DRAFT OPERATION AND MAINTENANCE ENVIRONMENTAL MANAGEMENT PLAN

FOR ESKOM'S OPEN CYCLE GAS TURBINE POWER PLANT ADDITIONAL UNITS AT MOSSEL BAY

This document is submitted in draft form as Addendum C of Annexure F of the final EIR undertaken by Ninham Shand Consulting Services on behalf of Eskom

April 2007.

---

1. Labour

1.1 Conduct of Employees

The following restrictions or constraints will be placed on the operation and maintenance staff in general:

- No indiscriminate disposal of rubbish or rubble.
- No littering of the plant and substation areas and the surrounding areas.
- No collection of firewood.
- No interference with any wildlife, fauna or flora.
- No poaching of any description.
- No use of facilities other than the toilets provided.

2. Hazard and Risk

Element	Management Plan
Potential Impacts	• Fire from flammable liquid • Transport spillage of fuel • Storage of fuel
Sources	Fuel
Actions/Controls	When design is completed, a detailed Risk Management and Emergency Response Plan must be developed prior to commissioning for review by appropriate stakeholders. The plan will cover: • Design specifications for layout, selection of materials, construction and operation of the facility; • Preventative measures • Control measures • Non-technical measures including organizational and systems measures. • Appropriate warning sign boards, clearly denoting warning procedures and emergency exit routes, must be posted at relevant locations in the facility. • Setting up of emergency teams with team leaders • Formulation of detailed emergency procedures such as: ∗ Emergency notification / alarm procedures including names and telephone numbers of internal and external emergency service

Element	Management Plan
	∗ Evacuation routes, maps, route signs etc. ∗ Directions to showers, wash stations, fire extinguishers etc. ∗ Location • Safety training. • On-site and off-site emergency plans (for fire and spill response) • Monitoring • Incident and safety reporting • Community consultation and information
Maintenance	Regular checks and drills must be conducted to ensure that the risk and hazard control strategies are maintained up to date.
Monitoring	• All monitoring will occur according to the risk management and emergency response plan, guidelines and license conditions. • A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.
Corrective Actions/Reporting	• If a report or drill indicates an error/omission in risk and hazard management procedures, then procedures must be altered or updated to ensure effective management. • If an incident occurs, then emergency procedures must be enacted to ensure all impacts are minimized.

3. Noise

Element	Management Plan
Potential Impacts	• Nuisance noise from the commissioning and operations activities
Sources	• Staff transport and equipment transport • Turbines • Commissioning activities • Maintenance activities • Pump house
Actions/Controls	• In order to reduce the overall noise emission to acceptable levels, final design of equipment will ensure the level of noise emission from the plant must be limited to levels guaranteed by the contractor. • All noise from activities at the OCGT Plant during the operation and maintenance of the OCGT Plant must be within acceptable limits (according to the Environment Conservation Act and the National Environmental Management Act), taking into consideration that maintenance activities may be required at the OCGT Plant outside of working hours, for example, in the case of emergencies. • Communication with neighbours during commissioning must occur, should there be potential for extraordinary

Element	Management Plan
	noise emissions. • Eskom will provide all equipment with standard silencers and maintain silencer units on vehicles and equipment in good working order, for those vehicles where it is necessary. • Noise mitigation strategies that are in compliance with SANS code 10103 must be implemented. The use of berms and vegetation for screening purposes must be further investigated and implemented once the facility becomes operational. • Noise levels must be monitored and corrective measures must be taken immediately should it become necessary. • All other noise mitigation measures required to make the facility compliant with the relevant SANS standards, must be implemented to minimise the noise impacts associated with the development
Maintenance	All plant and equipment, including vehicles, must be properly maintained in order to minimise noise generation.
Monitoring	• Observation of on-site noise levels by SHE Officer and recording of operating hours. • A complaints register must be held, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon. • Noise monitoring conducted following commissioning to ensure noise levels meet specified levels.
Corrective Actions/Reporting	• Corrective action is required to be undertaken immediately after a complaint is made or non-conformance is identified. • Any complaints regarding noise must be investigated, sources identified and mitigation measures implemented. Feedback on resolution of the issue must be provided to the complainant. • The SHE Officer/Station manager will maintain an incident reporting system to record non-conformances. • The Generation Environmental Manager will report on compliance with this EMP if required by the administering authority.

