SOUTHERN CROSS VETERINARY PRACTICE

Environmental Management Plan

The Operational Activities of a Mini Pet Cremator, Located in Walvis Bay, Namibia

November 2023

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DECLARATION OF INDEPENDENCE AND DISCLAIMER

I.N.K Enviro Consultants cc herewith declare that this report represents an independent qualitative assessment of the Mini Cremator Project, on the request of Southern Cross Veterinary Practice.

The Environmental Consultant has prepared this report based on an agreed scope of work and acts in all professional manner as an Independent Environmental Consultant to Southern Cross Veterinary Practice and exercises all reasonable skill and care in the provision of its environmental professional services in a manner consistent with the level of expertise exercised by members of the environmental assessment profession.

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1 INTRODUCTION

1.1 Project Background

Southern Cross Veterinary Practice (hereinafter referred to as “SCVP”) intends to apply for an Environmental Clearance Certificate (ECC) for their proposed operational activities of a mini pet cremator, located in Walvis Bay, Namibia.

The objective of the cremator is to provide a more suitable way to disposing the carcasses of pets as opposed to the current practice of openly dumping them at the Walvis Bay Municipal Landfill Site.

Two possible sites (sites 1 and 2) have been identified to deploy and operate the cremator (see figure 1). The first site is located in the central light industrial area of Walvis Bay (see figure 2), while the second is in the newly zoned light industrial area that is on the eastern outskirts of Walvis Bay (see figure 3). Considering the relatively small scale of the Mini Pet Cremator Project, a reasonable radius of 200 meter from its proposed location has been qualitatively considered, to indicate the extent of potential sensitive receptors that are likely to be impacted by the activities. This Environmental Management Plan (EMP) will provide recommendations on the most preferred site with the most favorable/suitable environmental conditions for the deployment of the cremator, and taking into consideration, the significance of the identified potential environmental impacts for each site.

Upon consultations done by SCVP with the Ministry of Environment, Forestry and Tourism (MEFT) – Directorate of Environmental Affairs (DEA) and the related Application for an ECC through MEFT’s online portal, MEFT only requires an EMP for the Environmental Commissioner to make a decision regarding the issuing of the ECC for the operation of the Mini Pet Cremator. However, a qualitative assessment has been conducted in order to develop the relevant management and mitigation measures related to the proposed activities. This assessment includes a scoping approach (excluding the public participation process) and an overview of the project description, affected environment and the environmental aspects and potential impacts that the proposed activities are likely to have.

I.N.K Enviro Consultants cc (I.N.K), an independent firm of environmental consultants, has been appointed by SCVP to compile the EMP for this project.

Figure 1: Project Site 1 and 2 Location Map

Figure 2: Site 1 - 200 m radius

Figure 3: Site 2 - 200 m radius

1.2 Project Need and Desirability

The current practice of disposing carcasses of household pets in Walvis Bay, is by disposing them at the Municipal landfill site, which in some cases, releases bad odour in the surrounding area and attracts other animals and insects such as flies etc. Therefore, SCVP intends to provide an essential service to the authorities and society at large, offering an accepted and safe way for disposing numerous carcasses of pets, as well as for pet owners to be able to keep the ashes in an urn or easier “burial options” as opposed to burying or dumping at the landfill site. The proposed activities allow and make way for a shift, from the more traditional way of burial and/or disposal/dumping of pets to a modernized and technologically advanced way of disposing carcasses of household pets.

It is against this background that the proponent has identified the need for a Mini Pet Crematorium to serve Walvis Bay and Namibia at large.

1.3 Applicable Listed Activities

The EIA Regulations promulgated in terms of the Environmental Management Act, identify certain activities which could have a substantially detrimental effect on the environment. These listed activities require environmental clearance from MEFT prior to commencing. The following activities identified in the regulations apply to the proposed project:

- **Waste Management, Treatment, Handling And Disposal Activities**

  - The construction of facilities for waste sites, treatment of waste and disposal of waste.
  - Any activity entailing a scheduled process referred to in the Atmospheric Pollution Prevention Ordinance, 1976.
  - The import, processing, use and recycling, temporary storage, transit or export of waste.

- **Hazardous Substance Treatment, Handling and Storage**
  - Any process or activity which requires a permit, licence or other form of authorization, or the modification of or changes to existing facilities for any process or activity which requires an amendment of an existing permit, licence or authorization or which requires a new permit, licence or authorization in terms of a law governing the generation or release of emissions, pollution, effluent or waste.

1.4 Introduction to the Environmental Management Plan 'Process'

Environmental Impact Assessment (EIA) processes and associated EMPs are regulated by the MEFT (DEA) in terms of the Environmental Management Act, 7 of 2007. This Act was gazetted on 27 December 2007 (Government Gazette No. 3966) and enacted on 6 January 2012. EIA Regulations: Environmental Management Act, 2007 (Government Gazette No. 4878) were promulgated on 6 January 2012.

1.4.1 EMP Team

I.N.K Enviro Consultants cc is the independent firm of environmental consultants that has been appointed by SCVP to compile the EMP.

Immanuel N. Katali, the Environmental Assessment Practitioner holds a B.Arts (Honors) Geography, Environmental Studies and Sociology and has over seven years of relevant experience in conducting/managing Environmental Impact Assessments (EIAs) in Namibia. Immanuel is certified as an Environmental Assessment Practitioner under the Environmental Assessment Professionals Association of Namibia (EAPAN).

