ENVIRONMENTAL MANAGEMENT PLAN (EMP)

THE PROPOSED ESTABLISHMENT OF SEAL OIL & SEAL PRODUCTS PROCESSING PLANT ON PORTION 105 OF THE HENTIES BAY TOWNAND NO. 133, HENTIES BAY, ERONGO REGION, NAMIBIA

Assesed by:

Erongo Consulting Group

Proponent:

Virgo Biotechnology Pty Ltd
P.O Box 21225
Windhoek

March 2025

Title	Application for Environmental Clearance Certificate for the Newly proposed Seal Oil & Seal Products Processing Plant on portion 105 of Henties bay townland no. 133 zoned "undermined"
Environmental Practitioner	Nyepez Consultancy cc
Reviewer	Erongo Consulting cc
Client	Virgo Biotechnology Pty Ltd
Status	Environmental Management Plan (EMP)
Issue Date	March, 2025

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1. INTRODUCTION

Virgo Biotechnology Pty Ltd is a 100% Namibian registered entity, initiated by business Namibians to participate in and benefit from Namibia's marine time commercial trade industry through harvesting rights and quota allocations for culling of 1000 to 2000 seals per annum. In early 2025, Virgo Biotechnology Pty Ltd applied for land development in Henties bay where it was allocated a 25 hectare of land on portion 105 of Henties bay townlands. The Company is part of many companies that were granted Seal harvesting quotas and harvesting rights from the relevant Ministries and agencies. The many objectives of acquiring the Seal harvesting rights is mainly for local processing, commercial retail and trade through exporting of processed products from Namibia to Asian and Chinese international markets.

Virgo Biotechnology Pty Ltd therefore intend and propose to set up or construct a state-of-the-art Seal Oil and Seal product processing plant within Henties Bay townlands on portion 105. In December 2024 to 2024 financial year, Virgo Biotechnology Pty Ltd through Ministry of fisheries and aquaculture was awarded seal harvesting right in the ocean waters of Namibia.

The Company chose Henties bay as their ideal town where the Company wants to establish a Seal Oil and Seal product processing plan. The Company identified Henties bay as the ideal town for construction and development of this processing plant, given the minimum distance between the town and the sources of raw materials where Seals will be harvested. The site for Seal harvesting and culling is Cape cross and Torra bay situated about 50 to 52 kilometres from Henties bay in Erongo district.

In order to fully realise the business potential of this right, the company intends to setup a seal oil and seal product processing plant on portion 105 Henties bay townland no. 133 where the harvested seal shall be cleaned, segmented, processed, packaged and exported and/or sold for local and international markets. The processing plant shall process products such as seal oil, seal skins for pelts, meat, seal genitals, blubber and other by-products.

The intension is to establish a seal product processing plant that will process seal products into finished products with value addition to the products. In future, the Company intend to explore and invest in other seal related byproducts such as processing of Mangetti Nut to produce Mangetti nut oil, production of Health supplement products like production of seal capsules for medication, cosmetic

creams and body skin care products from seal oil products. This will be considered in the long run of business operation.

1.2 MAIN OBJECTIVE

- To apply for the acquisition of the Environmental Clearance Certificate (ECC) for the proposed new Seal Oil & Seal Products Processing Plant on portion 105 of Henties bay townland no. 133 on behalf of Virgo Biotechnology Pty Ltd.
- To provide a brief background of the proposed project and its proponents
- Explain the need for this project;
- To explain the process that was followed during the Environmental Scoping Study;
- Provide for the Compliant and updated Environmental Management Plan for the project and explain all matters in relation to the Bio-physical environment of the project area;

1.3 THE PROCESSING PLANT

The plant will be erected to accommodate the different processes needed to produce the bulk products. The total cost to construct the Factory is in the region of +- N$30 million. Products produced are likely to stay in its primary form, but with added elements to diversify usage. For example,

- Skins will be pelted then sold & exported.
- Oil from the blubber is made fit for human and animal consumption, as well as create bio-diesel.
- The meat is usually processed and placed on the local and international markets.
- Organ processing and market set-off is still set-off to international.
- Future processing of Manketti Nut to produce Manketti nut oil, production of Health supplement products like production of seal capsules for medication, cosmetic creams and body skin care products from seal oil products

1.4 AIMS OF THIS STUDY

- Comply with Namibia's Environmental Assessment Policy, Environmental Management Act (2007) and its February 2012 EIA Regulations;
- Compile a management plan in line with the 2012 EIA Regulations of the Environmental Management Act (2007) and terms of reference.

1.5 LOCALITY

The land is currently zoned Undetermined as it falls within the Henties Bay Townlands. The project site is situated few meters (50meter) from the Henties Bay -Terrace Bay Road, but situated along Swakopmund, Henties bay Cape-cross C34 M0044 main road. Other development within the project surrounding area is the Aircraft hangers and the Chinese temporal habitable worker's shelters. According to the Henties Bay Town Planning Zoning Scheme other land uses in close proximity to the project site area are predominantly zoned Agricultural, General business and light industrial, hence the proposed land use is deemed compatible to land use zoned under the Scheme.

