



AFGRI OPERATIONS LIMITED

Dryden Rendering Facility draft EMP

Locality: Dryden, Mpumalanga

Departmental Ref No: 12/9/11/L1036/6

Date: 30 July 2014

SHANGONI
Management Services (Pty) Ltd



DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME (EMP)

AFGRI OPERATIONS LTD

Dryden Rendering Facility draft EMP

Locality: Dryden, Mpumalanga

Departmental Ref No: 12/9/11/L1036/6

30 July 2014

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PROJECT DETAILS

National Department of Environmental Affairs

Reference No.: 12/9/11/L1036/6

Project Title: AFGRI Animal Feeds Dryden Rendering Facility

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

Compiled by: Lizette Crous

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LIST OF ABBREVIATIONS

ECO	-	Environmental Control Officer
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Programme
GN	-	Government Notice
HCS	-	Hazardous Chemical Substances
NEMA	-	National Environmental Management Act, 1998
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)
NWA	-	National Water Act, 1998 (Act No. 36 of 1998)
SHE	-	Safety, Health and Environment
SWMP	-	Storm Water Management Plan

REFERENCES

COWI Consulting Engineers and Planners AS, Denmark, 2000. Cleaner Production Assessment in Meat Processing for United Nations Environment Programme, Division of Technology, Industry and Economics and Danish Environmental Protection Agency.

Midwest Research Institute (MRI), 1995. Emission Factor Documentation for AP-42 Section 9.5.3. Meat Rendering Plants. Final Report for U.S. Environmental Protection Agency.

Sindt, G.L., 2006. Environmental Issues in the rendering industry. Essential Rendering. All about the animal by-products industry. National Renderers Association.

World Bank Group, 2007. Environmental, Health and Safety General Guidelines.

World Bank Group, 2007. Environmental, Health and Safety Guidelines for Meat Processing.

World Bank Group, 2007. Environmental, Health and Safety Guidelines for Poultry Processing.

www.afgri.co.za, accessed on 3 December 2013.

Refer also to Part 4 regarding relevant environmental legislation.



1. INTRODUCTION

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).

High-protein poultry by-product meal is produced at AFGRI rendering facilities. 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 rendering facility does, however, not have a Waste Management License in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) for current and proposed waste management activities at the facility. This Waste Management License application process has therefore been lodged at the National Department of Environmental Affairs. A separate application for Environmental Authorisation is also being undertaken for listed activities triggered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), an Atmospheric Emission License application will be submitted in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) and a Water Use License application was submitted in terms of the National Water Act, 1998 (Act No. 36 of 1998).

This draft Environmental Management Programme forms part of the above mentioned application for a Waste Management License, as required by the Environmental Impact Assessment Regulations of 18 June 2010.

1.1 WASTE MANAGEMENT LICENSE APPLICATION FOR THE CURRENT AND PROPOSED ACTIVITIES AT THE RENDERING FACILITY

1.1.1 Proposed Activity

The Waste Management License application process is being conducted to license the current and future waste related activities at the rendering facility. The following activities are occurring or are being proposed at the rendering facility and require licensing in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008):

- The existing rendering plant (Plant 1) will continue to function and operate as it currently does.
- The expansion of the rendering facility through the construction of a second processing plant (Plant 2) adjacent to the existing plant. Two existing steel storage sheds will be demolished to make



space for the second processing 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 storage sheds.

- The second processing plant (approximately 6 000m²) will utilise new technology and will process four waste streams (feathers, blood, intestines and whole chickens) separately.
- The waste streams will not only come from poultry abattoirs, but will also include waste from other kinds of abattoirs (for example, blood from red meat and pork abattoirs).
- The plant will have a common waste receiving area and from there the waste will be separated into the before mentioned waste streams.
- Each waste stream will be sterilised and a different type of high-protein meal will be produced from each waste stream.
- Approximately 270m³ of wastewater will be generated per day during the waste sterilisation process after the expansion of the rendering facility. 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 be upgraded through the addition of liners to prevent wastewater seepage and the second, anaerobic dam will be split in two. The first pond has a volume of 225m³ and the second a volume of 371m³. These ponds provide a buffer capacity for the treatment of the wastewater and will act as a contingency plan 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.

At the time of submission of the Waste Management License application and upon submission of the draft and final Scoping reports to the competent authority, the following listed the waste management activities were triggered or would be triggered by the proposed expansions in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice No. 718 of 3 July 2009.

Table 1: List of waste management activities being applied for in terms of GNR 718 of 3 July 2009

Listed activity	Reason for licensing this activity
Category A, No. 2: The storage including the temporary storage of hazardous waste at a facility that has the capacity to store in excess of 35m ³	This activity is for the storage of hazardous poultry waste (blood, feathers, intestines and chicken pieces) at the current rendering facility storage bunkers and blood storage tank, and for the storage of poultry- and/or bovine- and/or pig-



