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PROPOSED COMMERCIAL CONCENTRATED SOLAR POWER (CSP) FACILITY




Draft Social and Environmental Management Programme
(SEMP) Report

2012/09/07

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2012/09/07

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Acronyms

CSP	Concentrated Solar Power
DEA	National Department of Environmental Affairs
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EO	Environmental Officer
NEMA	National Environmental Management Act (No. 107 of 1998), as amended (2010)
SEMP	Social and Environmental Management Plan
SEMS	Social and Environmental Management System
SMME	Small, Medium and Micro Enterprises
SNE	Sasol New Energy Holdings (Pty) Ltd
PM	Particulate Matter
PPE	Personal Protective Equipment

Glossary of Terms

Environment	The surroundings within which humans exist and that are made up of (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) any part or combination of (i) and (ii) and (iv) the inter relationships among and between them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.
Emergency incident	An unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed (e.g. groundwater contamination may take months or years before for the impact has an effect on the community).
Hazardous Waste	Any waste that contains organic or inorganic elements of compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

Chemical Symbols

NO₂	Nitrogen dioxide
SO₂	Sulphur dioxide

1 Introduction

1.1 Project background

Sasol New Energy Holdings (Pty) Ltd (SNE) proposes to develop a Commercial Concentrated Solar Power (CSP) facility near Upington, in the Northern Cape Province, hereafter referred to as the Sasol CSP Project or Project Solis.

The proposed Sasol CSP Project involves activities in Government Notices 544, 545 and 546 of 2010, published in terms of the National Environmental Management Act (No. 107 of 1998), as amended (2010) (NEMA). Prior to commencement of any activities listed in these notices, an Environmental Authorisation (EA) from the National Department of Environmental Affairs (DEA) is required.

WSP Environmental (Pty) Ltd (WSP) was appointed by SNE as the independent environmental assessment practitioner (EAP) on the 28 March 2012 to undertake the Scoping and Social and Environmental Impact Assessment (S&SEIA) process required in application for an EA.

As part of the SEIA project specific impacts and risks were identified. The Social and Environmental Management Plan (SEMP) is developed to provide mitigation and management measures for the impacts identified.

Based on the results of the impact assessment, recommendations have been made on the management strategy that should be implemented for the construction, operation and decommissioning phases of the proposed Sasol CSP Project.

The overall management plan has been based on the premise of sound environmental management and cost effective measures that will ensure wherever possible a stand-alone solution to the remediation of the impacts caused by the project phases.

It should be noted that the SEM should be regarded as a live document and that additional or alternative measures should be incorporated during course of the implementation of the plan where required, in order to ensure that the objectives as set by the document are met.

2 Organisational Commitment

It is recommended that an Environmental Officer (EO) be appointed prior to the commencement of the each project phase. Responsibilities should include, but not limited to ensuring adherence to SEM guidelines, guidance of activities, planning, reporting, adaptive management and incident control. The EO shall be a suitably qualified employee of the project owner.

2.1 Construction Phase

The EO will be responsible for the guidance of activities, planning, reporting, adaptive management and incident control during the operational phase of the project.

The Principal Contractor will be required to allocate the responsibility of overseeing day-to-day compliance with the SEM to a senior member of his / her staff. The Principal Contractor will be responsible for the implementation of all measures included in the SEM for all activities undertaken in terms of the construction contract (including work undertaken by sub-contractors).

Compliance reviews will be submitted by the Principal Contractor to the EO on a weekly basis. Non-conformances, incidents and deviations from the management plan will be communicated to the EO as soon as practically possible, within a 24hr period from the time of occurrence, .

The project owner will appoint a suitably qualified independent consultant to verify compliance on a monthly basis for the duration of the construction phase.

2.2 Operational Phase

The EO will be responsible for the guidance of activities, planning, reporting, adaptive management and incident control during the operational phase of the project.

SNE will appoint a suitably qualified independent consultant to verify compliance on an annual basis for the duration of the operational phase.

Periodic reports, as they relate to compliance with the SEMP (including environmental legal compliance) and overall environmental performance, will be submitted to a SNE senior executive for review.

2.3 Decommissioning Phase

The EO will be responsible for the guidance of activities, planning, reporting, adaptive management and incident control during the decommissioning phase of the project.

The Principal Contractor will be required to allocate the responsibility of overseeing day-to-day compliance with the EMP to a senior member of his staff. The Principal Contractor will be responsible for the implementation of all measures included in the SEMP for all activities undertaken in terms of the demolition and dismantling contract (including work undertaken by sub-contractors).

Compliance reviews will be submitted by the Principal Contractor to the EO on a weekly basis. Non-conformances, incidents and deviations from the management plan will be immediately communicated to the EO.

SNE will appoint a suitably qualified independent consultant to verify compliance on a monthly basis for the duration of the decommissioning phase.

3 Training

All persons responsible for undertaking work during the life of the project will be trained on the contents of the SEMP. It is recommended that the principles of the SEMP be included in the Induction Programme for the site.

Periodic informative sessions should be undertaken to ensure that any changes to the SEMP are communicated effectively and to ensure sustained learning regarding the contents of the SEMP.

4 Social and Environmental Management System

It is recommended that the contents of the SEMP be integrated in the overall Social and Environmental Management System (SEMS) to be implemented for the site. The SEMP must be developed to ensure that key performance indicators, set within certain parameters, are monitored, reported and problems identified well in time for appropriate action to be taken.

5 Grievance Mechanism

The EO will develop and maintain a complaints register on site. The complaints register must include:

- The date when a complaints was received;
- The details of the complainant (name, address, contact number);
- A detailed description of the complaint received;
- A detailed description of the corrective action taken, and
- A record of any follow-ups with the complainant regarding the effectiveness of the corrective action.

6 Stakeholder Consultation

Continued Stakeholder Consultation must be undertaken during all phases of the project. It is recommended that a Stakeholder Forum be established including directly affected parties, representatives from the local municipality and other identified persons. The forum will serve to communicate project progress, material changes to the project, grievances received and corrective action taken.

7 Social Aspects

The management measures outlined for social aspects as it relates to employment, employee wellness, safety and security, services to workers and gender issues is applicable to all phases of the project.

7.1 Employment

It is SNE's intention to employ local labour, in line with the IPP requirements. This is likely to have a positive impact on local communities and have downstream impacts on household income, education, and other social aspects.

With the implementation of specific skills training for local communities, SNE has the opportunity to develop local employee potential. These costs could be offset against the cost of relocating people from outside the region (i.e. higher labour costs, transport, relocation costs, etc.). In addition, it was highlighted that awareness training for the youth would assist in vocational guidance and the long-term development and skills base in the region. This is crucial to the long-term development of skills and education in the area, as firstly, there is no university in the region (the only high-education institution is the rural Further Education and Training college in Upington), and secondly, the youth are not aware of what training they require to make use of the employment opportunities offered. These skills would be transferrable to other sectors, and potentially result in long-term employment, beyond the construction phase.

To maximise the socio-economic benefits of the Sasol CSP Project, the implementation of enhancement measures must be investigated, including:

- Ensuring that contractors have a local SMME policy and they act upon this policy;
- Investment in local business development; and
- Partnering with, or at least obtaining cooperation, from the local and district municipalities.

SNE should initiate a local educational and awareness programme to potentially develop skills within the local area required for operational phase jobs. Implementing skills development policies through contractors would provide for a more stable workforce with greater employment possibilities. This impact could be enhanced should SNE implement education and awareness development programmes within the local area, schools, and tertiary education institutions (e.g. FET College in Upington).

7.2 Employee Wellness (HIV&AIDS)

Mitigation includes health and safety measures to be included in a Health and Safety Plan and communicated to the labour force¹:

- In consultation with local HIV/AIDS organisations and government structures, design and implement HIV/AIDS awareness and prevention campaign. This campaign should use various common practice methodologies in order to ensure social and cultural sensitivity;
- Develop a HIV/AIDS awareness and prevention program;
- Provide free condoms to all workers. Condoms should be located in the bathrooms on site;

¹Adapted from Kathu Solar Project SIA, 2010.

-
- A Voluntary Counselling and Testing program must be introduced; and
 - Undertake a HIV/AIDS prevalence survey amongst all workers on a regular basis. It will involve a voluntary test available to 100% of the workforce. The results of the survey will help to determine the HIV/AIDS strategy. When and if statistically representative results are obtained then the results of the survey should be made available to management and workers at the same time. Results should be presented as statistical returns that ensure confidentiality.

7.3 Community Health and Safety

The proponent will during the project life continue to seek opportunities (other than those identified in the Social and Environmental Impact Assessment) to improve environmental conditions, such as improvement in potable water availability or sanitary wastewater collection, treatment, or discharge, especially where these can be provided at marginal cost to the project.

Impacts on drinking water sources, whether public or private, will at all times be protected so to meet or not exceed standards. Alleviation of service pressure could be achieved through a number of means:

Community Trusts: The development of Community Trusts within identified local communities (specifically the McTaggerscamp community, as identified by the local municipality) could assist with the provision of services, housing and skills training.

- Housing: Should labourers be required to be housed in Upington (one potential scenario), SNE (or their relevant contractor) have an opportunity to discuss opportunities with the local municipality to provide formal housing for labourers, which could be handed over to the municipality to manage in the long-term (post-construction). The local municipality has indicated that they would be willing to provide land for housing, as this is available. There are, however, no services to many of these areas. These would have to be put in place by the relevant contractor. It may also be possible to enter into a “joint-venture” arrangement with the municipality to meet these housing/service needs.
- Services: Service provision for the project during construction would need to be provided by SNE, or relevant contractors. There are opportunities to form cooperative agreements with surrounding farmers, and other businesses in the area, to provide services such as water, waste removal and sewage disposal/treatment. This was indicated by stakeholders during the social impact assessment. These services could also be offered to neighbouring communities in order to alleviate pressure on service delivery in the rural area of the local municipalities.

7.3.1 Community Disease

SNE will put in place adequate surveillance programs to screen the health of workers, which may include documenting and reporting on existing diseases to avoid any inadvertent introduction of new or highly resistant diseases into host communities. Any health information obtained as part of these efforts, to prevent the transmission of communicable diseases, may not be used for exclusion from employment or any other form of discrimination.

Specific education and training programs for transportation contractors must be developed and implemented to prevent the further transmission of communicable diseases.

- Surveillance, active screening and treatment will be provided to workers in order to prevent the spread of illness in local communities by:
 - Undertaking health awareness and education initiatives.
 - Training health workers in disease treatment.
 - Conducting immunization programs for workers in local communities to improve health and guard against infection.
 - Providing health services (treatment through standard case management in on-site or community health clinic).

- Promoting collaboration with local authorities to enhance access of workers families and the community to public health services and promote immunization facilities.

7.3.2 Emergency Incidents

The project owner will, throughout the life of the project, continue to assess possible risks to the communities as it relates to emergency incidents such as the uncontrolled release of pollutants and fire. Specific and timely information on appropriate behaviour and safety measures will be adopted in the event of an accident including practice drills in locations with higher risks, if required.

Communities and other stakeholder will have access to information necessary to understand the nature of the possible effect of an accident and an opportunity to contribute effectively, as appropriate, to decisions concerning hazardous installations and the development of community emergency preparedness plans.

Specific attention must be given to the transportation of any hazardous materials. A Procedure must be developed to ensure compliance with local laws and international requirements applicable to the transport of hazardous materials, including waste classification and hazard analysis, labelling, emergency response approach, vehicle and container specifications, training of the drivers, risks associated with the transportation route etc.

Where the consequences of emergency events are likely to extend beyond the project boundary (e.g. hazardous material spill during transportation on public roadways), emergency response plans will be developed based on the risks to the health and safety of the affected community and other stakeholders.

Emergency plans must address the following aspects of emergency response and preparedness:

- Specific emergency response procedures.
- Communication strategy.
- Trained emergency response teams.
- Emergency contacts and communication systems/protocols.
- Procedures for interaction with local and regional emergency and health authorities.
- Protocols for fire truck, ambulance, and other emergency vehicle services.

7.3.3 Safety and Security

Measure to reduce safety and security risk would include the following:

- The sites should be fenced off to prevent access into these sites;
- Fencing is to be inspected weekly and maintained properly until closure;
- Trespassing on neighbouring properties must be forbidden and measures to incorporate transgression into a disciplinary code must be taken and explained to the workforce;
- Ensure that signs, which should be pictorial and in the vernacular, are erected on all boundary fences warning against entering the site; and
- Public awareness programmes should be developed with the community to identify areas of particular risk and approaches to reduce risk. This is expected to include awareness programmes at schools along roads leading to the site to advise children of the dangers of traffic as well as other frequent users.