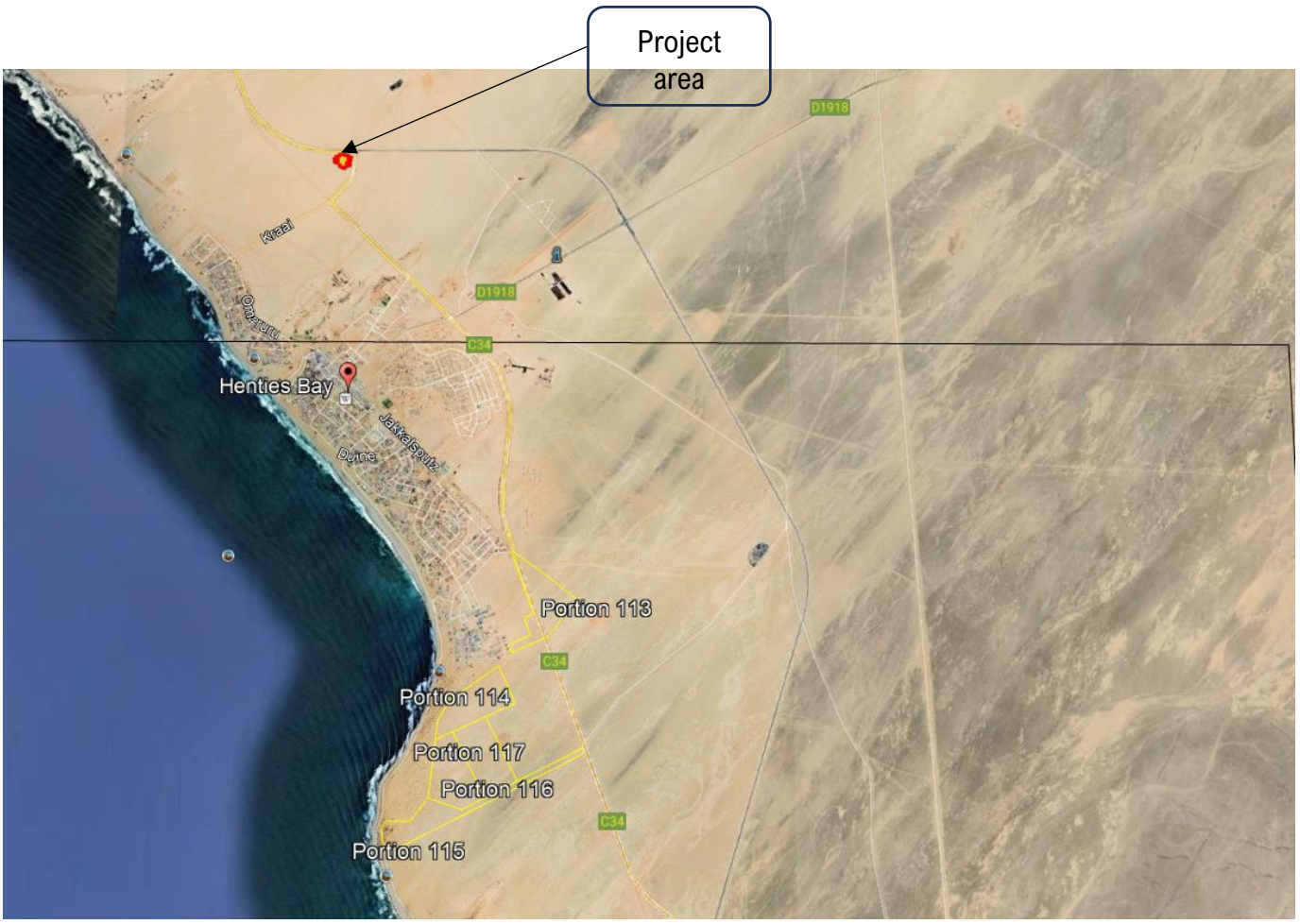
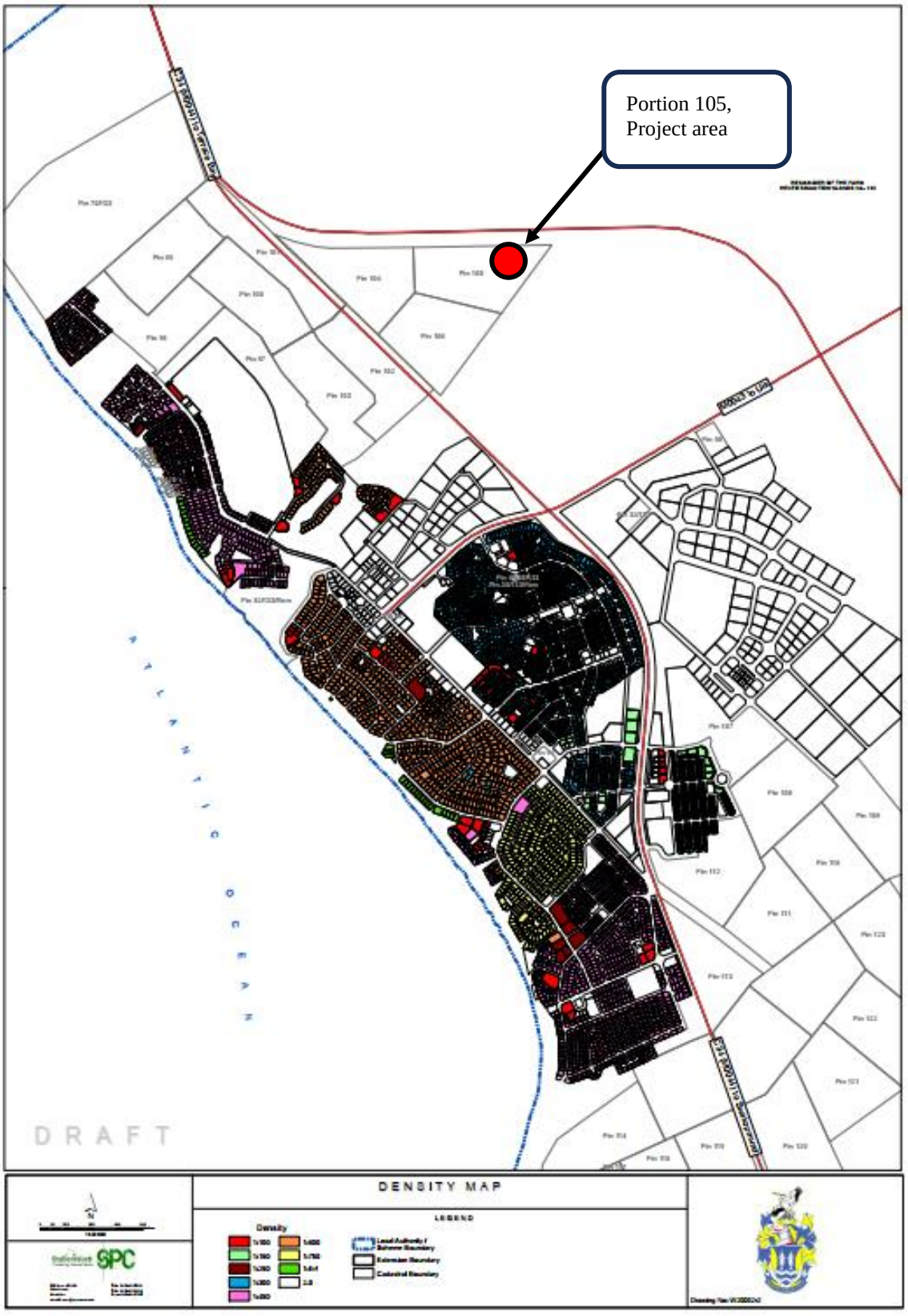
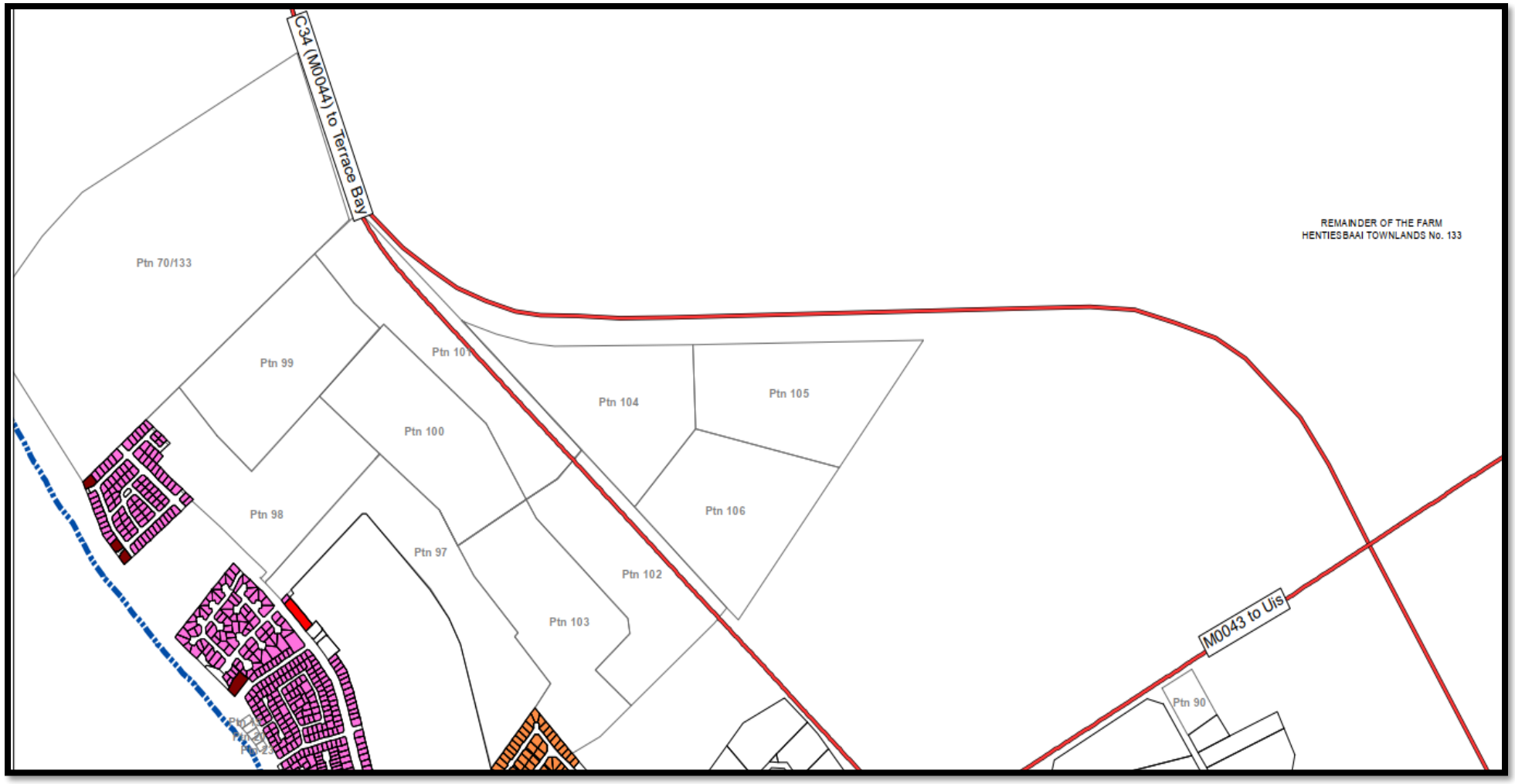