Listed activity	Reason for licensing this activity
of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons.	waste at the proposed receiving and intake area at the second plant (will be constructed where the two storage sheds are currently).
Category A, No. 18: The construction of facilities for activities listed in Category A of this Schedule (not in isolation to associated activity).	This activity is for the construction of new hazardous waste storage area (common receiving and intake area) at the proposed second processing plant. The storage area will be constructed where the two storage sheds are currently located.
Category A, No. 19: The expansion of facilities of or changes to existing facilities for any process or activity, which requires an amendment of an existing permit or license or a new permit or license in terms of legislation governing the release of pollution, effluent or waste.	This activity is for the expansion of the existing hazardous waste storage areas as part of the proposed upgrading of the rendering facility and for the expansion of the rendering facility through the construction a second processing plant (to be constructed where the two storage sheds are currently located).
Category B, No. 1: The storage including the temporary storage of hazardous waste in lagoons.	This activity is for the possible temporary storage of hazardous waste (broiler blow down water) in an evaporation pond.
Category B, No. 2: The reuse and recycling of hazardous waste.	This activity is for the rendering of hazardous waste (poultry abattoir waste) to produce a high-protein feather meal at the existing plant and for the processing of four different waste streams into high-protein meals at the proposed second plant (to be constructed where the two storage sheds are currently located).
Category B, No. 3: The recovery of hazardous including the refining, utilisation or co-processing of waste at a facility with a capacity to process more than 500kg of hazardous waste per day excluding recovery that takes place as an integral part of an internal manufacturing process within the	This activity is for the rendering of hazardous waste (poultry abattoir waste) to produce a high-protein feather meal at the existing plant and for the processing of four different waste streams into high-protein meals at the proposed second plant (to be constructed where the two storage sheds are currently located).



Listed activity	Reason for licensing this activity
same premises or unless the Minister has approved re-use guidelines for the specific waste stream.	
Category B, No. 4: The biological, physical or physio-chemical treatment of hazardous waste at a facility that has the capacity to receive in excess of 500kg of hazardous waste per day.	This activity is for the rendering of hazardous waste (poultry abattoir waste) to produce a high-protein feather meal at the existing plant and for the processing of four different waste streams into high-protein meals at the proposed second plant (to be constructed where the two storage sheds are currently located).
Category B, No. 5: The treatment of hazardous waste using any form of treatment regardless of the size or capacity of such as facility to treat such waste.	This activity is for the rendering of hazardous waste (poultry abattoir waste) to produce a high-protein feather meal at the existing plant and for the processing of four different waste streams into high-protein meals at the proposed second plant (to be constructed where the two storage sheds are currently located).
Category B, No. 6: The treatment of hazardous waste in lagoons.	This activity is for the treatment of wastewater from the rendering process in treatment ponds (for example, the existing anaerobic pond and settling pond).
Category B, No. 7: The treatment of effluent, wastewater or sewage with an annual throughout capacity of 15 000 cubic metres or more.	This activity is for the current treatment of wastewater from the existing rendering facility in the anaerobic pond and settling pond. It is also for the future treatment of wastewater from the proposed second plant (processing of blood, feathers, whole chickens and intestines) at the proposed upgraded wastewater treatment system. This wastewater treatment system will consist of an internal treatment plant (reverse osmosis system) within the second processing plant, a new external treatment works (outside the second processing plant), the existing anaerobic pond and the existing settling pond.
Category B, No. 11: The construction of facilities for activities listed in Category B of this Schedule (not in isolation to associated activity).	This activity is for the construction of the above mentioned Category B activities, such as the proposed second processing plant (to be constructed where the two storage sheds area currently), the two new wastewater treatment plants (internal reverse osmosis system and external wastewater treatment works) and potential upgrading of the existing anaerobic pond and settling pond.



On the 29th of November 2013 the National Department of Environmental Affairs made changes to the “List of Waste Management Activities that have, or are likely to have, a detrimental effect on the environment” and that require a Waste Management License. In terms of the new list (GNR 921 of 29 November 2013), the rendering facility triggers listed waste management activities as given in the table below.

The storage of hazardous waste (and specifically process wastewater) in lagoons no longer requires a Waste Management License as the Category B, No. 1 activity previously triggered under GNR 718 of 3 July 2009 now specifically excludes the storage of effluent, wastewater or sewage. The storage of hazardous waste no longer requires a Waste Management License, but the storage of more than 80m³ now falls under Category C of GNR 921. Such storage must comply with the Norms and Standards for Storage of Waste, 2013. The treatment of process wastewater and sewage has been moved from being governed under the Waste Act, 2008, to being governed under the National Environmental Management Act, 1998. The construction of facilities for the treatment of effluent, wastewater or sewage with a daily throughput of more than 2 000m³ now requires environmental authorisation under NEMA, 1998. The rendering facility will only treat a combined volume of approximately 270m³ of process wastewater on a daily basis and therefore no environmental authorisation is required for the construction of the proposed new wastewater treatment works.

Table 2: List of waste management activities being applied for in terms of GNR 921 of 29 November 2013

Listed activity	Reason for licensing this activity
Category B, No. 2: The reuse or recycling of hazardous waste in excess of 1 ton per day, excluding reuse or recycling that takes place as an integral part of an internal manufacturing process within the same premises.	This activity is for the rendering of hazardous waste (poultry abattoir waste) to produce a high-protein feather meal at the existing plant (Plant 1) and for the processing of four different waste streams into high-protein meals at the proposed second plant (Plant 2) (to be constructed where the two storage sheds are currently located).
Category B, No. 3: The recovery of waste including the refining, utilisation, or co-processing of the waste at a facility that processes in excess of 100 tons of general waste per day or in excess of 1 ton of hazardous waste per day, excluding recovery that takes place as an integral part of an internal	This activity is for the rendering of hazardous waste (poultry abattoir waste) to produce a high-protein feather meal at the existing plant and for the processing of four different waste streams into high-protein meals at the proposed second plant (to be constructed where the two storage sheds are currently located).