Werner Petrick (Namisun Environmental Projects and Development), the Reviewer has over twenty four years of relevant experience in environmental management, conducting/managing EIAs, compiling EMPs and implementing EMPs and Environmental Management Systems. Werner is certified as a Lead Environmental Practitioner and Reviewer under the Environmental Assessment Professional Association of Namibia (EAPAN).

2 IDENTIFICATION OF APPLICABLE ENVIRONMENTAL GUIDELINES

2.1 The Namibia Constitution (1990)

As the main source of legislation, the Constitution of the Republic of Namibia (1990) makes provision for the creation and enforcement of applicable legislation. In this context and in accordance with its constitution, Namibia has passed numerous laws intended to protect the natural environment and mitigate against adverse environmental impacts.

2.2 Environmental Management Act No 7 of 2007

The EIA Policy (1995) is enforced through the Environmental Management Act, 7 of 2007 and the EIA Regulations of 6 January 2012 (EIA Regulations). In terms of this legal framework, no party, whether private or governmental, can conduct a listed activity without an ECC obtained from the Environmental Commissioner.

2.3 Pollution Control and Waste Management Bill

This Bill is not yet promulgated so is not in force. The Act will regulate the discharge of pollutants to the air, water and land; it will regulate noise, dust and odour pollution; and it will establish a framework for integrated pollution prevention and control.

2.4 Atmospheric Pollution Prevention Ordinance No. 11 of 1976 (as amended)

This Ordinance provides for the prevention of pollution of the atmosphere. Part II deals with control of noxious or offensive gases, which applies to the emissions from a crematorium.. Namibia has no local air quality standards, so international criteria are used. The most widely referenced international air quality standards are those published by the World Health Organisation (WHO). The South African National Ambient Air Quality Standards (Crematoria and Veterinary Waste Incineration) as indicated in Table 1 below are also applicable.

Table 1: Crematoria and Veterinary Waste Incineration Emission Standards

Description:	Cremation of human remains, companion animals (pets) and the incineration of veterinary waste		
Application:	All installations		
Substance or mixture of substances		**Plant status**	**mg/Nm^3 under normal conditions of 11% O_2, 273 Kelvin and 101.3 kPa.**
Common name	**Chemical symbol**		
Particulate matter	N/A	New	40
		Existing	250
Carbon monoxide	CO	New	75
		Existing	150
Oxides of nitrogen	NO_X expressed as NO_2	New	500
		Existing	1 000
Mercury (Applicable to human cremation only)	Hg	New	0.05
		Existing	0.05

2.5 Public and Environmental Health Act (No. 1 of 2015)

This Act provides a framework for a structured uniform public and environmental health system in Namibia. The act identifies health nuisances, such as chimneys emitting smoke in quantities that can be offensive, injurious or dangerous to health, which are liable to be dealt with. Under this Act, all Local Authorities must take measures to prevent unhygienic or offensive conditions in their jurisdiction, and must prevent occurrence of health risks.

2.6 Labour Act of 2007 (Act 11)

The Labour Act of 1992 (Act 6), the New Labour Act of 2007 (Act 11) and Government Notice 156 of 1997: Labour Act, 1992: Regulations Relating to the Health and Safety of Employees at Work, governs working conditions of employees. These regulations are prescribed for among others safety relating to hazardous substances, exposure limits and physical hazards.

3 PROJECT DESCRIPTION

3.1 Introduction

As mentioned in Section 1.1, SCVP intends to apply for an ECC for their proposed operational activities of a mini pet cremator, located in Walvis Bay, Namibia.

The objective of the cremator is to provide a more suitable way to disposing the carcasses of household pets as opposed to the current practice of openly dumping them at the Municipal Landfill Site. The design of the Mini Pet Cremator, proposed to be installed and operated by SCVP, is indicated in Figure 4 below.