4. Visual Impact

Element	Management Plan
Potential Impacts	Negative impact on amenity for the surrounding community
Sources	• Power station plant • Roadways • Associated buildings
Actions/Controls	• As far as possible, the architectural and cultural heritage of the area must be included in the design guidelines for the development. • Use of low reflective materials on buildings • Use of colours on buildings and plant that are neutrally

Element	Management Plan
	toned and suit the surrounding landscape • Retention of as much existing vegetation as possible • Implementation of tree/shrub planting to assist screening the observer from the power station • Use of light fixtures and the fitment of covers and shields designed to contain rather than spread light
Maintenance	• Vegetation barriers must be regularly maintained so as to ensure minimal visual intrusion. • Timely maintenance of the OCGT units, ancillary infrastructure and general surrounds.
Monitoring	• Observation of site appearance by the Station manager • A complaints register must be maintained in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.
Corrective Actions/Reporting	• If a visually intrusive component of the site is identified, the procedures must be altered or updated to ensure effective management. • An incident reporting system will record and manage follow up of resolution of non-conformances • The Generation Environmental Manager will report on compliance with the EMP is required by the administering authority.

5. Fauna and Flora

Element	Management Plan
Potential Impacts	• Impact of operational activities on flora and fauna in the surrounding areas.
Sources	• Movement of employee and visitor vehicles within and around the site
Actions/Controls	• Implementation of a site rehabilitation and landscaping program • Use of indigenous plants in landscaping and rehabilitation activities • Program regular alien plant identification and eradication activities. • The maintenance staff may not harm or kill any fauna during the activities of maintaining the OCGT Plant. • Wildlife interaction will be investigated by the Environmental Officer. • The active control of all alien invasive species by means of manual removal, ring-barking, chemical control or a combination of these methods. • Rehabilitation of the cleared areas, starting with the establishment of a grass cover and phasing in the re-establishment of indigenous species. • All emergent seedlings must be removed by hand and re-sprouting from existing rootstock must be chemically treated in a continual monitoring and follow-up

Element	Management Plan
	programme. • The Control of Alien invasive species will be an ongoing process, especially if the source of invasion is not removed (i.e. the surrounding invasion of the greater complex area).
Maintenance	• Vegetative barriers must be regularly maintained so as to ensure minimal visual intrusion • Maintenance of plants on site to ensure continued viability of vegetative barriers • Maintenance of rehabilitated areas to ensure sustainability.
Monitoring	• Observation of site appearance by Station manager • A complaint register, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon. • Regular alien plant inspections
Corrective Actions/Reporting	• An incident reporting system will record and mange follow up of resolution of non-conformances. • In the event of an incident, the Environmental Officer will write a report regarding the incident, and make recommendations. A follow up site inspection will be conducted by the Environmental Officer in order to assess the effectiveness of the recommendations. • The Power Station Manager will report on compliance with this EMP if required by the administering authority.

5.1 Use of herbicides in the Alien Control Programme

The use of herbicides will be in compliance with the terms of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (No 36 of 1947). In terms of this Act, a registered pest control operator will apply herbicides, or will supervise the application of herbicides.

Therefore, Eskom will:

- Ensure that a registered pest control operator applies or supervises the application of all herbicides.
- Ensure that all herbicides are stored in a well-ventilated demarcated storage area.
- Ensure that a register of all contents of the storage area is kept and updated on a regular basis.
- Ensure that a daily register of all relevant details of herbicide usage is kept, and that such a register is maintained by the relevant Eskom custodian.

6. Air Pollution Management

Element	Management Plan
Potential Impacts	• Release of above guideline levels of air pollutants, i.e. exceeding the limits as set-out in the CAPCO license • Release of greenhouse gases