Listed activity	Reason for licensing this activity
manufacturing process within the same premises.	
Category B, No. 4: The treatment of hazardous waste in excess of 1 ton per day calculated as a monthly average; using any form of treatment excluding the treatment of effluent, wastewater or sewage.	This activity is for the rendering of hazardous waste (poultry abattoir waste) to produce a high-protein feather meal at the existing plant and for the processing of four different waste streams into high-protein meals at the proposed second plant (to be constructed where the two storage sheds are currently located).
Category B, No. 10: The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).	This activity is for the construction of the above mentioned Category B activities, such as the proposed second processing plant (to be constructed where the two storage sheds area currently), the two new wastewater treatment plants (internal reverse osmosis system within Plant 2 and external wastewater treatment works) and potential upgrading of the existing anaerobic pond and settling pond.

1.1.2 Design

The figure below shows the existing rendering facility as well as the proposed second processing plant and two additional wastewater treatment plants.



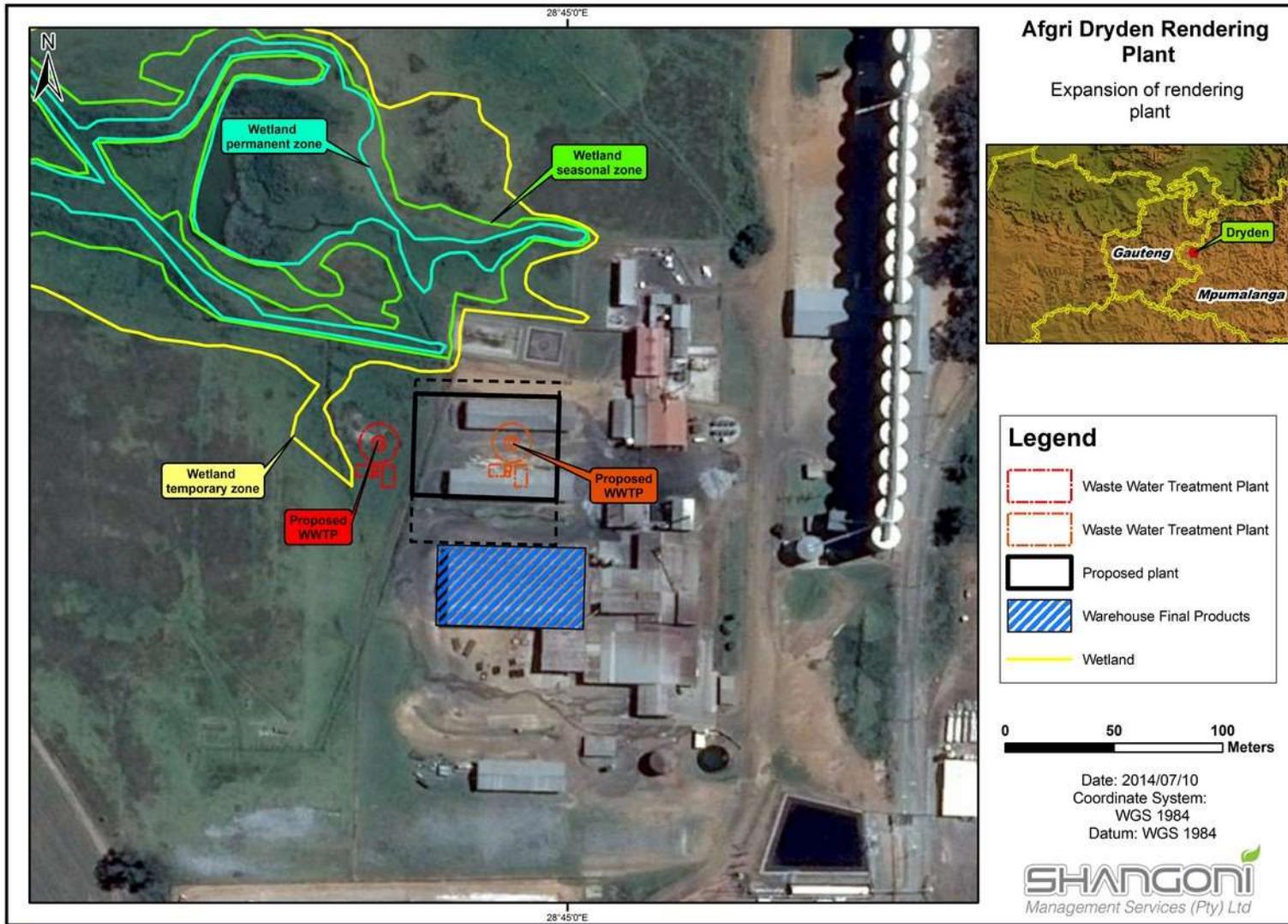


Figure 1: Proposed second rendering plant and wastewater treatment works

2. ENVIRONMENTAL ASSESSMENT PRACTITIONER

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



3. SITE DOCUMENTATION

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

- A copy of the Environmental Impact Assessment (EIA) Report.
- A copy of this Environmental Management Programme (EMP).
- A copy of the Environmental Authorisation (Waste Management License).