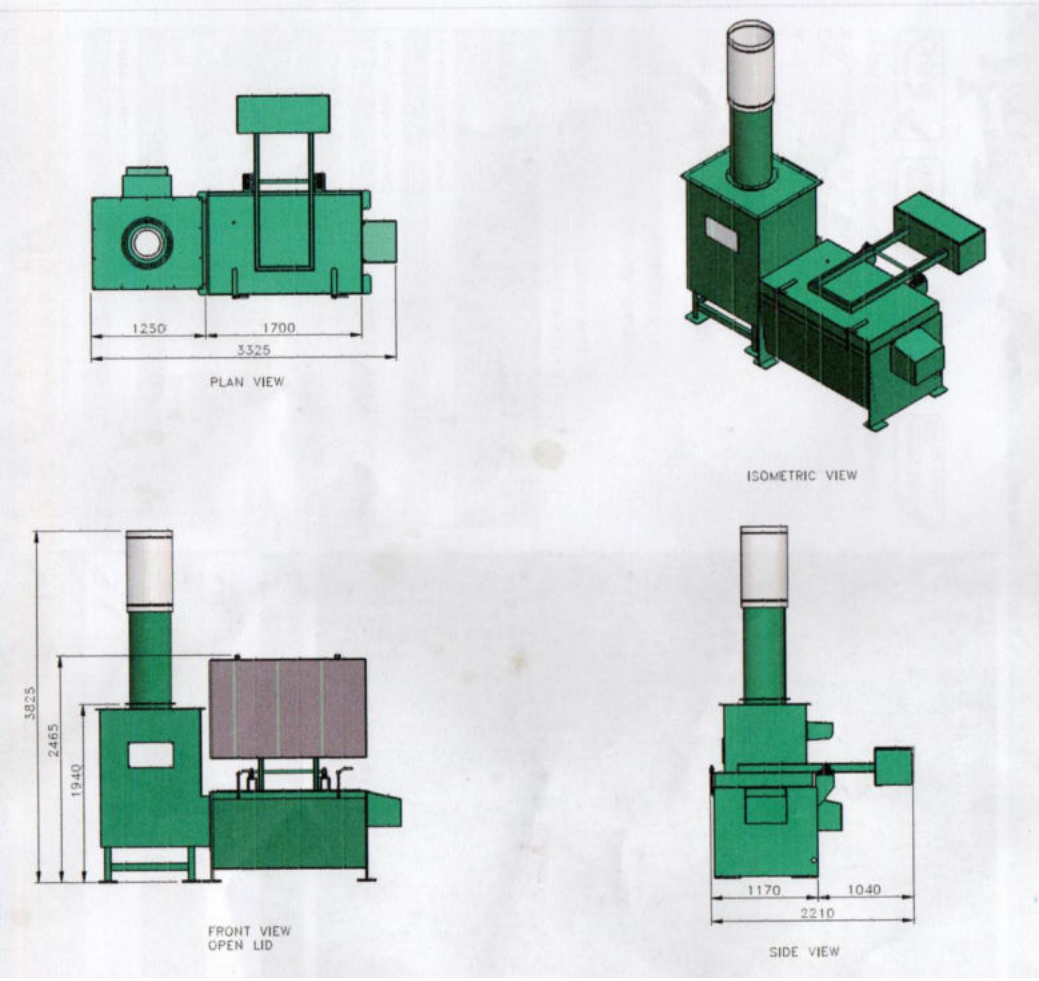


Figure 4: Design of a Mini Pet Cremator

3.2 The Mini Pet Cremator Design

The pet cremation machine is designed to be the most efficient solution for cremating medium to large pets. It consist of a front opening for ease of loading and de-ashing to optimise your daily throughput to up to 7 pets. It is designed for safety, performance and efficiency benefiting from Hot Hearth technology, continuously recycling heath throughout and below the primary cremation chamber, delivering complete 360° heating and reducing cremation time. The cremator is designed for safe and easy loading of most household pets. Loading through the front facing door can be completely manually or with the aid of a hydraulic lifting table, which is able to be safely loaded multiple times throughout a cycle to enable multiple individual pet cremations in a day. At the end of every incineration process, ash should be discharged through the loading door onto the supplied catcher tray prior to being loaded for the next burn.

The cremator will operate during daytime and nighttime hours. It consists of a primary and secondary chamber as per the following design in Table 2 below:

Table 2: Primary and Secondary Chamber Design

Primary Chamber	Secondary Chamber
Heavily insulated internal refractory lining constructed from high grade refractory brick ensuring a secure self supporting , interlocking arrangement.	Fully insulated internal refractory lining constructed from high grade refractory brick and low thermal mass insulation.
Manually opening, securely locking access door with viewing point.	Secondary chamber burnout burner with temperature controlled on/off and complete with internal air fans.
Automatic temperature controlled on/off, complete with internal air fans.	Automatically controlled integrated combustion burner air fans,
Hot Hearth Combustion Burner with temperature controlled on/off and complete with internal air fans.	Temperature sensor mounting point at the base at the base of the exit flue ensuring the chamber reaches the necessary 850°C minimum with a 2 second retention time.
Secondary Combustion burner air fans, automatically controlled distribution to their designated areas.	
Two temperature sensor mounting points.	

3.3 Power Supply

The Mini Pet Cremator runs on fuel powered jet engines only. It uses normal electricity for the electronics and initial spark, but needs the fuel burners to reach the temperatures required.

SCVP will only store the diesel on site that is used by the machine and no extra diesel will be stored at the site. A 350 litre bunded (double skinned to 110%), lockable safety tank, will store an amount of 75 litres required for operations, whereby 50 litres is stored as a normal reserve and fill up when needed with a 25 litre jerry can, by hand. The tank is lockable and has a level indicator.

The machine runs on about 5 litres/hour, depending on the particular animal and size. However, the range is normally between 3-8 litres/hour.

3.4 Types of Emissions from the Cremator

The informatioon below is extracted from gas emissions studies and tests done by the manufacturer (Addfield) of the Mini Pet Cremator.

Table 1 below indicates the expected emissions from the proposed Mini Pet Cremator manufactured by Addfield. The chimney stack is 2 m in height and can be extended in 1.2 m sections, if needed. The stack will emit gases resulting from cremation of individual pets, operating at a nominal throughput of ,50kg/hr, with a secondary after chamber in place with a minimum temperature of 850°C (Addfield, n.d).