Figure 1: Proposed Seal Oil & Seal Products Processing Plant locality area


Portion 105,
Project area
DRAFT
DENSITY MAP
LEGEND
Density


C34 (M0044) to Terrace Bay
REMAINDER OF THE FARM
HENTIESBAAI TOWNLANDS No. 133
Ptn 70/133
Ptn 99
Ptn 101
Ptn 104
Ptn 105
Ptn 100
Ptn 106
Ptn 98
Ptn 97
Ptn 102
Ptn 103
M0043 to Uis
Ptn 90

The plant will be designed and erected to accommodate the different processes needed to produce the bulk products. The products will likely stay in their primary form, processed into finished products to diversify their usage and improved value. For example, skins will be pelted and oil from the blubber will be made fit for human and animal consumption and to create biodiesel. The meat will be processed and placed on the local and international markets. Organ processing and market set-off for international markets.

1.5.1 The project and air emissions

A flow diagram of the process is provided in Figure 2. Below. The projected and anticipated main source of emission of air pollutants will be the boilers used to generate heat for the cookers, to render the blubber to oil. Odors, which can be a nuisance rather than a classic air pollutant, may emanate from different areas of the plant including the animal preparation area, from meat processing, skin and blubber splitting, skin cleaning and organ processing and from the storage of the animal carcasses.