4. LEGISLATION

4.1 LAWS OF GENERAL APPLICATION

- Constitution of the RSA, 1996 (Act No. 108 of 1996);
- National Environmental Management Act, 1998 (Act No. 107 of 1998);
- Environment Conservation Act, 1989 (Act No. 73 of 1989);
- Promotion of Access to Information Act, 2000 (Act No. 2 of 2000); and
- Protected Disclosures Act, 2000 (Act No. 26 of 2000).

4.2 AIR QUALITY AND NOISE

- Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965);
- National Environmental Management: Air Quality Act, 2004 (Act No. 36 of 2004);
- National Building Regulations and Building Standards Act, 1977 (Act No. 103 of 1977);
- Environment Conservation Act, 1989 (Act No. 73 of 1989) – Noise Control Regulations in terms of Section 25 of the Environment Conservation Act, 1989; and
- National Environmental Management Act, 1998 (Act No. 107 of 1998).

4.3 WATER MANAGEMENT

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

4.4 HAZARDOUS CHEMICALS AND SUBSTANCES

- Hazardous Substances Act, 1973 (Act No. 15 of 1973); and
- Occupational Health and Safety Act, 1993 (Act No. 85 of 1983) – GN 1179 of 25 August 1995 – Regulations for Hazardous Chemical Substances (HCS).

4.5 WASTE MANAGEMENT

- National Environmental Management: Waste Act (NEMWA), 2008 (Act No. 59 of 2008);



- Environment Conservation Act, 1989 (Act No. 73 of 1989);
- National Road Traffic Act, 1996 (Act No. 93 of 1996) – GN R225 of 17 March 2000 – National Road Traffic Regulations;
- Hazardous Substances Act, 1973 (Act No. 15 of 1973);
- Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) – GN 1179 of 25 August 1995 – Hazardous Chemical Substance Regulations;
- 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.

4.6 PLANNING OF NEW ACTIVITIES

- National Environmental Management Act, 1998 (Act No. 107 of 1998); and
- GN R.543, GN R.544, GN R.545 and GN R.546, dated 18 June 2010.

4.7 BIODIVERSITY

- National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004);
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983); and
- National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998).

4.8 LAND AND SOIL MANAGEMENT

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

4.9 HERITAGE RESOURCES

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

4.10 PROTECTED AREAS

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

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



5. ENVIRONMENTAL MANAGEMENT PROGRAMME

Refer to the tables below for the EMP. Responsibility is assigned to the relevant parties, keeping in mind that AFGRI Operations Limited are ultimately still responsible for ensuring implementation of the EMP. The EMP must be updated should any significant changes occur to the operation of the rendering facility.

5.1 LICENSING CURRENT AND FUTURE WASTE MANAGEMENT ACTIVITIES AT THE RENDERING FACILITY

5.1.1 Planning and Design Phase

Table 3: Planning and Design Phase

Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
Designs for the expansion of the rendering facility.	Inadequate design of the rendering facility expansion.	Option C1: 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.	To prevent disturbance and degradation of the wetlands onsite.	<ul style="list-style-type: none"> The biodiversity corridor (wetland) should not be disturbed and the building plan must ensure that no infrastructure extends into any of the wetland zones on site. 	AFGRI must verify that the indicated measures have been considered and incorporated into the design for the expansion and upgrading of the rendering facility and its associated infrastructures, as far as practically and feasibly possible.	Complete prior to commencement of construction phase.	<ul style="list-style-type: none"> AFGRI Engineering contractor
Design of the treated wastewater discharge pipe or channel.	Inadequate design of the discharge pipe or channel.	Disturbance or degradation of the wetland as pipes or channels for the discharge of treated wastewater are constructed or installed in wetland zones.	To ensure that disturbance of the onsite wetland is kept to a minimum.	<ul style="list-style-type: none"> The pipe or channel that will discharge treated wastewater into the environment (drainage line) must be designed so that it does not enter any wetland zones, as far as possible. The pipe or channel should ideally be designed to discharge the treated wastewater upstream of the wetland. 	AFGRI must verify that the indicated measures have been considered and incorporated into the design of the discharge pipe or channel, as far as practically and feasibly possible.	Complete prior to commencement of construction phase.	<ul style="list-style-type: none"> AFGRI Engineering and construction contractor
Scheduling for the construction phase of the proposed project.	Construction activities scheduled during summer months (raining season).	Degradation and loss of a valuable resource (topsoil) through increased runoff as stormwater flows over cleared, bare areas during rainfall events.	To reduce the duration and extent of exposure of topsoil to preserve it as a resource and protect it from erosion.	<ul style="list-style-type: none"> If possible, schedule construction activities for dry months (winter). 	AFGRI must verify that the indicated measures have been considered and incorporated into the scheduling of the project, as far as practically and feasibly possible.	Complete prior to commencement of construction phase.	<ul style="list-style-type: none"> AFGRI Construction contractor
Scheduling for the construction phase of the proposed project.	Construction activities occurring during inconvenient times of the day.	Generation of noise and nuisance to neighbours.	To minimise noise generation during the construction phase.	<ul style="list-style-type: none"> Schedule activities that will generate the most noise during times of the day that will result in least disturbance to neighbours. 	AFGRI must verify that the indicated measures have been considered and incorporated into the scheduling of the project, as far as practically and feasibly possible.	Complete prior to commencement of construction phase.	<ul style="list-style-type: none"> AFGRI Construction contractor
Design of the wastewater treatment works.	Inadequate design of the wastewater treatment works.	Soil, surface water and groundwater pollution during the operational phase due to inadequate design of the wastewater treatment works.	To ensure adequate design of the wastewater treatment works.	<ul style="list-style-type: none"> 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. 	AFGRI must verify that the indicated measures have been considered and incorporated into the design of the wastewater treatment works system, as far as practically and feasibly possible.	Complete prior to commencement of construction phase.	<ul style="list-style-type: none"> AFGRI Wastewater treatment works designer