Table 3: Expected Emissions from Addfield Cremator (Reference: Addfield, n.d)

Parameter	Addfield Emission Quantity
Particulate Matter	16 mg/Nm^3
Nitrogen Oxide	65 mg/Nm^3
Sulphur Oxide	62 mg/Nm^3
Carbon Monoxide	42 mg/Nm^3
Total Volatile Organic Compound (as carbon)	0.6 mg/Nm^3
Heavy Metals	0.05 mg/Nm^3
Hydrogen Chloride	1.04 mg/Nm^3
Hydrogen Fluoride	0.07 mg/Nm^3

3.5 Sound Level from Cremator

The informatioon below is extracted from sound level studies and tests done by the manufacturer (Addfield) of the Mini Pet Cremator.

Measurements of the sound emissions from the Addfield Mini Pet Cremator have been undertaken within the semi-reverberant environment within the Addfield factory. All measurements have been undertaken with a calibrated Class 1 sound level meter. All fans of the cremator were operating at full duty during the measurement. The measurements were undertaken in the center of the factory floor (single reflecting plane).

Induct sound power levels of the chimney have been determined in general accordance with the methodology of BS EM ISO5136-2003 using a traverse microphone method. The sound pressure of the plant has been measured at a distance of 5 meters (m) to the side of the unit. Table 5 below present the results of the measurements.

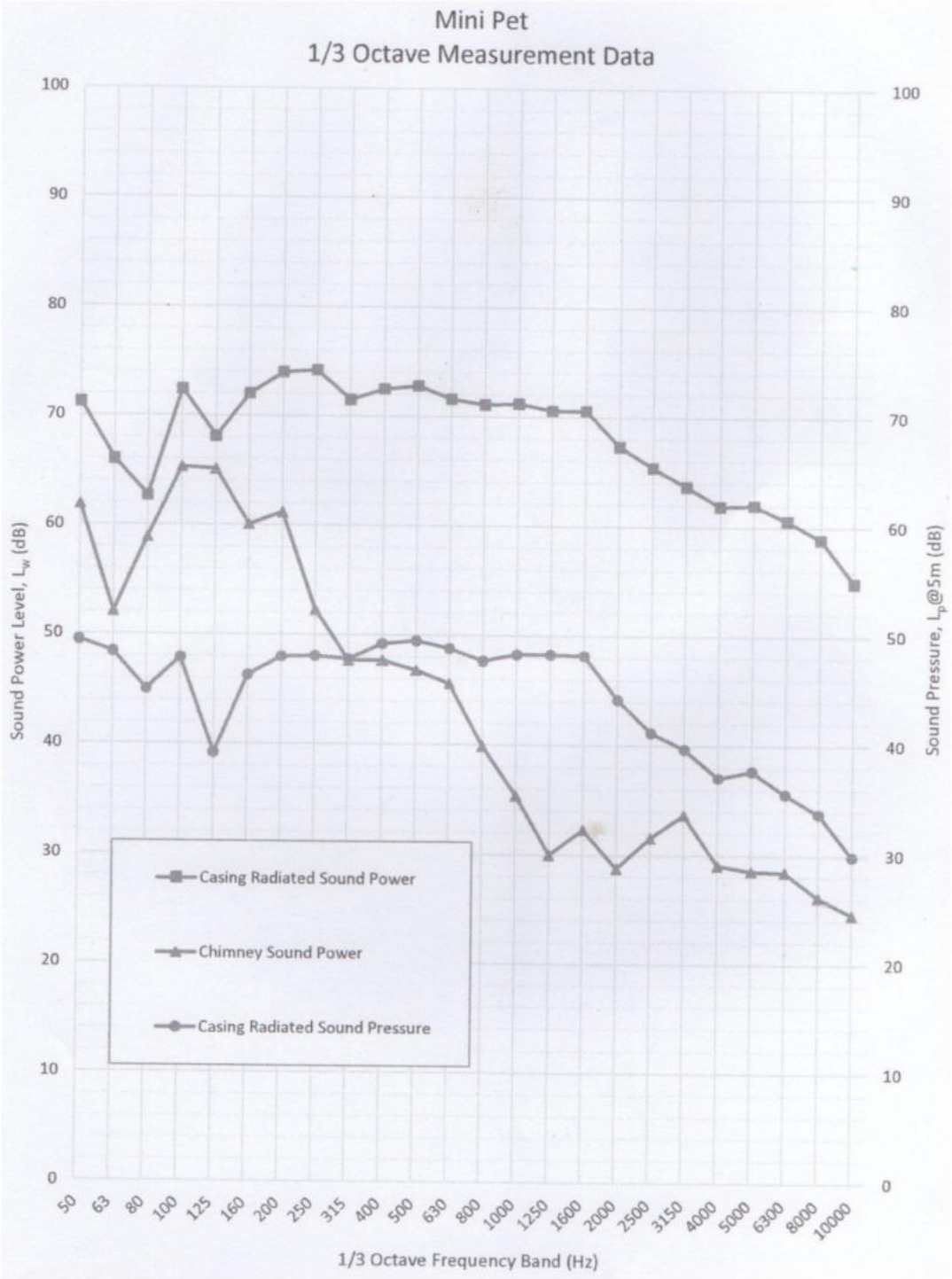
Table 5: Measured Sound Pressure Level of Mini Pet Cremator (Venta Acoustics, n.d)

	Octave Band Centre Frequency (Hz) Sound Pressure, L_P@5m (dB)								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Mini Pet Casing Radiated	53	51	53	54	53	50	43	39	57

Third octave measurement results are provided in chart 1 below. All measurements have been corrected for background noise. Measurements have not been corrected for reverberation within the factory.