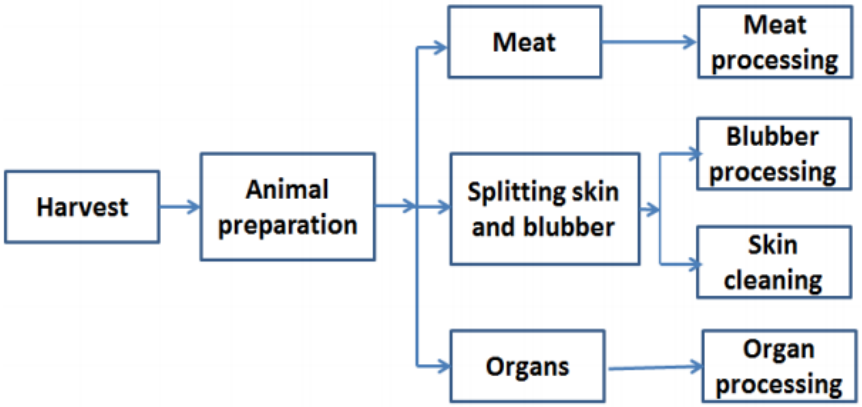


Figure 2: Seal process flow diagram (adopted from Enviro dynamics)

1.5.2 The Boiler

The boiler at the Seal Oil & Seal Products Processing plant will be diesel-fired. The by-products (or waste) from diesel combustion, as with all fossil fuels, include sulphur dioxide (SO2), oxides of nitrogen (NOX) and particulate matter inducing respirable particulates (PM10). SO2 will be produced from the combustion of sulphur that is bound in coal. NOX is produced from thermal fixation of atmospheric nitrogen in the combustion flame and from oxidation of nitrogen bound in the coal. The quantity of NOX produced is directly proportional to the temperature of the flame. SO2 and NOX are

released to the atmosphere via the boiler stack. The non-combustible portion of the fuel remains as solid waste or ash which is entrained in the flue gas and released via the stack as particulates.

1.5.3 Odour

Odors from animal processing plants are typically caused by the decomposition of animal by-products. Odors generated at Seal Oil & Seal Products Processing plant are expected to be minimized due to the daily process. The process will be designed to minimize the time length for each part of the animal and assure the food, nutraceutical or pharmaceutical grade. The turnaround time between the harvest and the processing will be anticipated to be less than 10 hours which will significantly reduce the spread of odors. The two places where odors may result is when the carcasses are left for up to eight hours being processed and when meat is cooked after a longer delay.

To minimize the potential of odors from the process, it is proposed that no drying of meat or bones will be done in open air, no sun drying will be done, and exhaust fans will be placed over the tables when skins are removed from the carcasses and in the cooking area.

2. LEGAL AND REGULATORY REQUIREMENTS

The Namibian Environmental Management Act (Act No. 7 of 2007) promotes the sustainable management of the environment and the use of natural resources by establishing principles for decision making on matters affecting the environment. With regard to managing ambient air quality in a sustainable way and limiting impacts, health-based ambient standards, emission standards, and ambient monitoring are considered the most appropriate approaches.

2.1 Emission standards and guidelines

Emission standards may be set for industrial processes so that the resultant ambient air quality concentrations will not exceed the air quality standards. Namibia does not have emission standards for industrial processes. The International Finance Corporation (IFC) provides emission guidelines for SO2, NOx and particulate matter for small combustion facilities (IFC, 2007). The World Bank provides emission and effluent guidelines for a variety of industrial processes that are normally accepted by the World Bank (World Bank, 1998).

2.2 Monitoring

Emissions and ambient air quality monitoring provide the necessary information to assess the effectiveness of emissions management. There are no specifications regarding monitoring of either in the Namibian environmental legislation. The IFC provides guidelines for monitoring programs (IFC, 2007) which include parameters to be monitored, the type of monitoring and frequency, the location of sampling equipment and the sampling methods.

3. IMPACT ASSESSMENT

3.1 Identification of key impacts

Project components that may have impacts on air quality and were assessed in the air quality specialist study are listed in Table below:

Project Component	**Potential Impacts**
Construction	None as the construction was already completed
Operations: Processing plant	Potential impacts on air quality from emissions from the boiler stack increasing concentrations of SO2, NOx and PM10. Potential impact on air quality from emissions of odors from the processing of seal meat, skins and organs
Decommissioning	Nuisance dust generated from demolition equipment and general decommissioning activities

3.2 Methodology for impact assessment

The assessment was conducted in terms of the significance of direct air quality impacts from the proposed development. Factors that were considered are the source strength, the characteristics of the pollutants, predicted ambient concentrations and the nature of the receiving environment. The predicted ambient concentrations are compared with ambient air quality standards or guidelines and recognized dust deposition limits. The assessment considered the extent, duration, intensity, probability, status of the impact and degree of confidence in predictions, which will lead to the determination of the significance of the impacts.

Criteria for the air quality assessment

Aspect	**Scale**	**Definition**
Extent	Site specific	Limited to the facility

	Local	Limited to within a radius of 15 km of the site
	Regional	Limited to within a radius of 100 km of the site
	National	Limited to Namibia
	International	Extends beyond Namibia
Duration	Very short term	Limited to 3 days
	Short term	3 days to 1 year
	Medium term	1 to 5 years
	Long term	5 to 20 years
	Permanent	Beyond the lifetime of the process
	No lasting effect	Predicted ambient concentrations are well below WHO ambient guidelines and no complaints are received.
	Minor effect	Predicted ambient concentrations occasionally exceed WHO guidelines in sensitive areas and complaints are rarely received.
Intensity/ Magnitude	Moderate effect	Predicted ambient concentrations frequently exceed WHO guidelines in sensitive areas and complaints are often received
	Serious effect	Predicted ambient concentrations always exceed WHO guidelines in sensitive areas and complaints are always received
Probability	Improbable	Impacts are improbable
	Possible	Impacts may possibly occur
	Probable	Impacts will probably occur
	Highly probably/definite	Impacts will definitely occur
	Improbable	Impacts are improbable
Status	Positive	Project will lead to an improvement in current air quality
	Negative	Project will lead to a deterioration in current air quality
Degree of confidence	High	Good data and proven techniques are used
	Medium	Reasonable data and techniques are used
	Low	Data is poor or limited

		Good data and proven techniques are used
Significance	None	A concern or potential impact that, upon evaluation, is found to have no significant impact at all.
	Low	Any impacts will be localized and temporary. Accordingly, the impact is not expected to require amendment to the project design
	Medium	Impacts of moderate magnitude locally to regionally in the short term. Accordingly, the impact is expected to require modification of the project design or alternative mitigation
	High	Impacts of high magnitude locally and in the long term and/or regionally and beyond. Accordingly, the impact could have a 'no go' implication for the project unless mitigation or re-design is practically achievable

3.3 Construction

Consequently, the project will have limited environmental impact from activities of construction as their project area is an open barren desert land, with no vegetation cover and no fauna; The project area is situated in middle of other developed commercial projects hence the area is partly disturbed by on-going town development and expansions. As a result, very limited negative impact is anticipated during construction phase of the proposed development.