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
				<ul style="list-style-type: none"> 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, evaporation ponds and/or beds must be lined with a 1.5mm HDPE liner. 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: <ul style="list-style-type: none"> Structures and hardened surfaces associated with the water use must not- <ul style="list-style-type: none"> 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- <ul style="list-style-type: none"> 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- <ul style="list-style-type: none"> 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. 			
Design of waste storage facilities and/or areas.	Inadequate design of waste storage facilities and/or areas.	Soil, surface water and groundwater pollution. Nuisance caused by odours and unsightly appearance of waste onsite.	To ensure environmentally responsible storage of all waste at the rendering facility during the operational phase.	<ul style="list-style-type: none"> 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 design of the hazardous waste storage facility must be conducted in accordance with GNR. 926 of 29 November 2013. The second rendering facility must be designed so that incoming waste can be stored in an enclosed, well-ventilated area and furthermore, that the waste storage area can be refrigerated should this be required. 	AFGRI must verify that the indicated measures have been considered and incorporated into the design of all new waste storage facilities and/or areas, as far as practically and feasibly possible.	Complete prior to commencement of construction phase.	<ul style="list-style-type: none"> AFGRI Construction contractor
Design of the air treatment system (odour abatement system).	Inadequate design of the air treatment system (odour abatement system).	Generation of atmospheric emissions, odours and nuisance to neighbours during the operational phase.	To minimise the generation of odours at the rendering facility and thus the	<ul style="list-style-type: none"> The air treatment system (odour abatement system) must be designed to minimise and eliminate atmospheric emissions, especially odourous emissions, as far as practically and feasibly possible. The system must be designed in such a way that AFGRI can demonstrate that they have implemented best practice measures intended to minimise or avoid offensive odours. 	AFGRI must verify that the indicated measures have been considered and incorporated into the design of the air treatment system (odour abatement system).	Complete prior to commencement of construction phase.	<ul style="list-style-type: none"> AFGRI Air treatment system designer



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
	abatement system).		nuisance to neighbours.				

5.1.2 Pre-construction and Construction Phase

Table 4: EMP- Pre-construction and Construction Phase

Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
Construction activities for the expansion of the rendering facility.	Lack of knowledge amongst workers and contractors in terms of how their actions may impact on the environment Unauthorised access to the site.	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).	To prevent harm to the environment by educating workers and contractors.	<ul style="list-style-type: none"> 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. 	ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> Facility Manager ECO
Site clearance and construction activities for the expansion of the rendering facility.	Removal of indigenous vegetation from the footprint for the expansion of the facility and possibly next to this footprint.	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	To prevent the disturbance of indigenous vegetation, specifically wetland vegetation within the temporary zone of the wetland (part of the biodiversity corridor).	<ul style="list-style-type: none"> 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. 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. 	ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> Facility Manager ECO



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
		<p>infrastructure will extend into any of the wetland vegetation on site, nor into any of the wetland zones.</p> <p>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.</p>		<ul style="list-style-type: none"> Exotic and invasive plant species should be eradicated as part of the construction phase as far as possible. Importantly: no vegetation, even alien and invasive plant species, may be removed from any of the wetland zones. 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. 			
<p>Hot work activities, smoking and cooking as part of the construction phase.</p>	<p>Disturbance or destruction of natural vegetation surrounding the site as a result of runaway veld fires caused by workers or contractors.</p>	<p>Loss of indigenous grassland and habitats for indigenous fauna species surrounding the site as a result of runaway veld fires.</p>	<p>To prevent the occurrence and spreading of a veld fire.</p>	<p>Equipment</p> <ul style="list-style-type: none"> 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). <p>Signage</p> <ul style="list-style-type: none"> 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. <p>Training</p> <ul style="list-style-type: none"> 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. <p>Activities</p> <ul style="list-style-type: none"> 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. 	<p>ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.</p>	<p>During construction phase, up until operation of the facility.</p>	<ul style="list-style-type: none"> Facility Manager ECO