SCVP propose to enclose their cremator in a building/container to absorb noise, to minimize noise impacts to nearby receptors. The operating furnace makes a low-frequency, soft burning noise that is designed to be unobtrusive.

Chart 1: Octave Measurement Results



3.6 Storage of Carcasses

No carcasses can, or will be stored on the premises. They will be kept frozen at Southern Cross Veterinary Practice until such time as they can be cremated, when they will be transported to the premises by vehicle. Only one animal at a time can be cremated and cannot do more than one a day, or even on a daily basis. This is due to not having that many to do and also due to time restrictions on staff, as we will not be employing an extra staff member to only do this. An existing staff member will do the cremations when needed, but is has to be slotted into his work schedule at the hospital as well. In addition, cremating one animal on daily basis is prevents the potential for odour to extend beyond the site. This is explained in detail, in the section below.

3.7 Odour

The potential for odour to extend beyond the site during the cremation process is greatly dependent on the intervals taken before every cremation process, most specifically for large sized pets. In the case that 2 and more cremation processes are undertaken without intervals of approximately 6 hours in between, the potential for odour impacts will most likely extend beyond the site. Therefore, the more the cremation, the more there is odour impacts extending beyond the site. However, should the necessary precautions be taken to ensure that enough time (6 hours) is allowed before the start of each cremation process, then the extent of the odour impacts will be minimal, transient and contained within the site.

3.8 Emissions of Polycyclic Aromatic Hydrocarbons (PAHs)

Only the carcass will be burned. The burning will not be done in a coffin or container of any sort, including plastic bags. The design of the machine is what limits the PAHs. The scale of the operation remains small and will not run every day. Therefore, that in itself limits the PAHs that will potentially be produced. In addition, SCVP will be required to fit an activated charcoal filter, which would limit PAHs and smells further.

3.9 Waste Management

The fine ash and crushed bone fragments derived from the cremation process are completely sterile from the high temperatures of the crematory, and can be safely disposed of. These are packaged in an urn and given to the pet owners. A municipal waste collection service will pick up any general waste from the crematorium, for standard disposal at the Walvis Bay waste disposal site. Hazardous waste such as diesel containers will be kept separately for disposal at the hazardous waste disposal site in Walvis bay.

4 PROJECT ALTERNATIVES

4.1 Alternative Site Locations

As discussed in section 1 above, there are two possible sites in the industrial areas of Walvis Bay that have been identified to deploy and operate the cremator (see figure 1). This EMP will provide recommendations on the most preferred site with the most favorable/suitable conditions for the deployment of the cremator, and taking into consideration, the significance of the identified potential environmental impacts for each site.

4.2 The “no project” option

The current practice of disposing carcasses of household pets in Walvis Bay, is by disposing them at the Municipal landfill site, which in some cases, releases bad odour in the surrounding area and attracts other animals and insects such as flies etc. Therefore, SCVP intends to provide an essential service to the authorities and society at large, offering an accepted and safe way for disposing numerous carcasses of pets, as well as for pet owners to be able to keep the ashes in an urn or easier “burial options” as opposed to burying or dumping at the landfill site. The proposed activities allow and make way for a shift, from the more traditional way of burial and/or disposal/dumping of pets to a modernized and technologically advanced way of disposing carcasses of household pets.

It is against this background that the proponent has identified the need for a crematorium to serve Walvis Bay and Namibia at large.

Therefore, the challenge facing the project proponent is its contribution towards achieving these goals while at the same time preventing and/or mitigating potential negative social and environmental impacts. The proponent will have to ensure that the identified mitigation measures and commitments to address the potential impacts, will appropriately be implemented and adhered to.

5 DESCRIPTION OF THE CURRENT ENVIRONMENT

This section was compiled utilizing the following sources of information:

- Visual observations during a site visit by I.N.K.
- Google Earth.
- Internet sources.

5.1 Climatic Conditions

Applicable to both sites.

The weather at the coast is significantly different from that to the inland. There is little rain at the coast, the average temperatures are much lower, radiation and sunshine is less and frost is absent. Yet, the winds are stronger and humidity is higher due to frequent fog. The climate of the area is mainly influenced by the Benguela Current and the South Atlantic Anticyclone. The Walvis Bay area experiences over 125 days of fog per year. February, which is the most humid month in Walvis Bay, can reach over 90% humidity whereas June is 60-70% humid.

5.1.1 Temperature

The average annual temperature is less than 16˚C. The sites, as well as the rest of Walvis Bay are situated within the Coastal Fog Zone. This zone forms a band along the coast of approximately 20 km in width. As a result of this, the climate is predominantly cool and humid with frequent fog occurring.

5.1.2 Precipitation

The mean annual precipitation (MAP) at the coast is very low, with much of the precipitation being associated with fog (the Atlas of Namibia quotes the average number of fog days at Walvis Bay as 146) and only occasional rainfall events. The Meteorological Office had a rainfall station at Pelican Point for a number of years and the record from this shows the MAP is 9.5 mm, while the median is 3.8 mm. The monthly evaporation for all months is significantly higher than the rainfall, indicating that the area is a water negative area.

5.1.3 Wind

Wind is a dominating feature of the coast. The presence of the subtropical South Atlantic Anticylcone (SAA) off the coast of Namibia strongly influences the wind pattern, generating gale force winds along the coast in all seasons, but most frequently during mid-summer and spring.