8 Social and Environmental Management Plan

8.1 Construction Phase

8.1.1 General

The following general measures as it relates to compliance, community relations, site access and site establishment applies:

- Non-compliance to management measures: All tendering contractors will be made aware of the contents of this SEMP. The EO will induct all contractors and sub-contractors and personnel working on the project on the contents of this SEMP and any penalties arising from non-compliance.
- Loss and/or transformation of sensitive areas resulting in disruption of ecological function: The EO shall clearly identify the areas that must be protected from disturbance by the contractors' activities at the commencement of the contractors' contract. The Contractor shall restrict all its activities, materials, equipment and personnel to within the area/s specified.
- Non-compliance with local legislation: SNE and all appointed contractors must be aware and comply with the provisions of the relevant legislation.

8.1.2 Environmental Education and General Training

- Non-compliance to management measures resulting in unacceptable impacts: Ensure that all site personnel have a basic level of environmental awareness training. The Contractor must submit a proposal for this training to the Environmental Consultant or Environmental Officer for approval. Topics covered should include:
 - What is meant by "Environment"?
 - Why the environment needs to be protected and conserved.
 - How construction activities can impact on the environment.
 - What can be done to mitigate against such impacts.
 - Awareness of emergency and spills response provisions.
 - Social responsibility during construction e.g. being considerate to local residents.
- Training should be provided to the staff members in the use of the appropriate fire-fighting equipment.
- The EO should be on hand to explain more difficult / technical issues and to answer questions.
- The need for a "clean site" policy also needs to be explained to all staff.

8.1.3 Climate

To minimise the release of greenhouse gasses to the atmosphere, maintenance of vehicles with specific focus on exhaust systems are required. Energy conservation programmes will be required to be put in place.

8.1.4 Air Quality

The following management practices must be implemented:

8.1.4.1 Roads

- A maximum speed limit of 40km/h for vehicles travelling on unpaved roads is recommended. Additionally, through adequate planning, limit the number of vehicles travelling on unpaved roads to reduce dust generation.
- Wet suppression may be implemented on unpaved roads, by spraying the surface of the road, to keep it damp and so reducing airborne particulates. The project site is situated in an arid region, chemical stabilisers are preferred². It is not recommended at sites with high traffic volumes or heavy vehicles. This method is best used where the road is close to sensitive receptors, to avoid nuisance dust.
- During the offloading of vehicles, to keep the drop height to a practicable minimum to minimise dust generation.

8.1.4.2 Soil Stockpiles

- Long term storage piles, such as top and subsoil, which will be used for rehabilitation at a later stage, should be hydro-seeded or vegetated. A short term method which can be deployed to reduce windblown dust from piles is to cover waste piles with shade netting to avoid windblown dust (should measures be required);
- It is recommended that stockpiles be situated away from the site boundary and nearby receptors and should take into account the predominant wind direction, in order to mitigate the potential effects of windblown fugitive dust on sensitive receptors.

8.1.5 Noise

Baseline noise levels are expected to be low and any increase in the ambient noise levels will result in noise impacts. During the construction phase, the activities responsible for the increased noise levels include construction of surface infrastructure, the operation of diesel generators which will provide initial site power and heavy vehicles.

Construction activities that may be considered as noisy must be undertaken during normal working hours (weekdays 8h00 – 17h00 and weekend 8h00 – 13h00). In the event that activities, that may be regarded as noisy, is undertaken outside of the specified working hours, all noise receptors will be informed of such activities in advance.

The provisions of SANS 10103:2004 shall apply to all areas within audible distance of neighbouring occupants.

The preferred method for controlling noise from stationary sources is to implement noise control measures at the source. Methods for prevention and control of sources of noise emissions are dependent on the source and proximity of receptors. The following noise reduction mitigatory options are recommended to keep noise levels within the legislative limits:

- Ensure the required silences are fitted on all engines and compressors.
- Where practical, the engineering design has made provision for the installation of enclosures around source equipment.
- On site generators should be clad in suitable material or housed in structures that would reduce their noise impacts.
- Enforce an appropriate speed limit for all vehicles.
- Regular maintenance of heavy equipment, vehicles and earth moving machinery.
- To address impact associated with occupational exposure, PPE should be worn as specified by Occupational Health and Safety Legislation.

² The chemical dust suppressant used must be confirmed to be non-hazardous, and environmentally friendly.

- Any noise complaints received will be subject to a complaints management system that provides for the assessment and management of the complaint.
- For persistent noise complaints, specific monitoring of noise should be undertaken to determine whether daytime levels exceed ambient (existing baseline noise level) +3 dBA.

Measurement method to ensure implementation of actions:

- Monthly noise monitoring is required in order to measure daily levels of exposure, and implement mitigation measure when required. These values will assist in assessing the impact of noise on the surrounding environment and the nearby sensitive receptors.
- The Site Manager shall investigate all noise complaints, or an official appointed by him / her, and assessed to determine if the noise is unreasonable. All complaints will be recorded and kept on file.

8.1.6 Soils

The management strategy proposed for the construction phase includes:

- The minimisation of the area to be disturbed for the construction of surface infrastructure as far as is possible, and
- Implementation of the mitigation and on-going rehabilitation plan pertaining to any temporary structures or facilities.

The objective is to:

- Strip and stockpile the topsoils and subsoils that are to be removed for infrastructure development and all, and
- To conserve the natural resources (soil) that will be needed as part of the rehabilitation process.

The mitigation measures aim to reduce the impacts of construction on the areas that are to be disturbed and post operation, to rehabilitate all un-used areas after construction so as to create a feature that emulates the existing landscape as closely as possible, and does not adversely impact on the area in general.

8.1.6.1 Soil Handling and Removal

The basic philosophy used in the management of soils is one of "Total Soil Utilisation", and is based on the understanding that all "utilisable" soil will be removed and stored for use for rehabilitation. With this basic understanding, a more detailed prescription for the handling of the soils during the construction phase is proposed. The topsoil portion of the profile must be stripped and stockpiled separately from the subsoils wherever possible.

The soils removed from the access road must be stored as close as possible to the road for rehabilitation of the infrastructure at decommissioning.

Stripping is undertaken to conserve the valuable natural resources that will be needed as part of the rehabilitation and the following stripping is recommended:

Table 1: Soil Stripping Ratios.

Area / footprint of impact	Stripping depth	Soil type	Storage	Stripping Sequence
Road ways	500 mm	Top and subsoils	Top and subsoils stored separately	Progressive stripping is recommended as the road building progresses
Infrastructure footprint	500 mm	Top and subsoils	Top and subsoils stored separately	All infrastructure areas are to be stripped prior to commencement of construction

8.1.6.2 Soil Emplacement and Storage

The soil emplacement and storage process will comprise the following action items:

- The storage of all soil should be designed to be upslope of the proposed facilities that are to be constructed, where feasible, but in close proximity to the area that will need to be rehabilitated;
- It is proposed that the construction of the topsoil storage stockpiles is undertaken in a series of 1.5m lifts if the storage facilities are to be greater than 1.5m high. Subsoils can be stored in stockpiles as required;
- Any top or subsoils that will be stored are to be adequately re-vegetated as soon as possible and maintained. This will reduce the effects of erosion, compaction and nutrient loss. It is recommended that the following actions be implemented:
 - Store the stripped soils in well-constructed stockpiles on a compacted footing (95% MODAshto) close to the areas where the soils will be needed for rehabilitation purposes;
 - Store the stripped subsoils as a separate stockpile alongside the topsoils or in areas close to where they will be used for rehabilitation;
 - It is imperative that the slopes of the soil stockpiles are constructed to 18 degrees or less slope angle. This will minimise the occurrence of erosion of the topsoil / subsoil and allow for the mechanical management of the soils on the slopes.
 - Vegetative cover to the topsoil and subsoil stockpiles must be encouraged (addition of fertiliser, compost, seed mix, temporary irrigation).

The soils are exceptionally sensitive to wind and water erosion if exposed (de-vegetated), and will need to be conserved if there is to be sufficient material of good quality (nutrient content) at the time of rehabilitation. It may be necessary in the first two to three months to use a synthetic dust suppressing agent or some other bio-degradable dust suppressant to minimise the effects of wind and water erosion, until vegetation has reached an 80% cover.

Soil should be replaced as soon as possible where there are sites that are no-longer to be utilized or are prepared for final rehabilitation during the construction and operational phases. These soils are to be prepared as a medium that will support vegetative re-growth.

8.1.6.3 Fertilisation and Amendments

It is recommended that a standard commercial fertilizer high in the standard elements is added to the soil before re-vegetation, at a rate of 10-20kg/ha (application rate to be confirmed based on analysis). The fertilizer should be added to the soil in a slow release granular form.

8.1.6.4 Soil Erosion

Areas showing erosion within the project boundary, and other areas directly affected by the operations, due to wind or water activity should be addressed timeously (not exceeding one month) from when the erosion is first noticed. The treatment of the erosion will depend on the type of erosion and the following guidelines are to be followed:

Wind Erosion:

Where wind erosion is noticed and depending on the circumstances, any of the following measures should be implemented:

- Increased re-vegetation effort;
- Temporary application of synthetic / bio-degradable soil stabilisation product, and/or
- The construction of a temporary / permanent wind break structures.

Water Erosion:

- Construction of rip-rap structure, placement of small stones to break water speed or other suitable engineering solution to prevent on-going erosion;

-
- Increased re-vegetation effort; and
 - Temporary application of synthetic / bio-degradable soil stabilisation product.

The areas affected by erosion are to be monitored after the implementation of the corrective action in order to ensure the effective rehabilitation of the area.

8.1.6.5 Hydrocarbon Contamination Amelioration

Hydrocarbon contamination of soils (and other components of the receiving environment) should be avoided through the implementation of good housekeeping practices, including the following:

- Vehicle and equipment repairs are to take place only in designated workshop areas where the appropriate management measures have been implemented;
- The designated workshop areas are to be constructed with an area of hard standing material (concrete or other) to prevent seepage of foreign material into the soils. Such surfaces are to be drained to the oil skimmer and sump for treatment of surface runoff water;
- Bunding should be provided around areas where hydrocarbon material or chemicals are to be stored or handled and any surface runoff is to be collected and treated appropriately, and
- Where vehicles or equipment are repaired under emergency conditions outside of the designated areas, drip trays capable of accommodating all fluids are to be used in as far as is practically possible. All liquids collected are to be contained and taken to the designated area for appropriate treatment or disposal.
- The refuelling of vehicles will be undertaken in a designated area, on an impermeable surface. Such surfaces are to be drained to the oil skimmer and sump for treatment of surface runoff water.

Hydrocarbon and / or chemical spills are to be contained through the use of a physical barrier, to prevent the spread of the spill;

- The spatial extent of the spill is to be determined (surface and depth);
- The affected materials are to be excavated from the in-situ location and containerised, and
- The affected material is to be removed to the closest facility capable of dealing with hydrocarbon contaminated materials.

8.1.7 Soil Contamination: Batching Plant

In terms of housekeeping for all activities involving concrete (batching plant or smaller site specific mixing operations):

- The batching / mixing area shall be kept neat and clean at all times.
- No batching / mixing activities shall occur on a permeable surface.
- All runoff from such areas shall be strictly controlled, with contaminated water collected, stored / contained and disposed of at an approved waste disposal site.
- Unused cement bags shall be stored so as not to be affected by rain / runoff.
- Used cement bags shall be stored so as to prevent windblown dust and potential water contamination. Used bags shall be disposed of regularly via the solid waste management system.
- Concrete transportation shall not result in spillage.
- Cleaning of equipment and flushing of mixers shall not result in pollution, with all contaminated wash water entering the waste water collection system.
- To prevent spillage onto roads, ready mix trucks shall rinse off the delivery shoot into a suitable sump prior to leaving the site.
- Suitable screening and containment shall be in place to prevent windblown contamination from cement storage, mixing, loading and batching operations.

- All contaminated water and fines from exposed aggregate finishes shall be collected and stored in sumps for disposal at an approved waste disposal site.
- All visible remains of excess concrete shall be physically removed on completion of the plastering or concrete pouring and disposed of in an acceptable manner.

8.1.8 Land Capability

The land use and capability will change as a result of the development project. Limited mitigation measures can be applied for the management of the impact. Through proper planning, the construction activities must be executed in such a way to minimise the footprint as far as possible through the following measures:

- Areas of construction should be limited in extent; and activities outside of this designated area limited.
- Due to the compaction and/or erosion of soils due to vehicles, traffic should be limited to existing or proposed roadways as far as possible. The construction of roads should be limited in width and length as far as is practical to limit impacts.