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
				<ul style="list-style-type: none"> • 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. • 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. <p>Flammable materials</p> <ul style="list-style-type: none"> • 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. <p>General</p> <ul style="list-style-type: none"> • 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). 			
<p>Site clearance and construction activities for the expansion of the rendering facility.</p>	<p>Site clearance extending into wetland zones.</p>	<p>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.</p> <p>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</p>	<p>To prevent disturbance and degradation of the wetlands onsite.</p>	<ul style="list-style-type: none"> • The biodiversity corridor (wetland) should not be disturbed. No construction activities may take place within 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. 	<p>ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.</p>	<p>During construction phase, up until operation of the facility.</p>	<ul style="list-style-type: none"> • Facility Manager • ECO



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
		<p>infrastructure will extend into any of the wetland zones present on site.</p> <p>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.</p>					
Stockpiling of topsoil and cleared vegetation.	Topsoil being exposed to the elements.	Degradation and loss of a valuable resource (topsoil).	To reduce the duration and extent of exposure of topsoil to preserve it as a resource and protect it from erosion.	<ul style="list-style-type: none"> • 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. • 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. 	ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> • Facility Manager • ECO
Site clearance.	Prolonged exposure of cleared areas.	Erosion of cleared areas.	To minimise the duration of exposure of cleared areas and to limit erosion of subsoil.	<ul style="list-style-type: none"> • 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. 	ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> • Facility Manager • ECO



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
				<ul style="list-style-type: none"> Removal of vegetation is to be avoided until such time as soil stripping is required. 			
The handling, storage, mixing and disposal of cement and concrete.	Concrete and cement spillage.	Soil and surface water pollution.	To prevent the pollution of soil and surface water as a result of spillage, improper handling, storage, mixing or disposal of cement and concrete.	<ul style="list-style-type: none"> 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. 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. 	ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> Facility Manager ECO
The cleaning of equipment and construction areas.	Generation and runoff of contaminated wash water.	Soil and surface water pollution.	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.	<ul style="list-style-type: none"> 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. 	ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> Facility Manager ECO
Handling, storage and disposal of general/domestic and hazardous waste.	Poor waste management.	Soil, surface water and groundwater pollution. Nuisance caused by odours and unsightly appearance of waste onsite.	To prevent soil, surface and groundwater pollution and nuisance due to poor waste management.	<ul style="list-style-type: none"> 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). 	ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> Facility Manager ECO



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
				<ul style="list-style-type: none"> 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. 			
Installation and use of ablution facilities.	Unsanitary conditions on site.	Soil, surface water and groundwater pollution.	Prevent soil, surface and groundwater pollution from unsanitary conditions onsite.	<ul style="list-style-type: none"> 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. The contractor is to ensure that no spillage occurs and that the contents are removed from site on a regular basis. 	ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> Facility Manager ECO
Storage and handling of hazardous chemical substances including fuel, greases and oils.	Poor management and spills of hazardous chemical substances including fuel, greases and oils.	Soil, surface water and groundwater pollution.	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.	<ul style="list-style-type: none"> 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. 	ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> Facility Manager ECO



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
				<ul style="list-style-type: none"> 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. 			
Vehicle and equipment maintenance and fuelling.	Leaking and/or spilling of fuels, greases and oils.	Hydrocarbon pollution of soil, surface water and groundwater.	To prevent hydrocarbon pollution of soils, surface and groundwater through the spilling of fuel, grease or oil or leaking equipment and vehicles.	<ul style="list-style-type: none"> 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. 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. 	ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> Facility Manager ECO
Excavation activities, loading and offloading activities and vehicles travelling to and from the site.	Dust generation.	Degradation of ambient air quality due to dust generation.	To minimise the impact of excavation activities, loading and offloading activities and vehicles travelling to and from the site on the ambient air quality.	<ul style="list-style-type: none"> 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. 	ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> Facility Manager ECO
Construction workers, vehicles, machinery and general noisy construction activities on site.	Generation of noise and nuisance.	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.	To minimise noise generation during the construction phase.	<ul style="list-style-type: none"> Schedule activities that will generate the most noise during times of the day that will result in least disturbance to neighbours. 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 hailer 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. 	ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> Facility Manager ECO



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
		<p>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.</p> <p>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.</p> <p>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.</p> <p>The distance to sensitive noise receptors (residences) is more than 45 metres in all cases.</p>		<ul style="list-style-type: none"> 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. 			
Increased traffic frequency on road infrastructure.	Wear of access roads and insufficient vehicle inspections.	Wear of access roads, accidents on access roads, unpermitted transport of materials and loss of materials being transported on access roads.	To minimise the impact of an increase of traffic on access roads to the facility.	<ul style="list-style-type: none"> 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. 	ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> Facility Manager ECO
Usage of resources, such as electricity and water (groundwater).	Inefficient and redundant use of valuable resources (electricity and groundwater).	Wastage or depletion of a valuable resource (groundwater) due to inefficient or redundant usage.	To prevent the wastage or depletion of a valuable resource (groundwater).	<p>General</p> <ul style="list-style-type: none"> Ensure that all employees have been informed on the importance of natural resources (proper environmental training and awareness). Regular site inspection by supervisors. <p>Water</p> <ul style="list-style-type: none"> Regular inspection and maintenance of all boreholes, JoJo tanks, reservoirs, toilets, water pipes and taps. 	ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> Facility Manager ECO