Although their strength decreases inland, their effect is noticeable for distances of up to 200 km from the coast. The daytime and night time wind roses for Walvis Bay are provided in Figure 5.

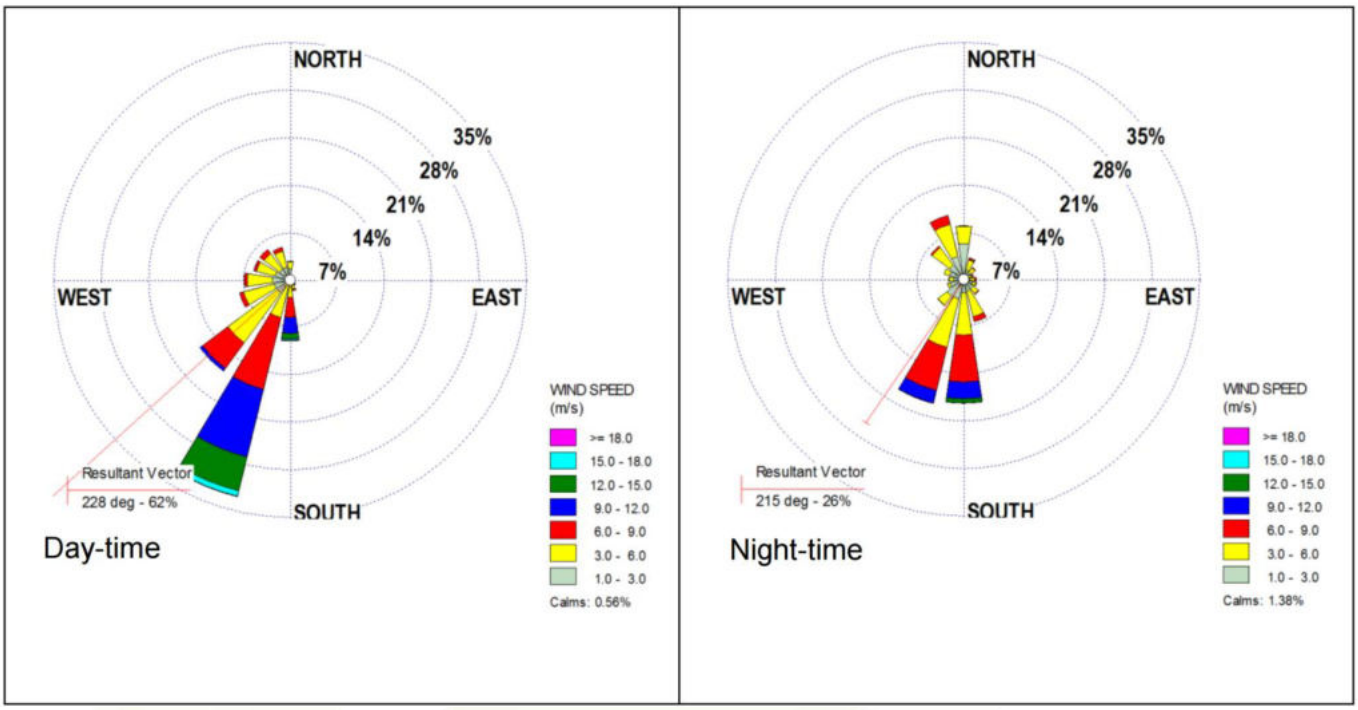


Figure 5: Day time and night time wind roses (SLR, 2016)

The prevailing wind direction at Walvis Bay is from the south-southwest, southwest and the south. During the day the south-southwesterly winds were more dominant with a shift to more frequent southerly winds during night-time. As is typical of night-time conditions the percentage calm conditions increase and the wind speeds decrease. Day-time wind speeds exceeding 5.4 m/s occurred for 32% of the time with the maximum recorded at 22.5 m/s.

5.2 Noise

Site 1

The only source of noise in the area is generated by the vehicles and trucks on the roads and the day-to-day industrial activities.

Existing noise sources within and around the project site include:

- natural sounds from wind.
- vehicle and truck movement on the public road network.

- noise arising from the day to day activities associated with the industrial area.

Potential receptors of noise are the neighboring businesses. The sensitivity of noise receptors usually increases at night when conditions are still, and ambient noise levels are at their lowest. However, the cremator will be operated during both daytime and nighttime hours. The typical daytime noise levels in an industrial area is 70 db (Safetch, 2009).

Site 2

The only source of noise in the area is generated by the activities of the truckport west of the site and vehicles traveling on the main road that links the industrial area to the Naraville location.

Existing noise sources within and around the project site include:

- natural sounds from wind.
- vehicle movement on the public road from Naraville location.
- noise arising from the day to day activities associated with the truckport west of the site.

Potential receptors of noise are the neighboring truckport. The sensitivity of noise receptors usually increases at night when conditions are still, and ambient noise levels are at their lowest. . However, the cremator will be operated during both daytime and nighttime hours. The typical daytime noise levels in an industrial area is 70 db (Safetch, 2009).

