on final reports contemplated in sub regulation (3) to the competent authority and provide a copy of such comments to the applicant or EAP.

(7) The competent authority must, in order to give effect to section 24O of the Act, on receipt of the draft reports contemplated in sub regulation (5), request any State department that administers a law relating to a matter affecting the environment to comment within 40 days.

(8) The timeframe of 40 days as contemplated in sub regulation (7) must be read as 60 days in the case of waste management activities as contemplated in the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), on which the Department of Water Affairs must concur and issue a record of decision in terms of section 49(2) of the National Environmental Management: Waste Management Act, 2008 (Act No. 59 of 2008).

(9)(a)When a State department is requested by the competent authority to comment, such State department must, within 40 days or in the case of Department of Water Affairs, 60 days for waste management activities, of being requested to comment by the competent authority, provide comments to the competent authority.

(b)If a State department fails to submit comments within 40, or 60 days for waste management activities, from the date on which the Minister, MEC, Minister of Mineral Resources or identified competent authority requests such State department in writing to submit comment, it will be regarded that there are no comments.

Comments of interested and affected parties to be recorded in reports submitted to competent authority

57. (1) The EAP managing an application for environmental authorisation must ensure that the comments of interested and affected parties are recorded in reports and that such written comments, including records of meetings, are attached to the report, submitted to the competent authority in terms of these Regulations.

(2) Where a person is desiring but unable to access written comments as contemplated in sub regulation (1) due to-

(i) a lack of skills to read or write;

(ii) disability; or

(iii) any other disadvantage,

reasonable alternative methods of recording comments must be provided for.

4.5 Public Participation Process Followed

The following PPP was conducted for the proposed upgrading and expansion of the AFGRI Dryden rendering facility:

- Identification of key Interested and Affected Parties (all adjacent landowners);
- Identification of key stakeholders;
- Informing the key stakeholders of the process by means of correspondence;
- Placement of a press notice in the Beeld and Streeknuus newspapers, informing the public of the process;
- Placement of site notices at the site; and
- Correspondence with I&APs and stakeholders and the addressing of their comments.

4.5.1 Identification & Registration of I&APs on a Database

Through networking and advertising, I&APs were registered on a database. Shangoni ensured that individuals or organisations from an institutional as well as a geographical point of view were identified.

Geographically, Shangoni focused on nearby or adjacent landowners, communities and structures that represent them. Institutionally, the focus was on those organisations or individuals that may influence policies and decisions or make a contribution to the project. Not all of these organisations were necessarily in the direct project sphere of impact.

4.5.2 Notification of key stakeholders and I&APs

Stakeholders are all the relevant Authorities and land owners that may possibly be affected by this project. The following stakeholders were identified:

Table 27: Stakeholders identified during the PPP

Name	Organisation/Farm	Postal Address	Contact details
Ms. Nelisiwe Sithole, CHP Kleynhans	Department of Agriculture, Rural Development and Land Administration	Private Bag X11219 Nelspruit 1200	Tel:013 766 6067/6068 Email: sitholenl@mpg.gov.za
Mr. David Mahlobo	Department of Co-operative Governance and Traditional Affairs	Private Bag X11304 Nelspruit 1200	Tel:013 766 6087/6675 Fax: 013 766 8441/2 Email: MahloboD@mpg.gov.za
Mr. Isaiah Khoza, Mr. ST Sibuyi	Department of Safety, Security and Liaison	Private Bag X11269 Nelspruit 1200	Tel: 013 766 4062 Fax: 013 766 4615 Email: ANMahlalela@mpg.gov.za Email:phiwe@mpg.gov.za
Ms. Sibongile Nkosi	Department of Culture, Sport and Recreation	PO Box 1243 Nelspruit 1200	Tel: 013 766 5242 Fax: 013 766 5591/8253 Email:nkosist@mpg.gov.za
Ms. Mahlasedi Mhlabane	Department of Education	Private Bag X11341 Nelspruit 1200	Tel:0800 203 116 Email: p.moosa@education.mpu.gov.za
Mr. J. Mbatha	Department of Finance	Private Bag X11205 Nelspruit 1200	Tel: 013 766 4229 Fax: 013 766 9424 Email:jbmbatha@mpg.gov.za/ echego@mpg.gov.za
Dr. Johnson Jerry Mahlangu, Mr M.R Mnisi	Department of Health and Social Development	Private Bag X11285 Nelspruit	Tel: 013 766 3429/30/28 Fax: 013 766 3458

Name	Organisation/Farm	Postal Address	Contact details
		1200	Email:pauleckm@social.mpu.gov.za Email: florencekh@social.mpu.gov.za
Mr. David Dube, Mr. S. Mstweni	Department of Human Settlements	Private Bag X11328 Nelspruit 1200	Tel: 013 766 6233 Fax: 013 766 8430 Email:apohl@mpg.gov.za
Mr. Kgopana Mathew Mohlasedi	Department of Public Works, Roads and Transport	Private Bag X11310 Nelspruit 1200	Tel: 013 766 6978/9 Fax: 013 766 8471/67 Email: kmohlasedi@mpg.gov.za
Mr. F. Mntambo, M Mahunonyane, Mr. Guma	Department of Water Affairs, Mpumalanga Regional Office	Private Bag X11259 Nelspruit 1200	Tel: 013 759 7310 Fax: 013 759 7525 Email: MahunonyaneM@dwa.gov.za Email: guma@dwa.gov.za
Madi Moloto	Department of Water Affairs	Private Bag X10580 Bronkhorstspruit 1020	Tel: 013 932 2061 Fax:013 932 2071 Email:molotom@dwa.gov.za
Mgolozeli Sinazo	Department of Water Affairs	Private Bag X10580 Bronkhorstspruit 1020	Tel: 013 932 2061 Fax:013 932 2071 Email: MgolozeliS@dwa.gov.za
Dumisane G. Hlongwane, Mogadi Maloba	Department of Water Affairs	Private Bag X10580 Bronkhorstspruit 1020	Tel: 013 932 2061 Fax: 013 932 2071 Email:hlongwaned@dwa.gov.za
Mr. Siyabonga Gama	Transnet SOC Ltd – Freight Rail	PO Box 72501	

Name	Organisation/Farm	Postal Address	Contact details
		Parkview 2122	
Ms. Yolanda Segami	Victor Khanye Local Municipality	PO Box 6 Delmas 2210	Tel: 013 665 6000 Fax:013 665 6041 Email:envirohealth@delmasmunic.co.za
Mr. Sam Lekhuleni	Victor Khanye Local Municipality	PO Box 6 Delmas 2210	Tel: 013 665 6000 Fax: 013 665 6041 Email: envirohealth@delmasmunic.co.za
Xolisile Ellias Nkosi	Victor Khanye Local Municipality	PO Box 6 Delmas 2210	Tel: 013 665 6000 Fax: 013 665 6041 Email: envirohealth@delmasmunic.co.za
Mr. T.C. Makola	Nkangala District Municipality	PO Box 437 Middelburg 1050	Tel: 013 249 2000
Mr. Mathe Boetie	Nkangala District Municipality	PO Box 437 Middelburg 1050	Tel: 013 249 2000 Email: matheb@nkangaladm.gov.za
Mr. Phillip Hine	South African Heritage Resources Agency (SAHRA)	PO Box 4637 Cape Town 8000	Tel: 021 462 4502 Fax: 021 462 4509 Email: phine@sahra.org.za
Mr. Tendo Ramagoma	National Heritage Council (NHC)	PO Box 74097 Lynnwood Ridge	Tel: 013 932 2061 Fax: 086 212 1220

Name	Organisation/Farm	Postal Address	Contact details
		Pretoria 0040	Email:P.Ramagoma@nhc.org.za
Cllr. Z.J.M. Zulu	Victor Khanye Local Municipality (Delmas) - Ward 7	PO Box 6 Delmas 2210	Fax: 013 665 6060 Email:okamageba2@gmail.com
Mr. Sonneyboy Ndhlovu	Adjacent Land Owner	PO Box 6 Delmas 2210	Tel: 013 665 6000
Omnia Fertilizer – Elizabeth Nkosi	Adjacent Land Owner – Remainder of Portion 33 of the farm Weltevreden 227 IR		
Colt Logistics – Allen Khumalo	Adjacent Land Owner – Portion 13 and 16 of the farm Weltevreden 227 IR		
Mr. Sarel Smit	Adjacent Land Owner – Portion 41 of the farm Weltevreden 227 IR		
Klinkerstene – G. Combrink	Adjacent Land Owner - Portion 41 of the farm Weltevreden 227 IR		
Mayet General Dealers - M. Mayet	Adjacent Land Owner - Portion 28 of the farm Weltevreden 227 IR		
Sunette Nel	Adjacent Land Owner - Portion 41 of the farm Weltevreden 227 IR		

Name	Organisation/Farm	Postal Address	Contact details
Johan Masonbuka	Adjacent Land Owner – Remainder of Portion 1 of the farm Weltevreden 227 IR		
Themba Mbonane	Adjacent Land Owner Remainder of Portion 1 of the farm Weltevreden 227 IR		
Bangane Ben Thahle	Adjacent Land Owner - Remainder of Portion 1 of the farm Weltevreden 227 IR		
Josephina Showane	Adjacent Land Owner - Portion 16 of the farm Weltevreden 227 IR		
Patience Ndhlovu	Adjacent Land Owner – Remainder of Portion 1 of the farm Weltevreden 227 IR	PO Box 2057 Delmas 2210	

Shangoni sent registered letters to the Departments and Organs of State containing a background information document (BID), map showing the location of the site and a stakeholder registration form. The notification letters were also sent via email as Shangoni was concerned that the road freight strike would affect postal delivery (proof is given under Appendix E). Notification letters were hand delivered to adjacent land owners. Figures 83 and 84 provide an example of the letters sent out to Departments, Organs of State and potential I&APs. Figures 85 and 86 provide proof that notification letters were sent to Departments and Organs of State. Proof that notification letters were delivered to adjacent land owners is attached under Appendix E.

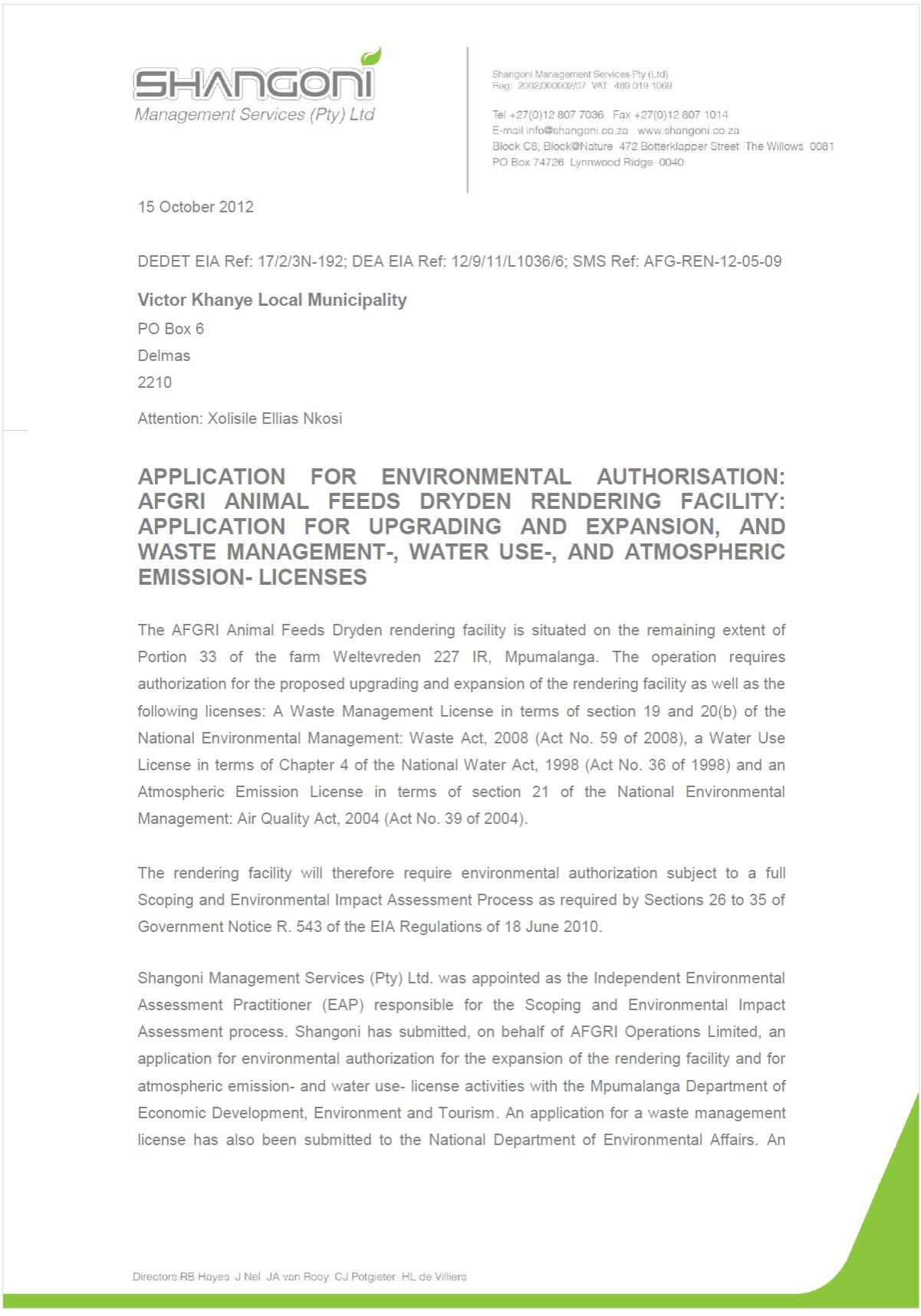
The following table provides a list of I&APs that registered and were added to the database of I&APs during the PPP.

Table 28: Registered I&APs

Name	Farm/Association	Postal Address	Contact details
JF JORDAAN INC – Mr. Koos Jordaan - on behalf of: • Mayet Family Trust • Truter Boerdery • GFP Boerdery	JF JORDAAN INC	PO Box 298 Menlyn 0063	Fax: 086 686 5187 Email: jfj@law.co.za
Mr. Tendo Ramagoma	National Heritage Council (NHC)	PO Box 74097 Lynnwood Ridge Pretoria 0040	Tel:013 932 2061 Fax:086 212 1220 Email:P.Ramagoma@nhc.org.za
Phiwe Mhlongo	Department of Community Safety, Security and Liaison	Private Bag X11269 Nelspruit 1200	Tel: 013 766 4039 Fax: 013 766 4600 Email:phiwe@mpg.gov.za
Mrs. M.O.C. Mhlabane*	Mpumalanga Department of Education	Private Bag X11341 Nelspruit 1200	Tel: 013 766 5000 Email:p.moosa@education.mpu.gov.za Fax: 013 766 5577
Mr. Philip Hine	South African Heritage Resources Agency (SAHRA)	PO Box 4637 Cape Town 8000	Tel:021 462 4502 Fax: 021 462 4509 Email:phine@sahra.org.za
Z. Lushaba	Department of Co-operative Governance and Traditional Affairs	Private Bag X11304 Nelspruit 1200	Tel: 013 766 6712

Name	Farm/Association	Postal Address	Contact details
Bridgette Manamela	Department of Water Affairs - Mpumalanga	Private Bag X11259 Nelspruit 1200	Tel: 013 932 2061 Fax: 013 932 2071 Email: manamelab@dwa.gov.za
Ms M. Maloba	Department of Water Affairs - Mpumalanga	Private Bag X11259 Nelspruit 1200	Tel: 013 932 2061 Fax: 013 932 2071 Email: malobam@dwa.gov.za

*The Mpumalanga Department of Education has requested no further participation in this application for environmental authorisation as it has no direct impact on the availability of sites for the future construction of schools.



SHANGONI
Management Services (Pty) Ltd

Shangoni Management Services Pty (Ltd)
Reg: 2002/000002/07 VAT: 489 019 1069

Tel +27(0)12 807 7036 Fax +27(0)12 807 1014
E-mail info@shangoni.co.za www.shangoni.co.za
Block C8, Block@Nature 472 Botterklapper Street The Willows 0081
PO Box 74726 Lynnwood Ridge 0040

15 October 2012

DEDET EIA Ref: 17/2/3N-192; DEA EIA Ref: 12/9/11/L1036/6; SMS Ref: AFG-REN-12-05-09

Victor Khanye Local Municipality
PO Box 6
Delmas
2210

Attention: Xolisile Ellias Nkosi

APPLICATION FOR ENVIRONMENTAL AUTHORISATION: AFGRI ANIMAL FEEDS DRYDEN RENDERING FACILITY: APPLICATION FOR UPGRADING AND EXPANSION, AND WASTE MANAGEMENT-, WATER USE-, AND ATMOSPHERIC EMISSION- LICENSES

The AFGRI Animal Feeds Dryden rendering facility is situated on the remaining extent of Portion 33 of the farm Weltevreden 227 IR, Mpumalanga. The operation requires authorization for the proposed upgrading and expansion of the rendering facility as well as the following licenses: A Waste Management License in terms of section 19 and 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), a Water Use License in terms of Chapter 4 of the National Water Act, 1998 (Act No. 36 of 1998) and an Atmospheric Emission License in terms of section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).

The rendering facility will therefore require environmental authorization subject to a full Scoping and Environmental Impact Assessment Process as required by Sections 26 to 35 of Government Notice R. 543 of the EIA Regulations of 18 June 2010.

Shangoni Management Services (Pty) Ltd. was appointed as the Independent Environmental Assessment Practitioner (EAP) responsible for the Scoping and Environmental Impact Assessment process. Shangoni has submitted, on behalf of AFGRI Operations Limited, an application for environmental authorization for the expansion of the rendering facility and for atmospheric emission- and water use- license activities with the Mpumalanga Department of Economic Development, Environment and Tourism. An application for a waste management license has also been submitted to the National Department of Environmental Affairs. An

Figure 83: Example of the notification letters sent (page 1)

atmospheric emission license application will be submitted to the relevant authority and a water use license application will be submitted to the Department of Water Affairs.

Attached please find a background information document, locality map of the site, and a stakeholder registration form in respect of the application. Should you wish to register as an Interested and Affected party for the above mentioned project, please complete the attached stakeholder registration form and send it to us before or on the **14th of November 2012.** Should you wish to not be part of this EIA process, it will be appreciated if we could receive a written confirmation thereof to enable us to continue with the application.

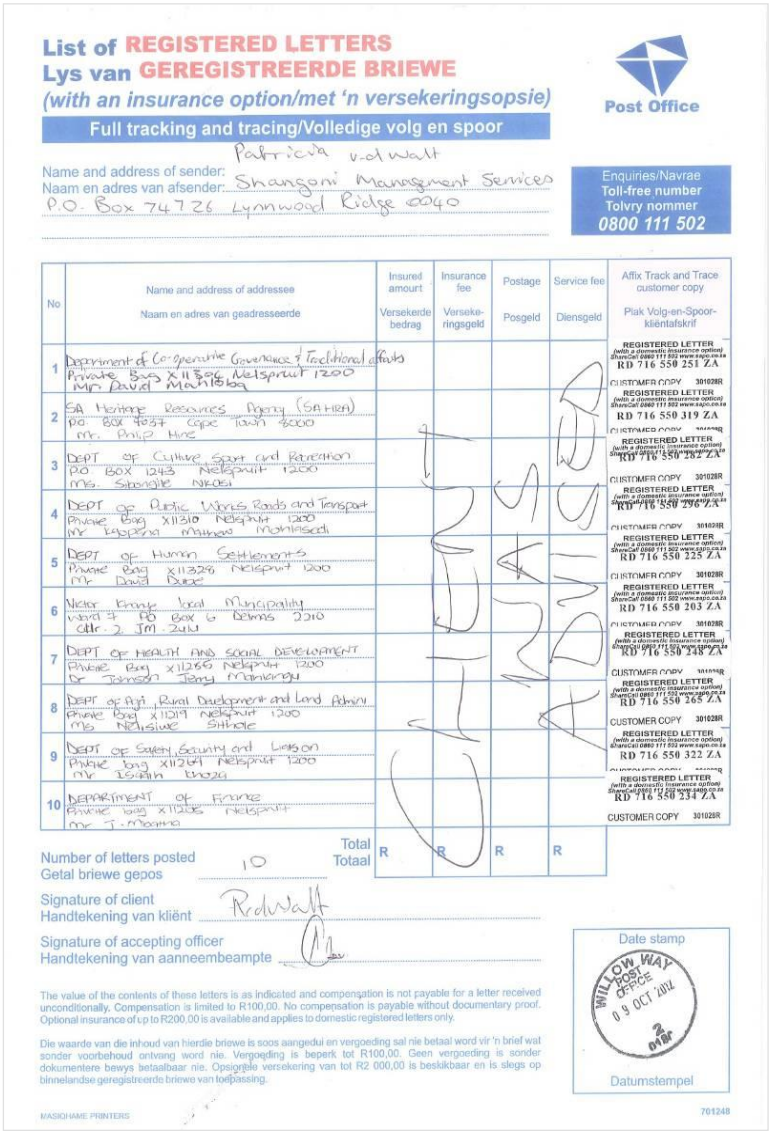
Please do not hesitate to contact the undersigned should you require any additional information.

Contact Details: Shangoni Management Services
Miss Lizette Crous
E-mail: lizette@shangoni.co.za
Cell: 071 673 3355
Fax 2 E-mail: 086 643 5360
Fax: 012 807 1014
Online Participation: Go to www.shangoni.co.za and click on Public Participation.

Yours Faithfully,

Miss Lizette Crous
Environmental Assessment Practitioner

Figure 84: Example of the notification letters sent (page 2)



List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
(with an insurance option/met 'n versekeringsopsie)
Full tracking and tracing/Volledige volg en spoor

Post Office

Name and address of sender: Patricia v.d Walt
Naam en adres van afsender: Shangoni Management Services
P.O. Box 74726 Lynnwood Ridge 0040

Enquiries/Navrae
Toll-free number
Tolvry nommer
0800 111 502

No	Name and address of addressee / Naam en adres van geadresseerde	Insured amount / Versekerde bedrag	Insurance fee / Versekeringsgeld	Postage / Posgeld	Service fee / Diensgeld	Affix Track and Trace customer copy / Plak Volg-en-Spoor-kliëntafskrif
1	Department of Co-operative Governance & Traditional affairs Private Bag X11396 Nelspruit 1200 Mr David Mahlobo					RD 716 550 251 ZA
2	SA Heritage Resources Agency (SAHRA) PO Box 4637 Cape Town 8000 Mr. Philip Hine					RD 716 550 319 ZA
3	DEPT of Culture Sport and Recreation PO Box 1243 Nelspruit 1200 Ms. Sibongile NKosi					RD 716 550 242 ZA
4	DEPT of Public Works Roads and Transport Private Bag X11310 Nelspruit 1200 Mr Kapsha Mathews Mahlaseli					RD 716 550 296 ZA
5	DEPT of Human Settlements Private Bag X11329 Nelspruit 1200 Mr David Buxe					RD 716 550 225 ZA
6	Victor Khanye local Municipality Ward 3 PO Box 6 Delmas 2210 attn: J. Jan Zulu					RD 716 550 203 ZA
7	DEPT OF HEALTH AND SOCIAL DEVELOPMENT Private Bag X11265 Nelspruit 1200 Dr Jonson Jerry Mankeroy					RD 716 550 248 ZA
8	DEPT of Agri Rural Development and Land Admin Private Bag X11219 Nelspruit 1200 Ms Nelisiwe Sithole					RD 716 550 265 ZA
9	DEPT OF Safety Security and Liaison Private bag X11269 Nelspruit 1200 Mr Isaiah Enoch					RD 716 550 322 ZA
10	DEPARTMENT OF Finance Private bag X11285 Nelspruit Mr J. Mamba					RD 716 550 234 ZA
	Total / Totaal	R	R	R	R	

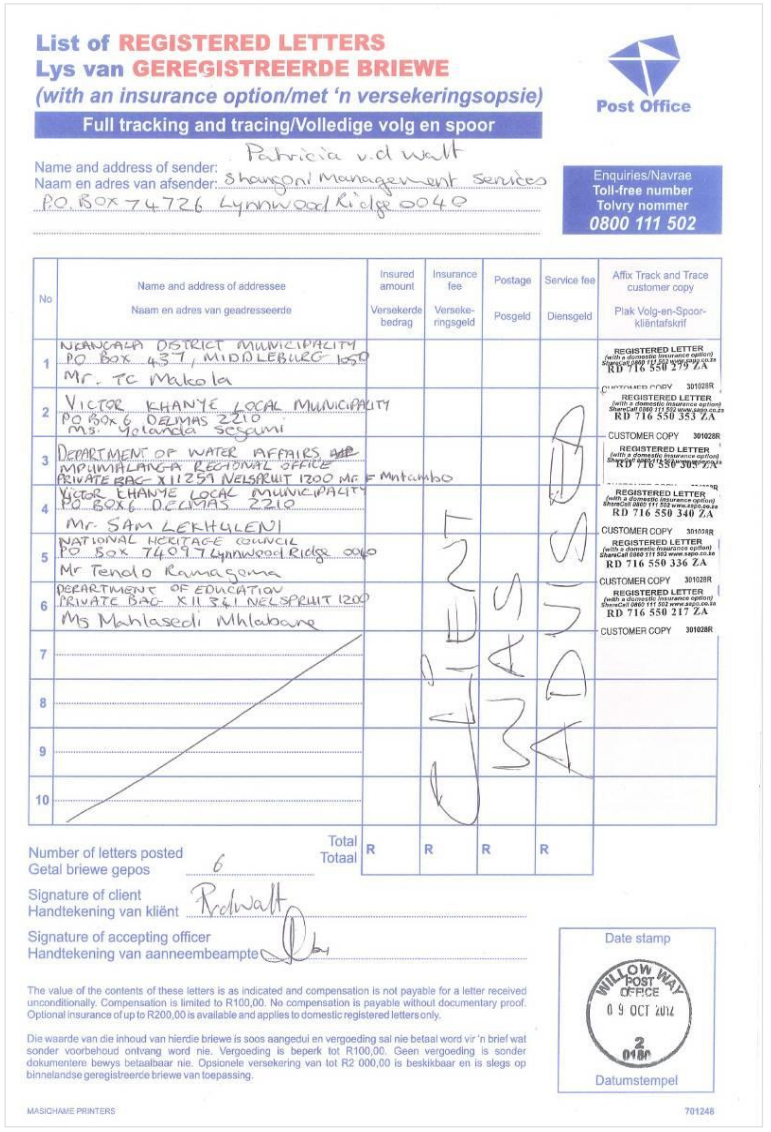
Number of letters posted / Getal briewe gepos: 10
Signature of client / Handtekening van kliënt: RdWalt
Signature of accepting officer / Handtekening van aanneembeampte:

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R200,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentere bewys betaalbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.

Date stamp / Datumstempel: WILLOW WAY POST OFFICE 09 OCT 2012

MASIOHAME PRINTERS 701248



List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
(with an insurance option/met 'n versekeringsopsie)
Full tracking and tracing/Volledige volg en spoor

Post Office

Name and address of sender: Patricia v.d Walt
Naam en adres van afsender: Shangoni Management Services
P.O. Box 74726 Lynnwood Ridge 0040

Enquiries/Navrae
Toll-free number
Tolvry nommer
0800 111 502

No	Name and address of addressee / Naam en adres van geadresseerde	Insured amount / Versekerde bedrag	Insurance fee / Versekeringsgeld	Postage / Posgeld	Service fee / Diensgeld	Affix Track and Trace customer copy / Plak Volg-en-Spoor-kliëntafskrif
1	NKANGALA DISTRICT MUNICIPALITY PO Box 437, MIDDELBURG 1050 Mr. TC Makola					RD 716 550 279 ZA
2	VICTOR KHANYE LOCAL MUNICIPALITY PO Box 6 DELMAS 2210 Ms. Yolanda Segumi					RD 716 550 353 ZA
3	DEPARTMENT OF WATER AFFAIRS MPUMALANGA REGIONAL OFFICE PRIVATE BAG X11259 NELSPRUIT 1200 Mr. Mntambo					RD 716 550 308 ZA
4	VICTOR KHANYE LOCAL MUNICIPALITY PO BOX 6 DELMAS 2210 Mr. SAM LEKHULENI					RD 716 550 340 ZA
5	NATIONAL HERITAGE COUNCIL PO Box 74097 Lynnwood Ridge 0060 Mr Tendo Ramagoma					RD 716 550 336 ZA
6	DEPARTMENT OF EDUCATION PRIVATE BAG X11341 NELSPRUIT 1200 Ms Mahlasedi Mhlabane					RD 716 550 217 ZA
7						
8						
9						
10						
	Total / Totaal	R	R	R	R	

Number of letters posted / Getal briewe gepos: 6
Signature of client / Handtekening van kliënt: RdWalt
Signature of accepting officer / Handtekening van aanneembeampte:

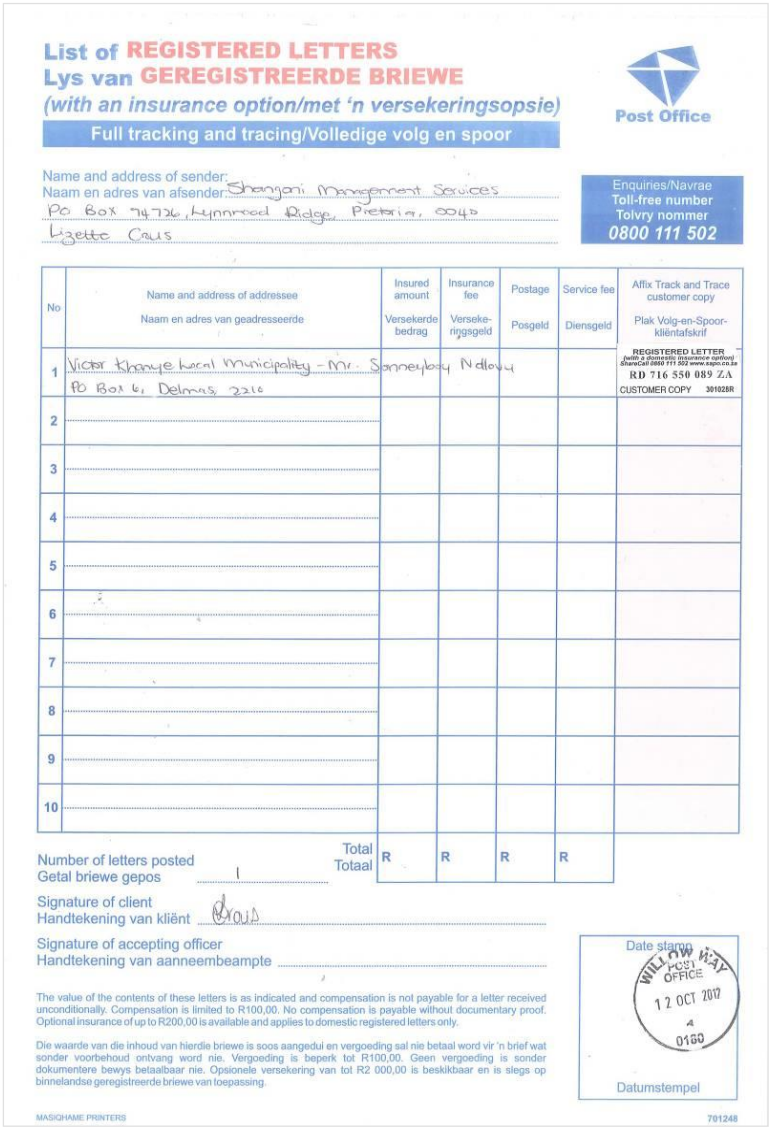
The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R200,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentere bewys betaalbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.

Date stamp / Datumstempel: WILLOW WAY POST OFFICE 09 OCT 2012

MASIOHAME PRINTERS 701248

Figure 85: Proof of postage of notification letters (pages 1 and 2)



List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
(with an insurance option/met 'n versekeringsopsie)
Full tracking and tracing/Volledige volg en spoor

Post Office

Name and address of sender:
Naam en adres van afsender: Shangoni Management Services
Po Box 74726, Lynnwood Ridge, Pretoria, 0040
Lizette Cauis

Enquiries/Navrae
Toll-free number
Tolvry nommer
0800 111 502

No	Name and address of addressee / Naam en adres van geadresseerde	Insured amount / Versekerde bedrag	Insurance fee / Versekeringsgeld	Postage / Posgeld	Service fee / Diensgeld	Affix Track and Trace customer copy / Plak Volg-en-Spoor-kliëntafskrif
1	Victor Khanye local Municipality - Mr. Sonnyboy Ndlovu PO Box 61, Delmas, 2210					REGISTERED LETTER RD 716 550 089 ZA CUSTOMER COPY 301028R
2						
3						
4						
5						
6						
7						
8						
9						
10						
	Total / Totaal	R	R	R	R	

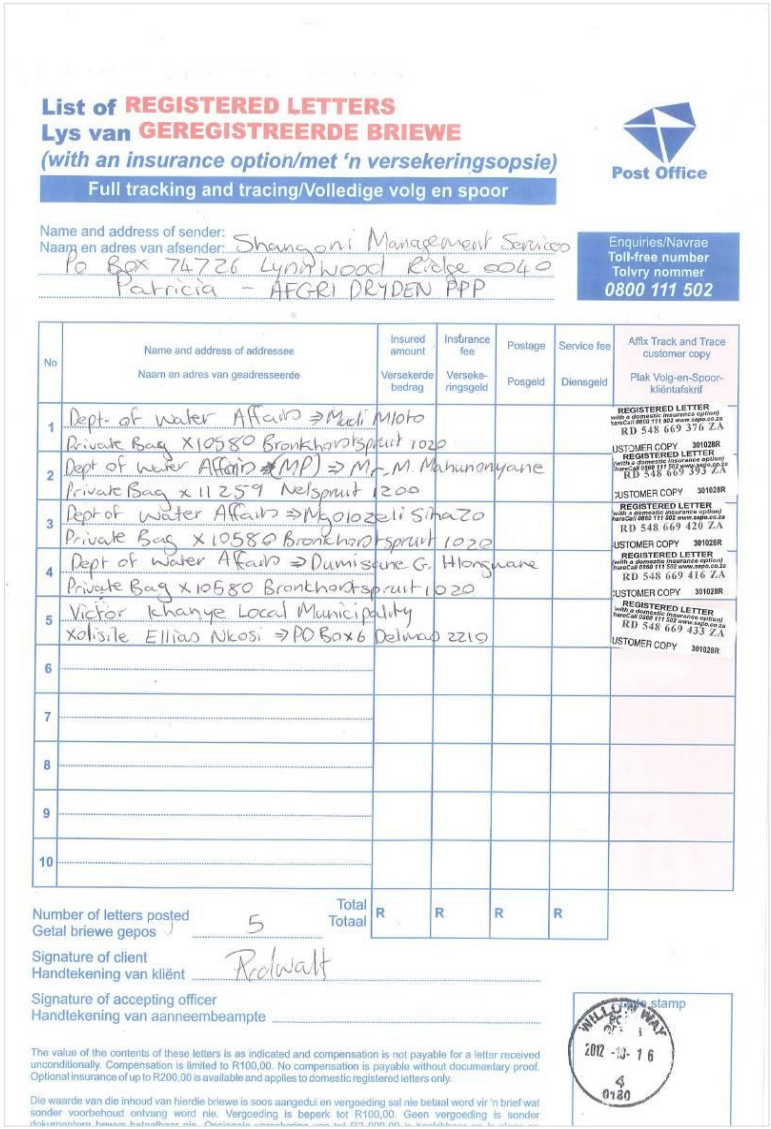
Number of letters posted / Getal briewe gepos: 1
Signature of client / Handtekening van kliënt: Grous
Signature of accepting officer / Handtekening van aanneembeampte:

Date stamp / Datumstempel: WILLOW WAY POST OFFICE 12 OCT 2017 4 0160

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R200,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentere bewys betaalbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.

MASIQHAME PRINTERS 701248



List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
(with an insurance option/met 'n versekeringsopsie)
Full tracking and tracing/Volledige volg en spoor

Post Office

Name and address of sender:
Naam en adres van afsender: Shangoni Management Services
Po Box 74726 Lynnwood Ridge 0040
Patricia - AFGRI DRYDEN PPP

Enquiries/Navrae
Toll-free number
Tolvry nommer
0800 111 502

No	Name and address of addressee / Naam en adres van geadresseerde	Insured amount / Versekerde bedrag	Insurance fee / Versekeringsgeld	Postage / Posgeld	Service fee / Diensgeld	Affix Track and Trace customer copy / Plak Volg-en-Spoor-kliëntafskrif
1	Dept of Water Affairs ⇒ Mudi Mjoto Private Bag X10580 Bronkhorstspruit 1020					REGISTERED LETTER RD 548 669 376 ZA CUSTOMER COPY 301028R
2	Dept of Water Affairs (MP) ⇒ Mr M. Mahunanyane Private Bag x11259 Nelspruit 1200					REGISTERED LETTER RD 548 669 393 ZA CUSTOMER COPY 301028R
3	Dept of Water Affairs ⇒ Mgolozeli Sihazo Private Bag x10580 Bronkhorstspruit 1020					REGISTERED LETTER RD 548 669 420 ZA CUSTOMER COPY 301028R
4	Dept of Water Affairs ⇒ Dumisane G. Hlongwane Private Bag x10580 Bronkhorstspruit 1020					REGISTERED LETTER RD 548 669 416 ZA CUSTOMER COPY 301028R
5	Victor Khanye Local Municipality Xolisile Ellias Nkosi ⇒ PO Box 6 Delmas 2210					REGISTERED LETTER RD 548 669 433 ZA CUSTOMER COPY 301028R
6						
7						
8						
9						
10						
	Total / Totaal	R	R	R	R	

Number of letters posted / Getal briewe gepos: 5
Signature of client / Handtekening van kliënt: Redwalt
Signature of accepting officer / Handtekening van aanneembeampte:

Date stamp: WILLOW WAY POST OFFICE 2012 -10- 16 4 0180

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R200,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder

Figure 86: Proof of postage of notification letters (pages 3 and 4)

4.5.3 Comments obtained during the public participation phase

Table 29: Comments received

Raised by	Date	Issue / Comment / Concern
NHC - Mr. Tendo Ramagoma	25-10-2012	**RE: NOTIFICATION OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION** Received with thanks. Here is my preliminary reply to this and many other applications that you had forwarded us for which we could not respond at the time. On the phase of it, we may not be the right authority from whom you should solicit comment. I suspect the South African Heritage Authority (SAHRA) established in terms of the National Heritage Resources (NHR) Act, 1999 (Act No. 25 of 1999) based in Cape Town with regional officers and/or Provincial Heritage Authority within your area of jurisdiction (Province) in which the property for which the activity requiring environmental or heritage impact assessment may be required and is situated is the most relevant authority to grant the necessary permit(s). SAHRA deals with tangible heritage in terms of the NHR Act whereas as NHC, we deal with intangible heritage as per our mandate outlined in the National Heritage Council Act, 1999 (Act No. 11 of 1999). Please apply through hereto and see if SAHRA is not your best bet in the circumstances. However, should you still need our assistance and/or advice, we would be happy to proffer same. Trusting the above does assist somehow albeit from a legal advisory point of view.
Mpumalanga Department of Community Safety, Security and Liaison – Phiwe Mhlongo	29-10-2012	**RE: Notification of an application for environment authorisation** We acknowledge receipt of the e-mail and the contents therein, we wish to state that our Department has no objection to the application being made particularly because it is our sister Departments that deals with such applications and not ours. Kindly change the addressee in future to Mr. ST. SIBUYI.

Raised by	Date	Issue / Comment / Concern
Mpumalanga Department of Education – Mrs. M.O.C. Mhlabane	05-11-2012	APPLICATION FOR ENVIRONMENTAL AUTHORISATION – AFGRI ANIMAL FEEDS DRYDEN RENDERING FACILITY; APPLICATION FOR UPGRADING AND EXPANSION AND WASTE MANAGEMENT-, WATER USE-, AND ATMOSPHERIC EMISSION LICENSES A communiqué on the abovementioned instance dated 9 October 2012 refers. The Department has no objection around the proposed expansion and upgrading existing facilities including the waste management, water use and atmospheric emission licenses. The Company must however comply with existing prescripts related to atmospheric emissions. The Department requests no further participation in this application as it has no direct impact on the availability if sites for the future construction of schools.
SAHRA – Mr. Philip Hine	08-11-2012	Ref: 9/2/219/0001 In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999) BACKGROUND INFORMATION DOCUMENT: PUBLIC NOTICE OF ENVIRONMENT AUTHORISATION: AFGRI ANIMAL FEEDS DRYDEN RENDERING FACILITY: APPLICATION FOR EXPANSION AND WASTE MANAGEMENT-, WATER USE -, AND ATMOSPHERE EMISSION- LICENCES Thank you for your indication that development is to take place in this area. In terms of the National Heritage Resources Act (NHRA), no 25 of 1999, heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are protected.

Raised by	Date	Issue / Comment / Concern
		They may not be disturbed without a permit from the relevant heritage resources authority. This means that before such sites are disturbed by development it is incumbent on the developer (or mine) to ensure that a Heritage Impact Assessment is done. This must include the archaeological component (Phase 1) and any other applicable heritage components. Appropriate (Phase 2) mitigation, which involves recording, sampling and dating sites that are to be destroyed, must be done as required. **Decision:** Since this development will likely not impact on any heritage resources no further action is required in terms of section 38 of the National Heritage Resources Act (Act 25 of 1999). However, if any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, and charcoal/ash concentrations), unmarked human burials, fossils or other categories of heritage resources are found during construction, SAHRA APM Unit (Mrs Colette Scheermeyer/Mr Philip Hine, tel: 021 462 4502) must be alerted immediately, and a professional archaeologist or palaeontologist according to the nature of the findings, must be contacted as soon as possible. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance a Phase 2 rescue operation might be necessary. Should you have any further queries, please contact the designated official using the case number quoted above in the case header.
JF JORDAAN INC on behalf of: • Mayet Family Trust • Truter Boerdery	12-01-2013	**RE: PROPOSED NEW DEVELOPMENT AT DRYDEN SITE** Our clients have informed us on several occasions of an unbearable stench that arises from the chicken processing plant. It is uncertain whether the plant is defective or alternatively is being used over capacity. You must please ensure than these occurrences are stopped and future occurrences prevented at all costs.

Raised by	Date	Issue / Comment / Concern
• GFP Boerdery		Should this occurrence persist our clients will have no other option but to approach the courts for the appropriate relief. We trust that this will not be necessary and look forward to your cooperation and assistance in this regard.
Mpumalanga Department of Co-operative Governance and Traditional Affairs – Z. Lushaba	07-10-2013	**SUBJECT: COMMENTS ON THE DRAFT SCOPING REPORT – AFGRI ANIMAL FEEDS DRYDEN RENDERING FACILITY: WASTE MANAGEMENT LICENSE APPLICATION – VICTOR KHANYE LOCAL MUNICIPALITY – MPUMALANGA** We would hereby like to thank you for affording our Department the opportunity to comment on the draft scoping report that forms part of the waste management license application. Our department perused the documents sent to us on 16 August 2013. **1. APPLICATION** Application is made to the Department of Economic Development, Tourism and Environmental Affairs by Shangoni Management Services (Pty) Limited (independent environmental practitioner) to assist the applicant (AFGI Operation Limited) in complying with the 2010 EIA Regulations in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the National Environmental Management Waste Act, 2008 (Act No. 59 of 2008). Application is made for a waste management license for activities occurring at the AFGRI Animal Feeds Dryden rendering facility situated on the remaining extent of Portion 33 of the farm Weltevreden 227 IR, approximately 7km north-east of Delmas. **2. POLICY ALIGMENT** **Spatial Development Framework (SDF)**

Raised by	Date	Issue / Comment / Concern
		The Victor Khanye Local Municipality has developed a Spatial Development Framework (SDF) to guide future growth and development (land use) within its area of jurisdiction. According to the SDF, the application site located on the periphery of an area earmarked "N12 Development Corridor". *"The concept of the N12 corridor seeks to take advantage of the Gold Reef Band (Benoni, Boksburg, Germiston and Johannesburg) as well as linking to Witbank on the Maputo development corridor. In the main this corridor will be characterised by commercial activities mixed land use and tourist facilities in the form of bed and breakfast and maybe a hotel. It will also include* ***agricultural and agro-processing activities****".* The proposed development seems to be in line with the future proposals of the municipality. **3. CONCLUSION AND RECOMMENDATIONS** In view of the above deliberation, our department supports the development, subject to the following conditions: • An application to obtain land use rights for the activities occurring (existing and proposed) at the AFGRI Animal feeds Dryden rendering facility (in terms of their Land Use Scheme), must be submitted to Victor Khanye Local Municipality. • All mitigation measures proposed in the Scoping Report and recommendations made in specialist studies should be strictly adhered to by the applicant and local municipality.
Department of Water Affairs – Mpumalanga – Bridgette Manamela	18-11-2013	**FINAL SCOPING FOR AFGRI ANIMAL FEEDS DRYDEN RENDERING FACILITY: APPLICATION FOR UPGRADING, EXPANSION AND LICENSING** The Department acknowledges receipt of the abovementioned report submitted by Shangoni Management Services (Pty) Ltd under a cover dated August 2013 for scoping report for AFGRI animal feeds Dryden rendering facility:

Raised by	Date	Issue / Comment / Concern
		application for upgrading, expansion and licensing. The Department of Water Affairs (DWA) has evaluated the abovementioned report and wish to comment as follows: 1. The Applicant shall conduct a preliminary legal assessment to identify all the water use activities associated with the proposed development project that will require authorisation by the DWA and shall note that in terms of section 22(1) of the National Water Act, 1998 (Act No.36 of 1998), "*A person may only use water-* *a) without a licence-* *I. If that water use is permissible under Schedule 1;* *II. If that water use is permissible as a continuation of an existing lawful use; or* *III. If that water use is permissible in terms of general authorisation issued under section 39;* *b) If the water use is authorised by a licence under this Act; or* c) *If the responsible authority has dispensed with a licence requirement under subsection (*3)". 2. Therefore any other water use related activities as outlined in section 21 of the National Water Act, 1998 (Act No. 36 of 1998) associated with the proposed development project that are not permissible as indicated on paragraph 1 above shall have to be authorized by the DWA prior to such water use activities taking place. 3. The Applicant is requested to liaise with the DWA for guidance on the requirements for water use authorization for the water use activities associated with the proposed project. 4. **Flood-lines:** The map of location of the proposed project showing the 1:100 year flood-line in terms of section 144 of the National Water Act, 1998 (Act No. 36 of 1998) shall be submitted to the DWA. 5. **Sanitation:** Please indicate the type of sanitation to be used during and after the operational phase of the proposed development. 6. **Stormwater management:** The applicant must ensure that stormwater is diverted away from any activities occurring around the proposed project and the stormwater leaving this area must not be contaminated by any substance, whether that substance is a solid, liquid, vapour or any combination thereof. The soil must be

Raised by	Date	Issue / Comment / Concern
		stabilised in order to prevent the resulting wash downs into any water resources and where possible rehabilitation of the disturbed areas must be effected. 7. **Waste:** The Applicant must note that domestic and hazardous waste generated on site must be taken to a relevant and permitted landfill site in such a manner not to cause any nuisance or secondary pollution. The applicant will be expected to provide the Department with a letter of consent from the Local Municipality confirming that there will be enough capacity at the waste site to accommodate additional waste. 8. **Storage of oil, diesel, hydraulic fluids and grease:** It is recommended that the storage of these fluids be banded with cement and in such a manner that any spillages can be contained and reclaimed without causing any pollution to the ground and surface water resources. 9. **Dust:** The Applicant is requested to provide the Department with the source, quality and estimated quantity of the water that will be used for dust suppression during the developmental phase of the proposed project. 10. **Wetlands:** Based on the information at hand (refer to Figure 1-1), It is clear that this activity will take place within the extent of a watercourse (the area within the 1:100 year flood line or delineated riparian habitat, whichever is the greatest, and/or within a 500m radius from the boundary of a wetland). There are several water bodies such as dams and pans present in the vicinity of the ash disposal site and therefore a Water Use Licence must be applied for in terms of section 21 (c) and (i) water uses. Refer to item 3.4 on page 13. The exact distance of the ash disposal facility from the affected water resources are not specified, and must be specified. 11. Attached to this letter is the Environmental Impact Assessment (EIA) checklist which will assist you in reviewing this scoping report and to verify the information and technical requirements that should be included. 12. Please refer to the information below for a summary of the outstanding that must be submitted for this Water Use License Application (WULA): a) License application forms in terms of section 21 (c) and (i) water uses for all proposed activities and infrastructure (should these activities be within the extent of a water course). b) Section 21 (c) and (i) water uses Supplementary Information Questionnaire.

Raised by	Date	Issue / Comment / Concern
		c) Master Plan layout of activity and construction site relating to the wetland and the affected watercourse showing where the engineering infrastructure will be located. d) Report and design drawings signed and ESCA registration. e) Method statement. f) Environmental Impact Assessment. g) Wetland delineation assessment (functionality and sensitivity must be addressed). h) Storm water management plan. i) Environmental Management Plan. j) Rehabilitation plan for the watercourses affected. k) Monitoring programme for the wetland and watercourses. l) Geotechnical Study. 13. **Pollution incidents:** The Applicant shall further note in terms of section 19(1) of the National Water Act, 1998 (Act No. 36 of 1998), it is stated that *"An owner of land, a person in control of land or a person who occupies or uses the land on which- (a) any activity or process is or was performed or undertaken; or (b) any other situation exists, which causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring"*. Any pollution incident (s) originating from the proposed development project shall be reported to the Regional Office of the DWA within 24 hours. Please do not hesitate to contact the DWA Regional Office should you have any queries.

4.5.4 EAP's responses to comments received

Table 30: EAP's responses

Raised by	Date	Response
Mr. Tendo Ramagoma - NHC	25-10-2012	Comments acknowledged and noted.
Mpumalanga Department of Community Safety, Security and Liaison – Phiwe Mhlongo	29-10-2012	Comments acknowledged and noted. The comments will be included in the Scoping and Environmental Impact Assessment reports for this project.
Mpumalanga Department of Education	05-11-2012	Comments acknowledged and noted. The comments will be included in the Scoping and Environmental Impact Assessment reports for this project. Notice is taken of the Department's request to be excluded from further participation for this project.
SAHRA – Mr. Philip Hine	08-11-2012	Comments acknowledged and noted. The comments will be included in the Scoping and Environmental Impact Assessment reports for this project.
JF JORDAAN INC on behalf of: • Mayet Family Trust • Truter Boerdery • GFP Boerdery	12-01-2013	**Initial response from Shangoni** I hereby confirm receipt of your letter dated 14 January 2013. The comments contained in your letter will be incorporated into our Environmental Impact reports and have also been forwarded to the applicant. **Response from the applicant** <u>PROPOSED NEW DEVELOPMENT AT DRYDEN SITE</u> 1. We refer to the above matter as well as your letter dated 14 January 2012. 2. In response to your clients concerns, we would like to assure you that rendering plant at Dryden is operating well within its capacity. 3. Between certain of your client's locations and the rendering plant there are grain silos that act as a large venturi when the wind is blowing from a north westerly direction. This tends to concentrate the odours as they pass through the gaps in the silos. However as part of the proposed upgrade to the

Raised by	Date	Response
		facility we will be investigating the use of appropriate technologies to reduce odours created during the sterilisation process. 4. A number of steps have already been taken to ensure that the odours are contained to reasonable limits; these include biological and mechanical installations as well as changes to the way product is brought onto the site from the poultry abattoirs. We are doing our utmost to bring in and process all raw poultry by-products as fresh as possible to reduce odours. Please be assured of our commitment to work with the community to improve the current situation. 5. As you will note from the above we are continuously exploring the possibilities and options available to improve the odours. 6. We trust that you find the above in order. **Second response from Shangoni** A new odour abatement system will be installed at the existing rendering plant as well as the proposed, new plant. This system will consist of an air cooled condenser with ozone treatment at the system outlet. It is believed that this system will mitigate the odours generated at the rendering facility to acceptable levels.
Mpumalanga Department of Co-operative Governance and Traditional Affairs – Z. Lushaba	07-10-2013	**Initial response from Shangoni** Comments have been noted and forwarded to the applicant. An application for re-zoning of the property to "Industrial 1" is being compiled and will be submitted to the Victor Khanye Local Municipality is due course. **Second response from Shangoni** An application for re-zoning of the property to "Industrial 1" was submitted to the Victor Khanye Local Municipality on the 17th of January 2014. **Third response from Shangoni**

Raised by	Date	Response
		On the 16th of July 2014, the Victor Khanye Local Municipality resolved per item B01/06/2014 that the application for the rezoning of the Remainder of Portion 33 of the farm Weltevreden 227 IR, from "Agriculture" to "Industrial 1" with the inclusion of a rendering plant be approved subject to the conditions from the Department of Water Affairs.
Department of Water Affairs – Mpumalanga – Bridgette Manamela	18-11-2013	The Department's comments are noted and are responded to as follows: 1. A legal assessment has been conducted by Shangoni Management Services and a Water Use License Application was submitted to the Department of Water Affairs on the 22nd of January 2014 for the following water uses requiring registration and/or licensing at the Dryden rendering facility: • Section 21(a): Taking water from a water resource; • Section 21(c): Impeding or diverting the flow of water in a watercourse; • Section 21(f): Discharge of waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit; • Section 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource; and • Section 21(i): Altering the bed, banks, course or characteristics of a watercourse. 2. Comments noted and a Water Use License application was submitted to the Department of Water Affairs on the 22nd of January 2014. 3. Comments noted. A meeting was held with the Department of Water Affairs on the 7th of September 2012. 4. SCIP Engineering Group assessed the property and found that the property does not lie in any floodline area. A letter from SCIP Engineering Group confirming the above is attached under Appendix D. 5. A french drain has historically been in use at the rendering facility and will continue to be used for sanitation on site.

Raised by	Date	Response
		6. A Stormwater Management Plan has been compiled for the rendering plant and is attached under Appendix D. The Stormwater Management Plan will be implemented by the applicant and will ensure effective separation of clean and affected stormwater and prevent affected stormwater from the rendering facility from entering the environment surrounding the rendering facility. Soil stabilising measures to be implemented are given in this report under Section 7.5 and also in the draft Environmental Management Programme attached under Addendum A. A Rehabilitation Plan for the watercourses is attached under Appendix D. 7. The applicant has sent an enquiry to the Victor Khanye Local Municipality to verify whether sufficient capacity will be available at the local landfill site for additional waste that will be generated at the rendering facility during the construction and operational phase of the second rendering plant. No response has been received from the municipality as yet. 8. Diesel is stored in a 23 000l above-ground diesel storage tank that is bunded, as shown below.  9. Water for dust suppression during the construction phase of the proposed project will be obtained from the one existing borehole on site. It is estimated that 5 000 litres of groundwater will be used for dust suppression per day during the construction phase. The quality of the water has been tested at a SANAS accredited testing laboratory and is given in the Geohydrological Report attached under

Raised by	Date	Response
		Appendix D. The water quality from the on-site borehole (AFRBH01) is given on page 61 of the Geohydrological Report as well as in Table 15 of this report. 10. A Water Use License Application was submitted to the Department of Water Affairs on the 22nd of January 2014. This application included the Section 21(c) and Section 21(i) water uses. There is no ash disposal facility at the rendering plant. Boiler ash has historically been stored on site, but this practise will no longer be continued. The boiler ash generated at the rendering facility has been classified according to the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008): National Norms and Standards for the Assessment of Waste for Landfill Disposal (Government Gazette No. 36784 of 23 August 2013). The boiler ash was found to have a *Type 3* classification. Type 3 wastes may be disposed of at a Class C landfill designed in accordance with sections 3(1) and (2) of the Norms and Standards or at a landfill site designated in accordance with the requirements for a GLB+ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd Ed., DWAF, 1998). The boiler ash will be disposed of according to the above. A letter confirming the classification of the boiler ash is attached under Appendix F. 11. No EIA checklist accompanied the letter from the Department of Water Affairs, dated 8 November 2013. 12. Comments noted. a) License application forms were submitted to the Department of Water Affairs as part of the Water Use License Application on the 22nd of January 2014. b) The Supplementary Information Questionnaire for Section 21(c) and (i) water uses was submitted to the Department of Water Affairs as part of the Water Use License Application on the 22nd of January 2014. c) The Master Plan layout was submitted to the Department of Water Affairs as part of the Water Use License Application on the 22nd of January 2014.

Raised by	Date	Response
		d) Design drawings signed by an ESCA registered engineer will be finalised before the construction phase of the project commences. e) The project description is given in Chapter 2 and 3 of the Integrated Water and Waste Management Plan submitted to the Department of Water Affairs as part of the Water Use License Application on the 22nd of January 2014. Please also refer to the rendering plant designs attached under Appendix C of this report. f) The draft Environmental Impact Assessment Report has become this final Environmental Impact Assessment Report after the draft report had proceeded through the required public review period as stipulated in the EIA Regulations of 18 June 2010. g) A Wetland Delineation and Assessment has been conducted and the report is attached under Appendix D. h) A Stormwater Management Plan has been compiled for the rendering facility and is attached under Appendix D. i) The draft Environmental Management Plan/Programme is attached under Addendum A. j) A Rehabilitation Plan for the watercourses is attached under Appendix D. k) A Monitoring Programme for the wetland and watercourses has been compiled and is attached under Appendix D. l) A Geotechnical Investigation/Study will be conducted before construction of the second rendering plant commences. 13. Comments noted.

4.5.5 Comments and Response Report

Comments and concerns received from I&APs were incorporated into a Comments and Responses Report, which is given in the table and under Appendix E.

Table 31: Comments and response report.

Raised by	Date	Issue / Comment / Concern	Response
Mr. Tendo Ramagoma - NHC	25-10-2012	**RE: NOTIFICATION OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION** Received with thanks. Here is my preliminary reply to this and many other applications that you had forwarded us for which we could not respond at the time. On the phase of it, we may not be the right authority from whom you should solicit comment. I suspect the South African Heritage Authority (SAHRA) established in terms of the National Heritage Resources (NHR) Act, 1999 (Act No. 25 of 1999) based in Cape Town with regional officers and/or Provincial Heritage Authority within your area of jurisdiction (Province) in which the property for which the activity requiring environmental or heritage impact assessment may be required and is situated is the most relevant authority to grant the necessary permit(s). SAHRA deals with tangible heritage in terms of the NHR Act whereas as NHC, we deal with intangible heritage as per our mandate outlined in the National Heritage Council Act, 1999 (Act No. 11 of 1999). Please apply through hereto and see if SAHRA is not your best bet in the circumstances. However, should you still need our assistance and/or advice, we would be happy to proffer same.	Comments acknowledged and noted.

Raised by	Date	Issue / Comment / Concern	Response
		Trusting the above does assist somehow albeit from a legal advisory point of view.	
Mpumalanga Department of Community Safety, Security and Liaison – Phiwe Mhlongo	29-10-2012	**RE: Notification of an application for environment authorisation** We acknowledge receipt of the e-mail and the contents therein, we wish to state that our Department has no objection to the application being made particularly because it is our sister Departments that deals with such applications and not ours. Kindly change the addressee in future to Mr. ST. SIBUYI.	Comments acknowledged and noted. The comments will be included in the Scoping and Environmental Impact Assessment reports for this project.
Mpumalanga Department of Education	05-11-2012	APPLICATION FOR ENVIRONMENTAL AUTHORISATION – AFGRI ANIMAL FEEDS DRYDEN RENDERING FACILITY; APPLICATION FOR UPGRADING AND EXPANSION AND WASTE MANAGEMENT-, WATER USE-, AND ATMOSPHERIC EMISSION LICENSES A communiqué on the abovementioned instance dated 9 October 2012 refers. The Department has no objection around the proposed expansion and upgrading existing facilities including the waste management, water use and atmospheric emission	Comments acknowledged and noted. The comments will be included in the Scoping and Environmental Impact Assessment reports for this project. Notice is taken of the Department's request to be excluded from further participation for this project.

Raised by	Date	Issue / Comment / Concern	Response
		licenses. The Company must however comply with existing prescripts related to atmospheric emissions. The Department requests no further participation in this application as it has no direct impact on the availability if sites for the future construction of schools.	
SAHRA – Mr. Philip Hine	08-11-2012	Ref: 9/2/219/0001 In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999) BACKGROUND INFORMATION DOCUMENT: PUBLIC NOTICE OF ENVIRONMENT AUTHORISATION: AFRI ANIMAL FEEDS DRYDEN RENDERING FACILITY: APPLICATION FOR EXPANSION AND WASTE MANAGEMENT-, WATER USE -, AND ATMOSPHERE EMISSION- LICENCES Thank you for your indication that development is to take place in this area. In terms of the National Heritage Resources Act (NHRA), no 25 of 1999, heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are protected. They	Comments acknowledged and noted. The comments will be included in the Scoping and Environmental Impact Assessment reports for this project.

Raised by	Date	Issue / Comment / Concern	Response
		may not be disturbed without a permit from the relevant heritage resources authority. This means that before such sites are disturbed by development it is incumbent on the developer (or mine) to ensure that a Heritage Impact Assessment is done. This must include the archaeological component (Phase 1) and any other applicable heritage components. Appropriate (Phase 2) mitigation, which involves recording, sampling and dating sites that are to be destroyed, must be done as required. **Decision:** Since this development will likely not impact on any heritage resources no further action is required in terms of section 38 of the National Heritage Resources Act (Act 25 of 1999). However, if any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, and charcoal/ash concentrations), unmarked human burials, fossils or other categories of heritage resources are found during construction, SAHRA APM Unit (Mrs Colette Scheermeyer/Mr Philip Hine, tel: 021 462 4502) must be alerted immediately, and a professional archaeologist or palaeontologist according to the nature of the findings, must be contacted as soon as possible. If the newly discovered	

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		heritage resources prove to be of archaeological or palaeontological significance a Phase 2 rescue operation might be necessary. Should you have any further queries, please contact the designated official using the case number quoted above in the case header.	
JF JORDAAN INC on behalf of: • Mayet Family Trust • Truter Boerdery • GFP Boerdery	14-01-2013	**RE: PROPOSED NEW DEVELOPMENT AT DRYDEN SITE** Our clients have informed us on several occasions of an unbearable stench that arises from the chicken processing plant. It is uncertain whether the plant is defective or alternatively is being used over capacity. You must please ensure than these occurrences are stopped and future occurrences prevented at all costs. Should this occurrence persist our clients will have no other option but to approach the courts for the appropriate relief. We trust that this will not be necessary and look forward to your cooperation and assistance in this regard.	**Initial response from Shangoni** I hereby confirm receipt of your letter dated 14 January 2013. The comments contained in your letter will be incorporated into our Environmental Impact reports and have also been forwarded to the applicant. **Response from the applicant** <u>PROPOSED NEW DEVELOPMENT AT DRYDEN SITE</u> 1. We refer to the above matter as well as your letter dated 14 January 2012. 2. In response to your clients concerns, we would like to assure you that rendering plant at Dryden is operating well within its capacity. 3. Between certain of your client's locations and the rendering plant there are grain silos that act as a large venturi when the wind is blowing from a north westerly direction. This tends to concentrate the odours as they

Raised by	Date	Issue / Comment / Concern	Response
			pass through the gaps in the silos. However as part of the proposed upgrade to the facility we will be investigating the use of appropriate technologies to reduce odours created during the sterilisation process. 4. A number of steps have already been taken to ensure that the odours are contained to reasonable limits; these include biological and mechanical installations as well as changes to the way product is brought onto the site from the poultry abattoirs. We are doing our utmost to bring in and process all raw poultry by-products as fresh as possible to reduce odours. Please be assured of our commitment to work with the community to improve the current situation. 5. As you will note from the above we are continuously exploring the possibilities and options available to improve the odours. 6. We trust that you find the above in order. **Second response from Shangoni** A new odour abatement system will be installed at the existing rendering plant as well as the proposed, new plant. This system will consist of an air cooled condenser with ozone treatment at the system outlet. It is believed that this system will mitigate the odours generated at the rendering facility to acceptable levels.

Raised by	Date	Issue / Comment / Concern	Response
Mpumalanga Department of Co-operative Governance and Traditional Affairs – Z. Lushaba	07-10-2013	**SUBJECT: COMMENTS ON THE DRAFT SCOPING REPORT – AFGRI ANIMAL FEEDS DRYDEN RENDERING FACILITY: WASTE MANAGEMENT LICENSE APPLICATION – VICTOR KHANYE LOCAL MUNICIPALITY – MPUMALANGA** We would hereby like to thank you for affording our Department the opportunity to comment on the draft scoping report that forms part of the waste management license application. Our department perused the documents sent to us on 16 August 2013. **1. APPLICATION** Application is made to the Department of Economic Development, Tourism and Environmental Affairs by Shangoni Management Services (Pty) Limited (independent environmental practitioner) to assist the applicant (AFGI Operation Limited) in complying with the 2010 EIA Regulations in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the National Environmental Management Waste Act, 2008 (Act No. 59 of 2008). Application is made for a waste management license for activities occurring at the AFGRI Animal Feeds Dryden	**Initial response from Shangoni** Comments have been noted and forwarded to the applicant. An application for re-zoning of the property to “Industrial 1” is being compiled and will be submitted to the Victor Khanye Local Municipality is due course. **Second response from Shangoni** An application for re-zoning of the property to “Industrial 1” was submitted to the Victor Khanye Local Municipality on the 17th of January 2014. **Third response from Shangoni** On the 16th of July 2014, the Victor Khanye Local Municipality resolved per item B01/06/2014 that the application for the rezoning of the Remainder of Portion 33 of the farm Weltevreden 227 IR, from “Agriculture” to “Industrial 1” with the inclusion of a rendering plant be approved subject to the conditions from the Department of Water Affairs.

Raised by	Date	Issue / Comment / Concern	Response
		rendering facility situated on the remaining extent of Portion 33 of the farm Weltevreden 227 IR, approximately 7km north-east of Delmas. **2. POLICY ALIGMENT** **Spatial Development Framework (SDF)** The Victor Khanye Local Municipality has developed a Spatial Development Framework (SDF) to guide future growth and development (land use) within its area of jurisdiction. According to the SDF, the application site located on the periphery of an area earmarked "N12 Development Corridor". *"The concept of the N12 corridor seeks to take advantage of the Gold Reef Band (Benoni, Boksburg, Germiston and Johannesburg) as well as linking to Witbank on the Maputo development corridor. In the main this corridor will be characterised by commercial activities mixed land use and tourist facilities in the form of bed and breakfast and maybe a hotel. It will also include* ***agricultural and agro-processing activities****".* The proposed development seems to be in line with the future proposals of the municipality.	

Raised by	Date	Issue / Comment / Concern	Response
		3. CONCLUSION AND RECOMMENDATIONS In view of the above deliberation, our department supports the development, subject to the following conditions: • An application to obtain land use rights for the activities occurring (existing and proposed) at the AFGRI Animal feeds Dryden rendering facility (in terms of their Land Use Scheme), must be submitted to Victor Khanye Local Municipality. • All mitigation measures proposed in the Scoping Report and recommendations made in specialist studies should be strictly adhered to by the applicant and local municipality.	
Department of Water Affairs – Mpumalanga – Bridgette Manamela	18-11-2013	**FINAL SCOPING FOR AFGRI ANIMAL FEEDS DRYDEN RENDERING FACILITY: APPLICATION FOR UPGRADING, EXPANSION AND LICENSING** The Department acknowledges receipt of the abovementioned report submitted by Shangoni Management Services (Pty) Ltd under a cover dated August 2013 for scoping report for AFGRI animal feeds Dryden rendering facility: application for upgrading, expansion and licensing. The Department of Water Affairs (DWA) has evaluated the abovementioned report and wish to comment as follows:	The Department's comments are noted and are responded to as follows: 1. A legal assessment has been conducted by Shangoni Management Services and a Water Use License Application was submitted to the Department of Water Affairs on the 22nd of January 2014 for the following water uses requiring registration and/or licensing at the Dryden rendering facility: • Section 21(a): Taking water from a water resource; • Section 21(c): Impeding or diverting the flow of water in a watercourse;

Raised by	Date	Issue / Comment / Concern	Response
		1. The Applicant shall conduct a preliminary legal assessment to identify all the water use activities associated with the proposed development project that will require authorisation by the DWA and shall note that in terms of section 22(1) of the National Water Act, 1998 (Act No.36 of 1998), "*A person may only use water-* *d) without a licence-* *IV. If that water use is permissible under Schedule 1;* *V. If that water use is permissible as a continuation of an existing lawful use; or* *VI. If that water use is permissible in terms of general authorisation issued under section 39;* *e) If the water use is authorised by a licence under this Act; or* f) *If the responsible authority has dispensed with a licence requirement under subsection (*3)". 2. Therefore any other water use related activities as outlined in section 21 of the National Water Act, 1998 (Act No. 36 of 1998) associated with the proposed development project that are not permissible as indicated on paragraph 1 above shall have to be authorized by the DWA prior to such water use activities taking place.	• Section 21(f): Discharge of waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit; • Section 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource; and • Section 21(i): Altering the bed, banks, course or characteristics of a watercourse. 2. Comments noted and a Water Use License application was submitted to the Department of Water Affairs on the 22nd of January 2014. 3. Comments noted. A meeting was held with the Department of Water Affairs on the 7th of September 2012. 4. SCIP Engineering Group assessed the property and found that the property does not lie in any floodline area. A letter from SCIP Engineering Group confirming the above is attached under Appendix D. 5. A french drain has historically been in use at the rendering facility and will continue to be used for sanitation on site. 6. A Stormwater Management Plan has been compiled for the rendering plant and is attached under Appendix D. The Stormwater Management Plan will be implemented by the applicant and will ensure effective separation of clean and affected stormwater and prevent affected stormwater from the rendering facility from entering the environment

Raised by	Date	Issue / Comment / Concern	Response
		3. The Applicant is requested to liaise with the DWA for guidance on the requirements for water use authorization for the water use activities associated with the proposed project. 4. **Flood-lines:** The map of location of the proposed project showing the 1:100 year flood-line in terms of section 144 of the National Water Act, 1998 (Act No. 36 of 1998) shall be submitted to the DWA. 5. **Sanitation:** Please indicate the type of sanitation to be used during and after the operational phase of the proposed development. 6. **Stormwater management:** The applicant must ensure that stormwater is diverted away from any activities occurring around the proposed project and the stormwater leaving this area must not be contaminated by any substance, whether that substance is a solid, liquid, vapour or any combination thereof. The soil must be stabilised in order to prevent the resulting wash downs into any water resources and where possible rehabilitation of the disturbed areas must be effected. 7. **Waste:** The Applicant must note that domestic and hazardous waste generated on site must be taken to a relevant and permitted landfill site in such a manner not to cause any nuisance or secondary pollution. The applicant will be expected to provide the Department	surrounding the rendering facility. Soil stabilising measures to be implemented are given in this report under Section 7.5 and also in the draft Environmental Management Programme attached under Addendum A. A Rehabilitation Plan for the watercourses is attached under Appendix D. 7. The applicant has sent an enquiry to the Victor Khanye Local Municipality to verify whether sufficient capacity will be available at the local landfill site for additional waste that will be generated at the rendering facility during the construction and operational phase of the second rendering plant. No response has been received from the municipality as yet. 8. Diesel is stored in a 23 000l above-ground diesel storage tank that is bunded, as shown below. 

Raised by	Date	Issue / Comment / Concern	Response
		with a letter of consent from the Local Municipality confirming that there will be enough capacity at the waste site to accommodate additional waste. 8. **Storage of oil, diesel, hydraulic fluids and grease:** It is recommended that the storage of these fluids be banded with cement and in such a manner that any spillages can be contained and reclaimed without causing any pollution to the ground and surface water resources. 9. **Dust:** The Applicant is requested to provide the Department with the source, quality and estimated quantity of the water that will be used for dust suppression during the developmental phase of the proposed project. 10. **Wetlands:** Based on the information at hand (refer to Figure 1-1), It is clear that this activity will take place within the extent of a watercourse (the area within the 1:100 year flood line or delineated riparian habitat, whichever is the greatest, and/or within a 500m radius from the boundary of a wetland). There are several water bodies such as dams and pans present in the vicinity of the ash disposal site and therefore a Water Use Licence must be applied for in terms of section 21 (c) and (i) water uses. Refer to item 3.4 on page 13. The exact distance of the ash disposal facility from the affected	9. Water for dust suppression during the construction phase of the proposed project will be obtained from the one existing borehole on site. It is estimated that 5 000 litres of groundwater will be used for dust suppression per day during the construction phase. The quality of the water has been tested at a SANAS accredited testing laboratory and is given in the Geohydrological Report attached under Appendix D. The water quality from the on-site borehole (AFRBH01) is given on page 61 of the Geohydrological Report as well as in Table 15 of this report. 10. A Water Use License Application was submitted to the Department of Water Affairs on the 22nd of January 2014. This application included the Section 21(c) and Section 21(i) water uses. There is no ash disposal facility at the rendering plant. Boiler ash has historically been stored on site, but this practise will no longer be continued. The boiler ash generated at the rendering facility has been classified according to the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008): National Norms and Standards for the Assessment of Waste for Landfill Disposal (Government Gazette No. 36784 of 23 August 2013). The boiler ash was found to have a *Type 3* classification. Type 3 wastes may be disposed of at a Class C landfill designed in accordance with sections 3(1) and (2) of the Norms and Standards or

Raised by	Date	Issue / Comment / Concern	Response
		water resources are not specified, and must be specified. 11. Attached to this letter is the Environmental Impact Assessment (EIA) checklist which will assist you in reviewing this scoping report and to verify the information and technical requirements that should be included. 12. Please refer to the information below for a summary of the outstanding that must be submitted for this Water Use License Application (WULA): a) License application forms in terms of section 21 (c) and (i) water uses for all proposed activities and infrastructure (should these activities be within the extent of a water course). b) Section 21 (c) and (i) water uses Supplementary Information Questionnaire. c) Master Plan layout of activity and construction site relating to the wetland and the affected watercourse showing where the engineering infrastructure will be located. d) Report and design drawings signed and ESCA registration. e) Method statement. f) Environmental Impact Assessment.	at a landfill site designated in accordance with the requirements for a GLB+ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd Ed., DWAF, 1998). The boiler ash will be disposed of according to the above. A letter confirming the classification of the boiler ash is attached under Appendix F. 11. No EIA checklist accompanied the letter from the Department of Water Affairs, dated 8 November 2013. 12. Comments noted. a) License application forms were submitted to the Department of Water Affairs as part of the Water Use License Application on the 22nd of January 2014. b) The Supplementary Information Questionnaire for Section 21(c) and (i) water uses was submitted to the Department of Water Affairs as part of the Water Use License Application on the 22nd of January 2014. c) The Master Plan layout was submitted to the Department of Water Affairs as part of the Water Use License Application on the 22nd of January 2014. d) Design drawings signed by an ESCA registered engineer will be finalised before the construction phase of the project commences. e) The project description is given in Chapter 2 and 3 of the Integrated Water and Waste Management Plan

Raised by	Date	Issue / Comment / Concern	Response
		g) Wetland delineation assessment (functionality and sensitivity must be addressed). h) Storm water management plan. i) Environmental Management Plan. j) Rehabilitation plan for the watercourses affected. k) Monitoring programme for the wetland and watercourses. l) Geotechnical Study. 13. **Pollution incidents:** The Applicant shall further note in terms of section 19(1) of the National Water Act, 1998 (Act No. 36 of 1998), it is stated that *"An owner of land, a person in control of land or a person who occupies or uses the land on which- (a) any activity or process is or was performed or undertaken; or (b) any other situation exists, which causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring"*. Any pollution incident (s) originating from the proposed development project shall be reported to the Regional Office of the DWA within 24 hours. Please do not hesitate to contact the DWA Regional Office should you have any queries.	submitted to the Department of Water Affairs as part of the Water Use License Application on the 22nd of January 2014. Please also refer to the rendering plant designs attached under Appendix C of this report. f) The draft Environmental Impact Assessment Report has become this final Environmental Impact Assessment Report after the draft report had proceeded through the required public review period as stipulated in the EIA Regulations of 18 June 2010. g) A Wetland Delineation and Assessment has been conducted and the report is attached under Appendix D. h) A Stormwater Management Plan has been compiled for the rendering facility and is attached under Appendix D. i) The draft Environmental Management Plan/Programme is attached under Addendum A. j) A Rehabilitation Plan for the watercourses is attached under Appendix D. k) A Monitoring Programme for the wetland and watercourses has been compiled and is attached under Appendix D.

Raised by	Date	Issue / Comment / Concern	Response
			l) A Geotechnical Investigation/Study will be conducted before construction of the second rendering plant commences. 13. Comments noted.

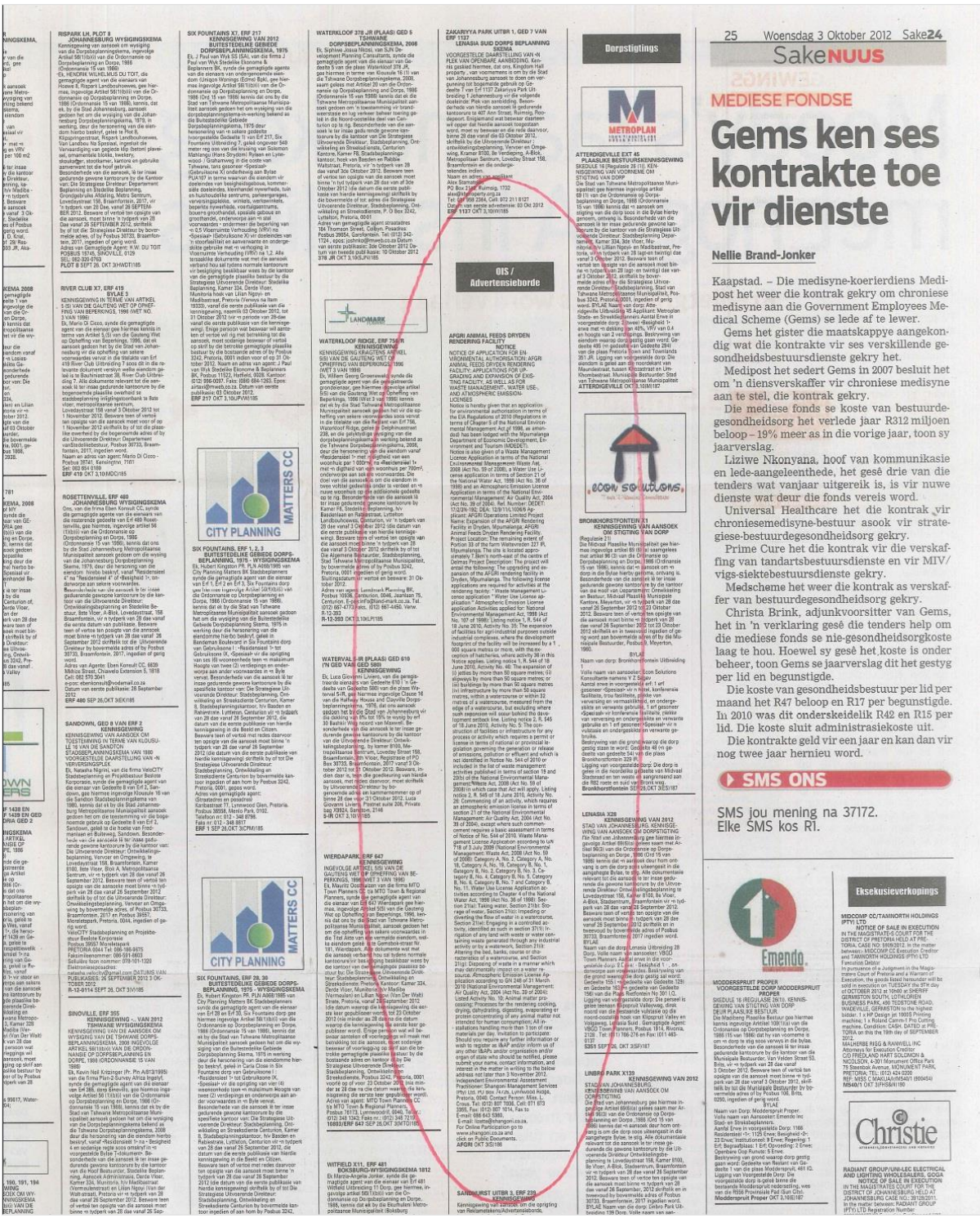
4.5.6 Registering Stakeholders

All key stakeholders were registered and received the draft Scoping Report.

4.5.7 Press Notices

In accordance with the National Environmental Management Act (NEMA) 1998, (Act No. 107 of 1998), the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) and the National Water Act, 1998 (Act No. 36 of 1998), a notice was placed in the Beeld newspaper on the 3rd of October 2012 and the Streeknuus newspaper on the 5th of October 2012. The press notices are shown below.

Press notices are crucial to create awareness of the project and to reach a broader range of I&APs.



25 Woensdag 3 Oktober 2012 Sake24

SakeNUUS

MEDIESE FONDSE

Gems ken ses kontrakte toe vir dienste

Nellie Brand-Jonker

Kaapstad. – Die medisyne-koerierdiens Medipost het weer die kontrak gekry om chroniese medisyne aan die Government Employees Medical Scheme (Gems) se lede af te lewer.

Gems het gister die maatskappye aangekondig wat die kontrakte vir ses verskillende gesondheidsbestuursdienste gekry het.

Medipost het sedert Gems in 2007 besluit het om 'n diensverskaffer vir chroniese medisyne aan te stel, die kontrak gekry.

Die mediese fonds se koste van bestuurdegesondheidsorg het verlede jaar R312 miljoen beloop – 19% meer as in die vorige jaar, toon sy jaarverslag.

Liziwe Nkonyana, hoof van kommunikasie en lede-aangeleenthede, het gesê drie van die tenders wat vanjaar uitgereik is, is vir nuwe dienste wat deur die fonds vereis word.

Universal Healthcare het die kontrak vir chroniesemedisyne-bestuur asook vir strategiese-bestuurdegesondheidsorg gekry.

Prime Cure het die kontrak vir die verskaffing van tandartsbestuursdienste en vir MIV/vigs-siekte bestuursdienste gekry.

Medscheme het weer die kontrak as verskaffer van bestuurdegesondheidsorg gekry.

Christa Brink, adjunkvoorsitter van Gems, het in 'n verklaring gesê die tenders help om die mediese fonds se nie-gesondheidsorgkoste laag te hou. Hoewel sy gesê het koste is onder beheer, toon Gems se jaarverslag dit het gestyg per lid en begunstigde.

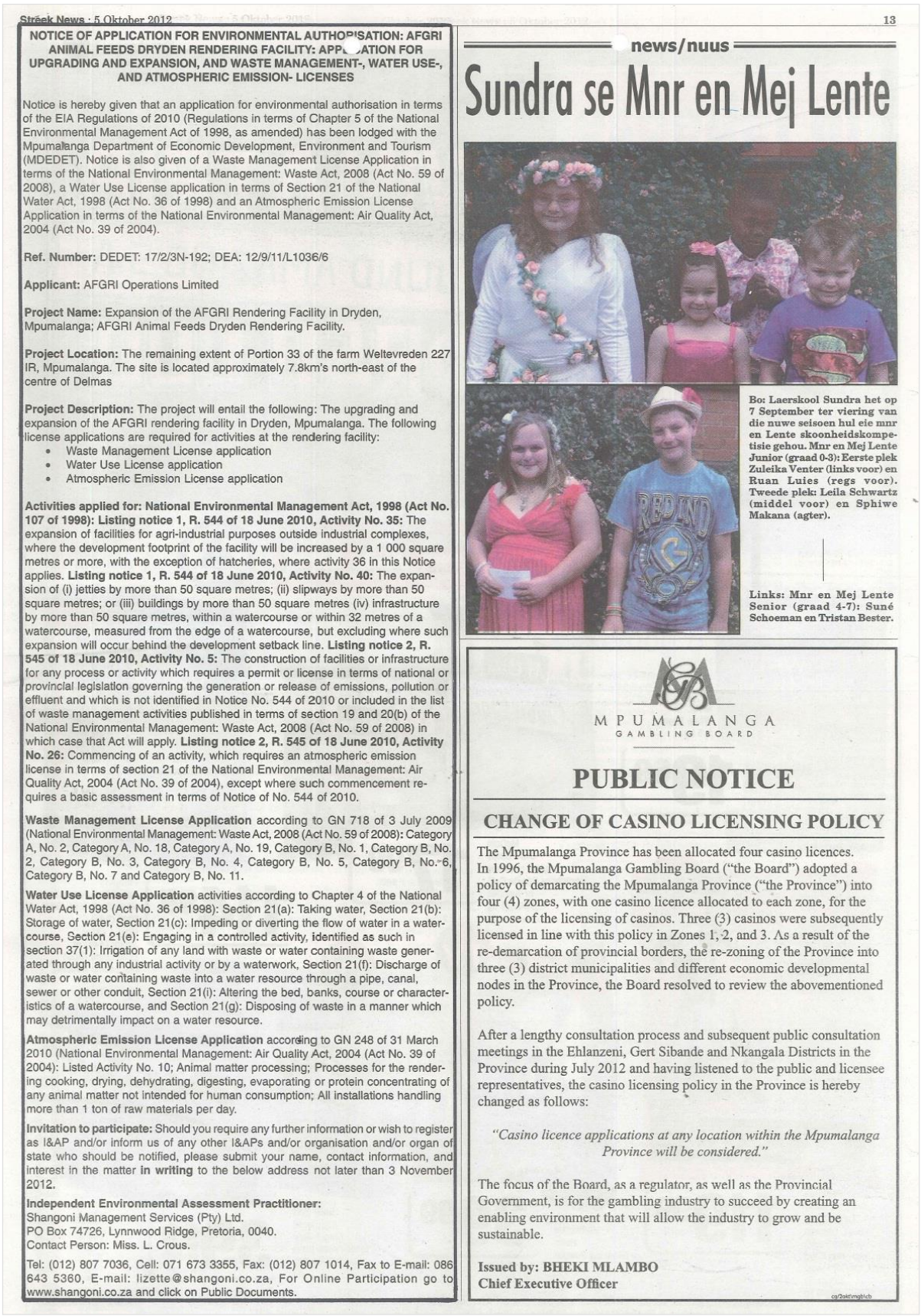
Die koste van gesondheidsbestuur per lid per maand het R47 beloop en R17 per begunstigde. In 2010 was dit onderskeidelik R42 en R15 per lid. Die koste sluit administrasiekoste uit.

Die kontrakte geld vir een jaar en kan dan vir nog twee jaar hernieu word.

SMS ONS

SMS jou mening na 37172.
Elke SMS kos R1.

Figure 87: Newspaper advertisement placed in the Beeld



Streek News · 5 Oktober 2012 13

NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION: AFGRI ANIMAL FEEDS DRYDEN RENDERING FACILITY: APPLICATION FOR UPGRADING AND EXPANSION, AND WASTE MANAGEMENT-, WATER USE-, AND ATMOSPHERIC EMISSION- LICENSES

Notice is hereby given that an application for environmental authorisation in terms of the EIA Regulations of 2010 (Regulations in terms of Chapter 5 of the National Environmental Management Act of 1998, as amended) has been lodged with the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET). Notice is also given of a Waste Management License Application in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), a Water Use License application in terms of Section 21 of the National Water Act, 1998 (Act No. 36 of 1998) and an Atmospheric Emission License Application in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).

Ref. Number: DEDET: 17/2/3N-192; DEA: 12/9/11/L1036/6

Applicant: AFGRI Operations Limited

Project Name: Expansion of the AFGRI Rendering Facility in Dryden, Mpumalanga; AFGRI Animal Feeds Dryden Rendering Facility.

Project Location: The remaining extent of Portion 33 of the farm Weltevreden 227 IR, Mpumalanga. The site is located approximately 7.8km's north-east of the centre of Delmas

Project Description: The project will entail the following: The upgrading and expansion of the AFGRI rendering facility in Dryden, Mpumalanga. The following license applications are required for activities at the rendering facility:

- Waste Management License application
- Water Use License application
- Atmospheric Emission License application

Activities applied for: National Environmental Management Act, 1998 (Act No. 107 of 1998): Listing notice 1, R. 544 of 18 June 2010, Activity No. 35: The expansion of facilities for agri-industrial purposes outside industrial complexes, where the development footprint of the facility will be increased by a 1 000 square metres or more, with the exception of hatcheries, where activity 36 in this Notice applies. **Listing notice 1, R. 544 of 18 June 2010, Activity No. 40:** The expansion of (i) jetties by more than 50 square metres; (ii) slipways by more than 50 square metres; or (iii) buildings by more than 50 square metres (iv) infrastructure by more than 50 square metres, within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, but excluding where such expansion will occur behind the development setback line. **Listing notice 2, R. 545 of 18 June 2010, Activity No. 5:** The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 and 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply. **Listing notice 2, R. 545 of 18 June 2010, Activity No. 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 a basic assessment in terms of Notice of No. 544 of 2010.

Waste Management License Application according to GN 718 of 3 July 2009 (National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008): Category A, No. 2, Category A, No. 18, Category A, No. 19, Category B, No. 1, Category B, No. 2, Category B, No. 3, Category B, No. 4, Category B, No. 5, Category B, No. 6, Category B, No. 7 and Category B, No. 11.

Water Use License Application activities according to Chapter 4 of the National Water Act, 1998 (Act No. 36 of 1998): Section 21(a): Taking water, Section 21(b): Storage of water, Section 21(c): Impeding or diverting the flow of water in a watercourse, Section 21(e): Engaging in a controlled activity, identified as such in section 37(1): Irrigation of any land with waste or water containing waste generated through any industrial activity or by a waterwork, Section 21(f): Discharge of waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit, Section 21(i): Altering the bed, banks, course or characteristics of a watercourse, and Section 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource.

Atmospheric Emission License Application according to GN 248 of 31 March 2010 (National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004): Listed Activity No. 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.

Invitation to participate: Should you require any further information or wish to register as I&AP and/or inform us of any other I&APs and/or organisation and/or organ of state who should be notified, please submit your name, contact information, and interest in the matter **in writing** to the below address not later than 3 November 2012.

Independent Environmental Assessment Practitioner:
Shangoni Management Services (Pty) Ltd.
PO Box 74726, Lynnwood Ridge, Pretoria, 0040.
Contact Person: Miss. L. Crous.

Tel: (012) 807 7036, Cell: 071 673 3355, Fax: (012) 807 1014, Fax to E-mail: 086 643 5360, E-mail: lizette@shangoni.co.za, For Online Participation go to www.shangoni.co.za and click on Public Documents.

news/nuus

Sundra se Mnr en Mej Lente

Bo: Laerskool Sundra het op 7 September ter viering van die nuwe seisoen hul eie mnr en Lente skoonheidskompetisie gehou. Mnr en Mej Lente Junior (graad 0-3): Eerste plek Zuleika Venter (links voor) en Ruan Luies (regs voor). Tweede plek: Leila Schwartz (middel voor) en Sphiwe Makana (agter).

Links: Mnr en Mej Lente Senior (graad 4-7): Suné Schoeman en Tristan Bester.

MPUMALANGA GAMBLING BOARD

PUBLIC NOTICE

CHANGE OF CASINO LICENSING POLICY

The Mpumalanga Province has been allocated four casino licences. In 1996, the Mpumalanga Gambling Board ("the Board") adopted a policy of demarcating the Mpumalanga Province ("the Province") into four (4) zones, with one casino licence allocated to each zone, for the purpose of the licensing of casinos. Three (3) casinos were subsequently licensed in line with this policy in Zones 1, 2, and 3. As a result of the re-demarcation of provincial borders, the re-zoning of the Province into three (3) district municipalities and different economic developmental nodes in the Province, the Board resolved to review the abovementioned policy.

After a lengthy consultation process and subsequent public consultation meetings in the Ehlanzeni, Gert Sibande and Nkangala Districts in the Province during July 2012 and having listened to the public and licensee representatives, the casino licensing policy in the Province is hereby changed as follows:

"Casino licence applications at any location within the Mpumalanga Province will be considered."

The focus of the Board, as a regulator, as well as the Provincial Government, is for the gambling industry to succeed by creating an enabling environment that will allow the industry to grow and be sustainable.

Issued by: BHEKI MLAMBO
Chief Executive Officer

Figure 88: Newspaper advertisement placed in the Streeknuus

4.5.8 Placement of Public Notices

The site notices (A2) were placed on the perimeter fence surrounding the Dryden rendering facility (as shown in the figures below). Wording for the site notices is given as Figure 93.

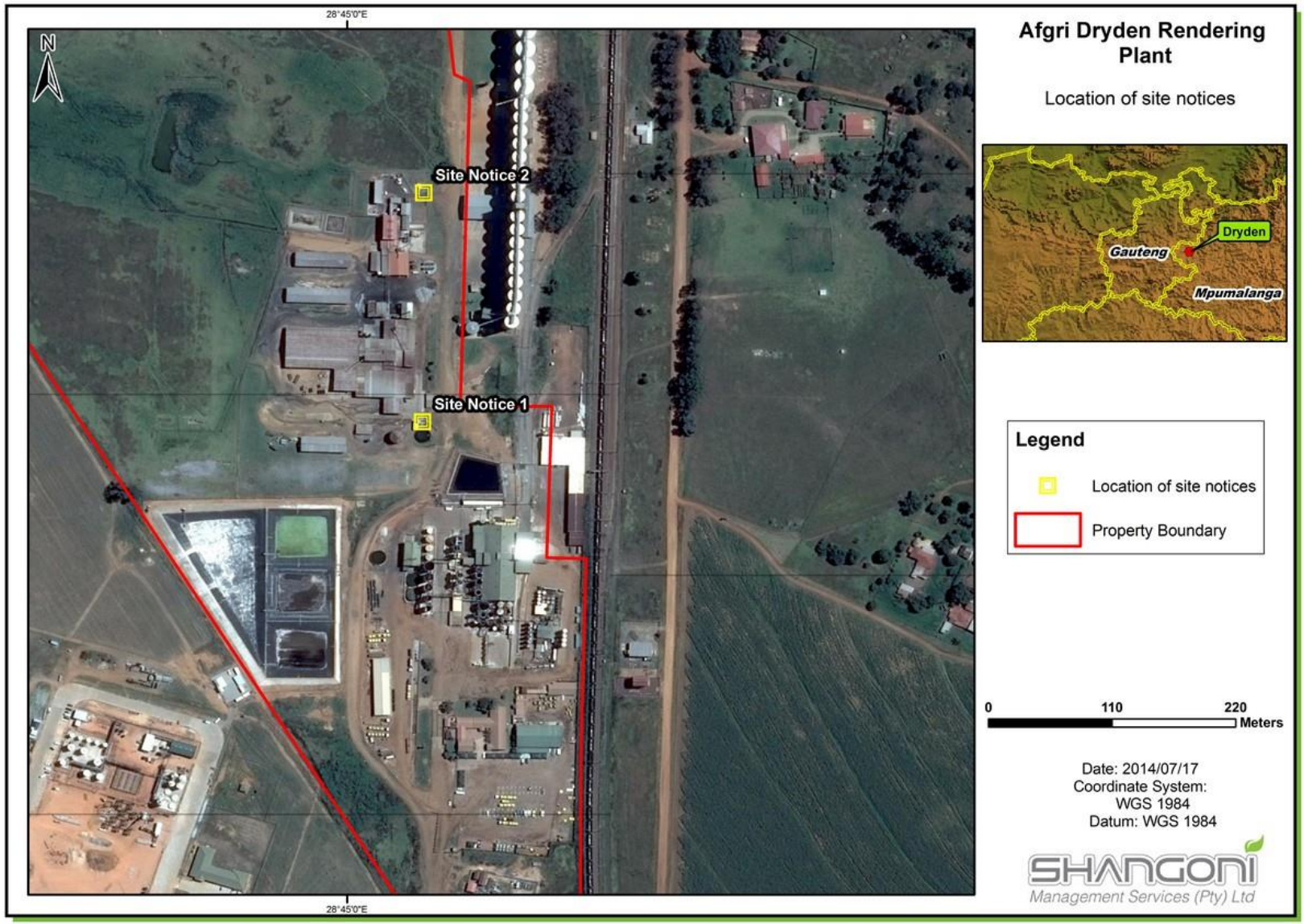


Figure 89: Location of the site notices

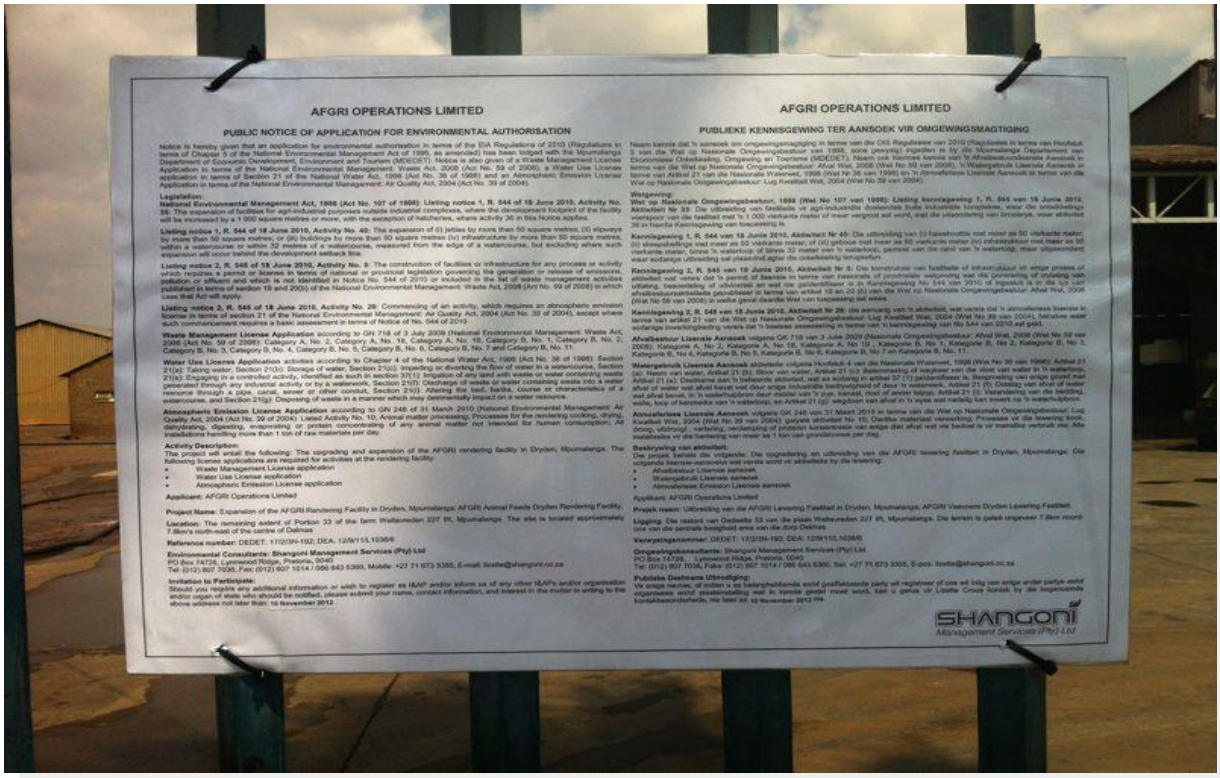


Figure 90: Site notice 1 (zoomed in)

Figure 91: Site notice 1 at the entrance gate to the rendering facility

Figure 92: Site notice 2 at the second entrance gate to the rendering facility

AFGRI OPERATIONS LIMITED

PUBLIC NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION

Notice is hereby given that an application for environmental authorisation in terms of the EIA Regulations of 2010 (Regulations in terms of Chapter 5 of the National Environmental Management Act of 1998, as amended) has been lodged with the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET). Notice is also given of a Waste Management License Application in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), a Water Use License application in terms of Section 21 of the National Water Act, 1998 (Act No. 36 of 1998) and an Atmospheric Emission License Application in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).

Legislation:
National Environmental Management Act, 1998 (Act No. 107 of 1998): Listing notice 1, R. 544 of 18 June 2010, Activity No. 35: The expansion of facilities for agri-industrial purposes outside industrial complexes, where the development footprint of the facility will be increased by a 1 000 square metres or more, with the exception of hatcheries, where activity 36 in this Notice applies.

Listing notice 1, R. 544 of 18 June 2010, Activity No. 40: The expansion of (i) jetties by more than 50 square metres; (ii) slipways by more than 50 square metres; or (iii) buildings by more than 50 square metres (iv) infrastructure by more than 50 square metres, within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, but excluding where such expansion will occur behind the development setback line.

Listing notice 2, R. 545 of 18 June 2010, Activity No. 5: The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 and 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.

Listing notice 2, R. 545 of 18 June 2010, Activity No. 26: Commencing of an activity, which requires an atmospheric emission licence in terms of section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), except where such commencement requires a basic assessment in terms of Notice of No. 544 of 2010.

Waste Management License Application according to GN 718 of 3 July 2009 (National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008): Category A, No. 2, Category A, No. 18, Category A, No. 19, Category B, No. 1, Category B, No. 2, Category B, No. 3, Category B, No. 4, Category B, No. 5, Category B, No. 6, Category B, No. 7 and Category B, No. 11.

Water Use License Application activities according to Chapter 4 of the National Water Act, 1998 (Act No. 36 of 1998): Section 21(a): Taking water, Section 21(b): Storage of water, Section 21(c): Impeding or diverting the flow of water in a watercourse, Section 21(e): Engaging in a controlled activity, identified as such in section 37(1): Irrigation of any land with waste or water containing waste generated through any industrial activity or by a waterwork, Section 21(f): Discharge of waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit, Section 21(i): Altering the bed, banks, course or characteristics of a watercourse, and Section 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource.

Atmospheric Emission License Application according to GN 248 of 31 March 2010 (National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004): Listed Activity No. 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.

Activity Description:
The project will entail the following: The upgrading and expansion of the AFGRI rendering facility in Dryden, Mpumalanga. The following license applications are required for activities at the rendering facility:

- Waste Management License application
- Water Use License application
- Atmospheric Emission License application

Applicant: AFGRI Operations Limited

Project Name: Expansion of the AFGRI Rendering Facility in Dryden, Mpumalanga; AFGRI Animal Feeds Dryden Rendering Facility.

Location: The remaining extent of Portion 33 of the farm Weltevreden 227 IR, Mpumalanga. The site is located approximately 7.8km's north-east of the centre of Delmas

Reference number: DEDET: 17/2/3N-192; DEA: 12/9/11/L1036/6

Environmental Consultants: Shangoni Management Services (Pty) Ltd
PO Box 74726, Lynnwood Ridge, Pretoria, 0040
Tel: (012) 807 7036, Fax: (012) 807 1014 / 086 643 5360, Mobile: +27 71 673 3355, E-mail: lizette@shangoni.co.za

Invitation to Participate:
Should you require any additional information or wish to register as I&AP and/or inform us of any other I&APs and/or organisation and/or organ of state who should be notified, please submit your name, contact information, and interest in the matter in writing to the above address not later than **10 November 2012**.

AFGRI OPERATIONS LIMITED

PUBLIEKE KENNISGEWING TER AANSOEK VIR OMGEWINGSMAGTIGING

Neem kennis dat 'n aansoek om omgewingsmagtiging in terme van die OIS Regulasies van 2010 (Regulasies in terme van Hoofstuk 5 van die Wet op Nasionale Omgewingsbestuur van 1998, soos gewysig) ingedien is by die Mpumalanga Departement van Ekonomiese Ontwikkeling, Omgewing en Toerisme (MDEDET). Neem ook hiermee kennis van 'n Afvalbestuurslisensie Aansoek in terme van die Wet op Nasionale Omgewingsbestuur: Afval Wet, 2008 (Wet No 59 van 2008), 'n Watergebruik Lisensie Aansoek in terme van Artikel 21 van die Nasionale Waterwet, 1998 (Wet Nr 36 van 1998) en 'n Atmosferiese Lisensie Aansoek in terme van die Wet op Nasionale Omgewingsbestuur: Lug Kwaliteit Wet, 2004 (Wet No 39 van 2004).

Wetgewing:
Wet op Nasionale Omgewingsbestuur, 1998 (Wet No 107 van 1998): Listing kennisgewing 1, R. 544 van 18 Junie 2010, Aktiwiteit Nr 35: Die uitbreiding van fasiliteite vir agri-industriële doeleindes buite industriële komplekse, waar die ontwikkelings voetspoor van die fasiliteit met 'n 1 000 vierkante meter of meer vergroot sal word, met die uitsondering van broeierye, waar aktiwiteit 36 in hierdie Kennisgewing van toepassing is.

Kennisgewing 1, R. 544 van 18 Junie 2010, Aktiwiteit Nr 40: Die uitbreiding van (i) hawehoofde met meer as 50 vierkante meter; (ii) skeepshellings met meer as 50 vierkante meter; of (iii) geboue met meer as 50 vierkante meter (iv) infrastruktuur met meer as 50 vierkante meter, binne 'n waterloop of binne 32 meter van 'n waterloop, gemeet van die rand van 'n waterloop, maar uitgesonderd waar sodanige uitbreiding sal plaasvind agter die ontwikkeling terugsetlyn.

Kennisgewing 2, R. 545 van 18 Junie 2010, Aktiwiteit Nr 5: Die konstruksie van fasiliteite of infrastruktuur vir enige proses of aktiwiteit wat vereis dat 'n permit of lisensie in terme van nasionale of provinsiale wetgewing wat die generering of vrylating van uitlating, besoedeling of uitvloeisel en wat nie geïdentifiseer is in Kennisgewing No 544 van 2010 of ingesluit is in die lys van afvalbestuursaktiwiteite gepubliseer in terme van artikel 19 en 20 (b) van die Wet op Nasionale Omgewingsbestuur: Afval Wet, 2008 (Wet No 59 van 2008) in welke geval daardie Wet van toepassing sal wees.

Kennisgewing 2, R. 545 van 18 Junie 2010, Aktiwiteit Nr 26: die aanvang van 'n aktiwiteit, wat vereis dat 'n atmosferiese lisensie in terme van artikel 21 van die Wet op Nasionale Omgewingsbestuur: Lug Kwaliteit Wet, 2004 (Wet No 39 van 2004), behalwe waar sodanige inwerkingtreding vereis dat 'n basiese assessering in terme van 'n kennisgewing van No 544 van 2010 sal geld.

Afvalbestuur Lisensie Aansoek volgens GK 718 van 3 Julie 2009 (Nasionale Omgewingsbestuur: Afval Wet, 2008 (Wet No 59 van 2008): Kategorie A, No 2, Kategorie A, No 18, Kategorie A, No 19 , Kategorie B, No 1, Kategorie B, No 2, Kategorie B, No 3, Kategorie B, No 4, Kategorie B, No 5, Kategorie B, No 6, Kategorie B, No 7 en Kategorie B, No. 11.

Watergebruik Lisensie Aansoek aktiwiteite volgens Hoofstuk 4 van die Nasionale Waterwet, 1998 (Wet No 36 van 1998): Artikel 21 (a): Neem van water, Artikel 21 (b): Stoor van water, Artikel 21 (c): Belemmering of wegkeer van die vloei van water in 'n waterloop, Artikel 21 (e): Deelname aan 'n beheerde aktiwiteit, wat as sodanig in artikel 37 (1) geïdentifiseer is: Besproeiing van enige grond met afval of water wat afval bevat wat deur enige industriële bedrywigheid of deur 'n waterwerk, Artikel 21 (f): Ontslag van afval of water wat afval bevat, in 'n waterhulpbron deur middel van 'n pyp, kanaal, riool of ander leipyp, Artikel 21 (i): Verandering van die bedding, walle, loop of kenmerke van 'n waterloop, en Artikel 21 (g): wegdoen van afval in 'n wyse wat nadelig kan inwerk op 'n waterhulpbron.

Atmosferiese Lisensie Aansoek volgens GK 248 van 31 Maart 2010 in terme van die Wet op Nasionale Omgewingsbestuur: Lug Kwaliteit Wet, 2004 (Wet No 39 van 2004): gelyste aktiwiteit No 10; Dierlike materiaal verwerking; Prosesse vir die lewering kook, droog, uitdroogt , vertering, verdamping of proteïen konsentrasie van enige dier afval wat nie bedoel is vir menslike verbruik nie; Alle installasies vir die hantering van meer as 1 ton van grondstowwe per dag.

Beskrywing van aktiwiteit:
Die projek behels die volgende: Die opgradering en uitbreiding van die AFGRI lewering fasiliteit in Dryden, Mpumalanga. Die volgende lisensie-aansoeke wat vereis word vir aktiwiteite by die lewering:

- Afvalbestuur Lisensie aansoek
- Watergebruik Lisensie aansoek
- Atmosferiese Emission Lisensie aansoek

Applikant: AFGRI Operations Limited

Projek naam: Uitbreiding van die AFGRI Lewering Fasiliteit in Dryden, Mpumalanga, AFGRI Veevoere Dryden Lewering Fasiliteit.

Ligging: Die restant van Gedeelte 33 van die plaas Weltevreden 227 IR, Mpumalanga. Die terrein is geleë ongeveer 7.8km noord-oos van die sentrale besigheid area van die dorp Delmas.

Verwysingsnommer: DEDET: 17/2/3N-192; DEA: 12/9/11/L1036/6

Omgewingskonsultante: Shangoni Management Services (Pty) Ltd.
PO Box 74726, Lynnwood Ridge, Pretoria, 0040
Tel: (012) 807 7036, Faks: (012) 807 1014 / 086 643 5360, Sel: +27 71 673 3355, E-pos: lizette@shangoni.co.za

Publieke Deelmane Uitnodiging:
Vir enige navrae, of indien u as belanghebbende en/of geaffekteerde party wil registreer of ons wil inlig van enige ander partye en/of organisasie en/of staatsinstelling wat in kennis gestel moet word, kan u gerus vir Lizette Crous kontak by die bogenoemde kontakbesonderhede, nie later as **10 November 2012** nie.

SHANGONI
Management Services (Pty) Ltd

Figure 93: Wording of the site notice

4.5.9 Minutes of public meetings

No public meetings were held during the Public Participation Phase.

4.5.10 Issuing I&APs and Stakeholders with a Draft Scoping Report

The draft Scoping Report was sent to all Departments and Organs of State as well as all registered I&APs in order to obtain their comments. The report was also submitted to the Mpumalanga Department of Economic Development, Environment and Tourism for review. The review period was from the 16th of August 2013 to 7th of October 2013.

4.5.11 Comments received on the draft Scoping Report

The following comments were received on the draft Scoping Report:

Raised by	Date	Issue / Comment / Concern
Mpumalanga Department of Co-operative Governance and Traditional Affairs – Z. Lushaba	07-10-2013	**SUBJECT: COMMENTS ON THE DRAFT SCOPING REPORT – AFGRI ANIMAL FEEDS DRYDEN RENDERING FACILITY: WASTE MANAGEMENT LICENSE APPLICATION – VICTOR KHANYE LOCAL MUNICIPALITY – MPUMALANGA** We would hereby like to thank you for affording our Department the opportunity to comment on the draft scoping report that forms part of the waste management license application. Our department perused the documents sent to us on 16 August 2013. **1. APPLICATION** Application is made to the Department of Economic Development, Tourism and Environmental Affairs by Shangoni Management Services (Pty) Limited (independent environmental practitioner) to assist the applicant (AFGI Operation Limited) in complying with the 2010 EIA Regulations in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the National Environmental Management Waste Act, 2008 (Act No. 59 of 2008). Application is made for a waste management license for activities occurring at the AFGRI Animal Feeds Dryden rendering facility situated on the remaining extent of Portion 33 of the farm Weltevreden 227 IR, approximately 7km north-east of Delmas. **2. POLICY ALIGMENT** **Spatial Development Framework (SDF)**

Raised by	Date	Issue / Comment / Concern
		The Victor Khanye Local Municipality has developed a Spatial Development Framework (SDF) to guide future growth and development (land use) within its area of jurisdiction. According to the SDF, the application site located on the periphery of an area earmarked "N12 Development Corridor". *"The concept of the N12 corridor seeks to take advantage of the Gold Reef Band (Benoni, Boksburg, Germiston and Johannesburg) as well as linking to Witbank on the Maputo development corridor. In the main this corridor will be characterised by commercial activities mixed land use and tourist facilities in the form of bed and breakfast and maybe a hotel. It will also include* ***agricultural and agro-processing activities****".* The proposed development seems to be in line with the future proposals of the municipality. **3. CONCLUSION AND RECOMMENDATIONS** In view of the above deliberation, our department supports the development, subject to the following conditions: • An application to obtain land use rights for the activities occurring (existing and proposed) at the AFGRI Animal feeds Dryden rendering facility (in terms of their Land Use Scheme), must be submitted to Victor Khanye Local Municipality. • All mitigation measures proposed in the Scoping Report and recommendations made in specialist studies should be strictly adhered to by the applicant and local municipality.
Department of Water Affairs – Mpumalanga – Bridgette Manamela	18-11-2013	**FINAL SCOPING FOR AFGRI ANIMAL FEEDS DRYDEN RENDERING FACILITY: APPLICATION FOR UPGRADING, EXPANSION AND LICENSING** The Department acknowledges receipt of the abovementioned report submitted by Shangoni Management Services (Pty) Ltd under a cover dated August 2013 for scoping report for AFGRI animal feeds Dryden rendering facility: application for upgrading, expansion and licensing. The Department of Water Affairs (DWA) has evaluated the abovementioned report and wish to comment as follows: 1. The Applicant shall conduct a preliminary legal assessment to identify all the water use activities associated with the proposed development

Raised by	Date	Issue / Comment / Concern
		project that will require authorisation by the DWA and shall note that in terms of section 22(1) of the National Water Act, 1998 (Act No.36 of 1998), "*A person may only use water-* *a) without a licence-* *I. If that water use is permissible under Schedule 1;* *II. If that water use is permissible as a continuation of an existing lawful use; or* *III. If that water use is permissible in terms of general authorisation issued under section 39;* *b) If the water use is authorised by a licence under this Act; or* c) *If the responsible authority has dispensed with a licence requirement under subsection (*3)". 2. Therefore any other water use related activities as outlined in section 21 of the National Water Act, 1998 (Act No. 36 of 1998) associated with the proposed development project that are not permissible as indicated on paragraph 1 above shall have to be authorized by the DWA prior to such water use activities taking place. 3. The Applicant is requested to liaise with the DWA for guidance on the requirements for water use authorization for the water use activities associated with the proposed project. 4. **Flood-lines:** The map of location of the proposed project showing the 1:100 year flood-line in terms of section 144 of the National Water Act, 1998 (Act No. 36 of 1998) shall be submitted to the DWA. 5. **Sanitation:** Please indicate the type of sanitation to be used during and after the operational phase of the proposed development. 6. **Stormwater management:** The applicant must ensure that stormwater is diverted away from any activities occurring around the proposed project and the stormwater leaving this area must not be contaminated by any substance, whether that substance is a solid, liquid, vapour or any combination thereof. The soil must be stabilised in order to prevent the resulting wash downs into any water resources and where possible rehabilitation of the disturbed areas must be effected. 7. **Waste:** The Applicant must note that domestic and hazardous waste generated on site must be taken to a relevant and permitted landfill site in such a manner not to cause any nuisance or secondary pollution. The applicant will be expected to provide the Department with a letter of consent from the Local Municipality confirming that

Raised by	Date	Issue / Comment / Concern
		there will be enough capacity at the waste site to accommodate additional waste. 8. **Storage of oil, diesel, hydraulic fluids and grease:** It is recommended that the storage of these fluids be banded with cement and in such a manner that any spillages can be contained and reclaimed without causing any pollution to the ground and surface water resources. 9. **Dust:** The Applicant is requested to provide the Department with the source, quality and estimated quantity of the water that will be used for dust suppression during the developmental phase of the proposed project. 10. **Wetlands:** Based on the information at hand (refer to Figure 1-1), It is clear that this activity will take place within the extent of a watercourse (the area within the 1:100 year flood line or delineated riparian habitat, whichever is the greatest, and/or within a 500m radius from the boundary of a wetland). There are several water bodies such as dams and pans present in the vicinity of the ash disposal site and therefore a Water Use Licence must be applied for in terms of section 21 (c) and (i) water uses. Refer to item 3.4 on page 13. The exact distance of the ash disposal facility from the affected water resources are not specified, and must be specified. 11. Attached to this letter is the Environmental Impact Assessment (EIA) checklist which will assist you in reviewing this scoping report and to verify the information and technical requirements that should be included. 12. Please refer to the information below for a summary of the outstanding that must be submitted for this Water Use License Application (WULA): a) License application forms in terms of section 21 (c) and (i) water uses for all proposed activities and infrastructure (should these activities be within the extent of a water course). b) Section 21 (c) and (i) water uses Supplementary Information Questionnaire. c) Master Plan layout of activity and construction site relating to the wetland and the affected watercourse showing where the engineering infrastructure will be located. d) Report and design drawings signed and ESCA registration. e) Method statement. f) Environmental Impact Assessment.

Raised by	Date	Issue / Comment / Concern
		g) Wetland delineation assessment (functionality and sensitivity must be addressed). h) Storm water management plan. i) Environmental Management Plan. j) Rehabilitation plan for the watercourses affected. k) Monitoring programme for the wetland and watercourses. l) Geotechnical Study. 13. **Pollution incidents:** The Applicant shall further note in terms of section 19(1) of the National Water Act, 1998 (Act No. 36 of 1998), it is stated that *"An owner of land, a person in control of land or a person who occupies or uses the land on which- (a) any activity or process is or was performed or undertaken; or (b) any other situation exists, which causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring"*. Any pollution incident (s) originating from the proposed development project shall be reported to the Regional Office of the DWA within 24 hours. Please do not hesitate to contact the DWA Regional Office should you have any queries.

4.5.12 Consideration of the final Scoping Report

The final Scoping Report was submitted to the responsible officer at the Mpumalanga Department of Economic Development, Environment and Tourism for consideration on the 8th of November 2013. The department accepted the final Scoping Report on the 3 February 2014.

4.5.13 Issuing I&APs and stakeholders with the Draft Environmental Impact Assessment Report

The draft Environmental Impact Assessment Report was sent, via registered mail or courier, to all Departments and Organs of State as well as registered I&APs in order to obtain their comments. The report was also submitted to the responsible official at the Mpumalanga Department of Economic Development, Environment and Tourism. The review period was from the 7th of August 2014 to the 23rd of September 2014.

4.5.14 Comments received on the draft Environmental Impact Assessment Report

No comments were received on the draft Environmental Impact Assessment Report during the above given public review period. Comments from the Department of Water and Sanitation were, however,

received after the public review period had ended. These comments were received on the 12th of November 2014 and are attached under Appendix E.

4.5.15 Conclusions of the Public Participation Exercise

In conclusion, the public participation exercise has provided adequate information to enable an understanding of what the proposed project would entail and also to address the concerns and comments of this Environmental Assessment.

5. NEED AND DESIRABILITY FOR THE ACTIVITY

A need and desirability for this project is evident from the following perspectives:

5.1 Developer

The existing rendering plant is limited by its throughput capacity and the fact that only one type of by-product meal can be produced. The proposed expansion of the rendering facility through the construction of a second plant will allow an increase in the amount of waste that can be processed per day (increased throughput capacity) and will also allow four separate high-protein meals to be produced. The wastewater treatment system will also be expanded and upgraded and an air treatment plant installed. These expansions will increase profits for AFGRI, will make the facility more sustainable in the long term and will lead to better economies of scale as the plant will be capable of processing more waste per day.

Licensing the rendering facility in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) and the National Water Act, 1998 (Act No. 36 of 1998) will mean that the facility will be one of only a few licensed rendering facilities, in terms of environmental legislation, in the area. The facility will then be able to obtain poultry and other wastes from external sources, thereby increasing the volumes of waste processed at the facility and AFGRI's market share in terms of high-protein meal production.

5.2 Local Community

Unemployment and dependency rates are high in the Victor Khanye Local Municipality. The proposed expansion of the rendering facility will result in a number of job opportunities for the local community during the construction phase of the project. The local economy will also be stimulated through for example the procurement of materials for the expansion of the rendering facility.

6. IDENTIFIED ALTERNATIVES

The following definition of “alternatives” is given in the EIA Regulations of 18 June 2010: “alternatives”, in relation to the proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to-

a) the property on which or location where it is proposed to undertake the activity;
b) the type of activity to be undertaken;
c) the design or layout of the activity;
d) the technology to be used in the activity;
e) the operational aspects of the activity; and
f) the option of not implementing the activity”.

Typically, alternative assessments are conducted to assist in comparing various projects or attributes of projects that will occur. The most critical comparison is evaluating any proposed project against the No-Go option. The alternatives assessment then considers alternatives to project site selection for the proposed development; alternatives to layout of the development; and alternatives to construction methodologies and/or materials used for the development.

The alternatives assessment was conducted using a simple cost-benefit analysis of each proposed alternative, through assessing various environmental attributes. These attributes can include physical (geology and soils, surface water quality and quantity, groundwater quality and quantity); biophysical (flora and fauna, sensitive environments); and social (site of archaeological or cultural importance, land use issues, social health and welfare).

The impact of the each alternative was then evaluated in terms of whether it has a positive, negative, or no impact. In this instance, the impact is not evaluated in terms of significance but rather whether or not it will arise. Positive impacts are assigned a value of 1; no impact a value of 0; and a negative impact a value of -1.

By adding all of the attribute scores for each alternative, a suitability score is derived that indicates the preferred alternative. A total positive score indicates the project benefits outweigh the potential negative impacts, while a total negative score indicates the project environmental costs outweigh the potential benefits. Essentially, the highest scoring alternative is then carried forward for full impact evaluation.

6.1 No-Go Option

The potential impact of the preferred project option on environmental and socio-economic attributes – identified during the assessment phase – is evaluated against the potential impact of the no-go option on the same attributes. The summary of this assessment is provided in Table 32 hereafter.

Table 32: Development vs. No-Go Option.

Attribute	Development Option	No-go Option 2
Physical environment		
Air Pollution	-1	-1
Noise Pollution	-1	-1
Water Quality	1	-1
Water Quantity	-1	-1
Visual Aesthetics	-1	-1
Biophysical environment		
Fauna and Flora	1	-1
Sensitive Environments	1	-1
Social environment		
Traffic	-1	-1
Impact on property values	1	-1
Safety and security	0	0
National and regional economy	1	0
Infrastructure development	1	0
Total	**1**	**-9**

As can be seen in the table above, the development option (expansion of the rendering facility) will have a small positive impact on the environment whilst the No-Go option (the current practices) has a large negative impact on the environment. Failure to authorise the proposed expansion and by association the licensing of the facility in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) and the National Water Act, 1998 (Act No. 36 of 1998), will result in the continuation of current activities at the rendering facility without an Atmospheric Emission License or a Water Use License. A separate Waste Management License application has also been submitted to the National Department of Environmental Affairs.

The small positive impact of the proposed plant will be as a result of the latest technology that will be used and the mitigation measures that form part of the design of the plant. The proposed, upgraded wastewater treatment system will result in a discharge of General Limit quality water into the environment, instead of only partially treated wastewater (not General Limit quality) that is currently being discharged into the environment. As there is a wetland to the west of the current plant, ceasing the discharge of only partially treated water into the wetland area should improve the state of the wetland and also the general habitat for fauna and flora in the area. The proposed air treatment system should also improve the current odour situation at the facility.

6.2 Alternatives

6.2.1 Activity Alternatives

The activity is the treatment of abattoir waste (hazardous waste) from the AFGRI abattoirs at the AFGRI Dryden rendering facility, making the waste harmless to the environment. The end-product of this process is a by-product meal that can be sold to generate an income for AFGRI. An alternative way for AFGRI to responsibly handle their hazardous abattoir waste would be to dispose of the waste at a licensed hazardous waste disposal site, such as Enviroserv's Holfontein hazardous waste disposal site. This is not deemed a feasible alternative for the following reasons:

- Disposal of hazardous waste at a licensed hazardous waste disposal site is costly and would be a significant financial burden to AFGRI in terms of the amount of abattoir waste that would need to be disposed on a monthly basis. This would jeopardise the profitability and long-term, sustainable operation of the AFGRI abattoirs and of the permanent jobs that are created at the abattoirs and at related industries; and
- Disposal of the abattoir waste at a hazardous waste disposal site would mean that the abattoir waste cannot be processed at the Dryden rendering facility. The income from this process would not be generated and the permanent jobs created at the rendering facility would not exist.

6.2.2 Location Alternatives

The following location alternatives have been identified and considered:

- The site of the existing rendering plant; and
- A separate, undeveloped property.

It would not be financially feasible for AFGRI to purchase a new property as they would then need to develop the entire site from scratch. From an environmental point of view this would also mean that a potentially undisturbed site would need to be developed. At the Dryden rendering plant, areas of land have historically been disturbed and existing infrastructure can be utilised. For these reasons, it is more feasible to expand the existing Dryden rendering facility than to develop a new site.

6.2.3 Process Alternatives

To enable an increase in throughput capacity for the processing of waste, a number of process alternatives have been identified and are listed below:

- The current rendering process can be continued and expanded;
- The current rendering process can be continued and the new technology process can also be implemented at the second plant;
- Discontinuing the current rendering process and implementing the new technology process;
- Processing only poultry waste; and
- Processing poultry waste as well as other wastes, such as blood from beef abattoirs.

All of the above listed alternatives are viable options and have been considered. An evaluation of the advantages and disadvantages of each option is given in the table below:

Table 33: Comparison of various process alternatives

Alternative	Advantages	Disadvantages
Option A1: Continuing and expanding the current rendering process.	All existing infrastructure can be utilised and no process changes will be required. The current process has been perfected over the course of many years.	The current process is only able to produce one kind of product and the volumes that can be processed are limiting to further expansions of the business.
Option A2 (preferred process alternative): Keeping the current rendering plant as is and implementing the new technology process at the second plant.	The current rendering plant can continue to function and operate as it currently does. The new technology process will allow the product range (different high-protein meals) to be diversified and will enable more sustainable and profitable operation of the facility. New technologies should also improve atmospheric emissions and the quality of wastewater released into the environment.	The current rendering plant will need to be maintained regularly.
Option A3: Discontinuing the current rendering process and implementing the new technology process at the second plant.	The new technology process will allow the product range (different high-protein meals) to be diversified and will enable more sustainable and profitable operation of the facility. New technologies should also improve atmospheric emissions and the quality of wastewater released into the environment.	Discontinuing the current rendering process will not allow the existing plant to operate and function as it currently does, producing a high-protein poultry by-product meal that can be sold.
Option B1: Processing only poultry waste.	Processing only poultry waste has been perfected over the course of many years.	Only processing poultry waste limits AFGRI in terms of expanding and diversifying their business.
Option B2 (preferred alternative): Processing poultry	AFGRI can diversify their product range, allowing a more sustainable and profitable operation of the facility. Waste producers that may currently dispose of	The processing of different kinds of wastes will need to be perfected (a process that

Alternative	Advantages	Disadvantages
waste as well as other kinds of wastes.	their waste at a hazardous landfill site or in an unsuitable manner can send their waste to the Dryden facility instead.	AFGRI are currently busy with).

6.2.4 Input Alternatives

The different input alternatives are listed and compared in the table below:

Table 34: Comparison of input alternatives

Alternative	Advantages	Disadvantages
Option B1: Processing only poultry waste including feathers, blood, intestines and chicken pieces.	Processing only poultry waste has been perfected over the course of many years.	Only processing poultry waste limits AFGRI in terms of expanding and diversifying their business.
Option B2 (preferred input alternative): Processing poultry waste as well as other kinds of wastes, such as whole chickens (mortalities from chicken farms and chickens that arrive dead at the abattoirs), blood and possibly meat from other kinds of abattoirs, such as red meat and pork abattoirs.	AFGRI can diversify their product range, allowing a more sustainable and profitable operation of the facility. Waste producers that may currently dispose of their waste at a hazardous landfill site or in an unsuitable manner can send their waste to the Dryden facility instead.	The processing of different kinds of wastes will need to be perfected (a process that AFGRI are currently busy with).

6.2.5 Site Layout Alternatives

As the entire property (Portion 33 of the farm Weltevreden) is owned by AFGRI and areas to the north, west and south-west of the site are undeveloped (shown in white on the figure below), the construction of the second plant could occur at various locations on the site. The undeveloped areas were considered, but have been eliminated as reasonable and feasible alternatives as large areas of undeveloped land would need to be disturbed and wetland zones also cover most of the site to the west and north of the current plant. There is also a land claim on the northern part of the site as well as informal settlements that cannot be disturbed.

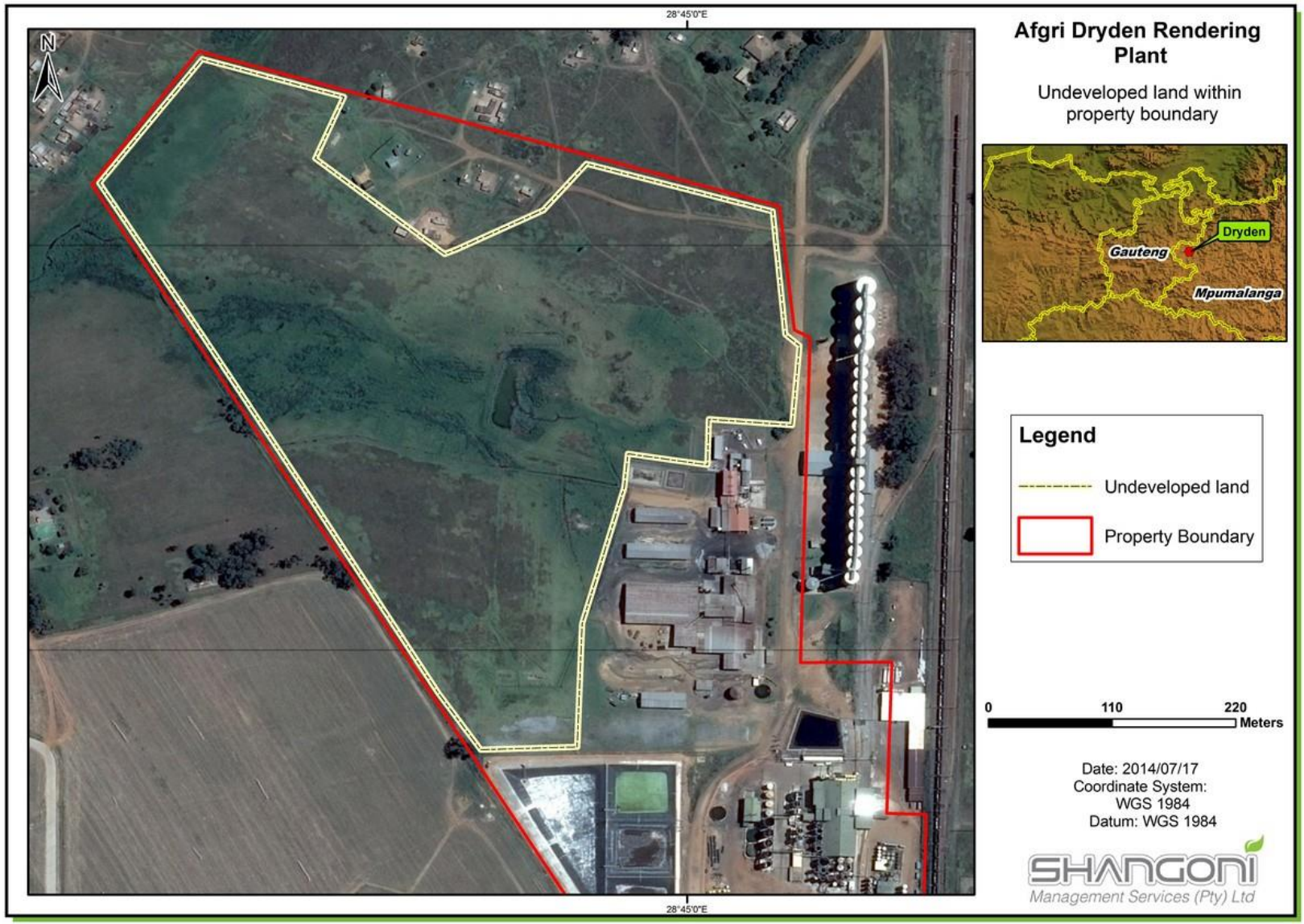


Figure 94: Undeveloped land (white) within the property boundary (red)

Option C1 (preferred site alternative): To ensure that as little undeveloped land is disturbed for the proposed development and also to keep the operations as concentrated as possible (for economic and logistical reasons) the proposed site for the second plant is adjacent to the existing rendering facility at the site of two existing storage sheds. Most of the footprint area for the proposed plant is already disturbed (where the storage sheds are situated), but the proposed plant will extend into undisturbed land to the west of the sheds.

Option C2: An alternative would be to construct the proposed plant in the open area to the south of the storage warehouse, where the land has also historically been disturbed. Sufficient space is available for the proposed plant, however, an enclosed storage area and diesel tank would need to be demolished should this area be used. As diesel is required at the site, a new diesel tank would need to be installed. Other disadvantages of this site is that the proposed plant would be far (approximately 100m) from the boiler and even further from the existing wastewater treatment ponds that will form part of the proposed upgraded wastewater treatment system. This would mean increased installation costs for piping systems and additional electricity usage to pipe the steam and wastewater to and from the proposed, second plant.

7. ENVIRONMENTAL IMPACT ASSESSMENT

7.1 Introduction and approach followed

The proposed rendering facility expansion can have a variety of impacts. These can also cover different spatial and temporal scales. The nature of each impact can also vary widely depending on the physical environment and the perceptions and values of the affected parties. In general, the environmental impacts associated with the proposed development will tend to decrease with increasing distance from the activity. The most noticeable impacts are therefore present on the site of operation or on adjacent properties. An assessment of the potential impacts on the social and natural environment should be conducted in a methodical manner.

Assessment and evaluation of environmental impacts is often complicated by the subjective nature of the impacts. Ideally, the degree of severity or significance of a particular impact should be expressed in quantitative terms. There must also be some expression as to whether a particular impact is desirable or not. As the desirability of an impact will depend largely on the attitude and experience of the assessment practitioner, subjectivity is unavoidable. To address these problems, a standard set of definitions were used for the entire impact assessment process.

It is believed that the approach followed will adequately fulfil the environmental authorities' requirements, the requirements of the EIA Regulations (2010) and the objectives of the environmental best practice, so as to ensure transparency and to enable an informed decision regarding the proposed project.

7.2 Methods used to identify impacts

Impact assessments should be conducted based on a methodology that includes the following:

- Clear processes for impact identification, predication and evaluation;
- Specification of the impact identification techniques;
- Criteria to evaluate the significance of impacts;
- Design of mitigation measures to lessen impacts;
- Definition of the different types of impacts (indirect, direct or cumulative); and
- Specification of uncertainties.

In broad terms, the impact assessment for this project included the following:

- All potential impacts of the proposed activity were identified and assessed;
- The nature, extent, magnitude and duration of all potentially significant impacts were predicted;
- A range of mitigation measures that could diminish the impacts were identified; and
- The significant of residual impacts that remain, after the proposed mitigation measures are implemented, were evaluated.

The construction and operational phases of the project were considered whilst identifying impacts. A detailed understanding of the proposed activity was obtained to ensure that all the potential impacts could be identified. The following process was followed to identify and assess the potential impacts of the proposed activity:

- The current environmental conditions were determined in detail. This acted as a baseline against which impacts could be identified and measured;
- The changes that will occur in future, should the proposed activity not occur, were identified;
- A detailed understanding of the activity was obtained in order to fully understand its consequences; and
- The significant impacts that will occur as a result of the proposed activity were identified (should the activity be authorised).

After all impacts were identified, the nature of each impact could be predicted. The impact prediction took into account physical, biological, socio-economic and cultural information and the likely parameters and characteristics of the impacts were then estimated. The aim of the impact prediction was to provide a basis from which the significance of each impact could be determined and appropriate mitigation measures could be developed. The impact prediction took into account the following parameters (summarised in the table below):

- The extent of the impact. This refers to the physical or geographical size that is affected by the impact and is divided into the following categories:
  - Onsite: Within the specific site boundary;
  - Local: Within the municipal boundary; and
  - Regional: Outside of the municipal boundary.
- The duration of the impact. This refers to the time span associated with the impact and is divided into the following categories:
  - Short term: An impact lasting for one year or less;
  - Medium term: An impact lasting for one to five years; and
  - Long term: An impact lasting for more than five years.
- The intensity and reversibility of the impact. This refers to the severity of the impact on the receiving environment and is divided into the following categories:
  - Low: Natural and/or cultural processes continue in a modified way and the impact is reversible;
  - Medium: Natural and/or cultural processes stop and the impact is partially reversible; and
  - High: Natural and/or cultural processes are disturbed to an irreversible state.

A weighting value is assigned to each parameter category, with the value increasing as the impact becomes higher. For example, an impact that is of short duration will have a lower weighting value than one that is of longer duration.

To determine the significance of an impact, the weighting values for its extent, duration and intensity are added together (Extent + Duration + Intensity = High / Medium / Low Impact). Multiplication of the

significance of the impact by the probability of the impact occurring produces a final conclusion of the overall risk that an impact poses to the surrounding environment (the "environmental risk"). To determine the probability or likelihood of an impact occurring, the following categories are used:

- Unlikely: There is a 0% - 45% chance of the potential impact occurring;
- Possible: There is a 46% - 75% chance of the potential impact occurring; and
- Likely: There is a greater than 75% chance of the potential impact occurring.

The environmental risk of an impact is plotted in a matrix, shown in Table 36. Assigning a colour to the environmental risk provides a clear and immediate visual representation of the magnitude of the risk of an impact on the environment.

Table 35: Environmental impact assessment parameters

Parameters	Description
Extent	Refers to the physical or geographical size that is affected by the impact. It can be categorised into the following ranges: • Onsite – Within specific site boundary (weight value – 1) • Local – Within municipal boundary (weight value – 2) • Regional – Outside municipal boundary (weight value – 3)
Duration	Time span associated with impact: • Short term – 1 Year or less (weight value – 1) • Medium term – 1-5 Years (weight value –2) • Long term – Longer than 5 Years (weight value – 3)
Intensity and reversibility	The severity of an impact on the receiving environment: • Low – Natural and/or cultural processes continue in a modified way and is reversible (weight value – 1) • Medium – Natural and/or cultural processes stop and is partially reversible (weight value – 2) • High – Natural and/or cultural processes disturbed to an irreversible state (weight value – 3)
Significance of Impact/ Consequence	Adding the extent, duration and intensity together provides the significance of the impact (High, Medium or Low). **Extent + Duration + Intensity = High/Medium/Low Impact**
Probability	The likelihood of an impact occurring: • Unlikely – 0% - 45% chance of the potential impact occurring (weight value – 1) • Possible – 46% - 75% chance of the potential impact occurring (weight value – 2) • Likely - >75% chance of the potential impact occurring (weight value – 3)
Environmental Risk - Refer to Table 36 below	Multiplication of the significance of the impact by the probability of the impact occurring produces a final conclusion of the overall risk that an impact poses to the surrounding environment. **High/Medium/Low Impact X Probability = High/Medium/Low Environmental Risk**

Table 36: Environmental Risk Matrix

Significance of Impact				
		Low Impact (3 → 5)	Medium Impact (6 → 8)	High Impact (9)
Probability	Definite / Very Likely 3	9 - 15 L - M	18 - 24 M - H	27 H
	Possible 2	6 - 10 L - M	12 – 16 M	18 M - H
	Unlikely 1	3 - 5 L	6 – 8 L	9 L

ENVIRONMENTAL RISK	Guidelines for Control Strategies
(H) - High	Proactively reduce risk level, short term response.
(M- H) Medium to High	Proactively reduce risk level, short term response.
(M) – Medium	Management strategies to reduce risk level, short to medium term response.
(L – M) Low to Medium	Management strategies to reduce risk level, short to medium term response, operational control and housekeeping.
(L) - Low	Operational control and housekeeping.

7.3 Processes undertaken to ensure that impacts are mitigated

Mitigation measures were identified to ensure that impacts from the proposed activity are reduced as far as possible. The following mitigation measure objectives were kept in mind while the mitigation measures were identified:

- To find more environmentally sound ways of undertaking specific activities;
- To enhance any environmental and social benefits of a proposed activity;
- To avoid, minimise or remedy negative environmental impacts; and
- To ensure that any residual negative environmental impacts are environmentally acceptable.

Identifying appropriate mitigation measures were conducted in a hierarchal manner:

1. Preventative measures were identified to avoid, where possible, negative impacts that may arise as a result of the proposed activity;
2. Measures were identified to minimise and/or reduce the negative impacts to “as low as practicable” levels; and
3. Measures were identified to compensate or remedy residual negative impacts that are unavoidable and cannot be minimised or reduced any further (Department of Environmental Affairs, 2006).

7.4 Description of Environmental Impacts

The aim of this section of this EIA report is to provide information regarding the potential environmental impacts associated with the proposed activities. In order to provide background information and a framework for the environmental risk assessment, a description of the different phases of the project is provided below. Refer to the tables below for the impacts associated with the rendering facility expansion project.

Construction Phase

The following activities are anticipated during the construction phase of the project:

- Demolition of the two storage sheds adjacent to the current rendering plant;
- Clearance of land to the west of the two existing storage sheds;
- Expansion and upgrading of the rendering facility through the addition of a second plant building with associated infrastructures, such as access gates and roads. A portion of this infrastructure will extend into an undeveloped area to the west of the current storage sheds;
- Upgrading of the existing anaerobic treatment pond and settling pond through the addition of liners or a concrete floor. The anaerobic pond will also be split in two;
- Expansion of the current wastewater treatment system through the addition of two wastewater treatment works [one internal to the proposed, second plant and one external to the plant (after the wastewater has exited the second plant)]. A reverse osmosis system will also form part of the last stage of this wastewater treatment system.

Operational Phase

The following activities are anticipated during the operational phase of the proposed project:

- Existing rendering plant (Plant 1):
  - The plant will continue to operate and function as it currently does;
  - Incoming waste will be brought into the waste storage bunker and/or blood tank. Blood will be pre-treated through coagulation and added to the other waste;
  - The waste mixture will be loaded into the cooking vessels for sterilisation;
  - Once sterilised, the product will be dried, pass through a screen, cooled and bagged for removal off site;
  - Steam from the cooking vessels and drier will pass through a condenser. This water and wash water used to clean the plant will pass through a pre-filtration process and will then enter the upgraded wastewater treatment system; and
  - Discharge of treated wastewater (General Limit quality) into the environment, or re-use at the rendering facility.

- Proposed second plant (Plant 2):
  - In the common intake and receiving area (storage area), the incoming waste will be separated into the four processing streams (feathers, blood, whole chickens and blood);

- Cleaning, preparation and sterilisation of the waste streams;
- Packaging of the four separate products (high-protein meals);
- Treatment of wastewater within the processing plant;
- Treatment of wastewater once it has exited the processing plant; and
- Discharge of treated wastewater (General Limit quality) into the environment, or re-use at the rendering facility.

Decommissioning Phase

The following activities are expected during the decommissioning phase of the proposed project:

- Rehabilitation and restoration of the disturbed areas.

7.5 Environmental Impact Assessment

All activities related to the proposed rendering facility expansion that could have some impact on the environment were identified. These impacts can be of environmental, socio-economic or cultural nature. Impacts are often not only confined within the direct scope of the proposed activity and can accumulate as a network of indirect impacts on the surrounding area.

Different impacts are associated with the construction and operational phases of the proposed activity. The suitability and feasibility of all proposed mitigation measures are included in the assessment of significant impacts. This was achieved through comparison of the significance of the impact before and after the proposed mitigation measure is implemented.

7.5.1 Impacts associated with the expansion and upgrading of the rendering facility (Triggered listed activities: Listing Notice 1, No 35 and 40 and Listing Notice 2, No 5 and 26)

Table 37: Environmental impact assessment: Environment in general

Activity: • Construction activities for the expansion of the rendering facility. • Operational activities at the rendering facility.												
Aspect: • Lack of knowledge amongst workers and contractors in terms of how their actions may impact on the environment. • Unauthorised access to the site.												
Applicable Alternatives: All project phases: A2, A3, B2, C1 and C2												
Nature and significance of environmental impact												
Impact Description	**Risk rating (before mitigation)**			**Environmental Objective**	**Management / Mitigation / Monitoring Measures**	**Timeframe**	**Responsibility**	**Risk rating (after mitigation)**			**Applicable legislation / other documents**	
	Probability	**Significance**	**Environmental Risk**					**Probability**	**Significance**	**Environmental Risk**		
Construction Phase												
Harm to the environment in general (this includes pollution of soil and water resources, as well as harm to employees and wasteful practices in terms of resource use and waste management).	3	6	18 M-H	To prevent harm to the environment by educating workers and contractors.	• The contractor is to ensure that all employees, including sub-contractors and their employees, attend onsite Environmental Awareness/Training prior to commencing work on site. • Follow-up Environmental Awareness/Training may be required from time to time as new subcontractors or crews commence work or for specific activities that may potentially impact the environment. • The contractor is to maintain accurate records of any training undertaken. • The ECO shall monitor the contractor's compliance with the requirement to provide sufficient environmental awareness training to all site staff. • Training is to cover all aspects of the EMP and procedures to be followed. • All construction workers shall be issued with ID badges and clearly identifiable uniforms.	During construction phase, up until operation of the facility.	• Facility Manager • ECO	1	5	5 L	• NEMA, 1998 • NEMWA, 2008 • OHSA, 1993	
Operational Phase												
Harm to the environment in general (this can include pollution of soil and water resources, as well as harm to employees and wasteful practices in terms of resource use and waste management).	3	6	18 M-H	To prevent harm to the environment by educating workers and contractors.	• All employees are required to attend onsite Environmental Awareness/Training prior to commencing work on site. • Follow-up Environmental Awareness/Training may be required from time to time as new employees commence work or for specific activities that may potentially impact the environment. • The facility manager is to maintain accurate records of any training undertaken. • Training is to cover all aspects of the EMP and procedures to be followed.	Life of operation	Facility Manager	1	4	4 L	• NEMA, 1998 • NEMWA, 2008 • OHSA, 1993	
Decommissioning Phase												
Closure and decommissioning of the rendering 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 38: Environmental impact assessment: Vegetation

Activity:
- Site clearance and construction activities for the expansion of the rendering facility.
- Hot work activities, smoking and cooking as part of the construction phase.
- Growth of alien and invasive vegetation on site.
- Operational activities at the rendering facility.

Aspect:
- Removal of indigenous vegetation from the footprint for the expansion of the facility and possibly next to this footprint.
- Disturbance or destruction of natural vegetation surrounding the site as a result of runaway veld fires caused by workers or contractors.
- Infestation of alien invasive vegetation.
- Poor veld management.

Applicable Alternatives: Construction Phase: A2, A3, B2, C1 and C2. Operational Phase: All alternatives.

Nature and significance of environmental impact												
Impact Description	Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents
	Probability	Significance	Environmental Risk					Probability	Significance	Environmental Risk	
Construction Phase											
According to the Ecological Habitat Assessment, indigenous vegetation at the site is considerably transformed and it is unlikely that any threatened plant species will be disturbed by the expansion. Some grasslands remain, but have poor microhabitat diversity. The wetland to the west of the rendering facility is seen as an important biodiversity corridor, even though the wetland is degraded. The vegetation at the wetland consists of a mixture of exotic kikuyu grass with exotic weeds and some indigenous herbs and grasses. No extensive marsh vegetation is present. **Option C1:** The expansion of the rendering facility may lead to loss of remaining indigenous vegetation and habitats for fauna species. Based on the current proposed layout for the expansion, the second plant will extend into undeveloped vegetation to the west of the storage sheds, but no infrastructure will extend into any of the wetland vegetation on site, nor into any of the wetland zones.	3	5	15 L-M	To prevent the disturbance of indigenous vegetation, specifically wetland vegetation within the temporary zone of the wetland (part of the biodiversity corridor).	• The biodiversity corridor (wetland) should not be disturbed and no construction activities may take place within any of the wetland zones on site. No infrastructure may be placed or erected in any of the wetland zones on site. • Before any construction takes place the proposed area for the expansion will be pegged out. All construction activities will be limited to within these areas in order to reduce the footprint disturbed and avoid impact on adjacent grasslands and temporary wetland zones. • Construction areas should be fenced off or barricaded prior to and during construction. • Site clearing is to be limited to only the area necessary for carrying out the specified work. • The contractor is to draw up a plan for submission to the ECO and the facility manager indicating the locations of construction infrastructure including the site-camp, paint or cement cleaning pits, toilets, stores, stockpiles (topsoil and building rubble), site office and wetland zones. • The site boundary is to be clearly demarcated and screened from the commencement of works. • All demarcation is to be regularly maintained. • No unauthorised entry, stockpiling, dumping or storage of equipment outside the site boundary is permitted. • No entry, stockpiling, dumping or storage of equipment is allowed within any of the wetland zones. • All construction activities are to be restricted within the site boundary and may not extend into any wetland zones. • Removal of vegetation is to be avoided until such time as soil stripping is required. • Cleared indigenous vegetation can be stockpiled for possible reuse in later rehabilitation or landscaping or as a brush pack for erosion prevention.	During construction phase, up until operation of the facility.	• Facility Manager • ECO	3	4	12 L-M	• NEMA, 1998 • NWA, 1998
Option C2: The expansion of the rendering facility may lead to loss of remaining indigenous vegetation and habitats for fauna species. This site alternative would entail constructing the second plant to the south of the storage warehouse, an area that has historically been disturbed. The footprint would therefore **not** extend into any undisturbed areas or into any wetland zones.	3	4	12 L-M					2	3	6 L-M	

					• Once the construction activities have been completed, the remaining disturbed area must be top-soiled, sloped and re-vegetated as soon as possible using indigenous grass species. • Exotic and invasive plant species should be eradicated as part of the construction phase as far as possible. • Compacted soil should be ripped to ensure effective re-vegetation. • Soil stabilising measures could include rotovating in straw bales (at a rate of 1 bale/20m²), applying mulching or brush packing or creating windbreaks using brush or bales.						
Loss of indigenous grassland and habitats for indigenous fauna species surrounding the site as a result of runaway veld fires.	2	5	10 L-M	To prevent the occurrence and spreading of a veld fire.	**Equipment** • Basic fire-fighting equipment is to be placed at strategic locations on site and must be readily available (e.g. at the site office, flammable material store and watchman's container). • Equipment is to be maintained in good working order to the satisfaction of local fire authorities. • All personnel handling fuels and hazardous materials are to be issued with the appropriate Personal Protective Equipment (PPE). **Signage** • Safety signage including "No Smoking", "No Naked Lights" and "Danger", and product identification signs, are to be clearly displayed on fuel storage facilities and tanks. • Emergency numbers are to be clearly displayed. **Training** • An emergency procedure, taking into consideration all potential emergencies, such as a fire outbreak, hazardous chemical spill, etc. should be compiled. • The contractor is to ensure that all employees, including sub-contractors and their employees, are trained on the emergency procedure. • Follow-up emergency training may be required from time to time as new subcontractors or crews commence work. • The contractor is to maintain accurate records of any emergency training undertaken. • The ECO shall monitor the contractor's compliance with the requirement to provide sufficient emergency training to all site staff. **Activities** • All construction workers shall be transported to and from site on a daily basis. • Workers shall remain on the site at all times during the work day and no one will be allowed to leave site by foot, not even during break times. • Cooking during lunch is to be restricted to bottled gas facilities in designated areas approved by the ECO. This facility is to be supervised and strictly controlled. • A dedicated braai facility may be permitted in an area approved by the ECO, if it is in close proximity to firefighting equipment. At no time is a braai fire to be left unattended. • Smoking is prohibited near places where any readily combustible or flammable materials are present. Notices are to be prominently displayed prohibiting smoking in such areas.	During construction phase, up until operation of the facility.	• Facility Manager • ECO	1	5	5 L	• NEMA, 1998 • National Veld and Forest Fire Act, 1998

					• Welding, flame cutting and other hot work is only to be undertaken in places where the necessary safety precautions are in place (i.e. not near potential sources of combustion and with a fire extinguisher immediately accessible). • If applicable, night watchmen are to be provided with adequate cooking and heating facilities (no open fires), a suitable method of disposing of wastewater and access to communication equipment. • No open fires are permitted. **Flammable materials** • Flammable materials storage must comply with standard fire safety regulations. • All flammable materials are to be stored in a suitable, lockable storage area. • Combustible materials may not accumulate on the construction site. • Access to fuel and chemical stores should be strictly controlled. • Stockpiles of vegetation are only to be located in areas approved by the facility manager and may not exceed 2m in height. Methods of stacking must take cognisance of the possible creation of a fire hazard. • Burning of stockpiled vegetation is not permitted. **General** • A fire break must be created on the inside boundary fence around the rendering facility. The fire break must be regularly maintained (kept clear of vegetation).						
Operational Phase											
Growth of alien and invasive vegetation leading to smaller habitat areas available for indigenous vegetation. Alien and invasive plant species also generally use more water than indigenous plants.	2	5	10 L-M	To control and eradicate alien and invasive plant species.	• Ensure all alien and invasive plants are identified on the site. • Ensure an eradication plan for the removal of the alien and invasive vegetation is developed. • Ensure all alien and invasive vegetation is removed from the site in accordance with the eradication plan. • Alien invasive vegetation must be eradicated and controlled by manual removal, chemical application and/or biological control. The regulations in terms of the Conservation of Agricultural Resource Act, 1983 apply.	Life of operation	Facility Manager	2	4	8 L-M	• NEMA, 1998 • NWA, 1998 • CARA, 1983
Loss of indigenous grassland and habitats for indigenous fauna species surrounding the site as a result of runaway veld fires.	2	5	10 L-M	To prevent the occurrence and spreading of a veld fire.	• A fire break on the inside of the boundary fence surrounding the rendering facility must be regularly maintained (kept free of vegetation). • Should the fire break be burnt, the provisions in terms of the National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998) must be complied with.	Life of operation	Facility Manager	1	5	5 L	• NEMA, 1998 • National Veld and Forest Fire Act, 1998
Decommissioning Phase											
Closure and decommissioning of the rendering 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 39: Environmental impact assessment: Sensitive landscapes - Wetlands

Activity:
• Site clearance and construction activities for the expansion of the rendering facility. • Operational activities at the rendering facility. • Discharge of treated process wastewater into the environment.
Aspect:

- Site clearance extending into wetland zones.
- Disturbance of wetland zones by pipes discharging treated wastewater into the environment.
- Disturbance of wetland zones as part of the operational activities of the rendering facility.
- Disturbance and degradation of wetland zones due to inefficiently treated wastewater being released into the environment.

Applicable Alternatives: Construction Phase: A2, A3, B2, C1 and C2. Operational Phase: All alternatives.

Nature and significance of environmental impact												
Impact Description	Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents
	Probability	Significance	Environmental Risk					Probability	Significance	Environmental Risk	
Construction Phase											
An artificial, Category E (seriously modified), valley bottom wetland is present to the west of the rendering facility. The wetland has a low/marginal Ecological Importance and Sensitivity (EIS). The vegetation at the wetland consists of a mixture of exotic kikuyu grass with exotic weeds and some indigenous herbs and grasses. In terms of connectivity, the wetland is connected to wetland systems downstream. Its ecological health and functionality is therefore important in terms of conserving the larger wetland network downstream. **Option C1:** The construction activities associated with the expansion may disturb or destroy areas of the wetland. Based on the current proposed layout for the expansion, the second plant will extend into undeveloped vegetation to the west of the storage sheds, but no infrastructure will extend into any of the wetland zones present on site.	3	6	18 M-H	To prevent disturbance and degradation of the wetlands onsite.	• The biodiversity corridor (wetland) should not be disturbed. No construction activities may take place within any of the wetland zones on site. No infrastructure may be placed or erected in any of the wetland zones on site. • Before any construction takes place the proposed area for the expansion will be pegged out. All construction activities will be limited to within these areas in order to reduce the footprint disturbed and avoid impact on temporary wetland zones. • Construction areas should be fenced off or barricaded prior to and during construction. • Site clearing is to be limited to only the area necessary for carrying out the specified work. • The contractor is to draw up a plan for submission to the ECO and the facility manager indicating the locations of construction infrastructure including the site-camp, paint or cement cleaning pits, toilets, stores, stockpiles (topsoil and building rubble), site office and wetland zones. • No entry, stockpiling, dumping or storage of equipment is allowed within any of the wetland zones. • All construction activities are to be restricted within the site boundary and may not extend into any wetland zones.	During construction phase, up until operation of the facility.	• Facility Manager • ECO	2	5	10 L-M	• NEMA, 1998 • NWA, 1998
Option C2: The construction activities associated with the expansion may disturb or destroy areas of the wetland. This site alternative would entail constructing the second plant to the south of the storage warehouse, an area that has historically been disturbed. The footprint would therefore not extend into any wetland zones.	3	5	15 L-M					2	4	8 L-M	
Disturbance or degradation of the wetland as pipes for the discharge of treated wastewater are constructed or installed in wetland zones.	3	5	15 L-M		• The pipe that will discharge treated wastewater into the environment (drainage line) must be designed so that it disturbs as little of the environment as possible.			2	4	8 L-M	
Operational Phase											
An artificial, Category E (seriously modified), valley bottom wetland is present to the west of the rendering facility. The wetland has a low/marginal Ecological Importance and Sensitivity (EIS). The vegetation at the wetland consists of a mixture of exotic kikuyu grass with exotic weeds and some indigenous herbs and grasses. In terms of connectivity, the wetland is connected to wetland systems downstream. Its	2	6	12 M	To prevent disturbance and degradation of the wetlands onsite.	• A wetland and watercourses rehabilitation plan must be developed and implemented. • Wastewater generated at the rendering facility must be treated to a quality that complies with the Department of Water Affairs' General Limit standards for discharge into a water resource. Only treated wastewater of this quality may be discharged into the environment (drainage line). • The quality of the treated wastewater being discharged into the environment must be monitored on a monthly basis. Surface water quality monitoring must also be	Life of operation	Facility Manager	1	6	6 L	• NEMA, 1998 • NWA, 1998

ecological health and functionality is therefore important in terms of conserving the larger wetland network downstream. The discharge of ineffectively treated wastewater into the environment (drainage line) can lead to further degradation of the wetland as larger quantities of wastewater will be generated and discharged once the rendering facility has been expanded. If possible, the applicant will treat the wastewater to a quality that will enable the water to be re-used at the rendering facility.					conducted on a monthly basis at a number of locations upstream and downstream of the rendering facility, as detailed in the Integrated Water and Waste Management Plan (IWWMP) attached under Appendix D. • A habitat assessment study must be conducted annually for a period of three years. • A monitoring programme for the wetland and watercourses must be implemented. • Operational activities must occur outside of the wetland zones. No entry, stockpiling, dumping or storage of equipment or other material is allowed within any of the wetland zones.						
Decommissioning Phase											
Closure and decommissioning of the rendering 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 40: Environmental impact assessment: Topsoil and erosion

Activity:
- Stockpiling of topsoil and cleared vegetation.
- Site clearance.
- Replacement of topsoil and re-vegetation.
- Vegetation establishment as part of the rehabilitation.

Aspect:
- Topsoil being exposed to the elements.
- Prolonged exposure of cleared areas.
- Poor topsoil replacement and establishment of vegetation.
- Unsatisfactory establishment of vegetation.

Applicable Alternatives: Construction Phase: A2, A3, B2, C1 and C2. Operational Phase: All alternatives.

Nature and significance of environmental impact

Impact Description	Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents
	Probability	Significance	Environmental Risk					Probability	Significance	Environmental Risk	
Construction Phase											
Degradation and loss of a valuable resource (topsoil).	3	5	15 L-M	To reduce the duration and extent of exposure of topsoil to preserve it as a resource and protect it from erosion.	• If possible, schedule construction activities for dry months (winter). • Topsoil (top 150mm) is to be stockpiled in discrete areas and retained for future landscaping efforts. • Any sub-soil or rocks removed should also be stockpiled separately and be used during the rehabilitation. • Cleared indigenous vegetation should be used as a brush pack on topsoil stockpiles for erosion prevention. • Minimise the length and steepness of slopes. • If sterilisation of the topsoil has occurred during stockpiling, inorganic fertilisers will be used to supplement the soils before seeding of the area takes place.	During construction phase, up until operation of the facility.	• Facility Manager • ECO	1	3	3 L	• NEMA, 1998

					• Replace topsoil concurrent with construction, whenever possible. • Cordon off areas under rehabilitation using danger tape. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. • Aim to replace stockpiled topsoil to its original depth. • Topsoil should be returned to the same area from where it was stripped. • If there is not enough topsoil available from a particular soil zone, topsoil of a similar quality may be used to replace it. The suitability of substitute topsoil will be determined by a soil analysis and approved by the ECO. • Sample soil to a depth of 200mm in all areas allocated for reintroduction of indigenous vegetation. Have samples analysed to determine the type of fertiliser and rate at which it should be applied. • Compacted soil should be ripped to ensure effective re-vegetation. • Work necessary additives, as indicated by the soil analysis, into the soil. • Re-vegetation by indigenous grass species. • If areas show no specific vegetation growth within three months, areas shall receive additional topsoil, ripped to a depth of 100mm and re-planted. • Soil stabilising measures could include rotovating in straw bales (at a rate of 1 bale/20m²), applying mulching or brush packing, or creating windbreaks using brush or bales.						
Erosion of cleared areas.	3	5	15 L-M	To minimise the duration of exposure of cleared areas and to limit erosion of subsoil.	• The contractor is to ensure that all reasonable measures are taken to limit erosion during the construction phase. Erosion protection measures include sand bags, cut-off drains and/or berms. • Placement of erosion prevention structures such as cement, rock or vegetation (grass) to reduce water velocity at concentration points within the drainage system. • Cleared indigenous vegetation can be stockpiled for possible reuse in later rehabilitation or landscaping, or as a brush pack for erosion prevention. • Site clearing is to be limited to only the area necessary for carrying out the specified work. • Removal of vegetation is to be avoided until such time as soil stripping is required.	During construction phase, up until operation of the facility.	• Facility Manager • ECO	1	3	3 L	• NEMA, 1998
Operational Phase											
Vegetation established as part of the rehabilitation of cleared areas and the construction site may not grow well and this may lead to erosion of bare areas.	3	5	15 L-M	To minimise erosion of bare areas by ensuring that vegetation establishes and grows satisfactory.	• Re-vegetated areas should continuously be monitored to verify whether the vegetation is growing and covering bare areas. • If areas show no specific vegetation growth within three months, areas shall receive additional topsoil, ripped to a depth of 100mm and re-planted. • Fertilisers can also be used to promote growth of vegetation.	Life of operation	Facility Manager	1	4	4 L	• NEMA, 1998
Decommissioning Phase											
Closure and decommissioning of the rendering 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 41: Environmental impact assessment: Soil, surface water, stormwater and groundwater pollution

Activity:

- The handling, storage, mixing and disposal of cement and concrete.
- The cleaning of equipment and construction areas.
- Handling, storage and disposal of general/domestic and hazardous waste.
- Installation and use of ablution facilities.
- Storage and handling of hazardous chemical substances including fuel, greases and oils.
- Vehicle and equipment maintenance and fuelling.
- Design of the wastewater treatment works.
- Handling, storage and processing of incoming waste from abattoirs.
- Generation and treatment of wastewater.
- Handling and storage of coal.
- The burning of coal in the boilers to generate steam.
- Rain events and rain water (stormwater) flowing through the site.

Aspect:

- Concrete and cement spillage.
- Generation and runoff of contaminated wash water.
- Poor waste management.
- Unsanitary conditions on site.
- Poor management and spills of hazardous chemical substances including fuel, greases and oils.
- Leaking and/or spilling of fuels, greases and oils.
- Inadequate design of the wastewater treatment works.
- Poor management of incoming waste from the abattoirs.
- Inefficient management and treatment of wastewater generated at the rendering facility.
- Poor management and spillage of coal.
- Generation of boiler ash.
- 'Clean' rainwater (stormwater) running into 'dirty' areas.

Applicable Alternatives: Construction Phase: A2, A3, B2, C1 and C2. Operational Phase: All alternatives.

Nature and significance of environmental impact												
Impact Description	Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents
	Probability	Significance	Environmental Risk					Probability	Significance	Environmental Risk	
Construction Phase											
Soil and surface water pollution.	3	6	18 M-H	To prevent the pollution of soil and surface water as a result of spillage, improper handling, storage, mixing or disposal of cement and concrete.	• Cement may only be mixed on an impermeable surface (not on bare soil). • Dry cement must be removed from the soil surface to prevent an impermeable layer forming on top of the soil. The cement must be disposed of together with any building rubble. • Ready-mix trucks are not permitted to clean chutes on site. Cleaning into foundations or a dedicated cleaning pit is permitted. • Bricklayers and plasterers are to minimise any cement spill or runoff in their work area and are to ensure that the work area is cleaned of all cement spillage at the end of each workday. • Both used and unused cement bags are to be stored in weatherproof containers so as not to be affected by rain or runoff.	During construction phase, up until operation of the facility.	• Facility Manager • ECO	2	5	10 L-M	• NEMA, 1998

					• Contaminated soil resulting from concrete or cement spills, including residue produced by the washing of cavities, are to be removed immediately after the spillage has occurred and placed on the appropriate rubble stockpile. • Runoff from the washing out of wall cavities is to be contained against the building by excavations or berms around the foundations. All reasonable measures must be taken to prevent the dirty water from contaminating a watercourse.					
Soil and surface water pollution.	3	6	18 M-H	To prevent the pollution of soil and surface water bodies, including wetlands, through contaminated wash water. An example of this would be water that is contaminated with cement or concrete.	• No washing of vehicles is permitted on site. • A dedicated temporary cleaning area is to be identified to facilitate washing of all cement and painting equipment. • The cleaning area could be a plastic lined cleaning pit or dedicated plastic or metal drums, located as close as possible to a water point. • No wastewater/wash water may be disposed of on site, onto the soil or into any water body. • Runoff from the washing activities is to be contained against the building by excavations of berms around the foundations.			2	5	10 L-M
Soil, surface water and groundwater pollution. Nuisance caused by odours and unsightly appearance of waste onsite.	3	6	18 M-H	To prevent soil, surface and groundwater pollution and nuisance due to poor waste management.	• Building and demolition waste, such as from the demolition of the two storage sheds, must be disposed of to a landfill site. Steel should be taken to a licensed recycling facility. • Installation of sufficient waste bins, skips or bulk containers. Containers must be present on site at all times. • All containers (bins, skips or bulk containers) shall be kept in a clean and hygienic manner. • Containers (bins, skips or bulk containers) utilised for the disposal of general and hazardous waste must be demarcated accordingly. • Waste material may only be temporarily stored at areas demarcated for such storage practices. • General waste shall be stored in a manner that prevents the harbouring of pests. • General waste materials should always be stored or disposed of separately from hazardous waste material (e.g. oil, diesel). • General and hazardous waste can be deposited into appropriately demarcated bins at the construction activities. Bins are then emptied into appropriately demarcated skips or bulk containers at the end of each day or more often if required. • Skips or bulk containers should be removed to a licensed landfill site on a weekly basis or more often if required.			1	5	5 L
Soil, surface water and groundwater pollution.	2	6	12 M	Prevent soil, surface and groundwater pollution from unsanitary conditions onsite.	• Sufficient ablution facilities shall be provided – minimum of 1 toilet per 15 workers. • The ablution facilities must be on impermeable surfaces and at least 50m from the wetland present onsite. • The location of toilets is to be approved by the ECO prior to site establishment, but shall be located within 100m of any work point. • Ablating anywhere other than in the toilets shall not be allowed. • The ablution facilities are to be secured to avoid them from blowing or falling over. • The contractor shall ensure that any chemicals and/or waste from the ablution facilities are not spilled on the ground at any time. • Ablution facilities are to be serviced weekly or more frequently if required.			2	5	10 L-M

					• The contractor is to ensure that no spillage occurs and that the contents are removed from site on a regular basis.					
Soil, surface water and groundwater pollution.	3	6	18 M-H	To prevent and minimise soil and water pollution as a result of poor management and accidental spills of hazardous chemical substances including fuel, greases and oils used onsite.	• Identify all hazardous chemical substances used onsite including fuel, greases and oils. • Obtain the material safety data sheet of each of hazardous chemical substance. • Ensure that the material safety data sheets have sufficient information to enable the user to take the necessary measures to protect his/her health and safety and that of the environment. • Material Safety Data Sheets for all hazardous chemical substances must be readily available on site. • Keep a stock inventory register of all chemicals in the store. • Powders must be stored above liquids. • Proper storage of chemicals in a lockable, well ventilated building. • Ensure adequate access control for the storage area. • Storage areas for hazardous chemicals are to comply with standard fire safety regulations. • Safety signage including “No Smoking”, “No Naked Lights” and “Danger”, and product identification signs, are to be clearly displayed in areas housing chemicals. • Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. • Chemicals are to be properly labelled and handled in a safety conscious manner. • All personnel handling hazardous chemicals and hazardous materials are to be issued with the appropriate Personal Protective Equipment (PPE). • Ensure that diesel/fuel tanks are in a bunded area with capacity of holding 110% of the total storage volume. • The removal of only the daily-required amount of chemicals to be used from the shed. • If refuelling on site or from drums, the ground must be protected and proper dispensing equipment is to be used i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel. • Use of drip trays during filling of machinery or equipment. Drip trays should be emptied into secondary containers on a regular basis. • Ensure that any spilled chemical cannot exit the designated storage area by constructing a berm or bump at the exit, or store chemicals in a spill tray. • Immediately clean all spillage of fuels, lubricants and other petroleum based products. • The contaminated material must be disposed of in accordance with the waste management procedure. • No hazardous chemical must be discarded in the sewage or stormwater system. • Train staff on the use of chemicals in accordance with the risks as described in the material data sheets. • Soil contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site.			2	5	10 L-M	
Hydrocarbon pollution of soil, surface water and groundwater.	3	6	18 M-H	To prevent hydrocarbon pollution	• Equipment and vehicles are to be repaired immediately upon developing leaks. • Drip trays shall be supplied for all repair work undertaken on machinery on site.			2	5	10 L-M	

				of soils, surface and groundwater through the spilling of fuel, grease or oil or leaking equipment and vehicles.	• Drip trays are to be utilised during greasing and re-fuelling of machinery and to contain incidental spills and pollutants. • Drip trays are to be inspected daily for leaks and effectiveness and emptied when necessary. This is to be closely monitored during rain events to prevent overflow. • Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks and drums or containers for contaminated water. • Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site. • If refuelling on site or from drums, the ground must be protected and proper dispensing equipment is to be used i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel. • All liquid fuels (petrol and diesel) are to be stored in tanks or containers with lids. • Inspect vehicles on entering the facility to ensure vehicles are in sound condition to reduce the risk of oil or diesel spillages.					
Soil, surface water and groundwater pollution during the operational phase due to inadequate design of the wastewater treatment works.	2	6	12 M	To ensure adequate design of the wastewater treatment works.	• The wastewater treatment works must be positioned so that it is not subject to flooding and must be situated above the 1:100 year floodline. • The wastewater treatment works must be designed to treat all wastewater generated at the rendering facility on a daily basis. Sumps and pumps must also be designed taking the necessary treatment rate into account. • The wastewater treatment works must be designed to at least treat the wastewater to a quality that complies with the Department of Water Affairs' General Limit standards for discharge into a water resource. • The wastewater treatment works must be designed so that the treated wastewater exits the wastewater treatment works at a temperature no higher than 3 degrees Celsius more than the natural ambient water temperature of the receiving water resource. • Ensure sufficient freeboard to guarantee facility integrity during heavy rainfall events. • The wastewater treatment works must be designed taking electricity usage into account. Gravity flow must be used wherever possible. • All treatment ponds and/or beds must be lined with a 1.5mm HDPE liner or impermeable concrete floor. The wastewater treatment works will be constructed within a bund wall. • Pipelines conveying wastewater must be manufactured to be or painted a conspicuous colour, distinctly different from the colour of pipes that are used to convey clean water. • The following conditions were abstracted from the Department of Water Affairs' Replacement of General Authorisation in terms of Section 39 of the NWA, 1998 (Act 36 of 1998), 18 December 2009: ▪ Structures and hardened surfaces associated with the water use must not- ➢ Be erosive; ➢ Be structurally unstable; ➢ Induce any flooding; or ➢ Be a health and safety hazard. ▪ The water use must not result in a potential, measurable or cumulative detrimental-			1	6	6 L

					➢ Change in the stability of the watercourse; ➢ Change in the physical structure of a watercourse; ➢ Scouring, erosion or sedimentation of a watercourse; or ➢ Decline in the diversity of communities and composition of the natural, endemic vegetation. ▪ The water use must not result in a potential, measurable or cumulative detrimental change in the quantity, velocity, pattern, timing, water level and assurance of flow in a watercourse. ▪ The water use must not result in a potential, measurable or cumulative detrimental change in the water quality characteristics of the watercourse. ▪ The water use must not result in a potential, measurable or cumulative detrimental change on the- ➢ Breeding, feeding and movement patterns of aquatic biota, including migratory species; ➢ Level of composition and diversity of biotopes and communities of animals and microorganisms; or ➢ Condition of the aquatic biota.						
Operational Phase											
Soil, surface water and groundwater pollution. Nuisance caused by odours and unsightly appearance of waste onsite.	3	6	18 M-H	To prevent soil, surface and groundwater pollution and nuisance as a result of poor waste management (waste generated at the facility and not including incoming waste from the abattoirs for processing at the rendering facility).	• New hazardous waste storage areas must be registered with the competent authority within ninety (90) days prior to construction taking place. • The location of hazardous waste storage areas must be in accordance with GNR. 926 of 29 November 2013 (National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008): National Norms and Standards for the storage of waste). • The construction and design of the hazardous waste storage facility must be conducted in accordance with GNR. 926 of 29 November 2013. • Waste storage facilities must have correct access control and signage as stipulated in GNR. 926 of 29 November 2013. • Waste storage facilities must be operated as stipulated in GNR. 926 of 29 November 2013. • All waste storage containers must comply with the conditions as stipulated in GNR. 926 of 29 November 2013. • Training must be provided continuously to employees working with waste. The training programme must include the provisions stipulated in GNR. 926 of 29 November 2013. • An Emergency Preparedness Plan must be compiled in accordance with GNR. 926 of 29 November 2013. • Monitoring, auditing, reporting and record keeping must be conducted in accordance with GNR. 926 of 29 November 2013. • Implement a waste management plan/procedure. • Take note that hazardous waste includes ash, empty hazardous chemical substance containers, soil and material (e.g. cloths) contaminated by hazardous chemical substances, etc. • The waste management plan/procedure should consider the type of waste, description, source, storage, disposal method, disposal facility and responsible person. • The implementation of the waste management plan/procedure should ensure: ▪ Installation of sufficient waste bins, skips or bulk containers, where necessary. The design of the bins, skips or bulk containers must ensure containment to	Life of operation	Facility Manager	1	5	5 L	• NEMA, 1998 • NEMWA, 1998 • OHSA, 1993

					prevent seepage, must be covered to prevent water ingress and must be placed on impermeable surfaces within bunded areas. ▪ All containers (bins, skips or bulk containers) shall be kept in a clean and hygienic manner. ▪ Containers (bins, skips or bulk containers) utilised for the disposal of general and hazardous waste must be demarcated accordingly. ▪ Waste material may only be temporarily stored at areas demarcated for such storage. ▪ General waste shall be stored in a manner that prevents the harbouring of pests. ▪ General and hazardous waste should always be stored and disposed of separately. ▪ General and hazardous waste should be disposed of in appropriately demarcated bins. Bins are then emptied into appropriately demarcated skips or bulk containers once a day or more often, if required. ▪ Skips or bulk containers should be removed to a nearby landfill site on a regular basis. No build-up of waste is permitted onsite. ▪ Safe disposal certificates should be requested from general and hazardous landfill sites with every waste disposal. Waste may only be disposed of at landfill in accordance with the Norms and Standards for Disposal to Landfill as stipulated in Section 7(1) of the NEMWA, 2008. ▪ These safe disposal certificates should be kept on file to illustrate compliance with the cradle to grave principle. • All waste generated at the facility must be classified in terms of GNR. 634 of 23 August 2013 (National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008): Waste Classification and Management Regulations). • Safety data sheets must be obtained or prepared for all hazardous waste, such as boiler ash, generated at the facility, as stipulated in GNR. 634 of 23 August 2013. • All waste storage containers must be labelled, as stipulated in GNR. 634 of 23 August 2013. • Detailed records must be kept of all waste generated, as stipulated in GNR. 634 of 23 August 2013. This includes the classification of the waste, quantities of waste generated and re-used, recycled, recovered, treated or disposed of (in tons or m^3 per month), and by whom the waste was managed. • Waste manifest documents must be compiled for all hazardous waste generated onsite, as stipulated in GNR. 634 of 23 August 2013 (specifically Annexure 2). • All waste transporters must also complete waste manifest documents for each load of waste transported, as stipulated in GNR. 634 of 23 August 2013 (specifically Annexure 2). • Waste manifest documentation must be retained for a period of at least five (5) years. • No incineration of any kind of waste will be permitted onsite. • Implement the surface- and groundwater monitoring programme as detailed in the Integrated Water and Waste Management Plan (IWWMP) and Geohydrological Report, both attached under Appendix D. • Undertake regular geohydrological studies to determine the impact of the rendering facility on the groundwater resource.					

					• Regular review of the monitoring programme by a competent person to identify areas of improvement as well as areas that require attention.					
Soil, surface water and groundwater pollution. Nuisance caused by odours and unsightly appearance of waste onsite.	3	6	18 M-H	To prevent soil, surface water and groundwater pollution and nuisance as a result of poor management of incoming waste from the abattoirs (waste to be processed at the rendering facility).	• New hazardous waste storage areas must be registered with the competent authority within ninety (90) days prior to construction taking place. • The location of hazardous waste storage areas must be in accordance with GNR. 926 of 29 November 2013 (National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008): National Norms and Standards for the storage of waste). • The construction and design of the hazardous waste storage facility must be conducted in accordance with GNR. 926 of 29 November 2013. • Waste storage facilities must have correct access control and signage as stipulated in GNR. 926 of 29 November 2013. • Waste storage facilities must be operated as stipulated in GNR. 926 of 29 November 2013. • All waste storage containers must comply with the conditions as stipulated in GNR. 926 of 29 November 2013. • Training must be provided continuously to employees working with waste. The training programme must include the provisions stipulated in GNR. 926 of 29 November 2013. • An Emergency Preparedness Plan must be compiled in accordance with GNR. 926 of 29 November 2013. • Monitoring, auditing, reporting and record keeping must be conducted in accordance with GNR. 926 of 29 November 2013. • Incoming waste should be stored in an enclosed, well-ventilated area. No storage is permitted in open areas (second, new plant). • Store incoming waste in a roofed area (in the case of the existing plant). • Incoming waste should be processed in a timely manner (i.e. when fresh) or should be refrigerated. • No incoming waste may accumulate in open areas not designated for its storage prior to processing. • Waste manifest documents must be obtained for each load of incoming waste from the abattoirs, as stipulated in GNR. 634 of 23 August 2013 (specifically Annexure 2). • All waste transporters must also complete waste manifest documents for each load of waste transported, as stipulated in GNR. 634 of 23 August 2013 (specifically Annexure 2). • Waste manifest documentation must be retained for a period of at least five (5) years. • Implement the surface- and groundwater monitoring programme as detailed in the Integrated Water and Waste Management Plan (IWWMP) and Geohydrological Report, both attached under Appendix D. • Undertake regular geohydrological studies to determine the impact of the rendering facility on the groundwater resource. • Regular review of the monitoring programme by a competent person to identify areas of improvement as well as areas that require attention.			1	5	5 L	
Soil, surface water and groundwater pollution.	2	6	12 M	Prevent soil, surface and groundwater pollution from	• Sufficient ablution facilities shall be provided – minimum of 1 toilet per 15 workers. • Ablution facilities shall be inspected and maintained to prevent and minimise blockage and leakages.			1	6	6 L	

				unsanitary conditions onsite.	• Ablution facilities are to be serviced weekly or more frequently if required. • Toilets should have properly closing doors and be supplied with toilet paper. • Awareness of the importance of proper hygiene should be created among employees. • Ablating anywhere other than in the toilets shall not be allowed. • A septic tank system should be considered instead of french drains. • Routine maintenance must be undertaken. • Implement the surface- and groundwater monitoring programme as detailed in the IWWMP and Geohydrological Report. • Undertake regular geohydrological studies to determine the impact of the rendering facility on the groundwater resource. • Regular review of the monitoring programme by a competent person to identify areas of improvement as well as areas that require attention.						
Soil, surface water and groundwater pollution.	3	6	18 M-H	To prevent and minimise soil and water pollution as a result of poor management and accidental spills of hazardous chemical substances, including fuel, greases and oils used onsite.	• Identify all chemical substances used onsite including fuel, greases, detergents etc. • Obtain the material safety data sheet of each of these chemical substances. • Ensure that the material safety data sheets have sufficient information to enable the user to take the necessary measures to protect his/her health and safety and that of the environment. • Material Safety Data Sheets for all hazardous chemical substances must be readily available on site. • Develop and implement a dangerous goods management plan based on the material safety data sheets of all identified chemical substances and the 1995 Hazardous Chemical Substances Regulations in terms of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993). • Keep a stock inventory register of all chemicals in the store. • Powders must be stored above liquids. • Proper storage of chemicals in a lockable, well ventilated building. • Ensure adequate access control for the storage area. • Storage areas for hazardous chemicals are to comply with standard fire safety regulations. • Safety signage including “No Smoking”, “No Naked Lights” and “Danger”, and product identification signs, are to be clearly displayed in areas housing chemicals. • Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. • Chemicals are to be properly labelled and handled in a safety conscious manner. • All personnel handling hazardous chemicals and hazardous materials are to be issued with the appropriate Personal Protective Equipment (PPE). • Ensure that diesel or fuel tanks are in a bunded area with capacity of holding 110% of the total storage volume. • The removal of only the daily-required amount of chemicals to be used from the shed. • If refuelling on site or from drums, the ground must be protected and proper dispensing equipment is to be used i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel.			2	5	10 L-M	

					• Use of drip trays during filling of machinery or equipment. Drip trays should be emptied into secondary containers on a regular basis. • Ensure that any spilled chemical cannot exit the designated storage area by constructing a berm or bump at the exit, or store chemicals in a spill tray. • Immediately clean all spillage of fuels, lubricants and other petroleum based products. • The contaminated material must be disposed of in accordance with the waste management procedure. • No hazardous chemical must be discarded in the sewage or stormwater system. • Train staff on the use of chemicals in accordance with the risks as described in the material data sheets. • Soil contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site. • Implement the surface- and groundwater monitoring programme as detailed in the IWWMP and Geohydrological Report. • Undertake regular geohydrological studies to determine the impact of the rendering facility on the groundwater resource. • Regular review of the monitoring programme by a competent person to identify areas of improvement as well as areas that require attention.					
Soil, surface water and groundwater pollution.	3	6	18 M-H	To prevent hydrocarbon pollution of soil, surface and groundwater through spillage of fuel, grease or oil and leaking equipment and vehicles.	• Inspection and maintenance of equipment, generators, diesel tank and vehicles owned by AFGRI shall take place on a regular basis. • Security shall inspect vehicles on entering the facility to ensure vehicles are in sound condition. This will reduce the risk of oil or diesel spillages. • Equipment, generators, diesel tank and vehicles are to be repaired immediately upon developing leaks. • The diesel storage tank and bund wall must undergo a yearly integrity assessment. • Generators must be stored on a concrete floor in a bunded area. • Drip trays shall be supplied for all repair work undertaken on machinery on site. • Drip trays are to be utilised during daily greasing and re-fuelling of machinery and to contain incidental spills and pollutants. • Drip trays are to be inspected daily for leaks and effectiveness and emptied when necessary. This is to be closely monitored during rain events to prevent overflow. • Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. • Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site. • If refuelling on site or from drums, the ground must be protected and proper dispensing equipment is to be used i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel. • All liquid fuels (petrol and diesel) are to be stored in tanks or containers with lids. • Implement the surface- and groundwater monitoring programme as detailed in the IWWMP and Geohydrological Report. • Undertake regular geohydrological studies to determine the impact of the rendering facility on the groundwater resource.			1	6	6 L

					• Regular review of the monitoring programme by a competent person to identify areas of improvement as well as areas that require attention.						
Soil, surface water and groundwater pollution due to the discharge of ineffectively treated wastewater into the environment (drainage line). Larger quantities of wastewater will be generated and discharged once the rendering facility has been expanded. If possible, the applicant is proposing to treat the wastewater to a quality that will permit its re-use at the rendering facility, thereby decreasing the amount of treated wastewater that will need to be discharged into the environment.	3	6	18 M-H	To ensure adequate management and treatment of wastewater generated onsite.	• During the commissioning phase of the wastewater treatment works, additives should be used to minimise the generation of odours. • Wastewater discharged into the environment may not alter the natural ambient water temperature of the receiving water resource by more than 3 degrees Celsius. • All reasonable measures must be taken to avoid liner or concrete damage and leakage. • All reasonable measures must be taken to prevent mechanical, electrical or operational failures and malfunctions of the wastewater treatment works. • Floating matter, such as grass, may not accumulate on the surface of the treatment ponds. • All ponds must be regularly inspected for signs of sludge build up and ineffective treatment of the wastewater. • Implement a preventative maintenance programme, providing for equipment reliability and availability. • Wastewater generated at the rendering facility must be treated to a quality that complies with the Department of Water Affairs' General Limit standards for discharge into a water resource. Only treated wastewater of this quality may be discharged into the environment (drainage line). • The quality of the treated wastewater being discharged into the environment must be monitored on a monthly basis. Surface water quality monitoring must also be conducted on a monthly basis at a number of locations upstream and downstream from the rendering facility, as detailed in the IWWMP. • Flow meters must be used to record the quantity of treated wastewater discharged into the environment on a daily basis. Flow meters must be maintained in a sound state of repair and calibrated by a competent person at intervals of not more than once in two years. Calibration certificates must be kept on record. • An incidents and complaints register must be kept on site. • Implement the surface- and groundwater monitoring programme as detailed in the IWWMP and Geohydrological Report. • Undertake regular geohydrological studies to determine the impact of the rendering facility on the groundwater resource. • Regular review of the monitoring programme by a competent person to identify areas of improvement as well as areas that require attention.			1	6	6 L	
Soil, surface water and groundwater pollution.	2	6	12 M	To ensure the proper handling and storage of coal.	• Store coal in bunkers. • Construct a bump/berm at the bunker entrance to prevent rain water from entering the bunker and becoming contaminated. • Construct a roof to prevent rain water from being contaminated by the coal. • Prevent coal spillages during loading and remove any coal spillages from the soil and return to the coal bunker. • Implement the surface- and groundwater monitoring programme as detailed in the IWWMP and Geohydrological Report. • Undertake regular geohydrological studies to determine the impact of the rendering facility on the groundwater resource. • Regular review of the monitoring programme by a competent person to identify areas of improvement as well as areas that require attention.			1	6	6 L	

Coal ash contains heavy metals and metalloids such as As, Pb and Se. These contaminants can leach into groundwater discharging at discharge zones into spruits and rivers. The coal ash generated at the rendering facility has been classified according to the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008): National Norms and Standards for the Assessment of Waste for Landfill Disposal (Government Gazette No. 36784 of 23 August 2013). The ash was found to have a Type 3 classification.	3	6	18 M-H	To prevent soil, surface and groundwater pollution as a result of poor ash management.	Note: The management of ash should be included in the waste management plan. • No coal ash may be stored on bare soil or in open areas. • The coal ash must be disposed of or managed in accordance with its waste classification. Type 3 wastes may be disposed of at Class C landfill sites designed in accordance with sections 3(1) and (2) of the Norms and Standards or at landfill sites designated in accordance with the requirements for a GLB+ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd Ed., DWAF, 1998). • New hazardous waste storage areas must be registered with the competent authority within ninety (90) days prior to construction taking place. • The location of hazardous waste storage areas must be in accordance with GNR. 926 of 29 November 2013 (National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008): National Norms and Standards for the storage of waste). • The construction and design of the hazardous waste storage facility must be conducted in accordance with GNR. 926 of 29 November 2013. • Waste storage facilities must have correct access control and signage as stipulated in GNR. 926 of 29 November 2013. • Waste storage facilities must be operated as stipulated in GNR. 926 of 29 November 2013. • All waste storage containers must comply with the conditions as stipulated in GNR. 926 of 29 November 2013. • Training must be provided continuously to employees working with waste. The training programme must include the provisions stipulated in GNR. 926 of 29 November 2013. • An Emergency Preparedness Plan must be compiled in accordance with GNR. 926 of 29 November 2013. • Monitoring, auditing, reporting and record keeping must be conducted in accordance with GNR. 926 of 29 November 2013. • Ash must be stored in an enclosed, concreted area or in suitable closed container prior to removal. It may also be stored in an enclosed, lined area. • Should ash be disposed of off-site, a safe disposal certificate must be obtained from the licensed waste disposal site. • Should ash be supplied to a third party for recycling or re-use, AFGRI should ensure that the third party is licensed for the recycling or re-use and a waste manifest document must be obtained. • Implement the surface- and groundwater monitoring programme as detailed in the IWWMP. • Undertake regular geohydrological studies to determine the impact of the rendering facility on the groundwater resource. • Regular review of the monitoring programme by a competent person to identify areas of improvement as well as areas that require attention.			1	6	6 L	
Soil and surface water pollution. Contamination of clean stormwater runoff flows through the site from east to west.	3	6	18 M-H	To prevent the contamination of 'clean' stormwater in 'dirty' areas through effective control of stormwater runoff.	• Clean stormwater runoff from the surrounding environment must be channelled away from 'dirty' areas. These 'dirty' areas include the coal storage area, ash storage area, chemicals storage areas and all waste storage areas (for example, intake areas). • Clean stormwater should be diverted and kept in the environment surrounding the site.			1	6	6 L	

					• Stormwater measures should be inspected on a regular basis in order to ensure that the structures are functional and not causing soil erosion. • Where necessary place culverts underneath road foundations. • All the mitigation measures of AFGRI's Stormwater Management Plan must be adhered to. • Implement the surface water monitoring programme as detailed in the IWWMP and Geohydrological Report. • Regular review of the monitoring programme by a competent person to identify areas of improvement as well as areas that require attention.						
Decommissioning Phase											
Closure and decommissioning of the rendering 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 42: Environmental impact assessment: Atmosphere and Noise

Activity:
- Excavation activities, loading and offloading activities and vehicles travelling to and from the site.
- Construction workers, vehicles, machinery and general noisy construction activities on site.
- Increased traffic frequency due to more waste being transported to site and more product being removed from site.
- General operational activities at the rendering facility.
- Burning of coal in boilers to generate steam.

Aspect:
- Dust generation.
- Generation of noise and nuisance.
- Ineffective management of atmospheric emissions generated by the rendering process.
- Ineffective management of atmospheric emissions generated by the burning of coal in the boilers.

Applicable Alternatives: Construction Phase: A2, A3, B2, C1 and C2. Operational Phase: All alternatives.

Nature and significance of environmental impact											
Impact Description	**Risk rating (before mitigation)**			**Environmental Objective**	**Management / Mitigation / Monitoring Measures**	**Timeframe**	**Responsibility**	**Risk rating (after mitigation)**			**Applicable legislation / other documents**
	Probability	**Significance**	**Environmental Risk**					**Probability**	**Significance**	**Environmental Risk**	
Construction Phase											
Degradation of ambient air quality due to dust generation.	3	5	15 L-M	To minimise the impact of excavation activities, loading and offloading activities and vehicles travelling to and from the site on the ambient air quality.	• A dustcart needs to be onsite to water down dusty roads. • 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 tires and breaks. Optimal engine combustion will allow for 'cleaner' exhaust emissions. • A complaints register must be kept onsite. 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.	During construction phase, up until operation of the facility.	• Facility Manager • ECO	3	4	12 L-M	• NEMA, 1998

According to Jorgensen & Johnson (1981), the noise levels generated by general construction activities on a building site can reach levels of approximately 70 dB, caused by for instance heavy machinery. It can therefore be assumed that the proposed development will have a negative impact on the environmental noise of the area once construction starts. Sound is inversely proportional to the distance from the source and can get absorbed by buildings and vegetation barriers. Noise intensities (dB) will be at their highest on site and will decrease as one moves away from their sources. The noise decline curve gives an indication of how noise generated at the site will decrease with distance. It gives an indication of the distance that the sound would have travelled upon reaching a level of 60 dB, prescribed by the SABS as being the acceptable limit for environmental noise. According to noise decline curve, at a distance of 27 metres from the construction site, the generated noise would have decreased to a level of 60 dB and at a distance of 45 metres it would have decreased to approximately 55dB. It can therefore be said that noise travelling further than 45 metres will have a low impact on neighbouring farms and residential areas. The distance to sensitive noise receptors (residences) is more than 45 metres in all cases.	3	5	15 L-M	To minimise noise generation during the construction phase.	• Schedule activities that will generate the most noise during times of the day that will result in least disturbance to neighbours. • Site workers and contractors will 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 and equipment. • All equipment and machinery should be fitted with adequate silencers. • Working hours should be restricted to daylight hours. • 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. • If work is to be undertaken outside of normal work hours permission must be obtained from the ECO and the facility manager. • No noisy work is to be conducted over the weekends or on public holidays. • A complaints register must be kept onsite. 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.			3	4	12 L-M	• NEMA, 1998 • OHSA, 1993
Operational Phase											
Degradation of ambient air quality.	3	7	21 M-H	To minimise the impact of dust generated by the increased traffic frequency on the ambient air quality.	• A dustcart needs to be onsite to water down dusty road. • 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 tires and breaks. Optimal engine combustion will allow for 'cleaner' exhaust emissions. • If the soil is compacted, open areas should be ripped, fertilised and re-vegetated as soon as possible using suitable grass species (indigenous seed mix). • A complaints register must be kept onsite. 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.	Life of operation	Facility Manager	2	5	10 L-M	• NEMA, 1998
Disturbance and nuisance to neighbours due to operational activities.	3	7	21 M-H	To maintain a dB reading of less than 50dB at the site boundary and minimise nuisance to neighbours.	• The site workers and contractors will 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. • If work is to be undertaken outside of normal work hours permission must be obtained from the ECO and the facility manager. • No noisy work is to be conducted over the weekends or on public holidays.			2	7	14 M	• NEMA, 1998 • OHSA, 1993

					• A complaints register must be kept onsite. 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.						
Generation of atmospheric emissions, odours and nuisance to neighbours. Odours are mostly caused by volatile organic compounds (VOCs) and these are the main atmospheric emissions generated at rendering facilities. VOC emissions can be made up of all or some of the following compounds: ammonia, organic sulphides, particulates, hydrogen sulphide, trimethylamine, disulphides, quinoline, C-4 and C-7 aldehydes, C-4 amines, C-3 to C-6 organic acids, dimethyl pyrazine and other pyrazines. Small volumes of the following may also be emitted: ketones, aromatic compounds, C-4 to C-7 alcohols and aliphatic hydrocarbons. Many of the compounds have low odour detection thresholds, with some as low as one (1) part per billion (ppb). Quonoline is the only compound that is classified as a hazardous air pollutant (HAP). The main VOC sources are the cooking vessels and the screw press. Other sources include the loading hopper, blood processing area, dryers, percolator pans and other processing areas that are not enclosed. Poultry waste stored at the facility may also generate VOC emissions, though this can be minimised by processing the waste in a timely manner. Particulate matter may also be produced at the dryers. Water vapour from the cooking vessels is condensed in the condenser and non-condensibles are emitted as VOC emissions. To treat odourous emissions at the rendering plant, a new air treatment system is being proposed. The second plant will be entirely enclosed and all air exiting the plant will pass through the air treatment system. The same air treatment system will also be installed for the existing rendering plant.	3	7	21 M-H	To minimise the generation of odours at the rendering facility and thus the nuisance to neighbours.	• Containers or vehicles transporting waste, including blood, to the rendering facility must be leak-proof. • Unload the incoming waste within an enclosed building with extraction ventilation connected to the air treatment system (odour abatement system). • Incoming waste should be stored in an enclosed, well-ventilated area. No storage is permitted in open areas. • Incoming waste should be processed in a timely manner (i.e. when fresh) or should be refrigerated. • The new plant should be operated under negative pressure as far as possible. • All storage and processing areas must be kept clean. • The rendering facility must obtain an Atmospheric Emission License in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004). • According to the Listed Activities and Associated Minimum Emission Standards identified in terms of Section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), the applicant must implement best practice measures intended to minimise or avoid offensive odours. These measures must be documented to the satisfaction of the Licensing Authority. • The proposed odour abatement system will consist of an air cooled condenser with ozone treatment at the system outlet. One such system will be installed at the existing rendering plant and another system will be installed at the second, proposed plant. • The proposed odour abatement systems must be operated and maintained as prescribed by the system designers to ensure effective operation of the system. • An Odour Management Plan must be developed and implemented. • A complaints register must be kept onsite. 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.			2	7	14 M	• NEMA, 1998 • NEM:AQA, 2004
Generation of atmospheric emissions from the burning of coal. Coal-fired boilers produce suspended particulate matter; ammonia; nitrogen and sulphur oxides; greenhouse gases; and may also produce VOCs.	3	8	24 M-H	To minimise the amount of atmospheric emissions generated and released into the atmosphere.	• Use high-grade coal where possible as lower grade coal may result in higher sulphur emissions. • Regular maintenance of the boilers. Optimal combustion will allow for ‘cleaner’ stack emissions. • Ensure adequate storage of coal to minimise dispersion of fine coal dust, i.e. a covered storage area. • The 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.			3	7	21 M-H	• NEMA, 1998 • NEM:AQA, 2004
Decommissioning Phase											

Closure and decommissioning of the rendering 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 43: Environmental impact assessment: Infrastructure

Activity: • Increased traffic frequency on road infrastructure.												
Aspect: • Wear of access roads and insufficient vehicle inspections.												
Applicable Alternatives: Construction Phase: A2, A3, B2, C1 and C2. Operational Phase: All alternatives.												
Nature and significance of environmental impact												
Impact Description	**Risk rating (before mitigation)**			**Environmental Objective**	**Management / Mitigation / Monitoring Measures**	**Timeframe**	**Responsibility**	**Risk rating (after mitigation)**			**Applicable legislation / other documents**
	Probability	**Significance**	**Environmental Risk**					**Probability**	**Significance**	**Environmental Risk**	
Construction Phase											
Wear of access roads, accidents on access roads, unpermitted transport of materials and loss of materials being transported on access roads.	2	6	12 M	To minimise the impact of an increase of traffic on access roads to the facility.	• Ensure that all construction vehicles using access roads are roadworthy. • All loads are to be securely fastened when being transported. • All vehicles are to adhere to the tonnage limitation and acquire a permit as required. • All speed limits and other traffic regulations on the public roadways must be adhered to.	During construction phase, up until operation of the facility.	• Facility Manager • ECO	1	6	6	• NEMA, 1998
Operational Phase											
Wear of access roads, accidents on access roads, unpermitted transport of materials and loss of materials being transported on access roads.	2	6	12 M	To minimise the impact of an increase of traffic on access roads to the facility.	• Ensure that all vehicles using access roads are roadworthy. • All loads are to be securely fastened when being transported. • All vehicles are to adhere to the tonnage limitation and acquire a permit as required. • All speed limits and other traffic regulations on the public roadways must be adhered to.	Life of operation	Facility Manager	1	6	6	• NEMA, 1998
Decommissioning Phase											
Closure and decommissioning of the rendering 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 44: Environmental impact assessment: Resource usage

Activity: • Usage of resources, such as electricity and water (groundwater).
Aspect: • Inefficient and redundant use of valuable resources (electricity and groundwater).

Applicable Alternatives: Construction Phase: A2, A3, B2, C1 and C2. Operational Phase: All alternatives.

Nature and significance of environmental impact												
Impact Description	Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents
	Probability	Significance	Environmental Risk					Probability	Significance	Environmental Risk	
Construction Phase											
Wastage or depletion of a valuable resource (groundwater) due to inefficient or redundant usage.	3	6	18 M-H	To prevent the wastage or depletion of a valuable resource (groundwater).	**General** • Ensure that all employees have been informed on the importance of natural resources (proper environmental training and awareness). • Regular site inspection by supervisors. **Water** • Regular inspection and maintenance of all boreholes, JoJo tanks, reservoirs, toilets, water pipes and taps. • Leaking JoJo tanks, reservoirs, taps, toilets and pipes are to be repaired immediately. • Running water taps and pipes may not be left unattended. • All pipe, hose and tap connections are to be fitted with correct and appropriate plumbing fittings.	During construction phase, up until operation of the facility.	• Facility Manager • ECO	1	5	5 L	• NEMA, 1998 • NWA, 1998
Operational Phase											
Wastage or depletion of valuable resources (groundwater and electricity) due to inefficient or redundant usage.	3	6	18 M-H	To prevent the wastage or depletion of valuable resources (groundwater and electricity).	**General** • Ensure that all employees have been informed of the importance of natural resources (proper environmental training and awareness). • Regular site inspection by supervisors. • Inspect operations regularly to determine areas of improvement with regards to resource consumption. • Regular maintenance and inspection of equipment such as hose pipes, to prevent leaks. • Monitoring of resource consumption. • Identify areas where resource consumption can be minimised. • Set targets to try minimise resource consumption. • Identify technologies and practices that may reduce resource consumption. • Implementation of technologies and practices that can reduce resource consumption. **Water** • Groundwater may only be abstracted from the onsite borehole in accordance with the IWWMP provisions and subsequent Water Use License that will be issued by the Department of Water Affairs. Furthermore, groundwater may only be abstracted at the recommended sustainable yield rate of 2.5l/s, as stipulated in the Borehole Pumping Test Certificate, attached under Appendix D. • The quantity of groundwater abstracted on a daily basis must be metered or gauged. Records must be kept of all abstractions.	Life of operation	Facility Manager	1	5	5 L	• NEMA, 1998 • NWA, 1998

					• All measuring devises must be properly maintained, must be in good working order and must be easily accessible. This shall include a programme of checking, calibration, and/or renewal of measuring devices. • Regular inspection and maintenance of all boreholes, JoJo tanks, reservoirs, toilets, water pipes and taps. • Leaking JoJo tanks, reservoirs, taps, toilets and pipes are to be repaired immediately. • Running water taps and pipes may not be left unattended. • All pipe, hose and tap connections are to be fitted with correct and appropriate plumbing fittings. • The site Water Balance, as contained in the IWWMP, will be improved and updated, as and when required. **Electricity** • Save electricity by turning off lights and computers when leaving the office. • Halogen light bulbs convert approximately 80% of the energy used into heat rather than light. Replace spent light bulbs with energy saving CFLs (compact fluorescent lights) or newer and more efficient LEDs (light-emitting diodes). • Improve energy efficiency by insulating cold storage buildings. • The use of multi-effective evaporators can be considered to recover evaporative energy in the rendering process.						
Decommissioning Phase											
Closure and decommissioning of the rendering 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 45: Environmental impact assessment: Hygiene

Activity: • Operational activities at the rendering facility, especially with regards to the handling of incoming poultry and other waste.											
Aspect: • Unsanitary conditions at the rendering facility.											
Applicable Alternatives: All alternatives.											
Nature and significance of environmental impact											
Impact Description	**Risk rating (before mitigation)**			**Environmental Objective**	**Management / Mitigation / Monitoring Measures**	**Timeframe**	**Responsibility**	**Risk rating (after mitigation)**			**Applicable legislation / other documents**
	Probability	**Significance**	**Environmental Risk**					**Probability**	**Significance**	**Environmental Risk**	
Construction Phase											
This is only applicable to the operational phase as it relates to the management of incoming hazardous waste at the rendering facility as part of the operational activities.	N/A										

Operational Phase											
Outbreak of diseases and possible infection of workers at the facility.	2	7	14 M	To maintain clean conditions at the rendering facility, to minimise the risk of an outbreak of disease and to keep employees healthy.	• Store incoming waste in an enclosed or at least roofed area (in the case of the existing plant). • Incoming waste should be processed in a timely manner (i.e. when fresh) or should be refrigerated. • Access control to and from the premises and access to the premises should only be by prior arrangement. • Installation of footbaths with disinfectant at all the entrances to the two rendering plants. • Installation of showers for all staff working on site. • Encourage workers to wash hands regularly. • Provide workers associated with the wastewater treatment works with adequate PPE, such as waterproof shoes or boots and rubber gloves. • Installation of rodent bait traps and flytraps.	Life of operation	Facility Manager	1	7	7 L	• NEMA, 1998 • OHSA, 1993
Decommissioning Phase											
Closure and decommissioning of the rendering 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 46: Environmental impact assessment: Heritage

Activity: Site clearance.											
Aspect: Disturbance of artefacts or sites of cultural heritage (archaeological and historical) significance.											
Applicable Alternatives: Construction Phase: A2, A3, B2, C1 and C2. Operational Phase: All alternatives.											
Nature and significance of environmental impact											
Impact Description	**Risk rating (before mitigation)**			**Environmental Objective**	**Management / Mitigation / Monitoring Measures**	**Timeframe**	**Responsibility**	**Risk rating (after mitigation)**			**Applicable legislation / other documents**
	Probability	**Significance**	**Environmental Risk**					**Probability**	**Significance**	**Environmental Risk**	
Construction Phase											
Loss of artefacts or sites protected by the National Heritage Resources Act, 1999 (Act No. 25 of 1999). SAHRA has indicated that the development will likely not impact on any heritage resources.	2	7	14 M	To protect artefacts or sites of cultural heritage (archaeological and historical) significance.	• If any sites, features or objects are found during site clearance, all activities must cease and a heritage expert must be contacted to investigate the site. • No sites, features or objects may be disturbed (e.g. picked up) by employees.	During construction phase, up until operation of the facility.	• Facility Manager • ECO	2	5	10 L-M	• NEMA, 1998 • NHRA, 1999
Operational Phase											
It is unlikely that any artefacts or sites of cultural heritage (archaeological and historical) significance will be disturbed or discovered during the operational phase as no undisturbed areas will be disturbed.	N/A										

Decommissioning Phase	
Closure and decommissioning of the rendering 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

Refer to Part 8 below for a summary on the key findings related to the rendering facility expansion and its associated infrastructures.

7.3.3 Cumulative Impacts

Cumulative impacts refer to the situation where an activity may in itself not have a significant impact, but may become significant when added to the existing and potential impacts from similar or different activities in the area.

The following potential cumulative impacts have been identified:

Table 47: Cumulative impacts

Activity	Impact	Cumulative Impact
Burning of coal in the boilers to generate steam.	Generation of atmospheric emissions such as suspended particulate matter; ammonia; nitrogen and sulphur oxides; greenhouse gases; and VOCs. The release of greenhouse gases into the atmosphere contributes to Global Warming.	While the boilers used at the rendering facility are small (10, 6 and 3 tonnes), there is a cumulative negative impact on the atmosphere as emissions do not remain at their generating sources, but travel extensive distances in the atmosphere. The greenhouse gas emissions from the rendering facility therefore combine with greenhouse gas emissions from other sources in the vicinity of the site as well as regional and eventually global sources. A large number of mines are located to the south east of the site and they likely release significant volumes of atmospheric emissions into the atmosphere in the vicinity of Delmas.
Operational activities at the rendering facility.	Generation of odourous emissions and subsequent nuisance to sensitive receptors such as residential dwellings in the vicinity of the site.	Rendering facilities generate significant amounts of odourous emissions and the nuisance caused is the main negative impact associated with rendering facilities. The odours generated at the rendering facility may have a cumulative impact when combined with other sources of odourous emissions in the area. These include chicken farms which are known for the generation of odourous ammonia emissions. There are five chicken farms within a three kilometre radius of the rendering facility (two are within a two kilometre radius). The proposed air treatment system (odour abatement system) should eliminate the release of odourous emissions from the rendering facility in future.

Activity	Impact	Cumulative Impact
Operational activities at the rendering facility.	Generation of noise and subsequent nuisance to sensitive receptors such as residential dwellings in the vicinity of the site.	A cumulative impact in terms of noise generation results from the combination of noise at the rendering facility together with noise generated at the adjacent Omnia Fertilizer plant. Omnia is also constructing another plant adjacent and to the south-west of the rendering facility. Noise generated during the construction phase and possibly also during the operational phase will also contribute to the overall cumulative noise impact of the area. Moving further from the rendering facility, another potential contributor to the cumulative noise impact is the Klinkerstene brick making facility, located 850m to the east of the rendering facility.
Release of wastewater into the environment.	Pollution and degradation of surface water resources downstream of the rendering facility.	Cumulative negative impacts on the surface water resources downstream of the rendering facility results from the combination of the ineffectively treated wastewater discharged into the environment by AFGRI and the runoff of sewage from the community to the north-west of the rendering facility. Upstream agricultural and mining activities also likely contribute to the deterioration of the surface water resources, in particular of the Bronkhorstspruit. The proposed wastewater treatment system will treat wastewater generated at the rendering facility to at least a quality that complies with the Department of Water Affairs' General Limit standards for discharge into a water resource. The negative impact from the release of wastewater into the environment will in future be eliminated as only treated wastewater of General Limit quality will be discharged into the environment from the rendering facility. It is also possible that the wastewater will be treated to a quality that will enable its re-use at the rendering facility.
Release of wastewater into the environment.	Pollution and degradation of groundwater resources.	Cumulative negative impacts on the groundwater resource results from a combination of the operations at the rendering facility, such as the historic storage of coal ash on bare soil and the discharge and seepage into the ground of ineffectively treated wastewater. The storage of the coal ash has likely resulted in the generation of

Activity	Impact	Cumulative Impact
		leachate. Other potential contributors to the degradation of the groundwater quality may be seepage from the Omnia dams adjacent to the rendering facility. The geohydrological assessment indicated that further studies are required to isolate the various contributors to the groundwater pollution as the likely sources (AFGRI and Omnia) are in close proximity to one another and the nature of both operations means that they may both be contributing nutrients to the receiving environment. AFGRI will cease the practise of storing coal ash on bare soil.

8. ENVIRONMENTAL IMPACT STATEMENT

8.1 Summary of key findings

The Application for Environmental Authorisation in terms of the National Environmental Management Act, 1998, and licensing in terms of the National Environmental Management: Air Quality Act, 2004 and the National Water Act, 1998, have been initiated to allow the AFGRI Dryden rendering facility to be licensed in terms of the required environmental legislation and to allow the rendering facility to be expanded to accommodate a processing capacity of 80 000 tons of raw product per annum.

Licensing will ensure that the rendering facility can operate for the long term without facing liabilities in terms of non-compliance to environmental legislation. The expansion of the facility will allow AFGRI to diversify their operation, thereby increasing their market share and profits to the company.

All alternatives will have an impact on the environment. The following main negative impacts are summarised for the proposed activity:

- Soil, surface water and groundwater pollution;
- Stormwater contamination;
- Disturbance and/or destruction of vegetation;
- Disturbance and/or destruction of a wetland that forms part of a biodiversity corridor; and
- Nuisance due to the generation of noise and odourous emissions.

8.2 Comparative assessment of positive and negative implications of the proposed activity and alternatives

Part 6 of this EIR contains a detailed investigation and assessment of the alternative options for the expansion activities. As can be seen in Part 6, the impacts from the various alternatives are the same (equal Environmental Risk for each activity, aspect and impact), except for the Site Layout alternatives, namely Option C1 and Option C2. The Environmental Risk in terms of “Vegetation” and “Wetlands” is higher for Option C1 than Option C2 in both cases.

In the table below, distinction is only made between the above mentioned Site Layout alternatives and a combination of all the other alternatives considered. In the table, the positive and negative implications of each alternative are described and compared to the No-go option. This should provide a fundamental consideration of the feasibility of the project.

Table 48: Comparison of the proposed preferred activities and the no-go option

	Proposed Activity (rendering facility expansion) with Site Layout Alternative Option 1	Proposed Activity (rendering facility expansion) with Site Layout Alternative Option 2	No-go option (current situation)
Positive impacts	• The proposed Wastewater Treatment Works will effectively treat the wastewater generated at the rendering facility, thereby eliminating the source of soil, surface water and groundwater pollution. • The proposed air treatment system (odour abatement system) should eliminate the release of odourous emissions from the rendering facility in future. • Additional job opportunities and stimulation of the economy during the construction and operational phase of the project.	• No disturbance and destruction of vegetation. • The proposed Wastewater Treatment Works will effectively treat the wastewater generated at the rendering facility, thereby eliminating the source of soil, surface water and groundwater pollution. • The proposed air treatment system (odour abatement system) should eliminate the release of odourous emissions from the rendering facility in future. • Additional job opportunities and stimulation of the economy during the construction and operational phase of the project.	• No additional disturbance of remaining undeveloped areas on site, including potentially the vegetation and wetland that forms part of a biodiversity corridor. • No additional short-term impacts on the environment due to construction activities.
Negative impacts	• Disturbance and destruction of a small area of vegetation on site. • Noise pollution during the construction phase. • Generation of odours and other atmospheric emissions during the operational phase.	• Noise pollution during the construction phase. • Generation of odours and other atmospheric emissions during the operational phase. • Higher construction costs as an enclosed storage area and diesel tank would need to be demolished and new facilities erected as diesel is required at the facility. • Increased electricity costs as steam and wastewater will need to be pumped or conveyed over greater distances to the rendering facility.	• Continued nuisance to neighbours due to the generation of odourous emissions. • Continued release of atmospheric emissions, such as greenhouse gases, into the atmosphere without adequate mitigation measures. • Continued pollution of soil, surface water and groundwater resources due to the release of ineffectively treated wastewater into the environment. • Continued contamination of stormwater (“clean” rainwater) flowing through the site as it comes into contact with “dirty areas”.

	Proposed Activity (rendering facility expansion) with Site Layout Alternative Option 1	Proposed Activity (rendering facility expansion) with Site Layout Alternative Option 2	No-go option (current situation)
			• Continued generation of leachate from the storage of coal ash on bare soil and its subsequent pollution of the groundwater resource. • Continued degradation of the wetland (part of a biodiversity corridor) onsite by the discharge of ineffectively treated wastewater into the environment. • Continued degradation of the vegetation onsite by the discharge of ineffectively treated wastewater into the environment.

As can be seen in the table above, the No-go option has more negative impacts than either of the Proposed Activity alternatives. This is due to the fact that the most significant impacts of the current rendering facility (odours and the release of ineffectively treated wastewater) will be remedied during the proposed project, no matter which development option is chosen (Proposed Activity with Site Layout Alternative Option 1 or 2 in the table above). In terms of positive impacts, the second “Proposed Activity option” (Proposed Activity with Site Layout Alternative Option 2), has one more positive environmental impact when compared to “Proposed Activity with Site Layout Alternative Option 1” since the development will not extend into any undeveloped vegetation areas on site. The first “Proposed Activity option” (Proposed Activity with Site Layout Alternative Option 1) has fewer negative environmental impacts than “Proposed Activity with Site Layout Alternative Option 2” and one of these is the disturbance of a small area of undeveloped, degraded vegetation. Negative environmental impacts from “Proposed Activity with Site Layout Alternative Option 2” include higher financial costs due to elevated electricity usage and the purchasing and installation of a new diesel tank.

9. CONCLUSION

Information has been provided to the Mpumalanga Department of Economic Development, Environment and Tourism and interested and affected parties during the Scoping- and EIA Phase. Comments and concerns were received and integrated into the Environmental Impact Assessment Report. This document serves as the final report to be considered by the competent authority.

This EIA process has been carried out in accordance with the NEMA, 1998, and the Regulations there under.

The identified impacts/environmental risks to the environment as a result of the proposed rendering facility expansion are mostly **Medium-High**. The impacts can, however, be mitigated to mostly **Low**, provided that the draft Environmental Management Programme, containing all proposed mitigation measures, is implemented. It is further important that the EMP must be viewed as a dynamic, working document that will be improved upon as and when required.

The impacts from the various alternatives that have been identified and assessed are the same (equal Environmental Risk for each activity, aspect and impact), except for the Site Layout alternatives, namely Option C1 and Option C2. The Environmental Risk in terms of “Vegetation” and “Wetlands” is higher for Option C1 than Option C2 in both cases. This is because the current proposed layout for the second processing plant will result in the destruction of a small area of degraded vegetation.

Positive impacts from the proposed project include the fact that the rendering facility will be licensed in terms of the NEMA, 1998, the NEM: AQA, 2004, and the NWA, 1998. The facility will therefore need to be operated in accordance with the provisions of all the relevant laws. Furthermore, the latest technology will be used for the second plant. This will include an air treatment system (odour abatement system) that should eliminate the release of odourous emissions and their subsequent nuisance to neighbours and an adequately designed wastewater treatment works to treat wastewater to at least a quality that complies with the Department of Water Affairs’ General Limit standard for discharge into a water resource. It is also being proposed to treat the wastewater to such as quality that will permit re-use at the rendering facility. The pollution of soil, surface water and groundwater resources will therefore be ceased.

Based on the outcomes of the Environmental Impact Assessment conducted as part of this EIA as well as the alternatives assessment, the following recommendations are made:

1. The project should be authorised and allowed to proceed on **Site Layout Alternative Option 1** on condition that no construction activities or infrastructure extend into any of the wetland zones on site.
2. The disturbance of some vegetation at **Site Layout Alternative Option 1** can be allowed as the vegetation is already in a highly disturbed state.

3. The mitigation measures proposed in this report and the draft Environmental Management Programme must be implemented during all phases of the proposed project.
4. A communications pathway must be established that would allow the designated ECO to accept and deal with stakeholder complaints.
5. Proposed mitigation measures should be incorporated as far as possible into the operational plan for the development.
6. Strict monitoring and enforcement of requirements of the EMP must be undertaken to ensure that contractors and operators adhere to these requirements.