3.4 operations

3.4.1 Assessment for the Boiler

The boilers to be considered for usage is a Thompson Compact TC250 3-pass wetback reverse flame steam boiler (pers. comm. Gordon Slater, Dryden Combustion) with a rating of 1 000 to 5 000 kg steam production per hour. It is fired by diesel or heavy fuel oil. It has a design fuel consumption of 162 l/h. The emission rates and stack parameters for the boiler are provided.

Estimated emissions from the Thompson T250 boiler
Emission rate

	kg/day	**g/s**

NOx	25.60	0.29
SO2	146.17	1.69
Particulate matter (PM10	4.65	0.054
Benzene	0.0001	0.0000012
Stack Dimensions		
Height above floor level (m)	10m	
Inside nominal diameter (m)	0.394 m	
Gas exit temp (K)	493 k	
Gas exit velocity (m/s)	12.5 m/s	

The emission and stack data in the table, above are used as input to SCREEN 3 as described in Section to predict the maximum ambient concentration downwind of the boiler. Points to note when assessing the predicted concentration are:

- These are predicted maximum concentrations. By definition, a maximum occurs once. It is not possible to assess the frequency of similar events using the SCREEN 3 model;
- It is assumed that all dust emitted from the stack is PM10 as the fraction of dust in the flue gas is not known. This assumption therefore provides a worst-case scenario;
- SCREEN 3 produces maximum predicted 1-hour concentrations. In order to compare predicted concentrations of PM10 with the daily guideline a multiplying factor is applied (CDPHE, 2002)

For NOX, the maximum predicted 24-hour ambient concentration of 43 µg/m3 occurs immediately at the stack, and concentrations decrease with increasing distance from the source (Figure 5-1). The predicted concentrations are significantly below the WHO 24-hour ambient guideline value of 200 µg/m3 for NO2. Considering that NOX = NO + NO2, and that not all NO converts to NO2, the predicted concentrations are conservative and are likely to be lower than those shown. Because of the low predicted NOX concentrations and the fact that dispersion with the prevailing winds will be away from any sensitive receptors, the impact is *expected to be very low. It will occur only when the boiler is in operation, and it will be limited* to the immediate plant site.

Assessment of air quality impacts of the boiler

Activities	Mitigation	Extent	Duration	Intensity/ Magnitude	Probability	Status	Confidence
Boiler	Without	Local	Long term	No lasting effect	Improbable	Negative	Medium
	With	Site specific	Long term	No lasting effect	Improbable	Negative	Medium
Significance	Low for the standard stack height of 10 m, but very low if this is increased to 15 m or higher						

The higher stack, 15m instead of the designed 10m stack, provides better dilution and lower predicted ambient concentration. However, the impact as a result of the design stack is very low and installing a higher stack in not necessary. The predicted ambient concentrations of pollutants from the boiler are well below guideline values and ambient air quality is considered unnecessary.

3.4.2 Qualitative Odour Impact Assessment

Odors from animal processing plants are typically caused by the decomposition of animal by-products. While they are seldom harmful to human health, they may be offensive and result in a nuisance impact and in some cases impact on quality of life. Odors may result from different parts of the seal processing process, particularly if delays of eight hours of longer occur from the time carcasses arrive to the time they are processed. Odor may also result from meat after such delays.

The process is designed to minimize the time length for each part of the animal to be processed to assure the food, nutraceutical or pharmaceutical grade of the products, i.e., that quality of the products. The animals will be processed in batches and the turnaround time between the harvest and the processing of a batch is anticipated to be less than 10 hours. This approach significantly

This approach significantly reduces the time that carcasses may be unattended and that decomposition may occur. In turn the potential the generation of offensive odors is significantly reduced. Furthermore, it is proposed to minimize the potential of odors from the process by:

- Ensuring no drying of meat or bones in the open air;
- Ensuring no sun drying will be done;
- Installing and placing exhaust fans over the tables when skins are removed from carcass;

• Installing and operating exhaust fans in the cooking area.

The seal harvest and subsequent processing of seals is seasonal and odors will only be present during the harvest and when animals are processed. The health impacts of odors under normal operating conditions are expected to be low for a number of reasons. The health risk associated with odors is generally low, there are proposed measures to minimize odors at the seal processing plant, the processing is seasonal, and the prevailing winds that will disperse odors away from any sensitive receptors. However, the nuisance impact of potentially offensive odors cannot be discounted if the normal processing regime is upset and animals are not processed in the desired time, or the installed odors control mechanisms do not function adequately. In this case, the impact may be significant. It was therefore important that the best available techniques be considered in the design, operation and management of the plant. The following is and/or were recommended over-and-above the measures that have been proposed by the developer:

- Provision is made in the plant design and process management to refrigerate a batch of harvested carcasses in the event of a delay in processing;
- The plant design ensures that exhaust fans in the area where skins are removed from carcasses and in the cooking, area are ducted to collect odors for treatment before being released to the atmosphere. Treatment of odors may be done by bio-filters, activated carbon, or the release via a stack (EC, 2005).

    1. Biofilters comprise an air distribution system and a carrier medium, often made from an organic material, which can support growing micro-organisms which feed on malodorous substances and thereby remove odors form the air. The malodorous substances must be caught on the micro-organism carrier, which must have a sufficiently high surface area.
    2. Activated carbon is used for odors abatement, based on the very large specific surface area, in the form of micro-pores, which bind the odors molecules.
    3. The efficiency falls as the pores become saturated and the carbon must be replaced or regenerated.
    4. Malodorous air from various sources may be collected into one or more chimney stacks for emission at a suitable height to ensure sufficient dilution and dispersion of the odors thereby reducing perception of odors problems.

