



ENVIRONMENTAL MANAGEMENT PROGRAMME

SIBERIAN STURGEON FARMING

Prepared by:



On behalf of

UMKHULU WENA COOPERATIVE

REFERENCE NUMBER: UMKE/15/01/702

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GLOSSARY USED

Contractor

Persons/organisations contracted by the developer to carry out parts of the work for the planned development.

Environment

The environment is defined in terms of the National Environment Management Act, No. 107 of 1998, as the surroundings within which humans exist and that are made up of the land, water and atmosphere of the earth, micro-organisms, plants and animal life; and any part or combination of the latter and any interrelationships among and between them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Assessment Practitioner

An independent consultant must be appointed by a developer to compile an Environmental Management Programme and to undertake audits. An individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments, Environmental Management Programmes or any other natural environment

Environmental Control Officer (ECO)

An individual nominated by the developer to act on behalf of a Contractor in matters concerning the day-to-day implementation of the EMPr, and for liaison with the DEDTEA, Municipality, EKZNW and DWAF and the public and owners or managers of properties affected by construction.

Environmental Impact

This is the degree of change whether desirable or undesirable in an environment resulting from the interaction of the activity.

The impact can either be direct or indirect of the construction activity.

Environmental Management Programme (EMPr)

The EMPr is a detailed plan for the implementation of the mitigation measures to minimise negative environmental impacts during the project life-cycle. The EMPr contributes to the preparation of the contract documentation by developing clauses to which the contractor must adhere to for the protection of the environment. A short and long term environmental management document for the project.

General Waste

Waste that does not pose an immediate hazard or threat to health or to the environment including Domestic waste; building and demolition waste; business waste; inert waste.

Hazardous Substances

Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste have a detrimental impact on health and the environment.

Project life - Cycle

This is the phase of the project from the Environmental Authorization to the, construction phase, to when the project is complete and the site is rehabilitated and handed over.

Proponent / Developer

The proponent, Umvoti Local Municipality is responsible for overlooking the construction of the proposed causeways.

Rehabilitation

Rehabilitation is defined as the return of a disturbed area to a state which approximates the state (where possible) which it was before disruption. Rehabilitation for the purposes of this specification is aimed at post - reinstatement re-vegetation of a disturbed area and the insurance of a stable land surface.

Re - vegetation must aim to accelerate the natural succession processes so that the plant community develops in the desired way, i.e. promote rapid vegetation establishment.

Waste

Any substance whether or not that substance can be reduced, re – used, recycled and recovered, a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of which: b) the generator, has no further use of for the purpose of production; c) that must be treated or disposed of; or d) that is identified as a waste by the Minister by notice in the Gazette and includes waste generated by the mining , medical or other sector, but;- i) a by-product is not considered waste; ii) any portion of waste, once re-used, recycled and recovered ceases to be waste.

ABREVIATIONS

C Contractor

DEDTEA KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs

DEV Developer

DAFF Department of Agriculture, Forestry and Fisheries

EA Environmental Authorisation

EAP Environmental Assessment Practitioner

ECA Environmental Conservation Act No. 73 of 1989

ECO Environmental Control Officer

EIA Environmental Impact Assessment

EKZNW Ezemvelo Kwazulu-Natal Wildlife

EMPr Environmental Management Programme

I&AP's Interested and affected Parties

MSDS Material Safety Data Sheets

NEMA National Environmental Management Act No. 107 of 1998

OHSA Occupational Health and Safety Act No. Act 85 of 1993

PM Project Manager

VERIFICATION	CAPACITY AND EXPERTISE	NAME
BY AUTHOR	Environmental Consultant BSocSc. Geog&Env. Manangement	N. Dlamini

1. INTRODUCTION

The Umkhulu Wena Cooperative is proposing to construct a Siberian Sturgeon Farm in the Jammerdaal Farm within Kranskop area. One of the major demands in the area's economy is employment, fish and caviar. Therefore the Umkhulu Wena Cooperative intends to provide employment through the fish farm for the local community and also produce fish and caviar within the fish farm.

The proposed project will mainly allow for the reproduction of Siberian fish which will enhance the local economy in many ways than one. The employment rate in the area is low, therefore almost 200 skilled and non-skilled workers will be employed to work in the fish farm.

The project was identified as a development that would have negative environmental impacts. Nzingwe Consultancy was subsequently appointed as the Independent Environmental Consultants for the project with the responsibility of ensuring that the project follows all applicable environmental guidelines and legislation. Following an assessment of the baseline conditions on site as well as the proposed activity, Nzingwe Consultancy identified that the project triggers activities listed within Listing Notices 1 (GNR 983):

Indicate the number and date of the relevant notice: Activity No (s) (in terms of the relevant or notice) : Describe each listed activity as per the project description (and not as per wording of the relevant Government Notice)¹:

NATIONAL ENVIRONMENTAL MANAGEMENT ACT REGULATIONS		PROJECT DESCRIPTION
GNR 983: Listing Notice 1 (December 2014)	Activity no: 3	The proposed fish farm is anticipated slaughter Siberian fish that will be more than 20 000 kg per annum
GNR 983: Listing Notice 1 (December 2014)	Activity no: 6	The production output is anticipated to exceed 20 000 kg per annum.