Element	Management Plan
	• Dust and particulates from stacks and establishment of vegetation
Sources	• Power station stacks • Rehabilitated land
Actions/Controls	• The power station must be modeled and designed so as to ensure greenhouse gas emissions and air quality will fall within the guideline levels. • The OCGT power plant must be fitted with the appropriate NO_x mitigation control equipment to minimise the production of NO_x. • Release of emissions from the turbine stacks must only be released to the atmosphere: ∗ From those release points and to the corresponding heights, velocities and concentrations specified in the license, and ∗ Directed vertically upwards without any impedance or hindrance.
Maintenance	• Power Station equipment must be performance tested during the commissioning phase to ensure that the manufacturer's standard has been delivered. • All power station equipment must be maintained according to industry standards. This will ensure that emissions, odours and dust from power station stacks continue to fall within guideline levels. • Roads must be maintained to ensure that dust from road or vehicle sources will not exceed prescribed levels. • During establishment of vegetation from rehabilitation/landscaping, affected areas must be watered to ensure dust level are minimized • Ensure incident and complaint registers are established and maintained.
Monitoring	• Monitoring must be undertaken to ensure emissions are not exceeding the legal limits. • A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, of appropriate acted upon.
Corrective Actions/Reporting	• Initial monitoring undertaken following commissioning to ensure emissions are meeting specified levels. • If monitoring results or complaints indicate inadequate performance, then the source of the problem must be identified, and existing procedures or equipment modified to ensure the problem is rectified. • The station manager is to keep an environmental incident reporting system to record non-conformances. • The Power Station Manager will report on compliance with the EMP if required by the administering authority. •

7. Water Management

Element	Management Plan
Potential Impacts	Wastewater entering the surrounding areas / system
Sources	• Stormwater • Firefighting water • Potentially contaminated bund water • Effluent from turbine blade washing • Storage of diesel for turbine operation • Management of potentially contaminated stormwater run-off • Landscaping and gardening
Controls/actions	• All chemical/hydrocarbon storage areas must be bunded. • All plant and chemical usage areas must be paved. • Potentially contaminated water must be directed to an oil/water separator. Oily water must be removed from the site under controlled conditions and disposed of at the licensed PetroSA waste site. • Any run-off that is discharged from the site must be uncontaminated. • All vehicle transfers of materials must be conducted within a bunded area to minimise the potential for spills to enter the stormwater. • Spills of potential contaminants must be immediately cleaned up and neutralised. Such spills must be handled with consideration to health and safety considerations. • The use of water to clean up spills must be avoided except where absolutely necessary. • Movement of vehicles on and off site is to be through approved access points only. • Spill kits must be made available on site for the clean up of spills and leaks of contaminants. • Spill response procedures to include removal/disposal of potentially contaminated water and any used absorbent materials.
Maintenance	• The water quality control structures used on site must be monitored and maintained in a fully operational state at all times. • Ensure incident/complaint registers are established and maintained.
Monitoring	• Monitoring program to be developed in consultation with relevant authorities and Stakeholders.
Corrective Actions/reporting	• Corrective action is required to be undertaken immediately on a complaint being made, or potential/actual leak or spill of polluting substance identified. This includes stopping the contaminant from further escaping, cleaning up the effected environment as much as practically possible and taking preventative measures. • An incident reporting system will record significant events and issues with the sediment and water quality controls. • In the event of a major spill or leak of contaminants, the

Element	Management Plan
	administering authority must be contacted immediately as per incident reporting procedures. • The Power Station Manager will report on the performance of the sediment and water quality control measures when required by the administering authority. • In the event that water quality at the monitoring locations is found to fall outside of the prescribed guideline levels, the source of the deviation must be investigate and measures taken to correct the problem. • No ground water or surface water must be polluted by any activities on site. • Should any negative effects on the quality of groundwater become apparent these must immediately be reported to DWAF, Mossel Bay Municipality and DEA&DP.

8. Maintenance of Rehabilitated areas

Element	Management Plan
Controls	• Monitoring of plant growth in rehabilitated areas will be conducted on a monthly basis during initial phases and on a six-monthly basis when plants have become firmly established. • Vegetation must be replanted in areas where vegetation cover has decreased due to dieback, or has failed otherwise to successfully establish. • Noxious weeds, invasive and alien species will be controlled by pulling, cutting or any other means approved by the Site Manager. The use of herbicides will not be allowed unless specified by the Site Manager. Bare patches will be replanted.