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
				<ul style="list-style-type: none"> 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. 			
Site clearance.	Disturbance of artefacts or sites of cultural heritage (archaeological and historical) significance.	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.	To protect artefacts or sites of cultural heritage (archaeological and historical) significance.	<ul style="list-style-type: none"> 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. 	ECO to verify implementation of mitigation measures proposed in this EMP. ECO to submit monthly compliance reports to the competent authority.	During construction phase, up until operation of the facility.	<ul style="list-style-type: none"> Facility Manager ECO

5.1.3 Operational Phase

Table 5: EMP - Operational Phase

Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
Operational activities at the rendering facility.	Lack of knowledge amongst workers and contractors in terms of how their actions may impact on the environment.	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).	To prevent harm to the environment by educating workers and contractors.	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
Growth of alien and invasive vegetation on site.	Infestation of alien invasive vegetation.	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.	To control and eradicate alien and invasive plant species.	<ul style="list-style-type: none"> 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. Importantly: no vegetation, even alien and invasive plant species, may be removed from any of the wetland zones. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
Operational activities at the rendering facility.	Poor veld management.	Loss of indigenous grassland and habitats for indigenous fauna species surrounding the site as a result of runaway veld fires.	To prevent the occurrence and spreading of a veld fire.	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
Operational activities at the rendering facility.	Disturbance of wetland zones as part of the operational activities of the	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	To prevent disturbance and degradation of the wetlands onsite.	<ul style="list-style-type: none"> 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). 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager

Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
	rendering facility.	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.		<ul style="list-style-type: none"> 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 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. 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. 			
Discharge of treated process wastewater into the environment.	Disturbance and degradation of wetland zones due to inefficiently treated wastewater being released into the environment.	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.			<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
Handling, storage and disposal of general/domestic and hazardous waste.	Poor waste management.	Soil, surface water and groundwater pollution. Nuisance caused by odours and unsightly appearance of waste onsite.	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).	<ul style="list-style-type: none"> 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: 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
				<ul style="list-style-type: none"> ▪ Installation of sufficient waste bins, skips or bulk containers, where necessary. The design of the bins, skips or bulk containers must ensure containment to 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 m³ 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. 			
Handling, storage and processing of incoming waste from abattoirs.	Poor management of incoming waste from the abattoirs.	Soil, surface water and groundwater pollution. Nuisance caused by odours and unsightly appearance of waste onsite.	To prevent soil, surface water and groundwater pollution and nuisance as a result of poor	<ul style="list-style-type: none"> • 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). 	<ul style="list-style-type: none"> • Regular site inspections. • Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
			management of incoming waste from the abattoirs (waste to be processed at the rendering facility).	<ul style="list-style-type: none"> 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. 			
Installation and use of ablation facilities.	Unsanitary conditions on site.	Soil, surface water and groundwater pollution.	Prevent soil, surface- and groundwater pollution from unsanitary conditions onsite.	<ul style="list-style-type: none"> Sufficient ablation 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. 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. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
Storage and handling of	Poor management	Soil, surface water and groundwater pollution.	To prevent and minimise soil	<ul style="list-style-type: none"> Identify all chemical substances used onsite including fuel, greases, detergents etc. Obtain the material safety data sheet of each of these chemical substances. 	<ul style="list-style-type: none"> Regular site inspections. 	Life of operation	Facility Manager



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
hazardous chemical substances including fuel, greases and oils.	and spills of hazardous chemical substances including fuel, greases and oils.		and water pollution as a result of poor management and accidental spills of hazardous chemical substances, including fuel, greases and oils used onsite.	<ul style="list-style-type: none"> • 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. • 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. 	<ul style="list-style-type: none"> • Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 		
Vehicle and equipment maintenance and fuelling.	Leaking and/or spilling of fuels, greases and oils.	Soil, surface water and groundwater pollution.	To prevent hydrocarbon pollution of soil, surface and groundwater	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Regular site inspections. • Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
			through spillage of fuel, grease or oil and leaking equipment and vehicles.	<ul style="list-style-type: none"> 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. Regular review of the monitoring programme by a competent person to identify areas of improvement as well as areas that require attention. 			
Generation and treatment of wastewater.	Inefficient management and treatment of wastewater generated at the rendering facility.	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.	To ensure adequate management and treatment of wastewater generated onsite.	<ul style="list-style-type: none"> 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 damage and leakage. Liners should regularly be monitored for integrity. 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. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
				<ul style="list-style-type: none"> 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. 			
Handling and storage of coal.	Poor management and spillage of coal.	Soil, surface water and groundwater pollution.	To ensure the proper handling and storage of coal.	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
The burning of coal in the boilers to generate steam.	Generation of boiler ash.	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.	To prevent soil, surface and groundwater pollution as a result of poor ash management.	<p>Note: The management of ash should be included in the waste management plan.</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
				<ul style="list-style-type: none"> Should ash be disposed of off-site, a safe disposal certificate must be obtained from the licensed hazardous waste disposal site. Ash is deemed to be hazardous waste. 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. 			
Rain events and rain water (stormwater) flowing through the site.	'Clean' rainwater (stormwater) running into 'dirty' areas.	Soil and surface water pollution. Contamination of clean stormwater runoff flows through the site from east to west.	To prevent the contamination of 'clean' stormwater in 'dirty' areas through effective control of stormwater runoff.	<ul style="list-style-type: none"> 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. 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. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
General operational activities at the rendering facility.	Dust generation.	Degradation of ambient air quality.	To minimise the impact of dust generated by the increased traffic frequency on the ambient air quality.	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
General operational activities at the rendering facility.	Generation of noise and nuisance.	Disturbance and nuisance to neighbours due to operational activities.	To maintain a dB reading of less than 50dB at the site boundary and minimise nuisance to neighbours.	<ul style="list-style-type: none"> 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. 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. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
General operational	Ineffective management of	Generation of atmospheric emissions, odours and nuisance to neighbours.	To minimise the generation of	<ul style="list-style-type: none"> Containers or vehicles transporting waste, including blood, to the rendering facility must be leak-proof. 	<ul style="list-style-type: none"> Regular site inspections. 	Life of operation	Facility Manager



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
<p>activities at the rendering facility.</p>	<p>atmospheric emissions generated by the rendering process.</p>	<p>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).</p> <p>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.</p> <p>Water vapour from the cooking vessels is condensed in the condenser and non-condensibles are emitted as VOC emissions.</p> <p>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</p>	<p>odours at the rendering facility and thus the nuisance to neighbours.</p>	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 		



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
		the air treatment system. The same air treatment system will also be installed for the existing rendering plant.					
General operational activities at the rendering facility.	Ineffective management of atmospheric emissions generated by the burning of coal in the boilers.	Coal-fired boilers produce suspended particulate matter; ammonia; nitrogen and sulphur oxides; greenhouse gases; and may also produce VOCs. The expected extent prior to mitigation is regional, the expected duration is long term and the expected intensity and reversibility is medium.	To minimise the amount of atmospheric emissions generated and released into the atmosphere.	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
Increased traffic frequency on road infrastructure.	Wear of access roads and insufficient vehicle inspections.	Wear of access roads, accidents on access roads, unpermitted transport of materials and loss of materials being transported on access roads.	To minimise the impact of an increase of traffic on access roads to the facility.	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
Usage of resources, such as electricity and water (groundwater).	Inefficient and redundant use of valuable resources (electricity and groundwater).	Wastage or depletion of valuable resources (groundwater and electricity) due to inefficient or redundant usage.	To prevent the wastage or depletion of valuable resources (groundwater and electricity).	<p>General</p> <ul style="list-style-type: none"> Ensure that all employees have been informed on 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. <p>Water</p> <ul style="list-style-type: none"> 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. All measuring devices 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. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager



Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
				<ul style="list-style-type: none"> • The site Water Balance, as contained in the IWWMP, will be improved and updated, as and when required. <p>Electricity</p> <ul style="list-style-type: none"> • 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. 			
Operational activities at the rendering facility, especially with regards to the handling of incoming poultry and other waste.	Unsanitary conditions at the rendering facility.	Outbreak of diseases and possible infection of workers at the facility.	To maintain clean conditions at the rendering facility, to minimise the risk of an outbreak of disease and to keep employees healthy.	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Regular site inspections. • Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager



5.1.4 Rehabilitation Phase

Table 6: EMP – Rehabilitation Phase

Activity	Aspect	Impact	Objective	Management / Mitigation Measures	Monitoring and Compliance reporting	Timeframes	Responsible Party
Landscaping, replacement and levelling of subsoil and topsoil.	Incorrect replacement and levelling of subsoil and topsoil.	Ineffective rehabilitation, including soil erosion and generation of dust.	To ensure proper replacement of subsoil and topsoil to promote effective rehabilitation of disturbed areas.	<ul style="list-style-type: none"> Replacement and rehabilitation should be progressive during the project and not left until the end. Implementation of effective and sustainable rehabilitation and remediation practices. Cordon off areas under rehabilitation using danger tape. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. Disturbed areas must be cleared of any building rubble or other debris. All weeds must be removed prior to soil replacement. Subsoil must be used to fill in excavations around the rendering facility and associated infrastructure. The disturbed area must be top-soiled, sloped and re-vegetated as soon as possible using indigenous grass species. 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. 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. Compaction must be minimised by using the correct equipment. Excessively heavy vehicles should not be used to replace the soil. A dozer must be used instead of a grader. Compacted soil should be ripped to ensure effective re-vegetation. Soils should ideally only be moved when dry. 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. 	Regular site inspection by facility manager to ensure that effective rehabilitation of disturbed areas is taking place.	Before completion of construction phase.	<ul style="list-style-type: none"> Construction contractor. ECO.
Replacement of vegetation.	Ineffective establishment and growth of vegetation planted during rehabilitation of disturbed areas.	Bare areas leading to soil erosion and generation of dust.	To ensure effective establishment and growth of vegetation.	<ul style="list-style-type: none"> Re-vegetation by indigenous grass species. 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. 	Regular site inspection by facility manager to ensure that effective rehabilitation of disturbed areas is taking place.	Before completion of construction phase.	<ul style="list-style-type: none"> Construction contractor. ECO.



5.1.5 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 National Department of Environmental Affairs prior to decommissioning.

5.2 CLOSURE 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 National Department of Environmental Affairs prior to decommissioning.



6. ENVIRONMENTAL AWARENESS PLAN

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

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

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