Therefore an Environmental Authorization from the Department of Economic Development, Tourism and Environmental Affairs is required.

As the project was identified as a project that would have negative environmental impacts it has to comply with Section 28: Duty of care and remedy of damage of the National Environmental Management Act (Act 107 of 1998). The EMPr has therefore been compiled to provide measures for the Contractor to avoid, minimize or remedy impacts that are anticipated to result from this development.

¹ Please note that this description should not be a repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description, i.e. describe the components of the desired development

2. OBJECTIVES OF THE EMPR

An EMPr is a documented compiled to provide mitigation measures which must be implemented throughout the project life cycle in order to address the anticipated environmental impacts identified during the environmental impact assessment for the project. It is therefore an important tool that bridges the gap between the EIA and construction, operation and rehabilitation phases of the project. An EMPr also allocates Responsibility, resources and deadlines for each of the actions that form part of the outlined mitigation measures.

EMPr implementation is a cyclical process that converts mitigation measures into actions and through cyclical monitoring, auditing, review and corrective action, ensures conformance with stated EMPr aims and objectives.

Objectives of the EMPr include the following:

- Ensuring that negative impacts associated with the proposed development are reduced and positive impacts are increased.
- Ensuring that regulatory authority stipulations from a local to international scale are complied with;
- Ensuring that there is sufficient allocation of resources so that the scale of the EIA follow-up activities is consistent with the significance of project impacts;
- Verifying environmental performance through information on impacts as they occur;
- Responding to project implementation changes that are not considered in the EIA;
- Responding to unforeseen events; and
- Providing feedback for continual improvement in environmental performance.

List of proponents

Organisation	Contact Person	Designation	Contact Details	Postal address
Umkhulu Wena Cooperative	Ms Lidia Dube	Developer	Tel: 032 481 5711 Cell:083 595 6553 Fax: N/A Email: N/A	Private Bag 252 Kranskop 3268
Nzingwe Consultancy	Ms. N. Dlamini	Environmental Consultant	Tel: 039 315 7751 Cell: 071 180 8692 Fax: 086 662 1789 Email:enviro@nzingwe.co.za	P. O. Box 939 Shelly Beach 4265
Aquelle	Mr N. Bosman	Consultants	Tel: 032 481 5005 Cell: N/A Fax:N/A Email:nicob@aquelle.co.za	Silverfarm Kranskop 3268

KZN Department of Economic Development, Tourism and Environmental Affairs	Ms. M. Padayachee	Authority	Tel: 033 343 8495 Cell: N/A Fax: N/A Email:mavis.padayachee@kzndea.gov.za	Private Bag X6005 Hilton 3245
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3. LEGAL ENFORCEABILITY OF AN EMPr AND COMPLIANCE.

Laws applicable to the protection of the environment in terms of Environmental Management include but are not restricted to; are:

1. National Environmental Management Act, Act 107 of 1998
2. Environmental Planning Act, Act No. 88 of 1967
3. Conservation of agricultural Resources Act, No 43 of 1983
4. National Water Act, Act 36 of 1998
5. Water Services Act No. 108 of 1997
6. Minerals Act (Act 50 of 1991)
7. Occupational Health and Safety Act, No. 85 of 1993
8. Atmospheric Pollution Prevention Act, No.45 of 1965
9. Hazardous Substances Act, No. 53 of 1973

An Environmental Control Officer (ECO) must be appointed to monitor the implementation of the EMPr, by conducting site assessment visits to the project site and compiling environmental compliance reports and presenting them at monthly progress meetings. These reports will also be forwarded to the KwaSani Local Municipality and the Department of Economic Development, Tourism and Environmental Affairs (DEDTEA) for review and enforcement in case of non-compliance.

The Contractor appointed for the construction of this project will be responsible for ensuring that provisions contained within the EMPr are complied with, as well as the compliance of any Sub - Contractors appointed thereof, and must be held accountable in terms of this document.