After the decommissioning of the facility the land use and capability will be restored as far as practically possible through:

- The effective replacement of the soils;
- The correct order of replacement of the soils and the preparation of an adequate seed bed will facilitate the re-vegetation program, will help to limit the potential for erosion, and will enhance the ability of obtaining a land capability of at least a grazing rating, and
- The amelioration of the soils will enhance the capability of the soils, aid in the prevention of erosion and the sustainability of the vegetative cover.

8.1.9 Surface Water

During the construction phase, the stripping of vegetation and topsoils will have an impact on surface water movement. The potential of hydrocarbon and / chemical spills may result in the pollution of surface water. Mitigation for this impact includes the following:

- Areas to be stripped are to be limited to the active and required areas as far as is practical. Where excavation occurs, it is recommended that erosion control measures are implemented to ensure any entrained sediments in runoff have time to settle before reaching watercourses.
- Erosion mitigation must be applied as outlined in Section 8.1.6;
- To correct storage and management of hydrocarbons and chemicals as outlined in Section 8.1.6 must be applied.
- Sanitation should be adequate to ensure sewage does not reach watercourses due to pipe leaks or improper sanitation.

During the detailed design phase, a Digital Terrain Model (DTM) will be developed to determine areas of concentrated water flow as the operation progresses. This will enable the detailed design of storm water management structures to be implemented. The following principles will apply in the management of storm water:

- Although the impact of the development on flows is expected to be limited, it is proposed that runoff is not routed directly to a watercourse, but rather to the surrounding land. This will act to limit the impact of increased flows to the watercourse, and increase the soil water store.
- Due to the potential for erosional scour at the outlet, it is recommended that the flow is diverted to an area with a gentle topography with appropriate velocity dissipaters and erosional control where required.

Due to the infrequent rainfall and runoff expected in this arid area, a water quality monitoring plan is considered unfeasible.

8.1.10 Groundwater

8.1.10.1 Groundwater Quality

Groundwater contamination during this stage is regarded as unlikely and considered negligible, provided that the proposed waste management systems are put in place. Due to the infrequent rainfall and runoff expected in this arid area, a water quality monitoring plan is considered unfeasible.

8.1.11 Flora

The objective of the flora management plan, is to ensure the long term success of rehabilitation and the limitation and prevention (where possible) of ecological degradation. During the construction phase, it is important that the environmental footprint of the development be kept to a minimum. For this purpose:

- The clearing of vegetation should be kept to a minimum and should be limited to the areas where infrastructure will be erected;
- The areas of vegetation cover retention are to be maximised in order to create a mosaic of vegetation patches in order to retain some measure of ecological connectivity across the directly affected project site, and
- All operational areas are to be demarcated by means of a permanent fence or other suitable, temporary methods in order to control movement of personnel and vehicles, thereby providing boundaries for construction sites in order to limit dilution or spread of peripheral impacts.
- Sensitive areas as demarcated on the sensitivity map should be avoided as far as possible, and where features such as drainage lines must be traversed, precautions should be taken to ensure that impacts are minimized.
- Temporary lay down areas should preferably be within degraded areas as these areas are more resilient to disturbance.
- Sensitive areas such as drainage lines or pans which occur near to the development footprint should be demarcated by an ecologist prior to construction.
- Final development footprint should be searched by a suitably qualified person prior to construction for any species suitable for search and rescue such as *Hoodia gordonii*.
- The two tree species protected under the National Forests Act were observed within the site. The protected tree species observed were *Boscia albitrunca* and *Acacia erioloba*. These species are not common and no individuals of these species were observed within the development footprint. It is possible that some younger individuals may occur within the development footprint. A permit from the Department of Agriculture, Forestry and Fisheries (DAFF) is required for the destruction or transplant or transport of any protected tree species. At the initiation of the construction phase, prior to land clearing activities, the project owner will ensure that a suitably qualified specialist confirm the presence of the afore-mentioned tree species. Features with some flexibility such as underground or overhead cables and access roads should be routed to avoid large or protected trees wherever possible.

Preservation is to be undertaken through:

- The removal and appropriate storage of top and subsoils in areas where construction takes place, and
- The implementation of proper infrastructure construction practices to ensure maintenance of cleared areas in order to limit erosion and proliferation of weeds.

Conservation principles are to be applied, including:

- The prevention of the collection of plants, parts of plants and or firewood;
- The importation of foreign plant species is to be limited in as far as this is practical. It should be noted that no foreign plants, capable of natural replication is to be brought onto the site or used for on-going rehabilitation purposes;

- Only locally occurring plant species are to be used for on-going rehabilitation purposes;
- Avoid bringing material likely to be contaminated with alien plant seed onto the site. This includes topsoil and any organic matter such as compost, hay etc., and
- An alien plant identification, eradication and control programme is to be developed and implemented.

8.1.11.1 Fire Prevention

Fire prevention measures are to be implemented, including:

- Open fires will be prohibited at the construction site, except in designated, controlled areas;
- Fire control measures will be implemented and a Emergency Response Plan must be developed.

8.1.11.2 Vegetation Stripping Process

Top and subsoils will be removed from infrastructure related. Part of the soil stripping practice will comprise vegetation clearing. The following site / action specific mitigation measures are recommended:

- Prior to site clearance, relocate suitable trees and shrubs to specific areas and for specific purposes such as wind, visual and noise breaks (where practically possible);
- The remaining vegetation layer on site is to be removed together with topsoil to storage areas for use during rehabilitation;
- Re-vegetate all finalised areas on an on-going basis by means of establishing a layer of grasses and forbs (where practically possible).

8.1.12 Fauna and Avifauna

Limited mitigation for the impacts such as habitat destruction and alteration associated with the facility footprint exists, some mitigation measures are proposed that could significantly lessen the total impact of the proposed development project. No significant mitigation of the loss and degradation of pristine faunal habitat are possible. Impacts are to be geographically limited by prohibiting habitat degradation or destruction outside of the development area. The following management measures are recommended:

- The disruption of ecological connectivity, localised habitat as well as territorial infringement will result from the development project. All impacts must be limited to the project site itself and no land use changes or other disturbances of animals outside of the site are to be allowed.
- Minimise the amount of land to be cleared through effective planning.
- Staying clear of the drainage through maintaining an appropriate buffer zone (at least 30 m) between these areas and the erected structures.
- Avoiding initial construction activity during spring/summer as animals reproduce and disperse during this period.
- Relocating slow-moving animals like Tortoises, found during ground-breaking to nearby suitable, undisturbed areas.
- For increased human and mechanical activity, the mitigations that can be implemented relate to keeping human numbers as low as possible on site (strictly authorised staff only) and to limit movement of people and machinery to the footprint of the CSP site only.
- Dangerous interactions between personnel and venomous fauna can be reduced through awareness courses, posters, and other forms of education.
- An increase in poaching, snaring and trapping of animals may occur as a result of an influx of large numbers of people. Appropriate disciplinary action is to be taken against transgressors who poach, snare or traps animals. This aspect is to be addressed during the induction process.

- In order to manage and mitigate any impact of chemical compounds from the operation on animals, ensure that no leaching of chemicals occur to soils and groundwater resources, through the implementation of appropriate structures (i.e. bunding). Likewise, transportation and storage of all chemicals must be in a responsible manner.
- Attraction of fauna to open water sources may occur. Open water sources must be limited as far as is practicable. Should it become evident that animals are regularly accessing these open water sources, a boundary fence must be erected in order to limit access.
- In order to prevent the loss of natural faunal species to introduced faunal species, all pets must be prohibited at the project site.
- Establish a veld fire action policy in the event of a veld fire to prevent unnecessary loss of fauna and habitat.

The following management measures specific to the mitigation of impacts on avifauna must be applied:

- Design and constructing new power lines in such a way that they have minimal impact on birds (i.e. bird-friendly designs, appropriate wire marking devices).
- The exterior design of the concrete structure (the tower structure) must be such that there are no prominent overhangs, ledges or perches (where practically possible). If such perches are requisite design characteristics, then bird-deterrents, which are widely available, should be installed. Rotating reflectors can also be installed near the receiver to deter birds from approaching.

8.1.13 Sites of Archaeological and Cultural Interest

One site from the Historical Age and 33 Stone Age occurrences were identified. Due to the large number of Stone Age features and the relative lack of information of Stone Age sites in this area as well as the concentration of thereof in the central surveyed area, it is recommended that:

- A representative sample of Stone Age material from Van Roois Vley be collected prior to commencement (as part of a Phase II Study).
- A report on the findings after analyses of the collected Stone Age material should be presented to SAHRA with the objective of obtaining a permit for destruction of the remainder of the sites.

The development may only continue after completion of the Phase II Study and when the appropriate approvals have been obtained.

As it is not possible to identify all sites or archaeological and heritage significance (with specific reference to unmarked graves), a Chance Find Procedure must be developed for the construction phase of the project.

8.1.14 Visual

During the construction phase of the project the mitigation of visual impact associated with the project includes:

- The construction of a glare fence around mirror construction area to contain ground-based glint impacts during installation.
- Colour mitigation for all building structures must be implemented to ensure that natural earth colours that relate to the surrounding landscape colour are utilised.
- Directional lighting located closer to the point of construction (within safety requirements).
- LED directional lighting on perimeter security fence.

Regardless of the mitigation proposed, significant visual impacts are expected. It is recommended that a continuous consultation process be undertaken to determine any requirements for further mitigation. Additional mitigation may include visual screening at the receptor location. The need for such measures will only be determined as the construction phase progress.

8.1.15 Waste Management

In order to ensure that waste management is effective for the construction phase, the necessary bins, storage areas and waste contracts must be established at the beginning of the construction phase such that the wastes can be sorted, stored on site without posing risks and associated impacts. A Waste Management Procedure and Implementation Plan must be developed and implemented. The following measures must be included:

- Areas are to be designated for the safe storage of hazardous waste, and a hazardous waste store erected. Storage areas must include concrete / impermeable hardstanding and bunding to prevent spillage of hazardous wastes;
- Areas are to be designated for the safe storage of general wastes, where the wastes can be separated into recyclables and non-recyclables. Bins to be provided and labelled / colour coded regarding the allowed contents;
- All staff, contractors and visitors to be trained in the waste management procedures;
- Staff assigned the responsibility to manage the waste on-site;
- Waste oil generated on site to be collected for recycling;
- Littering, dumping, burying and burning of any waste not allowed;
- Empty waste containers that previously contained hazardous wastes may not be given / sold to staff or the public;
- Staff to conduct inspections to ensure hazardous waste is separated from general waste, and that waste is disposed of in the designated waste receptacles;
- Contracts to be established with waste contractors to ensure that the waste is disposed of at registered facilities;
- Waste Carriers transporting wastes off-site must have a waste license, including in-house waste transporters and external contractors; and
- Records of waste collected from the site to be kept on file.

8.1.16 Hazardous Materials and Dangerous Goods

Significant risks are presented by hazardous materials stored and used on the construction site. These include the pollution of soil and surface water as a result of uncontrolled release as well as health and safety risks from fire, explosion of health impacts from exposure. Management measures to mitigate the potential impact include:

- Explore opportunities throughout the project life to use non-hazardous materials in place of hazardous materials.
- Where practicable, avoid or minimize the use of hazardous materials.
- Summarize hazards presented by chemicals and other dangerous goods by means of a Material Safety Data Sheet (MSDS).
- Systematically identify systems and procedures that could result in accidental pollutant release and quantify these risks to the extent possible, prioritize the allocation of resources for emergency response equipment and training programs.
- Establish hazardous materials and dangerous goods management priorities based on a hazard analysis of the risk presented by the material.
- Prevent the uncontrolled releases of hazardous materials and dangerous goods to the environment or uncontrolled reactions that might result in fire or explosion.
- Use engineering controls (containment, automatic alarms, and shut-off systems) commensurate with the nature of hazard.
- Implement management controls (procedures, inspections, communications, training, and drills) to address residual risks that have not been prevented or controlled through engineering measures.

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- Establish the level of risk of hazardous materials and dangerous goods through an on-going assessment process based on:
 - The types and amounts of hazardous materials present on site, including:
 - Name and description (e.g. composition of a mixture).
 - Classification (e.g. code, class or division).
 - Internationally accepted regulatory reporting threshold quantity or national equivalent.
 - Quantity used per month.
 - Characteristic(s) that make(s) the material hazardous (e.g. flammability, toxicity).
 - An analysis of the potential spill and release scenarios using available industry statistics on spills and accidents where available.
 - An analysis of the potential for uncontrolled reactions such as fire and explosions.
 - An analysis of the potential consequences based on the physical-geographical characteristics of the project site, including aspects such as its distance to settlements, water resources, and other environmentally sensitive areas.
 - Develop a Hazardous Materials and Dangerous Goods Management Plan to address:
 - Release Prevention and Control Planning.
 - Applicable, essential elements of occupational health and safety management.
 - Written process safety parameters (i.e., hazards of the chemical substances, safety equipment specifications, safe operation ranges for temperature, pressure, and other applicable parameters, evaluation of the consequences of deviations, etc.), written operating procedures and compliance audit procedures.