5.3 Social and Economic Environment

5.4 Demographics

According to the Namibian Planning Commission, approximately 62,096 people lived in the municipality of Walvis Bay in 2011 of whom 33,034 were male and 29,062 were female (NPC, 2011). The town's area is only 32.5sq.km as it is constrained by the desert and the sea, making it the most densely populated of all Namibian towns. The 2011 census is currently the latest census to be conducted. However, it is expected that the population has increased since 2011 due to the evident expansion of the town over the years.

5.5 Land-use

Site 1

The surrounding land at the site is used for typical peri-urban developments such as small industries. Therefore, the general land use of the area is light industry, with businesses within the considered 200 m radius.

Site 2

The surrounding land at the site is mostly open and consists of undeveloped plots earmarked for industrial development. However, there are truck port activities within a radius of 200, to the west of the site and (see figure 3).

5.6 Health

Walvis Bay has a main district government hospital and a private hospital, the Kuisebmond health centre and three clinics – Narraville, Coastal and Walvis Bay clinics. The main health challenges as listed by the Ministry of Health and Social Services are HIV/AIDS, TB, substance abuse, respiratory system diseases and children in need of care.

5.7 Walvis Bay Economy

The economy of the town is largely built around fishing, the port, tourism and salt production.

6 KEY ENVIRONMENTAL ASPECTS AND QUALITATIVE IMPACT ASSESSMENT

6.1 Qualitative Assessment Approach and Methodology

An assessment of the potential positive and negative impacts associated with the proposed Mini Pet Cremator Project is provided below.

Impacts are considered in a cumulative manner where possible such that the impacts of the proposed Project are seen in the context of the project description and baseline conditions described in Sections 3 and 5, respectively.

Significance is determined through a synthesis of impact characteristics. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact “without mitigation” is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as “positive”.

Both the criteria used to assess the impacts and the Method of determining the frequency/severity of the impacts is outlined in Table 6.

Table 6: Frequency/Severity Rating

Likelihood/ Frequency	Definition	Probability	Rating	Consequence/ Severity				
				Insignificant	**Minor**	**Moderate**	**Major**	**Critical**
				Very minor or no impact.	Minor impact that can be contained	Impact may have moderate effects	Serious impact/effect	Permanent Impact/effect
				1	**2**	**3**	**4**	**5**
Very high	Almost certain Extremely likely	>90%	**5**	Low	**Medium**	High	Extreme	Extreme
				5	10	15	20	25
High	Very likely Will probably occur	60-90%	**4**	Low	**Medium**	**Medium**	High	Extreme
				4	**8**	12	16	20
Medium	Likely to happen	40-59%	**3**	**Low**	**Low**	**Medium**	**Medium**	High
				3	**6**	**9**	12	15
Low	Possible but unlikely	10-39%	**2**	**Low**	**Low**	**Medium**	Medium	**Medium**
				2	**4**	**6**	8	**10**
Very low	Conceivable but extremely unlikely	<10%	**1**	**Low**	**Low**	**Low**	**Low**	**Low**
				1	**2**	**3**	**2**	**2**

Table 7: Environmental Aspects and Qualitative Impact Assessment

ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	IMPACT ASSESSMENT
Noise	Increase in disturbing noise levels (nuisance impact to third parties)	Site 1 With reference to section 5.2, the only source of noise in the area is generated by the vehicles and trucks on the roads and the day-to-day industrial activities. Existing noise sources within and around the project site include natural sounds from wind, vehicle and truck movement on the public road network, andnoise arising from the day to day activities associated with the industrial area. Potential receptors of noise are the neighboring businesses. The sensitivity of noise receptors usually increases at night when conditions are still, and ambient noise levels are at their lowest. Site 2 With reference to section 5.2, The only source of noise in the area is generated by the activities of the truck port west of the site and vehicles on the main road linking the industrial area to the Naraville location. Existing noise sources within and around the project site include natural sounds from wind, vehicle movement on the public road from Naraville location and noise arising from the day to day activities associated with the truckport west of the site. Potential receptors of noise are the neighboring truckport. The sensitivity of noise receptors usually increases at night when conditions are still, and ambient noise levels are at their lowest. SCVP propose to enclose their cremator in a building/container to absorb noise, to minimize noise impacts to nearby receptors. The operating furnace makes a low-frequency, soft burning noise that is designed to be unobtrusive. With reference to section 3.5, the sound pressure of the plant has been measured at a distance of 5 meters (m) to the side of the unit, with results indicating 57 Db (A). However, the typical noise levels in an industrial area is 70 Db (A), which indicated that the noise emissions from the cremator are well below, therefore indicating that the area is already prone to high noise levels and resulting in noise being an insignificant issue for the cremator operations. Therefore, this potential impact is rated as **LOW** in the unmitigated scenario and **VERY LOW** in the mitigated scenario for both sites. See relevant management and mitigation measures in section 8.
Social impacts	Positive Impact on society	With reference to section 4.7, SCVP intends to provide an essential service to the authorities and society at large, offering an accepted and safe way for disposing numerous carcasses of pets, as well as for pet owners to be able to keep the ashes in an urn or easier “burial options” as opposed to burying or dumping at the landfill site. The proposed activities allow and make way for a shift, from the more traditional way of burial and/or disposal/dumping of pets to a modernized and technologically advanced way of disposing carcasses of household pets. Considering the social contribution that the mini cremator will have, this potential impact