9. Waste management

Element	Management Plan
Potential Impacts	• Ineffective use of resources resulting in excessive waste generation • Litter or contamination of the site or water through poor waste management practices
Sources	• Office and workshop facilities • Transformers and switchgear • Fire services and fire water storage • Water storage tank • Fuel and oil storage
Actions/Controls	• All structures and/or components replaced during maintenance activities are appropriately disposed of at an appropriate DWAF licensed waste disposal site or sold to a recycling merchant for recycling. • Ensure that care is taken to ensure that spillage of oils and other hazardous substances are limited during maintenance. Should any accidental spillage take place, it must be cleaned up according to specified standards

Element	Management Plan
	regarding bioremediation. • Waste handling, collection and disposal operations are managed and controlled by an individual competent in waste management. • Wastewater ∗ Water from bunds and oily water from oil/water separator must be removed under controlled conditions. • Waste – Leaked oil and chemicals ∗ Appropriate disposal must be arranged with a licensed facility in consultation with the administering authority ∗ Waste must be stored and handled according to the relevant legislation and regulations. • General Waste ∗ Recycled where possible or disposed of properly to landfill as designated by the administering authority • Hazardous Waste ∗ Separate hazardous and general waste and dispose hazardous waste to an appropriate hazardous waste disposal site. • Sewage ∗ Disposal to municipal sewer.
Maintenance	• Uncontaminated waste must be removed at least weekly for disposal • Contaminated or regular wastes must be disposed of as necessary and in accordance with legislation • An incident/complaint register must be established and maintained
Monitoring	• Wastewater pumped to evaporation ponds, if any, to be tested periodically • Visual inspection of the site must be carried out daily for evidence of litter or waste material that has been inappropriately disposed of by site personnel • Waste collection must be monitored on a regular basis • Waste documentation must be completed and available for inspection on request • A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon. • Monthly reports on exact quantities of all waste streams exiting the site must be compiled and monitored by the SHE management representative. All appropriate waste disposal certificates accompany the monthly reports.

Element	Management Plan
Corrective Actions/Reporting	• Corrective action is required to be undertaken immediately after a complaint is made or non-conformance is identified. • Upon the identification of any non-conformance, appropriately feasible remediation measures must be determined and implemented. • An incident reporting system will record and manage follow up of resolution of non-conformances • The Power Station Manager will report on compliance with the EMP if required by the administering authority.

10. Storage, Handling and Management of Hazardous Substances

10.1 Specifications for the Decanting and Purification of transformer oil

(a) Description

Fuel storage and spill prevention during the transformer oil decanting and purification process.

(b) Programme

To ensure safe storage of oil and efficient handling of hazardous substances for the duration of the transformer oil purification process.

(c) Construction sequence and method

An Alphabetical Hazardous Chemical Substance (HCS) control sheet will be drawn up and kept up to date on a continuous basis. All hazardous chemicals that will be used on site will have Material Safety Data Sheets (MSDS). All employees working with HCS will be trained in the safe use of the substance and to work according to the MSDS.

(d) Storage

During the decanting and purification process the oil will be stored in mild steel or stainless steel containers on a plastic ground (tarpaulin) cover.

All relevant no smoking, no naked flames, and no eating signage will be displayed in the storage area.

Fire extinguishers will be placed in the storage area. All relevant signage will be present.

A full spill kit will be present at all times. Spillage kits are to be kept in the Oil Purification Plant for easy access.

(e) Handling

The following will be adhered to at all times:

I. Oil decanting will only be done if Tarpaulins are in place
II. Drip trays will be placed under all joints.

III. Oil spills are dangerous and should be cleaned immediately. They are to be reported to the site manager and ECO immediately.

(f) Disposal

Oil soiled rags/waste are not to be disposed of in the normal dustbins, but kept in a separate drum in the store for disposal.

Element	Management Plan
Potential Impacts	• Release of contaminated water from contact with spilled chemicals • Fuel source for on site fires • Generation of contaminated wastes from used chemical containers and spill clean up • Storage of Fuel
Actions/Controls	• Management strategies/operational procedures for the routine monitoring and inspection of fuel tanks, pipelines and other fuel related equipment will be compiled and implemented. • The storage of flammable and combustible liquids such as oils will comply with the relevant legislation. • The storage and handling of corrosive substances must be in accordance with the relevant legislation • The minimum amount of fuel required for efficient operation of the facility must be stored on site. • Any spills will be rendered harmless and arrangements made for appropriate collection and disposal, including cleaning materials, absorbents and contaminated solid in accordance with this EMP • Ensure that spill kits are available on site to clean up spills and leaks. • Obtain any permits and approvals necessary and comply with the conditions attached to such permits ad approvals • Transport of all hazardous substances must be in accordance with the relevant legislation. • Identify and maintain a register of all activities that involve the handling of potentially hazardous substances, as well as devise and supervise the implementation of protocols for the handling of these substances. This will include all fuels, oils, lubricants and grease. • Ensure that all hazardous substances are handled in accordance with the manufacturer's specifications, legal requirements and Eskom's procedures. • Store all hazardous substances in a manner prescribed in the relevant Acts and Regulations (e.g. in a well-ventilated area). • Implement appropriate actions and measures to reduce, stop or contain a spill of potentially hazardous substances (e.g. fuel or lubricating oil). • Implement appropriate actions and measures to reduce or prevent contamination of the ground and surface water as a result of a spill of potentially hazardous substances.