*In terms of the Environmental Conservation Act and the National Environmental Management Act No. 107 of 1998 Section 28; those responsible for Environmental Damage must pay the repair costs both to the Environment and human health and the preventative measures to reduce or prevent further pollution and/or environmental damage. **The polluter pays principle.***

Non - compliance with, or any deviations from the conditions set out in the EMPr constitute a failure in compliance. In the case of Non-compliance with the EMPr the Contractor or Proponent would have on or during compliance monitoring been found/ caused:

1. When the Contractor fails to comply with corrective instructions from the ECO within a specified period,
2. Evidence of non-compliance with the EMPr, Municipal bylaws within boundaries of the site, site extensions and access roads has been observed,
3. Environmental damages are as a result of negligence, and
4. The failure to respond to complaints from Interested and Affected Parties (I&AP's).

The Contractor must act immediately when such a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice.

Complaints received regarding activities on the construction site pertaining to the environment must be recorded in a dedicated register and the response noted with the date and action taken. This record must

be submitted with the monthly reports and any avoidable non-compliance with the above-mentioned measures must be considered sufficient ground for the imposition of a penalty. The value of the penalty must not be less than the payment that would have been due to the Contractor for the day's production of the relevant item of work that gave cause for the infringement.

The imposition of such a penalty must not preclude the relevant Provincial or National Authority from applying an additional penalty in accordance with its statutory powers. Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed.

Failure to redress the cause must be reported to the relevant authority for them to deal with the transgression, as it deems fit.

Application of a penalty clause to the Contractor will apply for incidents of non-compliance. The penalty imposed will be per incident and will be deducted from the Contractor's monthly payment certificate. Unless stated otherwise in the project specification, the penalties imposed per incident or violation will be:

- | | |
|---|--------|
| • Failure to demarcate working areas | R4,000 |
| • Working outside of the demarcated area | R4,000 |
| • Failure to strip topsoil with intact vegetation (where applicable) | R4,000 |
| • Failure to stockpile topsoil correctly | R4,000 |
| • Failure to stockpile materials in designated areas | R2,000 |
| • Failure to provide adequate sanitation for laborers | R2,000 |
| • Failure to erect temporary fences/shade cloth | R2,000 |
| • Failure to provide adequate waste disposal facilities and services | R4,000 |
| • Nuisance to neighbors by Construction staff | R2,000 |
| • Failure to control storm water run-off | R4,000 |
| • Failure to rehabilitate disturbed areas within the specified time-frame | R4,000 |
| • Any contravention of the requirements of DEDTEA | R4,000 |
| • Any other contravention of project specific specification | R2,000 |
| • Any other contravention of particular environmental specification | R2,000 |

Such fines will be paid to the Proponent and will be used in rehabilitation/remediation and or landscaping of the development.

The EMPr must be presented to the Contractor before the commencement of activities on site and the contents defined. **A copy of the EMPr must be kept on site during the construction period as it is binding to all Contractors operating on site and the proponent.**

4. PROJECT DESCRIPTION

The proposed fish farming will include an abattoir, theatre, cool rooms (42m x 75m), nursery, hatchery, fish pools, a filter system (24m x 24m), pump system (24m x 24m) as well as a food store room (40m x 40m). The fish pools will vary in size (D1 32m x 40m {30 pools of 3m x 10m} D2 30m x 60 m {20 pools of 5m x 15m} D3 & D4 40m x 200m {10 pools of 20mx 40}).



Figure 1: Google image depicting the location of the fish farm.

Technology to be used includes:

- Compactor
- Grader
- TLB
- Tipper truck
- Excavator

Locality and Layout

The proposed construction will be undertaken within the Kranskop in Jammerdaal farm. The proposed fish farm will be a new structure in the area. The geographic coordinates of the proposed project are:

South: 29° 04' 23.88"

End: 30° 56' 21.35"

Environmental Control Officer

The Environmental Control Officer is responsible for monitoring the implementation of the EMPr during the construction phase as well as liaising and reporting to the Project Manager. The ECO must conduct audits to monitor the Contractor's compliance to the EMPr. An audit report must thereafter be compiled for each audit conducted addressing identified non-compliances or inadequate compliance. It is advised that the ECO address identified non-compliances with the Contractor's representative on site and explain the recommended corrective measures for the non-compliances.

5. PUBLIC INVOLVEMENT

The public must be informed and engaged in decision making with regards to the proposed development. All personnel involved in any and all project stages must seek to understand and follow community

procedures for doing certain things provided that this will not result in them failing to follow legal guidelines. The traditional council must be notified of the commencement of construction activities prior to the commencement of the construction activities. The Contractor must ensure that all his staff conduct themselves accordingly and that the local leaders are engaged in problem solving. The project must also include to skills development within the community affected.