As a result of the proposed efficient processing of seals, the fact that seals are not processed all year, and the commitment to odors management measures such as extractors and no open drying, the intensity of the impact is expected to be medium in the immediate surroundings, and downwind under the prevailing south-south-easterly winds. The intensity of the impact may be reduced considerably if best available techniques are practiced throughout the process, refrigeration is available and malodors air is treated before being released to the atmosphere.

Assessment of air quality impacts of the TSF

Activities	**Mitigation**	**Extent**	**Duration**	**Intensity/ Magnitude**	**Probability**	**Status**	**Confidence**
Odor	Without	Local	Long term	medium	probable	Negative	Medium
	With	Site specific	Long term	Low	Possible	Negative	Medium
Significance	Medium without mitigation and without due process, but low with mitigation and best available techniques						

Odor is subjective and is perceived differently by different people. It is therefore difficult to measure odors in a cost-effective manner. Rather than a measuring program for odors, it is recommended that complaints register and committee be established to log and attend to odors complaints. Importantly, the record of complaints should include the date and time so that it may be associated with the odors generating activity. With identification of the odors source (or activity) management intervention can brought about to eliminate the activity as a future source.

4. IMPLEMENTATION OF THE ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Environmental Aspect	Objectives	Monitoring frequency	Mitigation and enhancement measures	Responsible person	Monitoring costs (N$)
PREPARATION & CONSTRUCTION PHASE					
Surface Water Quality	To protect contamination of storm water.	Seasonal	Construction of proper drains alongside access roads and drains within the project area and operation areas.	Operations Director	4,200
Ground Water Quality	To protect ground water contamination from oil spills and chemical run off.	Quarterly	Drip trays will be used when removing used oils from equipment waiting servicing.	Project Manager	3,400
			Fuel storage tanks will be placed in a banded wall and concreted surface. The bunding shall have a volume equivalent to 110% the volume of the fuel tank. A sump shall be constructed in such a way as to drain any oil that has spilled	Project Manager	
			Used oil storage facility shall be kept under lock and key, concreted and bunded	Project Manager	-
			Drainage systems in the project site will be constructed to prevent chemical runoff during irrigation and rainy season	Project Manager	-
Ambient Air Quality	Suppression of dust from construction sites and access roads	Weekly	The project area shall have a water bowser which shall be used to suppress dust on the main road and other access roads and construction sites where there is dust.	Project Manager	-

			If available molasses will be sprayed on roads and construction sites to suppress dust formation. Emissions and dust levels will be monitored by way of periodical air sampling using mobile dragger pump. Results will be submitted to DEA quarterly.	Project Manager	1,400
Soil Contamination	To protect soil from contamination from fresh and used oil spills, and fuel.	Quarterly	Refuelling & repair of construction equipment will be done in designated areas and periodic maintenance will be done on all equipment to avoid oil leaks getting into the soil	Project Manager	-
			Drip trays will be used in maintenance areas to drain used oil from equipment.	Project Manager	-
			Fresh and used oil will be stored in separate and lockable shades whose floors shall be concreted	Workshop manager	-
			A bioremediation plan shall be established for the purpose bioremediation of oil contaminated soils.	Project Manager	3,000
Soil Erosion	To protect the soil from erosion	Monthly	Storm water drains will be constructed around construction sites to collect storm water and there by prevent soil erosion *(However no severe storm water or rain have been experienced in this part of the region)*	Project Manager	-
			Access roads and the plant periphery will be left with trees and this will protect soil erosion	Project Manager	-

Noise	Minimise Noise to acceptable levels	Monthly	All project equipment will be subject to a routine maintenance to ensure they are in good working order, hence minimising noise levels. Restrict operations to day time only.	Project Manager	-
			Employees shall wear ear muffs or ear plugs and other necessary Personal Protective Equipment (PPE).	Project Manager	3,000
	To protect workers from noise exceeding acceptable levels	Monthly	Periodical monitoring of noise levels shall be conducted.	Project Manager	-
			Selection of low noise level equipment when purchasing farm and workshop equipment will be first priority.	Project Manager	-
Land Use	To rehabilitate the project area and try to restore to its original state.	Annually	The mitigations here shall only come at closure. Buildings like the farm house, workers houses, fuel storage facility, used oil storage shed and the mini workshop will be demolished, area cleared and rehabilitated and other irrigation equipment removed also. Pumps shall be roved and boreholes caped. The land shall be re-vegetated and or allowed to naturally re-vegetate.	Operations Director	1,000
Flora	To protect the local flora where possible.	Quarterly	The project will be implemented mostly to utilise spaces or land which was already disturbed in the surveyed project areas vicinity	Project Manager	1,800
Fauna	To protect local fauna.	Quarterly	Noticed fauna in the proposed project site will be preserved by taking it to areas that will remain undisturbed.	Project Manager	1,200

Archaeology and cultural sites	To protect cultural heritage from damage	Project Inception	Any cultural heritage site discovered during construction will be preserved and the cultural heritage commission informed accordingly.	Project Manager	1,500
Public Safety	To minimise health and safety risks.	Quarterly	Pre-employment and regular medical examinations will be carried out on all employees to ascertain their health.	Project Manager	1,450
			All plant equipment will be subject to a routine maintenance programme to ensure they are in good working order, hence minimising health and safety risks.	Project Manager	-
			All workers including contractors will be subject to wearing appropriate personal protective equipment (PPE) depending on the work type and place	Project Manager	-
			All workers to go through safety and health inductions upon employment.	Project Manager	-
	To protect members of the public from hazards associated with construction activities.		Only authorised workers will be allowed to enter construction areas. No members of the public will be allowed to enter construction sites as well as the farm premises	Project Manager	-
			"Danger" warning signs to be placed in different points along the boundary of the project area and along the access road.	Project Manager	-