		is therefore rated as **POSITIVE HIGH.**
Waste disposal	Emissions to land and environmental degradation	With reference to section 3.6, the fine ash and crushed bone fragments derived from the cremation process are completely sterile from the high temperatures of the crematory, and can be safely disposed of. These are packaged in an urn and given to the pet owners. A municipal waste collection service will pick up general waste for standard disposal at the Walvis Bay waste disposal site. Due to the minimal waste that will be generated on site, this potential impact is therefore rated as **LOW** in the unmitigated scenario and **VERY LOW** in the mitigated scenario for both sites. See relevant management and mitigation measures in section 8.
Air Quality	Health impacts on 3rd parties	With reference to section 4, the process uses power and produces emissions associated with fossil fuel combustion as well as emissions from the material being burned. The emissions will be expelled via a chimney stack measuring 2 m high and that is designed to expel the emissions at sufficient height. In addition, a single cremation process is not expected to have odour impacts extending beyond the site to 3rd parties. Mitigation measures should be put in place to ensure that the specified time frame between each cremation process is adhered to. Furthermore, the likelihood of the potential air quality impacts have as well been measured based on the air emission standards provided in section 2.4 The measured emissions of the expected gases from the Mini Pet Cremator indicated that they are well below the air quality standards as provided in section 2.4. Considering the above, emissions from the cremator are therefore deemed minimal and no significant impact on the receptors are expected. This potential impact is therefore rated as **MEDIUM** in the unmitigated scenario and **LOW** in the mitigated scenario for both sites. See relevant management and mitigation measures in section 8.

7 RECOMMENDED SITE

The selection of the most preferred/suitable site for the deployment of the Mini Pet Cremator is determined based on the site that is expected to have least environmental impacts. Furthermore, the assessment determined that air pollution is the most significant potential impacts that is expected from the operations of the cremator due to the expected gas emissions. However, these emissions are expected to be low and well below the emission standards, due to the fact that it is a small scale operation that will not operate on a daily basis, as well as the installation of the activated charcoal filter that will be fitted to limit further emissions. Therefore, the most preferred site would be selected based on the air quality criteria.

Site 1 is located in a business dominated and congested location, with sensitive receptors within 200 m radius from the site and that could potentially be impacted by air emissions. Whereas, Site 2 is located in an open environment with the only sensitive receptor within 200 m radius being the truck port to the east. Therefore, the assessment indicated that site 2 will be more suitable and favorable for the operations of the Mini Pet Cremator.

8 ENVIRONMENTAL MANAGEMENT PLAN

8.1 Aims

The aim of the EMP is to detail the actions required to effectively implement mitigation and management measures. These actions are required to minimize negative impacts and enhance positive impacts associated with the operations.

It is important to note that an EMP is a living document in that it will be updated and amended as new information (e.g. environmental data), policies, authority guidelines, technologies and proposed activities develop. The conceptual management measures proposed to mitigate the potential impacts are detailed in the action plans below.

8.2 Roles and Responsibilities

It is the responsibility of SCVP's cremator operators to implement the measure (commitments) below and to ensure that all actions are carried out.

8.3 Management and Mitigation Measures

The management and mitigation measures for the proposed project are outlined in the table below.

Environmental Issue	Management & Mitigation Measures
Air Quality	Ensure that the appropriate scrubbers and filters are installed in the crematory apparatus, as per the design specifications. These must be replaced regularly as required during the operational phase.
	An activated charcoal filter should be installed, which would limit PAHs and smells further
	Ensure that operation of the cremator strictly follows the manufacturer's instructions, especially regarding the temperature and duration of firing, to prevent and minimize potentially toxic emissions.
	Ensure that the equipment is regularly serviced and maintained for optimal functioning, so that the manufacturer's claim that operations are safe with respect to emissions, is upheld.
	Develop and implement a complaints register to record any 3rd party complaints relating to air pollution. Complaints must be investigated and actions developed.
Noise	Focus operational activities more during the day when ambient levels are high from the day to

	day activities of the industrial area and less operational activities during nighttime.
	General operational activities, following good engineering practice should be applied including: ○ Regular maintenance of the cremator ○ Enclosure of major sources of noise. The cremator should be enclosed in a building/container to absorb noise, so that the nearby receptors not disturbed by this aspect.
	Develop and implement a complaints register to record any 3rd party complaints relating to excessive noise. Complaints must be investigated and actions developed. Where relevant a once off-noise monitoring campaign should be initiated to confirm operations npise.
Waste Management and Hydrocarbon Spillages	No litter or waste accumulation will be permitted on site.
	Recycling will be promoted on site.
	Ensure immediate clean-up of all diesel spills/leakages
	Ensure proper removal of waste from site and disposal at licensed disposal site for general waste and hazardous disposal site for diesel containers and hydrocarbon spillages.
	Bins with with lids in order to prevent wind-blown litter, will be provided at strategic locations through the site and will be emptied regularly in order to ensure no overflows.
Health and Safety	Suitable First Aid equipment must be provided
	The Labour Act's Health and Safety Regulations should be complied with.
	No carcasses can, or will be stored on the premises.
	Only one animal at a time can be cremated and not more than one a day.
	Appropriate personal protective equipment should be provided to the operator.
EMP implementation	The operator must be responsible for environmental management and compliance.
	The operator must be made aware of, and familiar with, site operations during operations, the key environmental issues and consequences of non-compliance to the EMP.
	Ensure ongoing awareness and compliance.