6. SPECIFICATION, MITIGATION AND MANAGEMENT PROCEDURES

6.1 Preliminary Activities and Management of Construction

Environmental Education and Awareness	Responsible Person	Frequency/ Timing
<ul style="list-style-type: none"> • Ensure that all site personnel have a basic level of environmental awareness training. It is the contractor's responsibility to provide the site foreman with no less than 1 hour's environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff. • Prior to the commencement of construction, all staff needs to know must be trained on identification of archaeological or historical objects of value, and be informed to notify the Engineer/Contractor should such an item be uncovered. • The need for a 'clean site' policy needs to be explained to the construction workers. • Workers must be informed of the general conduct on site such as: <ul style="list-style-type: none"> ➤ No alcohol / drugs to be present on site. ➤ Prevention of excessive noise. ➤ Only making use of provided facilities; as opposed to ad-hoc alternatives (e.g. fires for cooking, the use of surrounding bush as a toilet facility are forbidden). ➤ No fires to be permitted on site. Encourage the use of gas operated cookers for food preparation at the site camp. ➤ No trespassing on private / commercial properties adjoining the site. ➤ Only pre-approved security staff is permitted to live on the site camp. ➤ Workers may refuse to do work that is potentially dangerous or what they had not been trained to do. ➤ Only trained operators who have been certified competent by the Project Management may operate critical items of mechanical equipment. 	ECO/C	Before Construction / On-going

Health and Safety Education and Awareness		
<p>A health and safety induction must be conducted prior to the commencement of the project. This training must include the following:</p> <ul style="list-style-type: none"> • Safety in the work place training : <ul style="list-style-type: none"> ➢ Displaying signage that will be or may be seen around the site and explaining what it means i.e. high voltage and highly flammable signs. ➢ Informing the laboures of any hazardous substances they will be using, the dangers associated with the use of these substances and correct means of handling hazardous substances. ➢ Explaining the importance of ensuring that equipment to be utilized is in good working condition. ➢ Explaining the use of Personal Protective Equipment such as work boots and reflector jackets provided to the personnel. ➢ Explaining the steps to be taken if personnel are injured while at work and the importance of recording such incidents. ➢ Ensuring that all laboures receive training on use of machinery and equipment they will be required to use during construction. 	EAP/C	Before construction/ On-going
Access to site		
<ul style="list-style-type: none"> • Construction sign must be placed at the beginning of the project indicating who is constructing the road and the Municipality that it falls within. Disruption of access for local residents must be minimized. • There must be signage warning of the undergoing activity and any disturbance of access. • Where access is disrupted, alternative access must be created. • Access to and movement of construction machinery around the project site, especially around the streams must be monitored and controlled. • There must be designated access for construction vehicles and machinery to the construction area and movement of the construction vehicles and machinery must be restricted to those areas. 	ECO/C/E	Before Construction / On-going

<ul style="list-style-type: none"> The access road is gravel in nature and therefore highly erodible when wet. Use of the road by vehicles; with special reference to heavy vehicles, must cease during periods where the road is wet. 		
Construction site boundaries		
<ul style="list-style-type: none"> Site boundaries for construction activities must be agreed to between the ECO, Contractor and Engineer prior to the commencement of any construction related activity. Such boundaries must be marked off accordingly and areas beyond must be treated as no-go areas. Site boundaries must be respected throughout the project life cycle to ensure that damage to the environment is minimized throughout the project life cycle. 	ECO/C/E	Before Construction
Construction Camp		
<ul style="list-style-type: none"> Choice of the site camp location must be guided by the ECO and Engineer. The construction camp must not be located in proximity to the stream. Construction camp must not be less than 100m away from the stream and must be properly fenced off and secured. The Contractor must provide temporary chemical toilets for all their employees during the Construction Phase. Such facilities must comply with local authority regulations and be maintained in a clean and hygienic condition. Their use must be strictly enforced. The Contractor must attend to the drainage of the camp site and site to avoid water ponding and/or sheet erosion. Stormwater management must be implemented on site to ensure constant drainage or redirecting of run-off to ensure that no water ponding occurs. 	E/ECO/C	Before Construction /Daily
Ablution Facilities		
<ul style="list-style-type: none"> Temporary chemical toilets must be provided by a company approved by the ECO. These toilets must not be closer than 100m from any of the streams and not situated in the 1:100 year flood line. A maintenance plan for the service of the toilets must be drawn up and strictly adhered to in order to prevent malfunctioning and neglect. The toilet must be positioned at a 100m walking distance of the workers, with toilet/s to be serviced twice weekly by a registered company. Toilet paper must be supplied, and the toilet and area around it is to be kept hygienically clean at all times. 	ECO/C	Weekly