Table 2: Summary of the SEMP – Construction Phase

Impact	Cause/Aspect	Objective	Management and Mitigation Practice	Schedule of Actions	Responsible Person	Monitoring requirements
CLIMATE						
Carbon and other greenhouse gasses into the atmosphere.	Construction operations.	Minimise the carbon footprint of the construction phase of the Sasol CSP Project	<ul style="list-style-type: none">Ensure vehicle exhaust systems function correctlyEnsure energy reduction practices are developed & implemented	Periodic monitoring	Environmental Officer	<ul style="list-style-type: none">Periodic vehicle inspectionReview of energy reduction practices
	Land based vehicle activity					
	Use of backup diesel generators during construction					
AIR QUALITY						
Fugitive Dust and PM	Particulate Matter (PM) emitted from the construction phase	Minimise the emission of PM	<ul style="list-style-type: none">Dust suppressionRe-vegetation of areas as soon as possibleReduction of drop height as far as is practicableReduction of speed of vehicles to keep within the applicable speed limits	On-going throughout construction phase	Environmental Officer	<ul style="list-style-type: none">On-going dust fallout monitoringAnnual audits
NOISE						
Noise Pollution	Construction activities	Comply with noise level criteria in legislative and Best Practice requirements (including occupational exposure)	<ul style="list-style-type: none">Construction activities must be undertaken during normal working hours.All machinery used during construction will be maintained in sound mechanical conditionAppropriate use of (Personal Protective Equipment) PPEOn-site generators should be clad in suitable material or housed in structures that would reduce their noise impactsGenerators will be fitted with appropriate silencers.Appropriate use of PPEAll vehicles will be fitted with	<ul style="list-style-type: none">Monthly noise monitoringInvestigation of each noise complaintAnnual audits	Environmental Officer	<ul style="list-style-type: none">Annual auditsInvestigation of all noise related complaintsMonthly noise monitoring
	Use of diesel generators					
	Increase traffic flow					

Impact	Cause/Aspect	Objective	Management and Mitigation Practice	Schedule of Actions	Responsible Person	Monitoring requirements
	(on-site)		<ul style="list-style-type: none"> appropriate sound suppression devices or silencers Keep within the applicable speed limits 			
SOILS						
Soil disturbance, loss of nutrients, loss of topsoil cover, loss of in situ structure and physical / chemical properties.	Clearing of vegetation for infrastructure development (roads, top structure, services)	<ul style="list-style-type: none"> Minimisation of disturbed area Soil conservation Implementation of on-going rehabilitation 	<ul style="list-style-type: none"> Strip and stockpile top- and subsoils appropriately Commence rehabilitation of affected and completed areas Application of soil handling and removal practices (including vegetative cover) 	Ad hoc throughout construction phase when required	Project Manager / Principle Contractor Environmental Officer	<ul style="list-style-type: none"> Visual inspection Measurement of dimensions Soil testing
Soil Pollution	Spillages (hydrocarbons, chemicals and waste)	Soil conservation	<ul style="list-style-type: none"> Application of soil emplacement and storage practices Fertilisation and amendments Re-use top- and subsoils during on-going rehabilitation Erosion control and treatment Implementation of good housekeeping practices (vehicle maintenance and waste management) Correct storage of dangerous goods, waste and other material which may cause contamination Spill clean up 			
LAND USE AND LAND CAPABILITY						
Change of land capability	Disruption of ecosystem due to the construction and development activities	Conserve land capability	<ul style="list-style-type: none"> Effective soil handling and removal practices Effective soil emplacement and storage practices Fertilisation and amendments Soil amelioration Limiting the footprint of the construction activities to a 	Ad hoc throughout construction phase when required	Project Manager / Principle Contractor Environmental Officer	<ul style="list-style-type: none"> Visual inspection Measurement of dimensions Soil testing

Impact	Cause/Aspect	Objective	Management and Mitigation Practice	Schedule of Actions	Responsible Person	Monitoring requirements
			minimum			
Change of land use.	Industrial operation and infrastructure	Mitigate the footprint of the Sasol CSP Project	<ul style="list-style-type: none"> Limiting the footprint of the construction activities Strip and stockpile top- and subsoils appropriately Commence rehabilitation of affected and completed areas where appropriate, as soon as practically possible 	On-going throughout construction phase		<ul style="list-style-type: none"> Visual inspections. Complaints from surrounding community
HYDROLOGY/SURFACE WATER						
Increased TDS, possible erosion (wind and water)	<ul style="list-style-type: none"> Stripping of vegetation as part of construction Instability of stockpiles (top and subsoil) 	Elimination of impacts on surface water	<ul style="list-style-type: none"> Limit areas to be stripped for construction purposes Minimise erosion Slope stabilisation DTM model and implementation of surface water management plan 	On-going throughout construction phase	Environmental Officer	Visual inspections of cleared areas and stockpiles
Surface water contamination	Spillages (hydrocarbons, chemicals and waste)		<ul style="list-style-type: none"> Erosion control and treatment Implementation of good housekeeping practices (vehicle maintenance and waste management) Correct storage of dangerous goods, waste and other material which may cause contamination Spill clean up 			
GROUNDWATER						
Groundwater quality deterioration	Contamination of localised aquifer due to waste management activities and sewage effluent disposal	Prevention of contamination of aquifer	<ul style="list-style-type: none"> Implement recommended waste management systems Manage inorganic substances on surface to prevent groundwater impacts 	On-going throughout construction phase	Environmental Officer	Visual Inspections
FLORA						
Potential loss / degradation of local	Land transformation though infrastructure	Limit and prevent ecological degradation	<ul style="list-style-type: none"> Minimise construction footprint: 	Bi-annual monitoring	Environmental Officer	Visual inspections

Impact	Cause/Aspect	Objective	Management and Mitigation Practice	Schedule of Actions	Responsible Person	Monitoring requirements
vegetation / habitat	development	where possible	<ul style="list-style-type: none"> • Use existing roads where possible • Clear minimum vegetation • Maximise site vegetation retention areas ■ Preservation of vegetation ■ Implementation of conservation practices (including the control of weeds and alien invasive species) ■ Fire prevention ■ On-going rehabilitation 			
Alteration of natural ecological processes / ecosystem functioning	Creation of atypical/ non-natural habitat, presence of humans for prolonged periods					
Introduction of species not associated with the region	High traffic volume between site & other areas					
Changes in vegetation dynamics	Fires, water, vegetation transformation					
Impacts on sensitive environments (receiving water body / watercourses)	Direct/ indirect impacts, physical or cumulative, wood harvesting, plant collection					
FAUNA						
Potential loss / degradation of local faunal habitat and/or communities	Land transformation through infrastructure development	Minimise land transformation	<ul style="list-style-type: none"> ■ Minimise construction footprint: <ul style="list-style-type: none"> • Use existing roads where possible • Clear minimum vegetation • Maximise site vegetation retention areas 	On-going throughout construction phase	Environmental Officer	% Of land transformed
Road deaths of animals on access roads	Reckless driving and night-time driving on feeder and access roads	Minimise road deaths of animals	<ul style="list-style-type: none"> ■ Keep within the applicable speed limits ■ Prohibit night driving, except in case of emergencies 		Vehicle drivers Environmental Officer	Recording of animal deaths on roads in log book
Alteration of natural ecosystem functioning/ disruption of migration routes	Land transformation through infrastructure development	Minimise land transformation	<ul style="list-style-type: none"> ■ Minimise construction footprint: <ul style="list-style-type: none"> • Use existing roads where possible • Clear minimum vegetation • Maximise site vegetation retention areas 		Environmental Officer	% Of land transformed

Impact	Cause/Aspect	Objective	Management and Mitigation Practice	Schedule of Actions	Responsible Person	Monitoring requirements
Increase in poaching, snaring and trapping of animals	Increase in human habitation at the site and lack of environmental awareness	Prevent poaching, snaring, trapping	<ul style="list-style-type: none">■ Awareness training and stipulated disciplinary action			<ul style="list-style-type: none">■ Number of incidents recorded■ Inspections of area surroundings
Hybridisation of African Wild Cats with domestic or feral cats	Increase in human habitation at the site and lack of environmental awareness	Prevent hybridisation of the African Wild Cat	<ul style="list-style-type: none">■ Awareness training and stipulated disciplinary action■ Prohibit the introduction of domestics cats			Inspections
Impact of chemical compounds from construction on animals	Release of hazardous/ bio-accumulating chemicals into the environment	Prevention of animal death / health hazard due to chemical contamination	<ul style="list-style-type: none">■ Eliminate leaching of chemicals■ Implementation of containment structures■ Responsible transportation and storage of chemicals			Number of incidents recorded
Attraction of animals to artificial surface water (animal drowning and increased interaction with workers on site)	Sources of artificial surface water introduced	Prevention of ecological alteration	<ul style="list-style-type: none">■ Limit open water sources to those required only■ Monitor animal access■ If required, fence open water sources			Size of open water sources
Loss of natural faunal species to introduced faunal species	Killing of small mammals by domestic cats and dogs		<ul style="list-style-type: none">■ Prevent introduction of foreign species by prohibiting all pets			Inspections
AVIFAUNA						
Destruction of foraging, roosting and nesting habitat	Land clearing for construction of surface infrastructure	Minimise land transformation	<ul style="list-style-type: none">■ Minimise construction footprint:<ul style="list-style-type: none">• Use existing roads where possible• Clear minimum vegetation• Maximise site vegetation retention areas■ Undertaken land clearing activities during the non-breeding season (if possible)	On-going throughout construction phase	Environmental Officer	% Of land transformed
Increased human	Construction activities	Minimise disturbance to	<ul style="list-style-type: none">■ Limit movement of people and machinery to the footprint of the			Inspections

Impact	Cause/Aspect	Objective	Management and Mitigation Practice	Schedule of Actions	Responsible Person	Monitoring requirements
activity and noise		avifauna	site <ul style="list-style-type: none">Persons on site to be limited to authorised workers only			
Loss of individual avifauna resulting from increased poaching	Presence of persons on site during the construction phase of the project	Prevent poaching, snaring, trapping	<ul style="list-style-type: none">Awareness training and stipulated disciplinary action			
ARCHAEOLOGY & HERITAGE						
Middle and Late Stone Age materials (stone tools)	Land clearing and transformation by construction of infrastructure	Preservation of Middle and Late Stone Age materials	<ul style="list-style-type: none">Collection, cataloguing, recording and removal of materials prior to the initiation of construction	Once off during construction phase	Environmental Officer Operations Manager	<ul style="list-style-type: none">Legal complianceDevelopment of a Chance Find Procedure
The destruction of archaeological / heritage resources and or graves	Chance finds during land clearing and construction activities	Preservation of heritage features	<ul style="list-style-type: none">Development of a procedure dealing with chance finds			
VISUAL ASEPECT						
Visual disturbance and change in landscape character	Land clearing: (facility footprint and infrastructure development such as the water pipeline and transmission line)	Minimise and mitigate visual impact	<ul style="list-style-type: none">Minimise construction footprint:<ul style="list-style-type: none">Use existing roads where possibleClear minimum vegetationMaximise site vegetation retention areasCommence rehabilitation of affected and completed areas where appropriate, as soon as practically possible	On-going during the construction phase	Project Manager / Principle Contractor Environmental Officer	% Of land transformed Implementation of rehabilitation plan
Light pollution	Construction activities undertaken at night	Minimise and mitigate visual impact resulting from light pollution at night	<ul style="list-style-type: none">Directional lighting located closer to the point of construction (within safety requirements)LED directional lighting on perimeter security fence	On-going during the construction phase	Project Manager / Principle Contractor Environmental Officer	Visibility of lighting at night
Visible dust pollution	Dust emissions form construction activities	Minimise and mitigate visual impact resulting	<ul style="list-style-type: none">Dust suppressionRe-vegetation of areas as soon	On-going during the construction phase	Project Manager / Principle Contractor	Visibility of dust pollution