			Warning signs to be written in symbols, English and Vernacular language for easy interpretation.	Project Manager	-
Landscape and Visual characteristics	To protect visual characteristics of the landscape.	Project inception	Where there shall be no roads and buildings, the visual characteristics of the landscape shall not be altered.	Project Manager	1,100
Hazardous Waste	To safely keep generated hazardous waste and dispose of appropriately	Throughout Project	Used oil and used batteries storage areas shall be constructed according to environmental guidelines. Lockable, concreted and bunded shed shall be constructed.	Project Manager	1,200
Sewerage Waste	To protect sewer waste from contaminating the soil and or ground water	Throughout Project	A septic soak way system shall be revamped and/or constructed to treat sewer waste since Henties Bay Virgo Biotechnology Pty Ltd proposed factory & surrounding areas are not serviced by municipal infrastructure	Project Manager	1,250
Solid Waste	Dispose solid waste at construction site accordingly	Throughout Project	Wheel bins and garbage boxes will be stored in designated areas and sold or given to authorised scrap metal dealers or given to the locals for domestic use.	Health officer	1,450
			Cement empty bags and containers will be re-used or returned to supplier for re-use.	Project Manager	
OPERATIONAL PHASE					
Surface and ground Water Quality		Quarterly	Proper maintenance of storm water drains along access roads and drains within the project area	Operations Director	

	To protect contamination of surface and ground water		The transport of hazardous materials to and from project site will be done in accordance with laid down procedures. Requirements will Include: documentation and inventory control through chain of custody; emergency response training for spills.	Project Manager	
			Only designated transport routes shall be used to transport chemicals such as fertiliser, fungicides, herbicides, fuel, used oil, fresh oil, lime and pesticides to and from the business.	Project Manager	
			Contracted transporters of chemicals shall be licenced with Ministry of Mines & Energy.	Project Manager	
			Contracted transporters of petroleum products shall be licenced with the Energy Regulation Board	Project Manager	
			Application of fertilisers, fungicides, pesticides and herbicides will be in accordance will the law and guidelines.	Project Manager	
Ambient Air Quality	To prevent contamination of air due to dust emissions from vehicles and trucks operating on dirt roads	Quarterly	The project area shall have a water bowser which shall be used to suppress dust on access roads and construction sites where there is dust.	Project Manager	1,250
			If available molasses will be sprayed on roads and construction sites to suppress dust formation	Project Manager	

	Low fume and gas emissions		Planted Trees or natural plants will be left along access roads and on the periphery of the proposed project site to act as a wind breaker and thereby reduce dust levels	Project Manager	
			Diesel equipment to be equipped with gas absorbers	Project Manager	
Soil	Protection of soil from contamination by hazardous waste	Quarterly	Hazardous waste shall be kept in a lockable, concreted and bunded storage facility	Project Manager	
	Protection of Soil from contamination by fertiliser, pesticides, fungicides and herbicides	Quarterly	Pesticides. Herbicides, fertiliser and fungicides shall be kept in a properly constructed area with proper ventilation, concreted floor, bunded and lockable shed	Project Manager	
			Application of these chemicals shall follow the right procedures	Project Manager	
Soil Erosion	To protect the soil from erosion	Quarterly	Storm water drains will be periodically maintained to collect storm water and there by prevent soil erosion.	Project Manager	
			Access roads and the plant periphery will be left with trees and this will protect soil erosion	Project Manager	
Noise	To minimise noise levels to acceptable levels	Quarterly	All project equipment will be subject to a routine maintenance programme to ensure they are in good working order, hence minimising noise levels.	Project Manager	1,450

	To protect workers from noise exceeding acceptable levels		Employees will wear appropriate ear protection in work-places where noise levels exceed. The Proponent will enforce the use of PPE in the project site.	Project Manager	
Land Use	Protect land from being used in other ways	Throughout project life	The Virgo Biotechnology Pty Ltd Initiative project development will be strictly for commercial harvesting and culling of seal marine mammals and. Any other use will be prohibited.	Project Manager	
Flora	To protect the local flora where possible	Throughout project life	All the trees left after the construction phase shall not be cut for whatever reason. A procedure for cutting of trees shall be put in place. Progressive planting of trees shall be carried out and encouraged in areas where trees had been carelessly cut.	Project Manager	
	Extinction of endangered plant species.		Identified Endangered plant species shall be preserved and planted elsewhere at all costs if possible.	Project Manager	
	Protection from introduction of invasive species		No invasive or alien species shall be introduced on this farmland in accordance with the invasive species act.	Project Manager	
Fauna	To protect local fauna.	Throughout project life	Noticed fauna in the proposed project sites will be preserved relocating it to areas that will remain undisturbed	Project Manager	
Archaeology and cultural sites	To protect cultural heritage from damage	Throughout project life	Any cultural heritage site discovered during operational phase other than the existing grave site will be preserved	Project Manager	

			and the cultural heritage commission informed accordingly		
Public Safety	To minimise health and safety risks.	Throughout project life	Pre-employment and regular medical examinations will be carried out on all farm employees	Project Manager	3,000
	To protect members of the public from hazards associated with construction activities		All plant equipment will be subject to a routine maintenance programme to ensure they are in good working order, hence minimising health and safety risks	Project Manager	
			All workers whether contractor or not will be subject to wearing appropriate personal protective equipment (PPE) depending on the work type and place	Project Manager	
			All workers to go through safety and health inductions when just employed	Project Manager	
	To protect members of the public from hazards associated with construction activities	Throughout project life	Only authorised workers will be allowed to enter construction areas. No members of the public will be allowed to enter construction sites.	Project Manager	
			"Danger" warning signage to be placed in different points along the boundary of the farm.	Project Manager	
			Warning signs to be written in symbols, English and vernacular language.	Project Manager	