NO LONG DROP TOILET MAY BE CONSTRUCTED.		
Equipment & Storage Areas		
<ul style="list-style-type: none"> Fuel tanks must meet relevant specifications and be elevated so that leaks may be easily detected. Material Safety Data Sheets (MSDSs) must be readily available on site for all chemicals and hazardous substances to be used on site. Where possible the available MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes. Choice of location for equipment and storage areas must take into account prevailing winds, distances to adjacent land uses, general on – site topography and water erosion potential of the soil. Location of equipment and storage areas must not pose environmental health or human injury. Fire extinguishers must be present at all storage facilities. Use of fire extinguishers must be included when training workers and such training must be given to all workers and not specific personnel. 	E/ECO/C	Daily
General & Hazardous Substances and Materials		
<ul style="list-style-type: none"> All material must be stored at the site camp and taken to construction sites when required. Only limited storage of materials may be allowed at the construction site. Material carried to construction site must be kept neatly on site. Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures. The Contractor must ensure that his staff is made aware of the health risks associated with any hazardous substances used and has been provided with the appropriate protective clothing/equipment in case of spillages or accidents and have received the necessary training. Storage areas should be secure so as to minimize the risk of crime. They should also be safe from access by children and animals. Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground and groundwater regime around the temporary storage area(s). These pollution prevention measures for storage should include a bund wall high enough to contain at least 110% of any stored volume. Under no circumstances must containers of hazardous substances be placed directly onto the ground. The Contractor must submit a method statement to the Engineer for approval. 	E/ECO/C	Daily

<ul style="list-style-type: none"> • Fire extinguishers must be present at all storage facilities. 		
Provision for camp waste disposal		
<ul style="list-style-type: none"> • All waste material generated must be disposed of at a permitted landfill site that is authorised to accept such waste. Safe disposal certificates must be kept on record. Disposal of waste must not result in any contamination of surface or ground water and must not cause any health hazards. • Bins must be provided for disposal of waste within the construction camp prior to disposal at a landfill site. • General and hazardous waste must be stored separately on marked bins and disposed of accordingly. • Proposed method of waste handling, storage and disposal must be confirmed and agreed upon in conjunction with the ECO and Engineer. • Construction rubble must be disposed of in pre-agreed, demarcated spoil dumps that have been approved by the Engineer and ECO. All waste from the construction must be reused and recycled as far as possible. • Hazardous waste disposal must be carried out by an approved waste Contractor and waybills kept for proof of disposal. 	E/ECO/C	Daily
Clearance of vegetation		
<ul style="list-style-type: none"> • The road rehabilitation must take place with minimal disturbance to the environment to avoid unnecessary removal of vegetation. • Grass tussocks must be conserved with topsoil with grass and topsoil and replaced once construction is complete. • In this regard scheduling will be important as grass should be conserved only just prior to construction passing through this point, kept in a shady area and watered, and replaced immediately upon construction of this road. Ideally, this cycle should be scheduled so that replacement occurs within a few days of removal. <p>As with non-grass species, grass removal and replanting should occur under supervision of the ECO or horticultural qualified person</p>	E/ECO/C	Before Construction and At all times.
Air Pollution		
<ul style="list-style-type: none"> • Use of materials that easily become airborne must cease during windy conditions 	E/ECO/C	Daily

<ul style="list-style-type: none"> • Vehicles and machinery are to be kept in good working order and to meet the manufacturer's specifications for safety, fuel consumption, etc. • Should excessive emissions be observed, the Contractor is to have the equipment serviced to as soon as possible. • Soil in the area is generally dry and would therefore become easily liberated when loosened. Areas with loosened soil must therefore be periodically dampened with the minimal amounts of water in order to hold the soil down. 		
Top Soil Stripping and Stock Piling of Materials		
<ul style="list-style-type: none"> • Where necessary top soil must be stripped to a depth of 150 mm and conserved, and replaced according to correct profile – i.e. topsoil replaced last. • Stockpiles are to be no more than 1m high and must be protected from wind and water erosion and be kept weed free through regular weeding. • Stripped topsoil must be stockpiled away from any potential disturbances. All earthworks must be vegetated immediately after completion of construction as is practically possible with locally sourced indigenous vegetation. • Material stockpiles or stacks must be stable and well secured to avoid collapse and possible injury to site workers / local residents. • Stockpiles must not be situated such that they obstruct natural water pathways. Exit points for run-off should be made between the stockpiles. • Stockpiles must not be left for longer than three (3) months, unless otherwise permitted by the Engineer. • All stockpile materials must be stored away from the flood plain. • If stockpiles are exposed to windy conditions or heavy rains, they must be covered either by vegetation or cloth. Stockpiles may further be protected by the construction of berms or low brick walls around their bases. 	E/ECO/C	Daily
Soil Erosion		
<ul style="list-style-type: none"> • Soil erosion on site must be prevented at all times i.e. pre, during- and post construction activities. If soil erosion cannot be prevented, it must be minimised. • Erosion control measures must be implemented in areas sensitive to erosion such as near stream edges. Rubble 	E/ECO/C	Daily