Impact	Cause/Aspect	Objective	Management and Mitigation Practice	Schedule of Actions	Responsible Person	Monitoring requirements
		visible dust pollution	as possible <ul style="list-style-type: none"> ■ Reduction of drop height as far as is practicable ■ Reduction of speed of vehicles to keep within the applicable speed limits 		Environmental Officer	
Glare	Mirror construction	Minimise and mitigate visual and safety impacts associated with glare from the heliostats	Construct glare fence around mirror construction area to contain ground-based glint impacts during installation	On-going during the construction phase	Project Manager / Principle Contractor Environmental Officer	Glare
WASTE MANAGEMENT						
Consumption of land space	Generation and disposal of general waste to landfill	Efficient use of resources	<ul style="list-style-type: none"> ■ Re-use of wastes – avoidance of virgin material ■ Recycling of wastes off site 	On-going throughout construction phase.	Environmental Officer	Volume of waste landfilled
Contamination of soil & groundwater	On-site land filling / burial of biodegradable wastes (permanent on-site disposal)	Limit contamination of soil and groundwater	<ul style="list-style-type: none"> ■ On-site disposal of organic food wastes to be prohibited 			<ul style="list-style-type: none"> ■ Visual inspection ■ Groundwater monitoring
Contamination of soil	Temporary storage of hazardous waste on unprotected ground – on site or off-site Hazardous waste spills outside contained areas		<ul style="list-style-type: none"> ■ Storage of hazardous wastes in purpose built stores (impermeable floors and bunding) ■ Labelling of containers 			<ul style="list-style-type: none"> ■ Visual inspection ■ Emergency Response Procedure
Contamination of groundwater	Disposal of hazardous wastes on general landfills		<ul style="list-style-type: none"> ■ Contactor control ■ Traceability (documentation) and reconciliation of waste disposed 			Auditing
Litter -aesthetic impacts Litter - ingestion by animals	Waste not placed in designated waste bins / containers	Limit impacts associated with littering	<ul style="list-style-type: none"> ■ Provision of bins ■ Management and education of people 			<ul style="list-style-type: none"> ■ Litter Management Programme ■ Visual inspections

Impact	Cause/Aspect	Objective	Management and Mitigation Practice	Schedule of Actions	Responsible Person	Monitoring requirements
Odour – unpleasant and may attract pests and wildlife	Waste not disposed of timeously or kept in closed containers	Prevent odour from waste storage on site	<ul style="list-style-type: none">■ Frequent removal of waste			Regular waste removal
Infections from medical waste	Unsuitable handling and disposal of medical waste (sharps and bandages)	Appropriate management of medical waste.	<ul style="list-style-type: none">■ Provision of suitable waste containers■ Contractor control■ Disposal to authorised sites			<ul style="list-style-type: none">■ Regularity of waste removal■ Waste audits■ Document control
Health risks of staff and public from exposure to hazardous wastes	Handling of hazardous waste without suitable PPE by staff or public	Prevention of hazardous waste related illnesses.	<ul style="list-style-type: none">■ Provision of suitable waste containers and PPE■ Contractor control■ Disposal to authorised sites			
SOCIAL ASPECT						
Creation of construction phase specific employment opportunities	Development of the Sasol CSP Project	Maximisation of positive benefit	<ul style="list-style-type: none">■ Site-specific construction positive impacts on unskilled, semi-skilled, skilled labour. But, little likelihood of sustained high involvement of local labour across community members. No clear means of mitigation, even with sourcing labour from directly affected area	On-going throughout construction phase	HR Manager	<ul style="list-style-type: none">■ Number of people employed<ul style="list-style-type: none">• Employees from directly affected community• Local employees• Expatriates
Creation of employment opportunities not directly related to the CSP Project itself.	Development of the Sasol CSP Project		<ul style="list-style-type: none">■ Focus on short-term employment opportunities near communities, preceded by extensive community liaison to support employment across community members			
Increased infection rates (site and surrounding communities)	Development / construction phase of the Sasol CSP Project resulting in influx of people (workers)	Minimising infection rates	<ul style="list-style-type: none">■ Sasol interventions on site, as per HIV/AIDS plan of action instituted by Sasol, and as per the Wellness Policy. Need to include condom programming, information and attitudinal change, gender relations and power over sexual decision-making, life skills education, testing, ARVs, recreational			<ul style="list-style-type: none">■ Staff participation in voluntary HIV/Aids programmes■ Sick days above expected median.■ Staff productivity.

Impact	Cause/Aspect	Objective	Management and Mitigation Practice	Schedule of Actions	Responsible Person	Monitoring requirements
			activities <ul style="list-style-type: none"> Conduct within the context of a broader wellness programme (if applicable) 			
Services for Workers	Development / construction phase of the Sasol CSP Project resulting in influx of people (workers)	Maximise in house services to staff	<ul style="list-style-type: none"> Provide services as intended 			<ul style="list-style-type: none"> Annual audits
Gender (gender inequality / discrimination)	Development / construction phase of the Sasol CSP Project resulting in influx of people (workers)	Minimise gender inequality.	<ul style="list-style-type: none"> Open dialogue about male and female employment opportunities Specific requests for females with experience to apply for construction jobs 			<ul style="list-style-type: none"> Employee surveys Community surveys Annual audits.

8.2 Operational Phase

8.2.1 General

The following general measures as it relates to compliance, community relations, site access and site establishment applies:

- Non-compliance to management measures: All staff and workers will be made aware of the contents of this SEMP and any penalties arising from non-compliance. The EO will induct all personnel working on the project on the contents of this SEMP and any penalties arising from non-compliance.
- Non-compliance with local legislation: The project owner will develop an environmental legal register for the operations of the Sasol CSP Facility. The legal register will include all applicable National and Provincial Environmental Legal Legislation as well as Local Bylaws relating to environmental aspects. The EO will be responsible to oversee legal compliance. The project owner will appoint a suitably qualified environmental legal consultant to verify compliance on an annual basis.

8.2.2 Environmental Education and General Training

Non-compliance to management measures resulting in unacceptable impacts: Ensure that all site personnel have a basic level of environmental awareness training including the topics as listed in Section 8.1.2.

Additionally, training should be provided to the staff members in the use of the appropriate emergency response and fire-fighting equipment.

8.2.3 Climate

Refer to Section 8.1.3.

8.2.4 Air Quality

The following management must be implemented:

8.2.4.1 Roads

- A maximum speed limit of 40km/h for vehicles travelling on unpaved roads during the washing of the heliostats.
- Wet suppression may be implemented on unpaved roads to limit dust liberation. Where chemical stabilisers are used, it must be confirmed that such chemical stabilisers are environmentally friendly.
- All measures prescribed in Section 8.1.4.1 for the construction phase are applicable to the operational phase.

8.2.4.2 Soil Stockpiles

- Long term soil storage piles which will be used for rehabilitation during on-going and final rehabilitation of the project site should be watered and hydro-seeded or vegetated. If required, stockpiles can be covered with shade netting to avoid windblown dust;
- Stockpiles must be situated away from the site boundary and nearby receptors and should take into account the predominant wind.

8.2.4.3 Start-Up Boiler

- The boiler must be fitted with NO₂ abatement technology to comply with National Standards.

8.2.4.4 Monitoring Requirement

- Implementation of a passive ambient air quality monitoring network to ensure compliance during the operational phase.

8.2.5 Noise

During the operational phase, the activities responsible for the increased noise levels include the operation of back-up diesel generators, vehicle movement and noise generated by the dry cooling fan.

The preferred method for controlling noise from stationary sources is to implement noise control measures at the source. The following noise reduction mitigatory options are recommended to keep noise levels within the legislative limits:

- Ensure the required silences are fitted on all engines and compressors.
- Where practical, the engineering design has made provision for the installation of enclosures around source equipment. The effectiveness of such measures must be monitored and additional mitigatory action implemented if required.
- On site generators must be clad in suitable material or housed in structures that would reduce their noise impacts.
- Enforce an appropriate speed limit for all vehicles to minimise noise from vehicle movement. A speed limit of 40km/hr has been stipulated to limit dust liberation and it is expected that this specified limit will also mitigate noise levels. It is recommended that noise monitoring be undertaken to confirm this assumption.
- Regular maintenance of heavy equipment, vehicles and earth moving machinery must be undertaken.
- To address impact associated with occupational exposure, PPE should be worn as specified by Occupational Health and Safety Legislation.
- Any noise complaints received will be subject to a complaints management system (grievance mechanism) that provides for the assessment and management of the complaint. The project owner or EO must confirm the effective resolution of grievances. All complaints will be recorded and kept on file.
- For persistent noise complaints, specific monitoring of noise should be undertaken to determine whether daytime levels exceed ambient (baseline noise levels) +3 dBA.

Measurement method to ensure implementation of actions:

- Monthly noise monitoring is required in order to measure daily levels of exposure, and implement mitigation measure when required. These values will assist in assessing the impact of noise on the surrounding environment and the nearby sensitive receptors. Once a stable operating environment has been established and it is confirmed, through monthly monitoring, that noise level are consistent and does not exceed the specific limits, the monitoring frequency may be reduced.

8.2.6 Soils

During the operational phase impacts will be imposed on the surface features of the site, inclusive of the soils and their capability to sustain an environmental equilibrium. The management strategy proposed during the construction phase (refer to Section 8.1.6.4) must be implemented during the operational phase.

8.2.6.1 Hydrocarbon Contamination Amelioration

Hydrocarbon contamination of soils (and other components of the receiving environment) should be avoided through the implementation of good housekeeping practices, including:

-
- Vehicle and equipment repairs are to take place only in designated workshop areas where the appropriate management measures have been implemented;
 - The designated workshop and fuel storage areas are to be inspected to confirm the integrity of the containment structures and the drainage of surface water and maintenance of the collection sump;
 - Where vehicles or equipment are repaired under emergency conditions outside of the designated areas, drip trays capable of accommodating all fluids are to be used in as far as is practically possible. All liquids collected are to be contained and taken to the designated area for appropriate treatment or disposal.
 - Hydrocarbon and / or chemical spills are to be contained through the use of a physical barrier, to prevent the spread of the spill;
 - The spatial extent of the spill is to be determined (surface and depth);
 - The affected materials are to be excavated from the in-situ location and containerised, and
 - The affected material is to be removed to the closest facility capable of dealing with hydrocarbon contaminated materials.

8.2.7 Land Capability

No additional management measures will apply.

8.2.8 Surface Water

During the operational phase the potential of hydrocarbon and / chemical spills may result in the pollution of surface water. Additionally, soil erosion of soil stockpiles and other areas may result in increased sedimentation of stormwater affecting surface water features. Mitigation for this impact includes the following:

- To correct storage and management of hydrocarbons and chemicals as outlines in Section 8.2.6 must be applied.
- The Digital Terrain Model (DTM) must be developed to determine areas of concentrated water flow as the operation progresses. This will enable the detailed design of storm water management structures to be implemented.

8.2.9 Groundwater

8.2.9.1 Groundwater Quality

Groundwater contamination during this stage is also regarded as unlikely and considered negligible, provided that the proposed waste and hazardous materials management systems are put in place. Due to the infrequent rainfall and runoff expected in this arid area, a water quality monitoring plan is considered unfeasible.

8.2.10 Flora

The objective of the flora management plan, is to ensure the long term success of rehabilitation and the limitation and prevention (where possible) of ecological degradation. During the operational phase, it is important that the environmental footprint of the development be kept to a minimum. Conservation principles are to be applied, including:

- The prevention of the collection of plants, parts of plants and or firewood;
- The importation of foreign plant species is to be limited in as far as this is practical. It should be noted that no foreign plants, capable of natural replication is to be brought onto the site or used for on-going rehabilitation purposes;
- Only locally occurring plant species are to be used for on-going rehabilitation purposes, and

- An alien plant identification, eradication and control programme is to be developed and implemented.

8.2.10.1 Fire Prevention

Fire prevention measures are to be implemented, including:

- Open fires will be prohibited at the site, except in designated, controlled areas;
- Fire control measures will be implemented and an Emergency Preparedness and Response Plan must be developed.

8.2.11 Fauna and Avifauna

Impacts are to be geographically limited by prohibiting habitat degradation or destruction outside of the development area. The following management measures are recommended:

- The disruption of ecological connectivity, localised habitat as well as territorial infringement is expected from the development project. All impacts must be limited to the project site itself and no land use changes or other disturbances of animals outside of the site must be allowed.
- An increase in poaching, snaring and trapping of animals may occur as a result of an influx of people. Appropriate disciplinary action is to be taken against transgressors who poach, snare or traps animals. This aspect is to be addressed during the induction process and general environmental awareness training.
- In order to manage and mitigate any impact of chemical compounds from the operation on animals, ensure that no leaching of chemicals, hazardous materials and / dangerous goods occur to soils and groundwater resources, through the implementation of appropriate structures (i.e. bunding). Likewise, transportation and storage of all chemicals, hazardous materials and / dangerous goods must be undertaken in a responsible manner.
- Attraction of fauna to open water sources may occur. Open water sources must be limited as far as is practicable. Should it become evident that animals are regularly accessing any open water sources; adequate fencing must be erected in order to limit access.
- In order to prevent the loss of natural faunal species to introduced faunal species, all pets must be prohibited at the project site.
- A loss of avifauna may occur as a result of heliostat collisions, incineration in focal standby points and electrocution from and direct collision with transmission lines. Limited mitigation measures for incineration and collision exist.