Element	Management Plan
	• Arrange and supervise the implementation of clean up operations and proper disposal of contaminated materials at a licensed hazardous waste disposal site. • Keep written records detailing the type of spill, the corrective and remedial measures implemented in the stopping or reduction of the spill, and the clean up of the spill. Such progress reporting is important for monitoring and auditing purposes and the written reports may afterwards be used for training purposes in an effort to prevent similar future occurrences. • All such tanks to be designed and constructed in accordance with a recognised code (international standard). • The rated capacity of tanks must provide sufficient capacity to permit expansion of the product contained therein by the rise in temperature during storage. • Tanks must be situated in a bunded area the volume of which must be at least 110% of the proposed volume of the tank. • The floor of the bunded area must be smooth and impermeable, constructed of concrete or plastic sheeting with impermeable joints with a layer of sand over to prevent perishing. The floor of the bunded area will be sloped towards an oil trap or sump to enable any spilled fuel and/or fuel –soaked water to be removed. • The fuel delivery area must be bunded and an interceptor system must be installed, with all drainage directed to an oil water separator. This will allow for the removal of free product from any surface run-off or spillages. The interceptor system must contain a holding tank that is used to contain any free product recovered. Free product must be removed from this separator, stored in a holding tank, and recycled or disposed of in an appropriate manner. • Internationally approved non-corrosive pipework systems must be installed (approved codes). • Antiflash nozzles must be installed at the end of the vent pipes and provisions must be made for overfill protection devices in the tank filling pipes to prevent tank overfills during filling operations. • Fuel must be dispensed via a system that has mechanical leak detectors linked to the fuel lines. These link detectors must form an integral part of the pumping system and allow for automatic cut-off of the fuel supply must a leak be detected. • Any water that collects in the bund must not be allowed to stand and must be removed and the hydrocarbon digestion agent within must be replenished.
Maintenance	• Spill and emergency response equipment must be accessible at chemical transfer/unloading points and refueling locations. • Bunds and storage facilities must be maintained to ensure

Element	Management Plan
	design capacity is available. • Water which ponds within the bunded areas must be pumped to the oil/water separator as soon as possible after rain events cease.
Monitoring	• Observation and supervision of chemical storage and handling practices and vehicle maintenance by Station manager throughout the power station's operational phase • Inspection of demineralization plant chemicals storage for corrosion • Inspection of bunding integrity, stability and function • A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.
Corrective Actions/Reporting	• Corrective action is required to be undertaken immediately after a complaint is made or non-conformance is identified • An incident reporting system will record and manage follow up of non-conformances • The Power Station Manager will report on compliance with the EMP if required by the administering authority.

11. Traffic and transport

Element	Management Plan
Controls	• Transport of hazardous substances ∗ The supplier must obtain relevant permits and obtain approval for the transport routes to be used. ∗ The routes to be used must be communicated to the local community. ∗ A management Strategy must be implemented for the delivery of hazardous substances. ∗ Hazardous substances delivery must be done during times that will have minimum impact on traffic along the routes taken • Access and Traffic control ∗ All drivers will be in possession of an appropriate valid driver's license. ∗ All maintenance vehicles travelling on public roads will adhere to the specified speed limits. ∗ Moderate speeds (to be agreed to by Eskom) will be employed and adhered to on all roads within the OCGT Plant area. ∗ The movement of all vehicles will be controlled such that they remain on designated routes. ∗ No member of the workforce will be permitted to drive a vehicle under the influence of alcohol or narcotic substances. ∗ No deviation from approved access roads or transportation routes will be allowed.

Element	Management Plan
	* Appropriate security measures must be established with regards to access into the OCGT Plant. * During vehicle tanker delivery, the tanker driver and adequately qualified staff must be present at all times during product offloading. * Hazardous substances tankers must not travel in convoy when delivering fuel.