<p>must be used to construct retaining walls where necessary.</p> <ul style="list-style-type: none"> • Procedures that are in place to conserve topsoil during the construction phase of the project are to be applied to the site set up phase. • All exposed soils must be stabilised post construction. <p>The following measures need to form part of the management of the site:</p> <ul style="list-style-type: none"> • Fill in and re-vegetate eroded areas and monitoring from placing of top soil to full re-vegetation phase. • Treating the stream banks as no-go zones for heavy machinery. • Starting re-vegetation as soon as a portion of the work has been completed as opposed to waiting for the entire project to be completed to avoid soil erosion and alien plant proliferation. 		
<p>Stormwater</p>		
<ul style="list-style-type: none"> • It is imperative that there is proper management of stormwater on site. Therefore, a stormwater management plan must be drawn up and strictly adhered to. • Temporary cut-off drains and berms may be required to capture stormwater and promote infiltration during construction. • Storage areas that contain hazardous substances must be bunded with an approved impermeable layer. • Stormwater management must manage intensity of release and spatial distribution of release points. • Spills in bunded areas must be cleaned up, removed and disposed of safely from the bunded area immediately after detection to minimise pollution risk and reduced bunding capacity. • A designated, bunded area is to be set aside for vehicle washing and maintenance. Materials caught in the bunded area must be disposed of to a suitable waste site or as directed by the Engineer. • Drainage must be controlled to ensure that run-off on-site does not culminate in off-site pollution, flooding or result in any damage to properties downstream of any stormwater discharge. 	<p>E/ECO/C</p>	<p>Weekly</p>

<p>Stormwater management at causeway sites</p> <ul style="list-style-type: none"> • Water containing waste from the construction site must not be discharged into the natural environment. • Water diversions must be limited to a specific time frame and must only divert a portion of the river at a time. • Diverted surface water should not erode the area that it is diverted to, which could occur in this instance as a result of steep gradient. • River diversions must be done upstream the channel. • Sand bags may be used for the diversion structure. Contractor is to take appropriate measures to ensure that no water flows through the construction site. • Diversions must only be done in the months of April to August when river flow is low to reduce effects of the diversion on the river. • Work within the 32m buffer must be as labour intensive as possible to reduce use of machinery. • As long as the bottom foundation slab is effectively anchored into the underlying bedrock and the top slab extends to the 1:50 year flood level (if applicable), the operational impacts on the stream must be minimal. However, owing to the need to excavate the channel bed down to bedrock and establish a concrete foundation slab, potentially significant long term impacts on the stream area may occur during the construction phase if appropriate mitigation measures are not applied. 		
<p>Hydrology and surface run-off</p>		
<ul style="list-style-type: none"> • Vegetation must be preserved as far as possible. • Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. • The excavation and use of rubbish pits on site and burning of waste is forbidden.. • If necessary these floodlines must be clearly demarcated on the layout plans. • All movement and construction within the stream must be restricted and strictly monitored to mitigate against disturbance of the river bed. 	E/ECO/C	Weekly

<p>The incorrect handling, storage, transport and disposal of substances and materials, and polluted run-off can have serious negative effects on groundwater quality. Soil erosion and sediment is also detrimental to water quality.</p>		
<p>Best practices applicable to watercourse crossing</p>		
<ul style="list-style-type: none"> • The crossing should run perpendicular to the natural flow of the stream. • Stream crossings to be adapted must be having minimal disturbance on the watercourse. • Design a crossing that keeps disturbance to a minimum and spans as much of the stream and perimeter or banks, floodplain, and floodway stream as possible. • Avoid disturbance to streambeds, stream soils, and vegetation. • Avoid fragmenting stream wildlife habitat by building away from wildlife travel corridors. • Avoid crossing through or bisecting a stream wildlife breeding area. • Minimize light and noise disturbance on roadways by installing plantings to act as a buffer on the sides of roadways. • Design and construct wildlife crossings that attempt to preserve existing light conditions and maintain soil moisture levels similar to existing natural conditions. • Maintain existing elevations, or consider installing retaining walls to reduce disturbance and side slope fill. • Where the disturbance of the stream channel cannot be avoided, the stream channel must be restored. • Maintain existing side slope grades, as much as possible, to minimize fill and any wetland loss. <p>Environmental Management Guidelines For Riparian Areas Streams And Wetlands has been attached as an Appendix to the EMPr.</p>	<p>E/ECO/C</p>	<p>Before and during construction</p>
<p>Geology</p>		
<ul style="list-style-type: none"> • Where required, provision should be made to accommodate or avoid collapsing settlement or structures should be founded below the collapsible horizon. 	<p>E/ECO/C</p>	<p>Weekly</p>

