



AFGRI Poultry (Pty) Ltd.

Draft Environmental Impact Report

Locality: Delmas

Departmental Ref No: 12/9/11/L875/6

SHANGONI
Management Services (Pty) Ltd



DRAFT ENVIRONMENTAL IMPACT REPORT

AFGRI Poultry (Pty) Ltd.

Draft Environmental Impact Report

Locality: Delmas

Departmental Ref No: 12/9/11/L875/6

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PROJECT DETAILS

National Department of Environmental Affairs

Reference No.: 12/9/11/L875/6

Project Title: AFGRI Poultry Delmas Abattoir Wastewater Treatment Works

Project Number: AFG/del/11-08-11

Compiled by: Ms. Lizette Crous

Date: 7 January 2013

Location: Portion 21 of the farm Geluk 234 IR, Delmas

Technical Reviewer: Mr. Lourens de Villiers



Signature



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DEFINITIONS

Biodegradable industrial wastewater

Wastewater that contains predominantly organic waste arising from industrial activities and premises including -

- milk processing;
- manufacture of fruit and vegetable products;
- sugar mills;
- manufacture and bottling of soft drinks;
- water bottling;
- production of alcohol and alcoholic beverages in breweries, wineries or malt houses;
- manufacture of animal feed from plant or animal products;
- manufacture of gelatine and glue from hides, skin and bones;
- abattoirs;
- fish processing; and
- feedlots.

Complex industrial wastewater

Wastewater arising from industrial activities and premises that contains

- a complex mixture of substances that are difficult or impractical to chemically characterise and quantify; or
- one or more substances, for which a wastewater limit value has not been specified, and which may be harmful or potentially harmful to human health, or to the water resource (identification of complex industrial wastewater will be provided by the Department upon written request).

Domestic Wastewater

Domestic wastewater consists of 90% or more wastewater by volume that arises from domestic and commercial activities and premises, and may contain sewage. domestic wastewater includes household waste from washing, bathing, toilets.

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 organization'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 organization'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.

Irrigation

It is the application of wastewater for the purpose of crop production, and includes the cultivation of pasture.

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 characterizing 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 Response Report
DEA	Department of Environmental Affairs
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act of 1989
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
GN	Government Notice
I&AP	Interested and Affected Party
NEMA	National Environmental Management Act, Act 107 of 1998 as amended Regulation



EXECUTIVE SUMMARY

The purpose of this document is to supply the National Department of Environmental Affairs with the requested information pertaining to the National Environmental Management Act (NEMA), as amended, and Regulation 28 of the Environmental Impact Assessment Regulations, 2010, and the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008). Contained in this document is a brief overview of the activity and site specific information of the proposed AFGRI Poultry Delmas abattoir wastewater treatment works project (location, topography, surrounds, vegetation, etc.). A draft Environmental Management Programme (EMPr) also forms part of this document.



1. INTRODUCTION

This draft Environmental Impact Report forms part of an application for environmental authorisation (waste management licence) and water use licence for the proposed AFGRI Poultry Delmas abattoir wastewater treatment works on Portion 21 of the farm Geluk 234 IR, Delmas, Mpumalanga. The application process is undertaken on behalf of the applicant, AFGRI Poultry (Pty) Ltd., 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 Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) and the National Water Act, 1998 (Act No. 36 of 1998).

An application to undertake an Environmental Impact Assessment (Scoping and Environmental Impact Reporting) process was submitted to the identified competent authority, the National Department of Environmental Affairs (DEA). 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 Poultry (Pty) Ltd.
Contact Person	Mr. Willem Breedt
Postal Address	PO Box 186 Sundra 2200
Telephone No.	013 661 1063/4
Fax No.	013 661 11595
Farm name and portion on which the activities take place	Portion 21 of the farm Geluk 234 IR, Delmas
Co-ordinates of operation	26°07'40.98"S; 28°38'37.42"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	Responsibility
Mr. H.L. de Villiers	Bsc. (Hons) (PU for CHE) MSc.(UP)	EIA Project Leader and Co-ordinator
Ms. Lizette Crous	Post Graduate Certificate Environmental Management (University of London)	EAP
Ms. Patricia van der Walt	B.Sc. (Hons) (Applied Science in Environmental Technology)	Junior EAP

Detailed CV's for the project team are appended (Appendix F).

1.3 Current situation

The abattoir was built by Rossgro Chickens (Pty) Ltd. a number of years ago and became the property of AFGRI Operations Limited when they bought the Rossgro Chickens business at the beginning of 2011.

At present, 360 000 chickens are slaughtered at the abattoir per week. The abattoir operates 24 hours a day, 7 days a week.

To run the abattoir, water is obtained from two boreholes on an adjacent property, approximately 1.5km from the abattoir. Approximately 12 litres of water is used per chicken slaughtered.



Abattoir wastewater has a high organic content due to the waste materials (blood, fat, small pieces of meat, gizzard contents, urine and dung) produced in the slaughtering process. The wastewater is treated as follows:

1. The wastewater is screened by a rotary screen to remove the solids. The solids are sent to the Dryden rendering plant.
2. The wastewater is pumped to a storage vessel where manual fat skimming occurs.
3. The wastewater is pumped to an aeration pond and is then discharged into a constructed dam within a natural drainage line.

1.4 Proposed Activity

The current wastewater treatment process at the abattoir was re-evaluated and found to be inadequate for the current operation and any future expansions to the abattoir. Dekker Envirotech CC has been appointed as the process designer for the wastewater treatment works. The wastewater treatment works will be able to treat 2 500m³ of abattoir wastewater per day, meeting the Department of Water Affairs' General Limit standards. SKCM engineers have been appointed to oversee the civil engineering design and project construction monitoring (Appendix A).

Approximately 2 500m³/day of abattoir wastewater will be collected in a collection sump before it is taken through the wastewater treatment process (shown visually in Figure 1). The first point of treatment is the rotary mechanical screen where the majority of large solids will be removed and taken to a rendering facility. The remaining wastewater will then flow into an existing sump, from where it will be pumped into an anaerobic pond.

The anaerobic pond, with a capacity of 15 000m³, will in the future be fitted with a floating HDPE cover for biogas collection. The anaerobic pond functions to reduce the Chemical Oxygen Demand (COD).

The water from the anaerobic pond will flow into a smaller anaerobic settling pond with a capacity of 2 000m³. Biomass from this pond will be returned to the main anaerobic pond where it can undergo further anaerobic breakdown. The water from the anaerobic settling pond will flow into an oxidation pond.

The oxidation pond, with a capacity of 5 800 m³, will be fitted with surface aerators that will mainly achieve nitrification. The oxidation pond will discharge into a 1 900m³ anoxic pond where denitrification will occur.



From the anoxic pond, the water will flow into a 2 000 m³ clarifier pond. Biomass from this clarifier pond will be taken back to the anaerobic pond for further digestion. The water from the clarifier pond will then flow into a stabilisation pond (2 000m³) and from there into the constructed wetlands.

The constructed wetlands will consist of a number of individual cells and will have a combined capacity of 10 000m³. The constructed wetlands will remove nutrients and suspended solid, thereby polishing the water. The quality of water exiting the constructed wetlands will be at DWA's General Limit standards. From the wetlands, the water will flow into a 90m³ collection sump. Depending on salinity levels, approximately 50% of the treated water will be re-used at the abattoir after it has undergone sand filtration and disinfection. The remaining treated water will be provided to farmers for crop irrigation or will be discharged into a natural drainage line.

To determine the suitability of the proposed site for the construction of the pond and wetland wastewater treatment works, a site investigation was conducted (Refer to section 2.1.1). Undisturbed samples taken from the top (1.8m) of the soil horizon was found to have a high coefficient of permeability. All the ponds and artificial wetland cells will therefore be lined with a HDPE liner to prevent any seepage into the ground.