8.2.12 Sites of Archaeological and Cultural Interest

As it is not possible to identify all sites of archaeological and heritage significance (with specific reference to unmarked graves), a Chance Find Procedure must be developed for the construction phase of the project.

8.2.13 Visual

Impact associated with the operational phase of the project include visual disturbances and impact on sensitive receptors which affect the general scenic value of the area as well as impact associated with the glare and glint from the facility. The following management measures must be implemented.

- Monitoring of all luminance emissions, once the tower has been in operation, to assess potential health impacts to proximate receptors located in the high exposure (2km) distance area. Ensure that railway personnel were all informed of the potential glare risks and have the required personnel protection eye equipment should it be required.
- Undertake a glint monitoring program to inform South Africa best practice norms and standards.

-
- Management of impacts from light at night using directional LED-type lighting of a green hue. The selection of lighting must consider all health and safety requirements.
 - Visual impact mitigation at the receptor position could be implemented by planting trees at the farmsteads to reduce the intrusion as seen from the farmsteads. This could cause further visual intrusion of the receptors as their views of the open veldt could be obscured. It is recommended that this option and the positioning of the screening trees be negotiated with receptors to determine their preference as this would be an effective method in retaining their residential sense of place.

8.2.14 Waste Management

In order to ensure that waste management is effective for the operational phase mitigation measured outlined as part of Section 8.1.15 must be implemented.

8.2.15 Hazardous Materials

Significant risks are presented by hazardous materials stored and used during the operational phase of the project. These include the pollution of soil and surface water as a result of uncontrolled release as well as health and safety risks from fire, explosion of health impacts from exposure. Management measures to mitigate the potential impact as included in Section 8.1.16 must be implemented.

Table 3: Summary of the SEMP – Operational Phase

Impact	Cause/Aspect	Objective	Management Mitigation Practice	and Schedule Actions	of Responsible Person	Monitoring requirements
CLIMATE						
Carbon and other greenhouse gasses into the atmosphere.	Land based vehicle activity	Minimise the carbon footprint of the operational phase of the Sasol CSP Project	<ul style="list-style-type: none">■ Ensure vehicle exhaust systems function correctly■ Ensure energy reduction practices are developed & implemented	Periodic monitoring	Environmental Officer	<ul style="list-style-type: none">■ Periodic vehicle inspection■ Review of energy reduction practices
	Use of backup diesel generators during construction					
Reduction of the emission of carbon and greenhouse gasses into the atmosphere	Nature of the project – solar power generation	Reduction of dependency on non-renewable resources and reduction of carbon and greenhouse gas emissions	None	None	None	None
AIR QUALITY						
Fugitive Dust and PM	Particulate Matter (PM) emitted from the operational phase	Minimise the emission of PM	<ul style="list-style-type: none">■ Dust suppression■ Reduction of speed of vehicles to keep within the applicable speed limits	On-going throughout construction phase	Environmental Officer	<ul style="list-style-type: none">■ On-going dust fallout monitoring■ Annual audits
Reduction in ambient air quality from SO2 and NO2 emissions	Uncontrolled start-up of boiler	Minimise emissions	<ul style="list-style-type: none">■ Boiler to be fitted with NO2 abatement technology to comply with National Standards;			<ul style="list-style-type: none">■ Annual Audits
NOISE						
Noise Pollution	Operational phase activities (traffic, cooling fans)	Comply with noise level criteria in legislative and Best Practice requirements (including occupational exposure))	<ul style="list-style-type: none">■ All vehicles used will be maintained in sound mechanical condition■ Keep within the applicable speed limits■ Where practical, the engineering design has made provision for the installation of enclosures around source equipment	<ul style="list-style-type: none">■ Noise monitoring■ Investigation of each noise complaint■ Annual audits	Environmental Officer	<ul style="list-style-type: none">■ Annual audits■ Investigation of all noise related complaints■ Monthly noise monitoring
	Use of back-up diesel generators		<ul style="list-style-type: none">■ On-site generators should be clad in suitable material or housed in structures that would			

Impact	Cause/Aspect	Objective	Management Mitigation Practice	and Schedule Actions	of Responsible Person	Monitoring requirements
			<div>reduce their noise impacts</div> <ul style="list-style-type: none">Generators will be fitted with appropriate silencers.			
SOILS						
Soil disturbance, loss of nutrients, loss of topsoil cover, loss of in situ structure and physical / chemical properties	Soil erosion	Soil conservation	<ul style="list-style-type: none">Erosion control and treatmentImplementation of good housekeeping practices (vehicle maintenance and waste management)Correct storage of dangerous goods, waste and other material which may cause contaminationSpill clean up	Ad hoc throughout operational phase when required	Environmental Officer	<ul style="list-style-type: none">Visual inspectionMeasurement of dimensionsSoil testing
Soil contamination	Spillages (hydrocarbons, chemicals and waste)					
LAND USE AND LAND CAPABILITY						
Change of land use.	Industrial operation and infrastructure	Mitigate the footprint of the Sasol CSP Project	<ul style="list-style-type: none">Limiting the footprint of the facility	On-going throughout operational phase		<ul style="list-style-type: none">Visual inspections.Complaints from surrounding community
HYDROLOGY/SURFACE WATER						
Increased TDS, possible erosion (wind and water)	Increase in impermeable surface resulting in increased flow causing erosion	Elimination of impacts on surface water	<ul style="list-style-type: none">Minimise erosionDTM model and implementation of surface water management plan	On-going throughout operational phase	Environmental Officer	Visual inspections of cleared areas and stockpiles
Surface water contamination	Spillages (hydrocarbons, chemicals and waste)		<ul style="list-style-type: none">Implementation of good housekeeping practices (vehicle maintenance and waste management)Correct storage of dangerous goods, waste and other material which may cause contaminationSpill clean up			
GROUNDWATER						
Groundwater quality deterioration	Contamination of localised aquifer due to waste management	Prevention of contamination of aquifer	<ul style="list-style-type: none">Implement recommended waste management systemsManage inorganic substances on surface to prevent	On-going throughout operational phase	Environmental Officer	Visual Inspections

Impact	Cause/Aspect	Objective	Management Mitigation Practice	and Schedule Actions	of Responsible Person	Monitoring requirements
	activities and sewage effluent disposal		groundwater impacts			
FLORA						
Introduction of species not associated with the region	High traffic volume between site & other areas	Limit and prevent ecological degradation where possible	<ul style="list-style-type: none">■ Preservation of vegetation■ Implementation of conservation practices (including the control of weeds and alien invasive species)■ Fire prevention■ On-going rehabilitation	Bi-annual monitoring	Environmental Officer	Visual inspections
Changes in vegetation dynamics	Fires, water, vegetation transformation					
Impacts on sensitive environments (receiving water body / watercourses)	Direct/ indirect impacts, physical or cumulative, wood harvesting, plant collection					
FAUNA						
Road deaths of animals on access roads	Reckless driving and night-time driving on feeder and access roads	Minimise road deaths of animals	<ul style="list-style-type: none">■ Keep within the applicable speed limits■ Prohibit night driving, except in case of emergencies	On-going throughout operational phase	Vehicle drivers Environmental Officer	Recording of animal deaths on roads in log book
Increase in poaching, snaring and trapping of animals	Increase in human habitation at the site and lack of environmental awareness	Prevent poaching, snaring, trapping	<ul style="list-style-type: none">■ Awareness training and stipulated disciplinary action		Environmental Officer	<ul style="list-style-type: none">■ Number of incidents recorded■ Inspections of area surroundings
Hybridisation of African Wild Cats with domestic or feral cats	Increase in human habitation at the site and lack of environmental awareness	Prevent hybridisation of the African Wild Cat	<ul style="list-style-type: none">■ Awareness training and stipulated disciplinary action■ Prohibit the introduction of domestics cats			Inspections
Impact of chemical compounds from construction on animals	Release of hazardous/ bio-accumulating chemicals into the environment	Prevention of animal death / health hazard due to chemical contamination	<ul style="list-style-type: none">■ Eliminate leaching of chemicals■ Implementation of containment structures■ Responsible transportation and storage of chemicals			Number of incidents recorded

Impact	Cause/Aspect	Objective	Management Mitigation Practice	and Schedule Actions	of Responsible Person	Monitoring requirements
Attraction of animals to artificial surface water (animal drowning and increased interaction with workers on site)	Sources of artificial surface water introduced	Prevention of ecological alteration	<ul style="list-style-type: none">■ Limit open water sources to those required only■ Monitor animal access■ If required, fence open water sources			Size of open water sources
Loss of natural faunal species to introduced faunal species	Killing of small mammals by domestic cats and dogs		<ul style="list-style-type: none">■ Prevent introduction of foreign species by prohibiting all pets			Inspections
AVIFAUNA						
Heliostat collisions and incineration in focal standby points, electrocution from and direct collision with transmission lines	Collision with heliostat mirrors, incinerated by the superheated concentrated beam and collision with overhead transmission lines	Limit avifaunal deaths	<ul style="list-style-type: none">■ None	On-going throughout operational phase	Environmental Officer	Number of incidents recorded
ARCHAEOLOGY & HERITAGE						
The destruction of archaeological / heritage resources and or graves	Chance finds	Preservation of heritage features	<ul style="list-style-type: none">■ Development of a procedure dealing with chance finds	Once off during operational phase	Environmental Officer Operations Manager	Development of a Chance Find Procedure
VISUAL ASEPECT						
Glow	Triangular glowing shape generated by the reflected light from the CSP Tower	Minimise and mitigate visual impact	<ul style="list-style-type: none">■ Monitoring of all luminance emissions to assess potential health impacts to proximate receptors	On-going during the operational phase	Environmental Officer Operations Manager	Luminance emissions
Light Pollution	Operations at night	Minimise and mitigate visual impact resulting from light pollution during at night	<ul style="list-style-type: none">■ Directional lighting located closer to the point of use■ Use directional LED-type lighting of a green hue	Once-off during the initiation of the operational phase	Environmental Officer	Visibility of lighting at night
Visual Impact	CSP Tower and associated buildings and structures	Minimise and mitigate visual impact	<ul style="list-style-type: none">■ Abate at sight mitigation could be implemented by planting trees at the receptor (if	Once-off during the initiation of the operational phase	Environmental Officer	Grievances received

Impact	Cause/Aspect	Objective	Management Mitigation Practice	and Schedule Actions	of Responsible Person	Monitoring requirements
			<ul style="list-style-type: none"> required) ■ Colour mitigation for all building structures must be implemented to ensure that natural earth colours that relate to the surrounding landscape colour are utilised 			
Glint	Glint	Minimise and mitigate visual and safety impacts resulting from glint	<ul style="list-style-type: none"> ■ Aircraft flight patterns in relation to the site need to be assessed ■ A mirror malfunction procedure must be implemented to ensure that malfunctioning mirrors automatically face downwards ■ Glint monitoring program to inform South Africa best practice norms and standards 	On-going during the operational phase	Environmental Officer Operations Manager	Monitoring of glint
WASTE MANAGEMENT						
Consumption of land space	Generation and disposal of general waste to landfill	Efficient use of resources	<ul style="list-style-type: none"> ■ Re-use of wastes – avoidance of virgin material ■ Recycling of wastes off site 	On-going throughout the operational phase.	Environmental Officer	Volume of waste landfilled
Contamination of soil & groundwater	On-site land filling / burial of biodegradable wastes (permanent on-site disposal)	Limit contamination of soil and groundwater	<ul style="list-style-type: none"> ■ On-site disposal of organic food wastes to be prohibited 			<ul style="list-style-type: none"> ■ Visual inspection ■ Groundwater monitoring
Consumption of land space						
Contamination of soil	Temporary storage of hazardous waste on unprotected ground – on site or off-site		<ul style="list-style-type: none"> ■ Storage of hazardous wastes in purpose built stores (impermeable floors and bunding) ■ Labelling of containers 			<ul style="list-style-type: none"> ■ Visual inspection ■ Emergency Response Procedure
	Hazardous waste spills outside contained areas					
Contamination of groundwater	Disposal of hazardous wastes on general landfills		<ul style="list-style-type: none"> ■ Contactor control ■ Traceability (documentation) and reconciliation of waste disposed 			Auditing
Litter -aesthetic	Waste not placed in	Limit impacts	<ul style="list-style-type: none"> ■ Provision of bins 			<ul style="list-style-type: none"> ■ Litter Management

Impact	Cause/Aspect	Objective	Management Mitigation Practice	and Schedule of Actions	Responsible Person	Monitoring requirements
impacts Litter - ingestion by animals	designated waste bins / containers	associated with littering	■ Management and education of people			Programme ■ Visual inspections
Odour – unpleasant and may attract pests and wildlife	Waste not disposed of timeously or kept in closed containers	Prevent odour from waste storage on site	■ Frequent removal of waste			Regular waste removal
Infections from medical waste	Unsuitable handling and disposal of medical waste (sharps and bandages)	Appropriate management of medical waste.	■ Provision of suitable waste containers ■ Contractor control ■ Disposal to authorised sites			■ Regularity of waste removal ■ Waste audits ■ Document control
Health risks of staff and public from exposure to hazardous wastes	Handling of hazardous waste without suitable PPE by staff or public	Prevention of hazardous waste related illnesses.	■ Provision of suitable waste containers and PPE ■ Contractor control ■ Disposal to authorised sites			
SOCIAL ASPECT						
Creation of operational phase specific employment opportunities	Sasol CSP Project	Maximisation of positive benefit	■ Site-specific construction positive impacts on unskilled, semi-skilled, skilled labour. But, little likelihood of sustained high involvement of local labour across community members. No clear means of mitigation, even with sourcing labour from directly affected area	On-going throughout operational phase	HR Manager	■ Number of people employed <ul style="list-style-type: none">• Employees from directly affected community• Local employees• Expatriates
Creation of employment opportunities not directly related to the CSP Project itself.	Sasol CSP Project		■ Focus on short-term employment opportunities near communities, preceded by extensive community liaison to support employment across community members			
Increased infection rates (site and surrounding communities)	Operational phase of the Sasol CSP Project resulting in influx of people (workers)	Minimising infection rates	■ Sasol interventions on site, as per HIV/AIDS plan of action instituted by Sasol, and as per the Wellness Policy. Need to include condom programming, information and attitudinal change, gender relations and power over sexual decision-			■ Staff participation in voluntary HIV/Aids programmes ■ Sick days above expected median. ■ Staff productivity.

Impact	Cause/Aspect	Objective	Management Mitigation Practice and Schedule Actions	Responsible Person	Monitoring requirements
			<ul style="list-style-type: none"> making, life skills education, testing, ARVs, recreational activities Conduct within the context of a broader wellness programme (if applicable) 		
Services for Workers	Operational phase of the Sasol CSP Project resulting in influx of people (workers)	Maximise in house services to staff	<ul style="list-style-type: none"> Provide services as intended 		<ul style="list-style-type: none"> Annual audits
Gender (gender inequality / discrimination)	Operational phase of the Sasol CSP Project resulting in influx of people (workers)	Minimise gender inequality.	<ul style="list-style-type: none"> Open dialogue about male and female employment opportunities Specific requests for females with experience to apply for construction jobs 		<ul style="list-style-type: none"> Employee surveys Community surveys Annual audits.

8.3 Decommissioning Phase

8.3.1 General

The following general measures as it relates to compliance, community relations and site access and applies:

- Non-compliance to management measures: All tendering contractors (for the demolition and dismantling of the Sasol CSP Facility) will be made aware of the contents of this SEMP and any penalties arising from non-compliance. The EO will induct all contractors and sub-contractors and personnel working on the project on the contents of this SEMP and any penalties arising from non-compliance.
- Loss and/or transformation of sensitive areas resulting in disruption of ecological function: The EO shall clearly identify the areas that must be protected from disturbance by the contractors' activities at the commencement of the contractors' contract. The Contractor shall restrict all its activities, materials, equipment and personnel to within the area/s specified.
- Non-compliance with local legislation: The project owner and all appointed contractors must be aware and comply with the provisions of the relevant legislation.

8.3.2 Environmental Education and General Training

Non-compliance to management measures resulting in unacceptable impacts: Ensure that all site personnel have a basic level of environmental awareness training including the topics as listed in Section 8.1.2.

Additionally, training should be provided to the staff members in the use of the appropriate emergency response and fire-fighting equipment.

8.3.3 Climate

Refer to Section 8.1.3.

8.3.4 Air Quality

Particulate emissions during the demolition operations are a source of pollution. The following management practices are recommended:

8.3.4.1 Roads

Implement management measures as outlined in Section 8.1.4.1.

8.3.4.2 Soil Handling and Placement

- Topsoil handling and placement will be undertaken as part of the rehabilitation programme. All placed soil must be re-vegetation as soon as possible to mitigate the impacts associated with windblown dust and erosion.
- The fall height material is to be kept to the practicable minimum, in order to avoid dust generation. It is recommended that a similar principle be used when offloading vehicles, to keep the drop height to a practicable minimum.

8.3.5 Noise

Implement management measures as outlined in Section 8.1.5.

8.3.6 Soils

During the operational phase impacts will be imposed on the surface features of the site, inclusive of the soils and their capability to sustain an environmental equilibrium. The management strategy proposed during the construction phase (refer to Section 8.1.6.4) must be implemented during the decommissioning phase.

8.3.7 Land Capability

After the decommissioning of the facility the land use and capability will be restored as far as practically possible through:

- The effective replacement of the soils;
- The correct order of replacement of the soils and the preparation of an adequate seed bed will facilitate the re-vegetation program, will help to limit the potential for erosion, and will enhance the ability of obtaining a land capability of at least a grazing rating, and
- The amelioration of the soils will enhance the capability of the soils, aid in the prevention of erosion and the sustainability of the vegetative cover.

8.3.8 Surface Water

During the decommissioning phase the potential of hydrocarbon and / chemical spills may result in the pollution of surface water. Additionally, erosion of newly placed topsoils for the purposes of rehabilitation may result in increased sedimentation. Mitigation for this impact includes the following:

- Erosion mitigation must be applied as outlined in Section 8.1.6.4;
- To correct storage and management of hydrocarbons and chemicals as outlined in Section 8.1.6.4 must be applied.

8.3.9 Groundwater

8.3.9.1 Groundwater Quality

Groundwater contamination during this stage is also regarded as unlikely and considered negligible, provided that the proposed waste and hazardous materials management systems are put in place. Due to the infrequent rainfall and runoff expected in this arid area, a water quality monitoring plan is considered unfeasible.

8.3.10 Flora

The objective of the flora management plan, is to ensure the long term success of rehabilitation and the limitation and prevention (where possible) of ecological degradation. During the decommissioning phase, it is important that the environmental footprint of the development be kept to a minimum. For this purpose all working areas are to be demarcated by means of suitable temporary methods in order to control movement of personnel and vehicles.

Conservation principles are to be applied, including:

- The prevention of the collection of plants, parts of plants and or firewood;
- The importation of foreign plant species is to be limited in as far as this is practical. It should be noted that no foreign plants, capable of natural replication is to be brought onto the site or used for on-going rehabilitation purposes;
- Only locally occurring plant species are to be used for rehabilitation purposes, and
- An alien plant identification, eradication and control programme is to be developed and implemented.

8.3.10.1 Fire Prevention

Fire prevention measures are to be implemented, including:

- Open fires will be prohibited at the construction site, except in designated, controlled areas;
- Fire control measures will be implemented and an Emergency Response Plan must be developed.

8.3.11 Fauna and Avifauna

Impacts are to be geographically limited by prohibiting habitat degradation or destruction outside of the activity area. The following management measures are recommended:

- The disruption of ecological connectivity, localised habitat as well as territorial infringement may result from the demolition of the facility. All impacts must be limited to the project site itself and no land use changes or other disturbances of animals outside of the site are to be allowed.
- An increase in poaching, snaring and trapping of animals may occur as a result of an influx of large numbers of people. Appropriate disciplinary action is to be taken against transgressors who poach, snare or trap animals. This aspect is to be addressed during the induction and training process.
- In order to manage and mitigate any impact of chemical compounds from the operation on animals, ensure that no leaching of chemicals occur to soils and groundwater resources, through the implementation of appropriate structures (i.e. bunding). Likewise, transportation and storage of all chemicals must be in a responsible manner.
- In order to prevent the loss of natural faunal species to introduced faunal species, all pets must be prohibited at the project site.

8.3.12 Sites of Archaeological and Cultural Interest

As it is not possible to identify all sites or archaeological and heritage significance (with specific reference to unmarked graves), a Chance Find Procedure must be developed for the decommissioning phase of the project.

8.3.13 Visual

Visual impact associated with the construction and operational phases of the project will be mitigated during the decommissioning phase of the project. The rehabilitation of the project site must be completed effectively to ensure that all visual impact is finally mitigated.

8.3.14 Waste Management

In order to ensure that waste management is effective for the operational phase mitigation measures outlined as part of Section 8.1.15 must be implemented.

8.3.15 Hazardous Materials

Significant risks are presented by hazardous materials stored and used during the operational phase of the project. These include the pollution of soil and surface water as a result of uncontrolled release as well as health and safety risks from fire, explosion of health impacts from exposure. Management measures to mitigate the potential impact as included in Section 8.1.16 must be implemented.

Table 4: Summary of the SEMP – Decommissioning Phase

Impact	Cause/Aspect	Objective	Management Mitigation Practice	and Schedule Actions	of Responsible Person	Monitoring requirements
CLIMATE						
Carbon and other greenhouse gasses into the atmosphere.	Land based vehicle activity	Minimise the carbon footprint of the decommissioning phase of the Sasol CSP Project	<ul style="list-style-type: none"> Ensure vehicle exhaust systems function correctly 	Periodic monitoring	Environmental Officer	<ul style="list-style-type: none"> Periodic vehicle inspection
AIR QUALITY						
Reduction in ambient air quality from fugitive dust emissions	Particulate Matter (PM) emitted from the demolition and dismantling of infrastructure	Minimise the emission of PM	<ul style="list-style-type: none"> Dust suppression Re-vegetation of areas as soon as possible Reduction of drop height as far as is practicable Reduction of speed of vehicles to keep within the applicable speed limits 	On-going throughout decommissioning phase	Environmental Officer	<ul style="list-style-type: none"> On-going dust fallout monitoring
NOISE						
Noise Pollution	Demolition and dismantling of infrastructure Increase traffic flow (on-site)	Comply with noise level criteria in legislative and Best Practice requirements (including occupational exposure)	<ul style="list-style-type: none"> All machinery used during construction will be maintained in sound mechanical condition Appropriate use of PPE All vehicles will be fitted with appropriate sound suppression devices or silencers Keep within the applicable speed limits 	<ul style="list-style-type: none"> Monthly noise monitoring Investigation of each noise complaint 	Environmental Officer	<ul style="list-style-type: none"> Investigation of all noise related complaints Monthly noise monitoring
SOILS						
Soil disturbance, loss of nutrients, loss of topsoil cover, loss of in situ structure and physical / chemical properties	Clearing of vegetation resulting from demolition and dismantling activities	<ul style="list-style-type: none"> Minimisation of disturbed area Soil conservation 	<ul style="list-style-type: none"> Commence rehabilitation of affected and completed areas Application of soil emplacement and storage practices Fertilisation and amendments Erosion control and treatment Implementation of good housekeeping practices (vehicle maintenance and 	Ad hoc throughout decommissioning phase when required	Project Manager / Principle Contractor Environmental Officer	<ul style="list-style-type: none"> Visual inspection Measurement of dimensions Soil testing
Soil contamination	Spillages (hydrocarbons,	Soil conservation				

Impact	Cause/Aspect	Objective	Management Mitigation Practice	and Schedule Actions	of Responsible Person	Monitoring requirements
	chemicals and waste)		waste management) <ul style="list-style-type: none">■ Correct storage of dangerous goods, waste and other material which may cause contamination■ Spill clean up			
LAND USE AND LAND CAPABILITY						
Land Capability will be restored to “grazing land”	Rehabilitation of the project site	Restore land capability	<ul style="list-style-type: none">■ Commence rehabilitation of affected and completed areas where appropriate, as soon as practically possible	On-going throughout decommissioning phase	Environmental Officer	<ul style="list-style-type: none">■ Visual inspection■ Measurement of dimensions■ Soil testing
Land use will be restored to “grazing land”	Rehabilitation of the project site	Mitigate the footprint of the Sasol CSP Project				
HYDROLOGY/SURFACE WATER						
Increased TDS, possible erosion (wind and water)	Clearing of vegetation resulting from demolition and dismantling activities	Elimination of impacts on surface water	<ul style="list-style-type: none">■ Minimise and manage erosion	On-going throughout decommissioning phase	Environmental Officer	Visual inspections
Surface water contamination	Spillages (hydrocarbons, chemicals and waste)		<ul style="list-style-type: none">■ Implementation of good housekeeping practices (vehicle maintenance and waste management)■ Correct storage of dangerous goods, waste and other material which may cause contamination■ Spill clean up			
GROUNDWATER						
Groundwater quality deterioration	Contamination of localised aquifer due to waste management activities and sewage effluent disposal	Prevention of contamination of aquifer	<ul style="list-style-type: none">■ Implement recommended waste management systems■ Manage inorganic substances on surface to prevent groundwater impacts	On-going through the decommissioning phase	Environmental Officer	Visual inspections
FLORA						
Limited restoration of local vegetation /	Restoration of ecosystem habitat	Restoration of habitat and ecological	<ul style="list-style-type: none">■ Undertake re-vegetation through the use of indigenous	Monthly monitoring	Environmental Officer	Visual inspections

Impact	Cause/Aspect	Objective	Management Mitigation Practice	and Schedule Actions	of Responsible Person	Monitoring requirements
habitat	through rehabilitation activities	processes	<ul style="list-style-type: none"> species Control and management of weeds and invasive alien plant species 			
Impacts as identified for the construction phase: During the process of demolition and dismantling of the facility, impacts similar to those identified during the construction of the project may occur. Reference is made to the impact assessment section for the construction phase. Management and mitigation measures will similarly apply.						
FAUNA AND AVIFAUNA						
Restoration of local faunal habitat and/or communities	Restoration of ecosystem habitat through rehabilitation activities	Restoration of habitat and ecological processes	<ul style="list-style-type: none"> Undertake re-vegetation through the use of indigenous species Control and management of weeds and invasive alien plant species 	On-going throughout decommissioning phase	Environmental Officer	Visual inspections
Impacts as identified for the construction phase: During the process of demolition and dismantling of the facility, impacts similar to those identified during the construction of the project may occur. Reference is made to the impact assessment section for the construction phase. Management and mitigation measures will similarly apply.						
ARCHAEOLOGY & HERITAGE						
The destruction of archaeological / heritage resources and or graves	Chance finds during demolition activities	Preservation of heritage features	<ul style="list-style-type: none"> Development of a procedure dealing with chance finds 	Once off during decommissioning phase	Environmental Officer Operations Manager	Development of a Chance Find Procedure
WASTE MANAGEMENT						
Consumption of land space	Generation and disposal of general waste to landfill	Efficient use of resources	<ul style="list-style-type: none"> Re-use of wastes – avoidance of virgin material Recycling of wastes off site 	On-going throughout decommissioning phase.	Environmental Officer	Volume of waste landfilled
Contamination of soil & groundwater	On-site land filling / burial of biodegradable wastes (permanent on-site disposal)	Limit contamination of soil and groundwater	<ul style="list-style-type: none"> On-site disposal of organic food wastes to be prohibited 			<ul style="list-style-type: none"> Visual inspection Groundwater monitoring
Consumption of land space	Temporary storage of hazardous waste on unprotected ground – on site or off-site		<ul style="list-style-type: none"> Storage of hazardous wastes in purpose built stores (impermeable floors and bunding) Labelling of containers 			<ul style="list-style-type: none"> Visual inspection Emergency Response Procedure
Contamination of soil	Hazardous waste spills outside					

Impact	Cause/Aspect	Objective	Management Mitigation Practice	Schedule of Actions	Responsible Person	Monitoring requirements
	contained areas					
Contamination of groundwater	Disposal of hazardous wastes on general landfills		<ul style="list-style-type: none"> ■ Contactor control ■ Traceability (documentation) and reconciliation of waste disposed 			Auditing
Litter -aesthetic impacts Litter - ingestion by animals	Waste not placed in designated waste bins / containers	Limit impacts associated with littering	<ul style="list-style-type: none"> ■ Provision of bins ■ Management and education of people 			<ul style="list-style-type: none"> ■ Litter Management Programme ■ Visual inspections
Odour – unpleasant and may attract pests and wildlife	Waste not disposed of timeously or kept in closed containers	Prevent odour from waste storage on site	<ul style="list-style-type: none"> ■ Frequent removal of waste 			Regular waste removal
Infections from medical waste	Unsuitable handling and disposal of medical waste (sharps and bandages)	Appropriate management of medical waste.	<ul style="list-style-type: none"> ■ Provision of suitable waste containers ■ Contractor control ■ Disposal to authorised sites 			<ul style="list-style-type: none"> ■ Regularity of waste removal ■ Waste audits ■ Document control
Health risks of staff and public from exposure to hazardous wastes	Handling of hazardous waste without suitable PPE by staff or public	Prevention of hazardous waste related illnesses.	<ul style="list-style-type: none"> ■ Provision of suitable waste containers and PPE ■ Contractor control ■ Disposal to authorised sites 			
SOCIAL ASPECT						
Creation of operational phase specific employment opportunities	Sasol CSP Project	Maximisation of positive benefit	<ul style="list-style-type: none"> ■ Site-specific construction positive impacts on unskilled, semi-skilled, skilled labour. But, little likelihood of sustained high involvement of local labour across community members. No clear means of mitigation, even with sourcing labour from directly affected area 	On-going throughout decommissioning phase.	HR Manager	<ul style="list-style-type: none"> ■ Number of people employed <ul style="list-style-type: none"> • Employees from directly affected community • Local employees • Expatriates
Creation of employment opportunities not directly related to the CSP Project itself.	Sasol CSP Project		<ul style="list-style-type: none"> ■ Focus on short-term employment opportunities near communities, preceded by extensive community liaison to support employment across community members 			
Increased infection	Operational phase of	Minimising infection	<ul style="list-style-type: none"> ■ Sasol interventions on site, as 			<ul style="list-style-type: none"> ■ Staff participation in

Impact	Cause/Aspect	Objective	Management Mitigation Practice and Schedule Actions	Responsible Person	Monitoring requirements
rates (site and surrounding communities)	the Sasol CSP Project resulting in influx of people (workers)	rates	<p>per HIV/AIDS plan of action instituted by Sasol, and as per the Wellness Policy. Need to include condom programming, information and attitudinal change, gender relations and power over sexual decision-making, life skills education, testing, ARVs, recreational activities</p> <ul style="list-style-type: none"> Conduct within the context of a broader wellness programme (if applicable) 		<p>voluntary HIV/Aids programmes</p> <ul style="list-style-type: none"> Sick days above expected median. Staff productivity.
Services for Workers	Operational phase of the Sasol CSP Project resulting in influx of people (workers)	Maximise in house services to staff	<ul style="list-style-type: none"> Provide services as intended 		<ul style="list-style-type: none"> Annual audits
Gender (gender inequality / discrimination)	Operational phase of the Sasol CSP Project resulting in influx of people (workers)	Minimise gender inequality.	<ul style="list-style-type: none"> Open dialogue about male and female employment opportunities Specific requests for females with experience to apply for construction jobs 		<ul style="list-style-type: none"> Employee surveys Community surveys Annual audits.

8.4 Site Rehabilitation

8.4.1 Objectives & Principles for Rehabilitation

The following objectives for rehabilitation were used as the basis of the rehabilitation plan:

- Achieve physical stability across the site and for all residual landforms;
- Ensure chemical stability of the site;
- Minimise and/or eliminate any residual environmental impacts;
- Ensure human safety, and
- Ensure that the future land use will be practicable.

8.4.2 On-going Rehabilitation

On-going rehabilitation can be defined as the remediation of the site during the construction and operational phases of the project. It implies that once activity in a particular area of the site ceases, rehabilitation of that area can commence.

The following general rehabilitation practices are to be implemented across the site and are applicable to all structures discussed in detail in the section following:

- Re-vegetation will take place in areas that were subjected to surface disturbances during the construction or operational phase beyond the actual footprint of the facility. This includes areas where soils were removed or areas where soils and rocks are temporarily or permanently stored and covered with topsoil.
- The purpose of this is firstly to ameliorate the visual impact of the impacts associated with the disturbance and secondly to prevent resulting impacts from affecting surrounding areas, such as erosion and dust control. In order to achieve these goals it is imperative that the layer of vegetation that is established is similar in appearance and species composition than the surrounding areas. Access to the areas undergoing rehabilitation is to be restricted.

Success of the re-vegetation of impacted areas will ultimately be the establishment of a layer of vegetation that is:

- Similar in appearance than the surrounds;
- Similar in dominant species composition than surrounding vegetation;
- Similar in structure than the surrounds;
- Effectively cover impacted areas in order to contain existing impacts and stabilize soil conditions, and
- Is self-sustained in terms of water requirements and propagation.

The cover of vegetation in re-vegetated areas should ideally simulate natural conditions. Results of the surveys generally indicated a crown cover of approximately 85% (60% grasses and forbs and 25% shrubs).

Erosion control measures for newly rehabilitated areas must be applied as discussed in the social and environmental management plan.

8.4.2.1 Construction Camps

- Remove all infrastructure and waste from the site. All hazardous and domestic waste is to be containerised and disposed of at a suitably registered site.
- All fences are to be taken down and removed from site.

- Once all structures have been removed from the site, the area is to be contoured to be free draining and is to blend with the surrounding topography.
- Topsoil removed and stockpiled are to be placed onto the affected areas.
- The area is to be re-vegetated with the appropriate species.

8.4.2.2 Power Line Infrastructure

- All litter and other waste material is to be collected from the footprint and disposed of at an appropriately licensed disposal site.
- The area is to be re-vegetated with the appropriate species.

8.4.3 Rehabilitation at Decommissioning

8.4.3.1 Buildings, CSP Tower and Heliostat Field

- All structures are to be dismantled and where appropriate, material should be recycled, including all steel, glass, prefabricated buildings and others as is appropriate.
- All pipelines and containers (surface and subsurface) are to be drained of substances and these are to be containerised for appropriate disposal.
- All containers / pipes removed from site are to be recycled / disposed of at a suitably registered facility.
- Concrete and impermeable substrates are to be broken up and dispose of at a licensed disposal site.
- All compacted soil / sand areas are to be ripped.
- Once all structures have been removed from the site, the area is to be contoured to be free draining and is to blend with the surrounding topography.
- The area is to be lined with subsoils, followed with the laying down of a mixture of topsoil, fertiliser and compost as a growth medium.
- The area is to be re-vegetated with the appropriate seed mix and the planting of shrubs and small trees is to be undertaken;
- The area is to be inspected on a monthly basis for a period of 12 months for the following:
 - Remove any unwanted plants and weeds.
 - Inspect for and repair soil / wind erosion features. Should engineering intervention be required to limit areas of consistent erosion (wind / water), these should be implemented timeously.

8.4.3.2 Chemical, Fuel and Storage Areas

- Chemicals of all types are to be recycled, returned to vendor, sold, or disposed of in an approved site.
- During this phase, the clean and dirty water diversion structures as well as chemical containment structures are to be maintained. Only once all chemicals have been removed from the site, is infrastructure to be dismantled and removed from the site. Should some of the building rubble be contaminated with chemicals / hydrocarbons, those materials are to be treated as hazardous waste and handled and disposed of at an appropriately licensed landfill site.
- All other concrete and impermeable substrate is to be broken up and disposed of at an appropriately licensed disposal site.
- All compacted soil / sand areas are to be ripped.
- Once all structures have been removed from the site, the area is to be contoured to be free draining and is to blend with the surrounding topography.

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- The area is to be lined with subsoils, followed with the laying down of a mixture of topsoil, fertiliser and compost as a growth medium.
 - The area is to be re-vegetated with the appropriate seed mix and the planting of shrubs and small trees is to be undertaken;
 - The area is to be inspected on a monthly basis for a period of 12 months for the following:
 - Remove any unwanted plants and weeds.
 - Inspect for and repair soil / wind erosion features. Should engineering intervention be required to limit areas of consistent erosion (wind / water), these should be implemented timeously.

8.4.3.3 Hazardous Waste Areas

- All hazardous materials are to be appropriately containerised and removed from the site. The materials can either be recycled, returned to vendor, sold, or disposed of in an approved site.
- During this phase, the clean and dirty water diversion structures as well as hazardous waste containment structures are to be maintained. Only once all hazardous materials have been removed from the site, is infrastructure to be dismantled and removed from the site. Should some of the building rubble be contaminated with hazardous waste material, those materials are to be treated as hazardous waste and handled and disposed of at a registered H:H site.
- All other concrete and impermeable substrate is to be broken up and disposed of at an appropriately licensed disposal site.
- All compacted soil / sand areas are to be ripped.
- Once all structures have been removed from the site, the area is to be contoured to be free draining and is to blend with the surrounding topography.
- The area is to be lined with subsoils, followed with the laying down of a mixture of topsoil, fertiliser and compost as a growth medium.
- The area is to be re-vegetated with the appropriate seed mix and the planting of shrubs and small trees is to be undertaken;
- The area is to be inspected on a monthly basis for a period of 3 months for the following:
 - Remove any unwanted plants and weeds.
 - Inspect for and repair soil / wind erosion features. Should engineering intervention be required to limit areas of consistent erosion (wind / water), these should be implemented timeously.

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