<ul style="list-style-type: none"> The use of heavy machinery in the stream must be monitored by the ECO. 		
Public Participation		
<ul style="list-style-type: none"> Open liaison channels should be established between the Community and Contractor such that any queries, complaints or suggestions can be dealt with quickly and by the appropriate person(s). In terms of Noise pollution it is envisaged that it will be minimal as the construction will not include heavy earthworks. 	ECO/C	At all times
Flora and fauna		
<ul style="list-style-type: none"> No vegetation may be cleared without the prior permission from the ECO. Gathering of firewood, fruit, muthi plants, crops or any other natural material on site or in areas adjacent to the site is prohibited. Snares and traps on site are prohibited. Care must be taken to conserve existing plant and animal life on and surrounding the site. Disturbance to birds, animals and reptiles and their habitats should be minimised wherever possible. Immediate re-vegetation of stripped areas and removal of aliens by weeding must take place. This significantly reduces the amount of time and money spent on alien plant management during rehabilitation. Alien plant encroachment is particularly damaging to natural habitats and is often associated with disturbance to the soil during construction activities. Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. 	E/ECO/C	At all times
Water Quality		
<ul style="list-style-type: none"> Storage areas that contain hazardous substances must be bunded with an approved impermeable liner. A designated, bunded area is to be set aside for vehicle washing and maintenance. Materials caught in this bunded area must be disposed of to a suitable waste disposal site. The Contractor must compile a list of emergency contact numbers including those of the Department of Water Affairs and the ECO to refer to in order to deal with spillages and contamination of land and aquatic environments. 	E/ECO/C	Weekly

<ul style="list-style-type: none"> Spills in banded areas must be cleaned up, removed and be disposed of at a registered hazardous land fill site immediately after detection to minimize pollution risk. <p>In the event of a spillage the following action must be taken:</p> <ul style="list-style-type: none"> Stop the source of a spill. Contain the spill. Report all significant spillages to the Department of Water Affairs. Remove the spilled product for treatment or authorised disposal. Determine if there is soil, ground water or any other environmental impact. Document the incident. <ul style="list-style-type: none"> A designated, banded area must be set aside for vehicle maintenance. Materials caught in this banded area must be disposed of at the nearest registered waste disposal site. All polluted run-off must be collected on site and disposed of by a licensed treatment company. The Contractor must provide the construction team with portable water and use of any stand pipes be prohibited. 		
Concrete/Cement		
<ul style="list-style-type: none"> Concrete/Cement mixing must be restricted to hardened surfaces and mixing trays within the construction zone. It should take place on plastic liners where proper mats cannot be acquired to avoid contamination of soil. Cleaning of cement mixing and handling equipment must only be done using proper cleaning trays. All access cement and concrete must be stored as hazardous waste on site prior to disposal off site in a suitable landfill and waybills kept for proof of disposal. Ready mix concrete should be used where possible and no vehicles transporting concrete, asphalt or any other contaminating products to the site may be washed on site. 	C/ECO	Daily
Record Keeping		

<ul style="list-style-type: none"> • The ECO/ Engineer will continuously monitor the Contractor's adherence to the approved EMPr, and must issue to the Contractor a notice of non-compliance whenever transgressions are observed. • The ECO/ Engineer should document the nature and magnitude of the non-conformance in a designated register, the action taken to discontinue the noncompliance, the action taken to mitigate its effects and the results of the actions. The non-compliance should be documented and reported and captured in a monthly report. • The EMPr for this project must be kept on site at all times. • The Engineer is the primary responsible person with authority over the secondary responsible roles, duties and tasks of the ECO and the Contractor. • All monitoring conducted by the ECO should be recorded in writing and handed to the Engineer. 	E/ECO/C	At all times
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6.2 Post Construction Activities

Site Camp	Responsible Person	Frequency/ Timing
<ul style="list-style-type: none"> • All structures comprising the construction camp are to be removed from site. • The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these should be cleaned up. • All hardened surfaces within the construction camp area should be ripped, all imported materials removed, and the area must be top-soiled and re-vegetated if appropriate. • The Contractor must arrange the cancellation of all temporary services. 	E/ECO/C	After Construction
Access Roads		
<ul style="list-style-type: none"> • All roads used by construction vehicles must be rehabilitated, at least to their original condition, by the Contractor 	E/ECO/C	After Construction
Vegetation		
<ul style="list-style-type: none"> • All areas that have been disturbed by construction activities (including the construction camp area) must be cleared of alien vegetation. • Alien plants must be treated according to the species type using guidelines set out in the Invasive Alien Plants in 	E/ECO/C	After Construction