Landscape and Visual characteristics	To protect visual characteristics of the landscape	Throughout project life	Where there shall be no roads and buildings, the visual characteristics of the landscape shall not be altered	Project Manager	
Hazardous Waste	To safely store and handle generated hazardous waste	Throughout project life	Used oil and batteries storage areas shall be maintained according to environmental guidelines. Lockable, concreted and bunded shed shall be used.	Project Manager	
Sewerage & effluent Waste	To protect sewer waste from contaminating the soil and/ or ground water	Throughout project life	A septic soak way system already exists on Seal Factory business (a sister company) to the proposed Virgo Biotechnology Pty Ltd initiative. Thus, no construction of other septic tank will be required on the new development.	Project Manager	
Solid Waste	Disposal of solid waste	Throughout project life	Biomass from the plants will be stored and energy generation options evaluated	Project Manager	
			Domestic solid waste will be disposed of at the Henties Bay designated Dumping site in accordance with the waste management regulations	Project Manager	
DECOMMISSIONING AND CLOSURE PHASE					
Ambient Air Quality	Contamination of ambient air with dust	Quarterly	Progressive and natural re-vegetation shall be done and this will protect land from winds and that result into generating of dust.	Project Manager	

Soil Erosion	To protect the soil from erosion	Quarterly	Storm water drains will be periodically maintained to collect storm water and there by prevent soil erosion	Project Manager	
			Access roads and the plant periphery will be left with trees and this will protect soil erosion	Project Manager	
Land Use	Change of land use	Bi-annual	Demolition of all surface infrastructures, grading and re-profiling of the surface and re-vegetation will be done. If possible, land use will change to the original one.	Project Manager	
Public Safety	Danger to the community from farm equipment	Monthly	All equipment removed and infrastructure will be demolished. Areas requiring rehabilitation rehabilitated. Bore holes shall be caped.	Project Manager	3,000
Landscape and Visual characteristics	Change to landscape and visual characteristics	Quarterly	Demolition of all surface infrastructures, grading and re-profiling of the surface and re-vegetation will change the landscape and visual characteristics	Project Manager	
Solid Waste	Generation of Domestic Waste	Quarterly	Domestic solid waste will be disposed of at the Henties Bay disposal sites according to the waste management regulations.	Project Manager	
Sewerage Waste	To protect sewer waste from contaminating the soil and or ground water	Quarterly	A septic tank-soak way system shall be used to treat sewer waste	Project Manager	

5. CONCLUSIONS AND RECOMMENDATIONS

The Ministry of Fisheries and Marine Resources grants our right holders a quota of around 600 Bulls and 2000 Pups per annum. The culling period usually starts in July to December of every year. After completion of this State-of-the art seal product processing plant, the Company will have the capacity to harvest 8000 Bulls and 40000 Pups per annum. In order to fully realize the business potential of this right, the company proposes to establish a seal processing facility enabling processing of pelts, meat, blubber and other by-products.

Potential air quality impacts were identified as a key environmental issue through the scoping process. The main source of emission of air pollutants are the boilers used to generate heat for the cookers to render the blubber to oil. Odors, which are a nuisance rather than a classic air pollutant, may emanate from different areas of the plant including the animal preparation area, from meat processing, skin and blubber splitting, skin cleaning and organ processing and from the storage of animal.

The atmospheric dispersion potential in Henties bay is expected to be effective for a lot of the time due to the frequent moderate or strong wings. As a result, pollutants are expected to disperse effectively. Poor dispersion conditions can occur when cool temperatures coincide with light or calm winds such, particularly between May and November when the coldest night time temperatures occur. Current air quality in Henties bay is perceived to be good, although odors were experienced in the Henties bay Extension 9, Henties bay Industrial Area during the site visit, emanating from an effluent pool adjacent to the existing seal processing plant. The significance of impacts on air quality from construction activities at the seal processing facility is zero as there are no construction activities to be conducted.

The significance of impacts on air quality as a result of emissions from the boiler stack is expected to be low. A small boiler was proposed (during the scoping report) that will only operate during the harvest and the prevailing winds are orientated away from any sensitive receptors. There are no predicted exceedances of ambient NOX and PM10 guidelines. While there are predicted exceedances of the WHO 24-hour SO2 guideline at the plant site, the guideline is very low compared to the interim target values of 125 and 50 µg/m3 that are typically adopted.

As the direction of dispersion with the prevailing winds will be away from any sensitive receptors and the predicted concentrations are well below the interim target values, the impact of SO2 from the boiler is expected to be low. Odors may result from different parts of the seal processing process, particularly if delays of eight hours of longer occur from the time carcasses arrive to the time they are processed. Odor may also result from meat after such delays. While they are seldom harmful to human health, they may be offensive and result in a nuisance impact and in some cases impact on quality of life.

The process is designed to minimize the time length for each part of the animal to be processed to assure the food, nutraceutical or pharmaceutical grade of the products, i.e., the quality of the products. The animals will be processed in batches and the turnaround time between the harvest and the processing of a batch is anticipated to be less than 10 hours. This approach significantly reduces the time that carcasses may be unattended and that decomposition may occur and the potential for offensive odors to generate. It is proposed to further minimize the potential of odors from the process by ensuring no sun drying or drying of meat or bones in the open air and to installing and placing exhaust fans over the tables when skins are removing from carcass and the cooking area.

The health impacts of odors under normal operating conditions are expected to be low for a number of reasons. They may only result during the harvest, the health risk associated with odors is generally low, there proposed measures to minimize odors. However, the nuisance impact of potentially offensive odors cannot be discounted if normal processing procedures are upset and animals are not processed in the desired time, or the installed odors control mechanisms do not function adequately, in this case, the nuisance impact may be significant.

It is therefore important that the best available techniques are considered in the design, operation and management of the plant. Over-and-above the proposed measures to control odors, it is recommended that provision is made in the plant design and process management to refrigerate a batch of harvested carcasses in the event of a delay in processing. It is also recommended that the plant design ensures that exhaust fans in the area where skins are removed from carcasses and in the cooking, area are ducted to collect odors for treatment before being released to the

atmosphere. Dispersion from the designed 10 m stack is effective and ensures ambient concentrations are well below ambient guideline values. Installing a higher stack in not necessary and ambient air quality is considered unnecessary.

Odour is subjective and perceived differently by different people. It is therefore difficult to measure odour in a cost-effective manner. Rather than a measuring program for odour, it is recommended that complaints register and committee be established to log and attend to odour complaints. Importantly, the record of complaints should include the date and time so that it may be associated with the odour generating activity. With identification of the odour source (or activity) management intervention can brought about to eliminate the activity as a future source.

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Environmental and Management Consultant

6. REFERENCE

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