Table 1: Discharge Standards Regulated by Water Affairs (as set out in Table 3.1 of the GN 399 General Authorisations, dated March 2004)

Substance/Parameter	General limit
Faecal Coliforms (per 100ml)	1 000
Chemical Oxygen Demand (mg/l)	75 (after removal of algae)
pH	5,5 – 9,5
Ammonia (ionised and un-ionised) as Nitrogen (mg/l)	6
Nitrate/Nitrite as Nitrogen (mg/l)	15
Chlorine as Free Chlorine (mg/l)	0,25
Suspended Solids (mg/l)	25
Electrical Conductivity (mS/m)	70 mS/m above intake to a maximum of 150 mS/s
Ortho-Phosphate as phosphorous (mg/l)	10
Fluoride (mg/l)	1
Soap, oil or grease (mg/l)	2,5
Dissolved Arsenic (mg/l)	0,02
Dissolved Cadmium (mg/l)	0,005
Dissolved Chromium (VI) (mg/l)	0,05
Dissolved Copper (mg/l)	0,01
Dissolved Cyanide (mg/l)	0,02



Dissolved Iron (mg/l)	0,3
Dissolved Lead (mg/l)	0,01
Dissolved Manganese (mg/l)	0,1
Mercury and its compounds (mg/l)	0,005
Dissolved Selenium (mg/l)	0,02
Dissolved Zinc (mg/l)	0,1
Boron (mg/l)	1



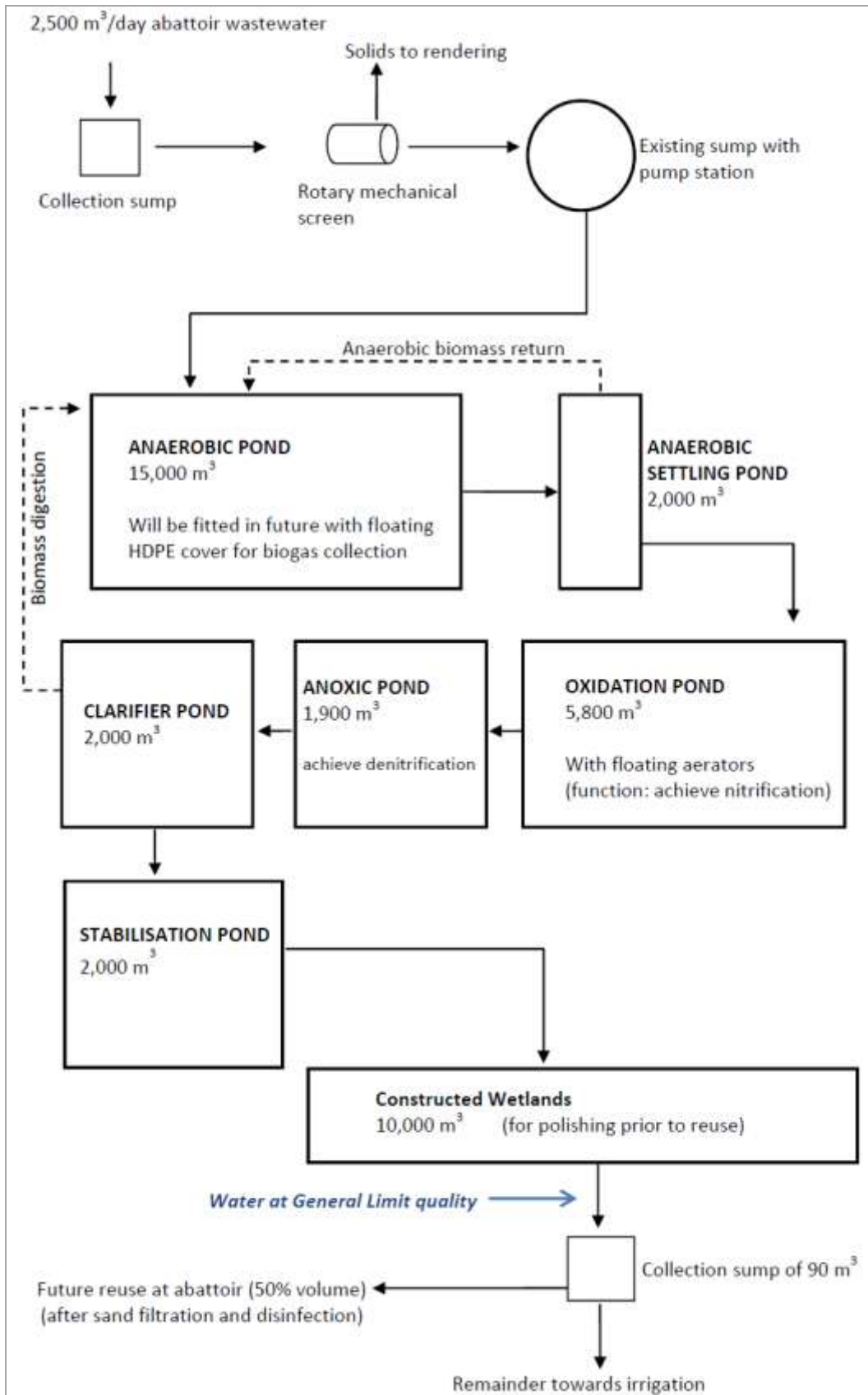


Figure 1: A flow diagram of the proposed wastewater treatment works.



1.5 Proposed Locality

The AFGRI Poultry Delmas abattoir falls 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 proposed wastewater treatment works (WWTW) will be located on Portion 21 of the farm Geluk IR, approximately 4.3km North-west of Delmas. A Google Earth overlay of the proposed location for the WWTW is given as Figure 2.

Figure 3 and Appendix A show the location of the site together with the area immediately surrounding the site. The site photographs are given Figure 4, Figure 5, Figure 6 and Figure 7.

The site is located on level to gently sloping land, with a slope of no greater than 5% according to the AGIS Comprehensive Atlas. It is mainly drained by means of surface runoff to the West and is situated at approximately 1 598 metres above mean sea level.

The area for the proposed WWTW is currently used for crop production.

Table 2: Direction and distance to the nearest town.

Direction	Distance from site	Closest town
North-west	4.3km	Delmas





Figure 2: Google earth image overlay of the proposed wastewater treatment works layout.



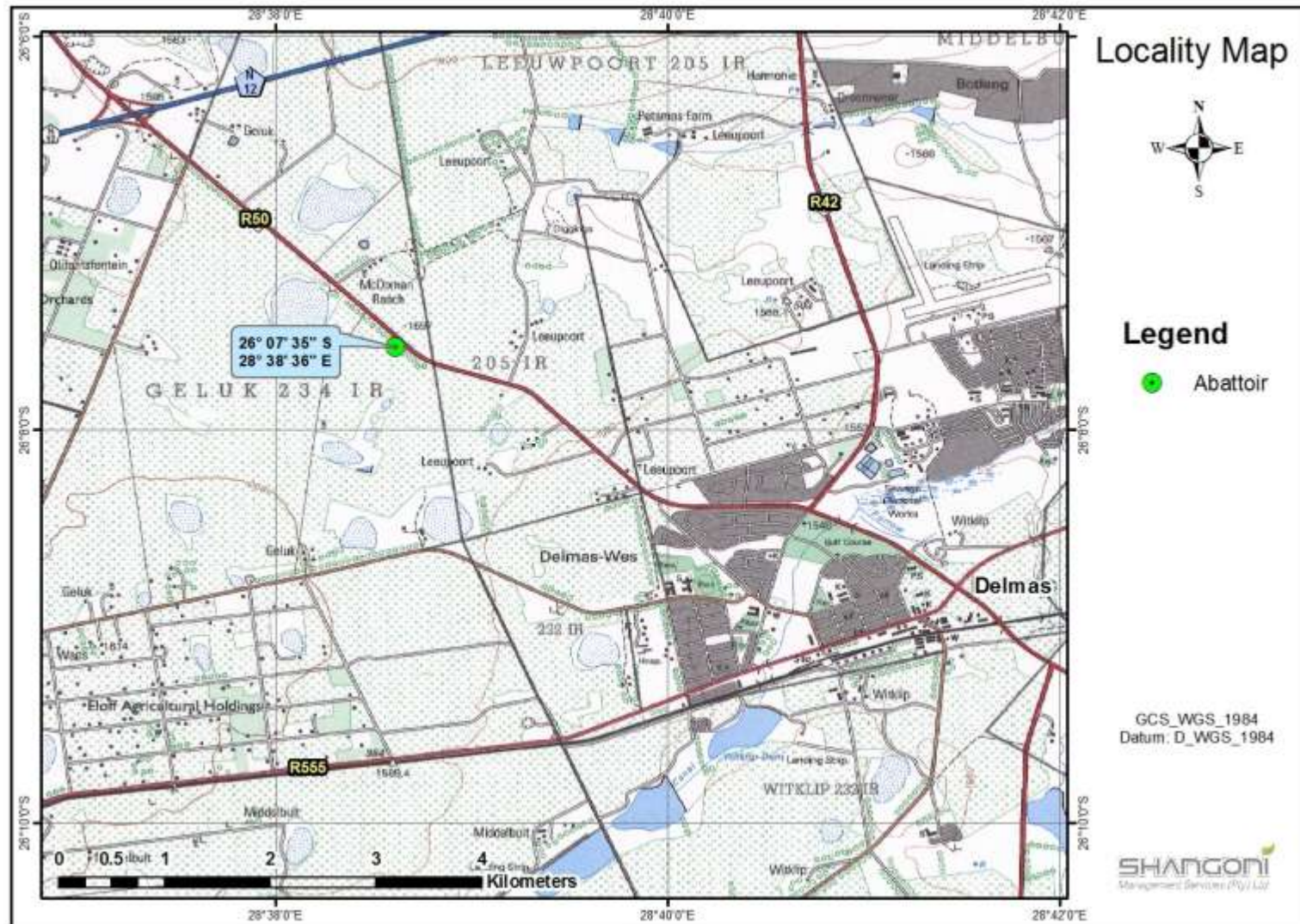


Figure 3: Site locality map.



Figure 4: Site photograph 1 (Google Inc., 2011)



Figure 5: Site photograph 2





Figure 6: Site photograph 3



Figure 7: Site photograph 4



1.6 Activities applied for

The following activities are being applied for in terms of GN 718 of 3 July 2009: Waste management activities in respect of which a waste management license is required in accordance with Section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008).

- Category B, Nr. 7: The treatment of effluent, wastewater or sewage with an annual throughput capacity of 15 000 cubic metres or more.; and
- Category B, No. 11: The construction of facilities for activities listed in Category B of this Schedule (not in isolation to associated activity).

Category B, Nr. 1: “The storage including the temporary storage of hazardous waste in lagoons” is not triggered by the proposed WWTW for the following reason: The proposed WWTW constitutes an in-line system. Wastewater from the AFGRI Delmas abattoir will be pumped directly into the Wastewater Treatment Works, where the treatment of the wastewater commences as soon as the wastewater enters the first treatment pond. The wastewater will be continuously treated in each pond that forms part of the Wastewater Treatment Works. Furthermore, as per the National Environmental Management Waste Act, 2008, “storage” is defined as the accumulation of waste in a manner that does not constitute treatment or disposal of that waste.