<p>KwaZulu-Natal Management and Control Wildlife Handbook by WESSA-KZN.</p> <ul style="list-style-type: none"> Open areas/exposed soils that are not developed are to be promptly re-vegetated. Vigorous grass establishment must be achieved as part of the re-vegetation. <p>The Contractor is to water and maintain all planted vegetation until the end of the defects liability period and is to submit a method statement regarding this to the Engineer.</p>		
<p>Landscaping</p>		
<ul style="list-style-type: none"> All disturbed areas or areas, which have been engineered for the purpose of the development, must be rehabilitated with indigenous vegetation, which must be sourced from surrounding areas where possible. This will aid in preventing erosion within the site. The Contractor must ensure that each plant is handled and packed in the approved manner for that species or variety, and that all necessary precautions are taken to ensure that the plants arrive on Site in a proper condition for successful growth. No plants or plants with exposed roots must be subjected to prolonged exposure to drying winds and sun, or subjected to water logging or force-feeding at any time after purchase. The Contractor must ensure that the plants are in a good condition and free from plant diseases and pests. The Contractor must immediately remove plants containing any diseases and/ or pests from the Site. All plants supplied by the Contractor must be healthy, well formed, and well rooted. Roots must not show any evidence of having been restricted or deformed at any time, unless these were plants rescued from natural habitats for replanting. The potting materials used must be weed free. There must be sufficient topsoil around each plant to prevent desiccation of the root system. Where plants are stored on Site prior to planting they must be maintained to ensure that the root systems remain moist. 	E/ECO/C	After Construction
<p>Rehabilitation</p>		
<ul style="list-style-type: none"> Contractor must ensure that all rehabilitation measures are implemented to restore the ecological integrity of the site and avoid or mitigate against post-construction environmental impacts of the project activities. Surfaces are to be checked for waste products from activities such as concreting or asphaltting and cleared in a manner approved by the Engineer. 	E/ECO/C	After Construction

<ul style="list-style-type: none"> • Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas during and following rehabilitation. • All surfaces hardened due to construction activities are to be ripped and imported material thereon removed. • All rubble is to be removed from the site to an approved disposal site as approved by the Engineer. Burying of rubble on site is prohibited • Contractor is to check that all stormwater channels are free from building rubble, spoil materials and waste materials. 		
Materials and Infrastructure		
<ul style="list-style-type: none"> • All residual stockpiles must be removed to spoil or spread on site as directed by the Engineer. • All leftover building materials must be removed from the site. All construction rubble must be removed from the site and disposed of at a licensed waste disposal site in terms of Section 20 of ECA (Act No. 73 of 1989). The contractor responsible for the removal of rubble/waste must supply a certificate indicating safe disposal of such rubble at a permitted waste disposal site. • The Contractor must repair any damage that the construction works has caused to neighbouring properties. 	E/ECO/C	After Construction
Monitoring and maintenance Programmes		
<ul style="list-style-type: none"> • Any erosion scars found on site during monitoring and maintenance inspections should be rehabilitated immediately. Once rehabilitated the affected areas must be monitored for an appropriate amount of time to ensure no further erosion risks. • The Umkhulu Wena Cooperative must ensure appropriate maintenance of the fish farm and vegetation around the area. • A meeting is to be held on site between the Engineer, ECO and the Contractor to approve all remediation activities and to ensure that the site has been restored to a condition approved by the Engineer. A representative of DEDTEA must be present at the final meeting or when the site is handed over on completion of construction. 	E/ECO/C	After Construction

6.3 Operational Phase

Vegetation / Landscape Management

All rehabilitated areas will need to be maintained and re-seeded with local indigenous vegetation where necessary on a regular basis. It is the responsibility of the Contractor to ensure that rehabilitation of all areas disturbed during the construction phase is conducted. This would need to be monitored by the ECO.

Noise Control

No excessive noise is anticipated for the operational phase of the proposed as the proposed road is a local road which will not be regularly used by large or any other noise generating vehicles. The road will mainly be accessed by taxis and small vehicles and movement of traffic within the area is not busy.

Storm water Management

The stormwater management system for the development needs to be implemented and maintained on a regular basis as directed by the engineer. This would be the responsibility of the appointed engineering team.

7. AMENDMENTS TO THE EMPr

Any amendments to the EMPr put forth by the ECO/ Engineer must be approved by the Environment Branch of the Department of Economic Development, Tourism and Environmental Affairs. This EMPr is currently in draft form, and sets out environmental specifications which are required to be implemented in order to minimise potentially significant negative environmental impacts associated with the project actions.

It will be the responsibility of the appointed Engineer to detail method statements, which are required to be implemented in order to meet the required environmental specifications. All method statements are to be approved and added to the relevant section/s of this EMPr once the final design is underway, and are to be binding.

This EMPr must be considered to be a dynamic document and must be updated as and when required.

ACKNOWLEDGEMENT FORM
SIBERIAN STURGEON FARMING

DEVELOPER / PROPONENT: Umkhulu Wena Cooperative

Signed: Date:

PROJECT MANAGER:

Signed: Date:

CONTRACTOR:

Signed: Date:

ENVIRONMENTAL CONTROL OFFICER

Signed: Date: