

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
	<p>maintained for as short a time as possible and should be enclosed by wind breaking enclosures of similar height to the storage pile.</p> <ul style="list-style-type: none"> Storage piles should be situated away from the site boundary, and nearby receptors and should take into account the predominant wind direction. 		

6.12 Heritage and Palaeontology

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
Potential impact on archaeological and palaeontological resources.	<ul style="list-style-type: none"> If during development any heritage remains or graves are found all work has to stop till the site has been mitigated by a heritage specialist. If fossil plant material is discovered during the excavation and construction of the development, then it is strongly recommended that a professional palaeontologist, preferably a palaeo-botanist, be called to assess the importance and to rescue them if necessary (with the relevant SAHRA permit). If the fossil material is deemed to be of scientific interest then further visits by a professional palaeontologist would be required to collect more material and house it in a recognised institution. 	Weekly	Contractor; PM; ECO & Archaeologist and Palaeobotanist

6.13 Noise

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
Noise generation during construction.	<ul style="list-style-type: none"> All construction vehicles and equipment are to be kept in good repair. Construction activities, and particularly the noisy ones, are to be contained to reasonable hours during the day and early evening. In general, operations should meet the noise standard requirements of the Occupational Health and Safety Act (No 85 of 1993). Construction staff working in areas where the 8-hour ambient noise levels exceed 75 dBA should wear ear protection equipment. Construction activities, and particularly the noisy ones, are to be contained to reasonable hours (08:00 – 16:00) during the day and early evening. With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, Sasol should liaise with 	Weekly	Contractor

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
	local residents on how best to minimise the impact.		

6.14 Traffic Management and Transportation

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
Increase in traffic from construction vehicles.	<ul style="list-style-type: none"> No person is allowed to drive more than 20 km/h on a gravel road. This is applicable only to the access roads on site. All areas within the site itself, has a reduced speed limit of 50 km/h. This is communicated to all persons by means of National Speed Signs. When using heavy or large vehicles / equipment, “spotters” are to be present to assist the driver with his blind spots. Any incident or damage to a vehicle must be reported immediately as per Sasol Policies and Procedures. Seatbelts are to be worn at all times. 	Weekly	Contractor

6.15 Health and Safety

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
During construction, personnel may be exposure to dust during windy periods.	<ul style="list-style-type: none"> The vehicle speed limits at the landfill must be adhered to and the access of vehicles should be strictly controlled. Staff working at the landfill and pollution control pond area must be trained in basic safety procedures. All staff working should wear the Sasol approved PPE at all times. Occupational health practices and operating procedures which have been in existence should be maintained and continually improved in keeping with the current approach. Requirements of the OHS Act (No 85 of 1993) and its Regulations will apply to the project. 	Monthly	Contractor

7 Environmental Management Programme – Operations

A concept operational plan has been compiled for the proposed project that forms part of the Feasibility Engineering Package (Section 15 of Appendix B) and reference can be made to the current Charlie 1 Landfill Operating Procedures.

7.1 Geotechnical

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
Increase in landfill height resulting in potential stability impacts.	<ul style="list-style-type: none"> Earthworks and drainage measures should be designed in such a way as to prevent ponding of, or high concentrations of, stormwater or groundwater anywhere on the sites. Concurrent capping/rehabilitation activities are to be carried out in order to protect the side slopes of the Charlie 1 Landfill from erosion, reduce stormwater collection volumes and to lessen the visual impact of the ash dump. The maximum final finished capped side slope of the Charlie 1 Landfill should not be steeper than 1V:3H to ensure long term stability of the slope. The Charlie 1 Landfill should be monitored on a regular basis for possible movement and slope failure. The amount of movement that is likely to occur before failure determines the sensitivity of the monitoring equipment required. Movement varies with the type of material disposed, the disposal facility height and the location at which monitoring will be done. 	Bi-monthly	SM

7.2 Soils

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
<p>Improper management of the leachate and stormwater run-off from the Charlie 1 Landfill site could potentially contaminate soils.</p> <p>Potential contamination of soils (lateral movement of the leachate in the upper soil zone) during operations and maintenance due to:</p> <ul style="list-style-type: none"> accidental release of the leachate and stormwater from the ponds; damage of the ponds lining system; 	<ul style="list-style-type: none"> Regular maintenance of the stormwater management system to ensure that leachate and stormwater run-off does not pond on the surface and side areas of the landfill. V-drains and silt traps will be need to be de-silted regularly. If blockages occur in the leachate drains, specialist rodding equipment will be used to unblock the drains. Pumps will be maintained as per their specifications. The enhanced evaporation system will be monitored and adjusted daily. The CLP and CSP will be de-silted and precipitated solids will be removed. Care must be taken not to damage any HDPE liners. 	Bi-monthly	SM

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
<ul style="list-style-type: none"> lack of maintenance of stormwater and leachate drains; and silt traps that are not de-silted regularly. 	<ul style="list-style-type: none"> Where damage has occurred, a professional liner installer must repair the damage. Personnel must avoid walking on the liners. Tears or deep scratches to the exposed liner should be repaired where necessary by a specialist contractor. Plastic spades must be used to remove precipitated solids. All leakages onto soils should be cleaned immediately. 		

7.3 Geohydrology

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
<p>Operational activities related to leachate infiltration in to groundwater resources:</p> <ul style="list-style-type: none"> Improper management of the leachate and stormwater run-off from the Charlie 1 Landfill site allows rainwater to pond in areas on the surface and side areas of the landfill. Improper design of the lining system for the ponds could provide a pathway for the contamination of the groundwater resources. 	<ul style="list-style-type: none"> Sizing of ponds - designed to accepted standards and norms. Lining of the CLP and CSP as per the recommendations of the FEP (Appendix B) where it is proposed that a triple liner system or equivalent Class A barrier system be installed for the CLP. The following system will be used for the CLP: a double geomembrane system with a leakage detection layer between the two geomembranes, from which any leakage that occurs through the top geomembrane will be monitored, captured and returned to the leachate pond. For the CSP, it is proposed that a Class B barrier system is installed. The following system will be used for the CSP: a double geomembrane system with a leakage detection layer between the two geomembranes, from which any leakage that occurs through the top geomembrane will be monitored, captured and returned to the stormwater pond. In the maintenance of the two ponds, care must be taken not to damage any HDPE (black plastic) liners. Personnel should avoid walking on the liners. Scratches can compromise the service life of a liner. Tears or deep scratches to the exposed liner should be noted and repaired where necessary by a specialist Contractor. It is possible to have patches welded over damaged areas of liner. Regular inspections of the exposed liners should be carried out as part of routine maintenance. For both ponds, should desilting or removal of precipitated solids be required, absolute care must be taken not to damage the liners. Only plastic spades should be used. Care must also be taken not to damage the HDPE liners with herbicides or “weedeaters” and other grass cutting machines. Where damage 	Bi-annually	SM; AM & Environmental Specialist

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
	<p>is noted, the operator should call in a professional liner installer to repair the damage. The liners are UV resistant and resistant to most chemicals. However, as the quality of the leachate can vary with time, the ponds should be monitored for unexpected degradation.</p> <ul style="list-style-type: none"> • Maintenance of the both the stormwater and leachate drains should be carried out on a regular basis. The v-drains associated with stormwater management require simple de-silting. This may be achieved manually without any additional equipment. The silt trap will also require regular de-silting which may be done by hand or with a skid steer via the access ramp. Leachate drains should be monitored by regular inspections of the manholes located every 100 m. If blockages occur, specialist rodding equipment may be required for unblocking. A standby borehole pump may be kept on site in case of significant blockages requiring extraction of leachate. • Pumps must be maintained as per their specifications. This may require periodic servicing and possible replacement. The enhanced evaporation system is designed and includes accessories to minimise operational maintenance. The nozzles specified on the sprayers are self-cleaning to prevent blockages while an “auto-flush” strainer bank is also included. Overall configuration and adjustments to the system will be an ongoing process until optimal outcomes are achieved. Once optimised, the system should be largely automated by linking it to a weather station. The site operator or responsible party will however have to monitor and make adjustments to the system on a daily basis. • Two abstraction periods should be scheduled per year for the CLP. Ideally these periods should be scheduled immediately before and after the rain season (i.e. September/October and April/May). • Abstraction should be scheduled once a year for the CSP. Ideally these periods should be scheduled immediately before and after the rain season (i.e. September/October and April/May). • The leakage monitoring sumps associated with each pond also need to be monitored on a regular basis. This monitoring includes the measurement of leakage flow rates into each monitoring manhole. These flow rates are to be compared with relevant regulatory standards to determine whether the liner installations are performing adequately. If excessive leakage is 		

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
	<p>experienced, a leak detection survey may need to be performed in order to identify any problem areas within the pond and carry out repairs. Any leakage retrieved from these monitoring points is to be returned into the respective pond.</p> <ul style="list-style-type: none"> • Implementation of a groundwater monitoring programme: <ul style="list-style-type: none"> – Ten boreholes are monitored as part of the groundwater monitoring programme. The monitoring frequency is twice a year (May and November) for all boreholes except REGM-98 and REGM-229, which are sampled annually (November). – If the monitoring data indicates the need for corrective action, the magnitude of the impact must be assessed by an appropriately qualified and experienced specialist and the necessary measures put forward based on the magnitude of the impact. 		
<p>Potential contamination of groundwater during operations and maintenance due to:</p> <ul style="list-style-type: none"> • Accidental release of the leachate and stormwater from the ponds; • Damage of the ponds lining system; • Lack of maintenance of stormwater and leachate drains; and • Silt traps that are not de-silted regularly. 	<ul style="list-style-type: none"> • Regular maintenance of the stormwater management system to ensure that leachate and stormwater run-off does not pond on the surface and side areas of the landfill. • V-drains and silt traps will be de-silted. • If blockages occur in the leachate drains, specialist rodding equipment will be used to unblock the drains. • Pumps will be maintained as per their specifications. • The enhanced evaporation system will be monitored and adjusted daily. • The CSP will be de-silted and precipitated solids will be removed. • Liners should be regularly monitored for degradation due to high chemical concentrations in the leachate. • Care must be taken not to damage any HDPE liners. • Where damage has occurred, a professional liner installer must repair the damage. • Personnel must avoid walking on the liners. • Tears or deep scratches to the exposed liner should be repaired where necessary by a specialist contractor. • Plastic spades must be used to remove precipitated solids. 	Weekly	AM & Environmental Specialist

7.4 Hydrology

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
Contamination of surface water run-off	<ul style="list-style-type: none"> • The landfill should be shaped in a manner that run-off will be 	Bi-annually	SM & Environmental

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
<p>due to operation activities:</p> <ul style="list-style-type: none"> • Improper management of the leachate and stormwater run-off from the Charlie 1 Landfill site due to an absence of clean and dirty water segregation. • Improper surface water management arising from rainfall falling on the landfill due to ponding on the surface of the landfill rather than freely draining. 	<p>channelled away from the site.</p> <ul style="list-style-type: none"> • Sizing of ponds - designed to accepted standards and norms. • Contaminated stormwater from the landfill site is captured in perimeter drains along the northern, western and southern boundary. This water is then gravity fed via a silt trap to the CSP. Enhanced evaporation systems on each of the ponds allow for a significant reduction in the ponds required holding capacity. Upslope clean stormwater is diverted away from the site by a berm located along the eastern boundary. • Due to the standard cell operation method used for the landfill which stipulated that only one cell will be operational at any given time, stormwater will be minimal. • A surface water monitoring programme is currently taking place around the Sasol Industrial Complex. RESM 4, 5, 6 and 7 are the nearest surface water monitoring points to the Charlie 1 Landfill site. If the monitoring data indicates the need for corrective action, the magnitude of the impact must be assessed by an appropriately qualified and experienced specialist and the necessary measures put forward based on the magnitude of the impact. • Regular maintenance of stormwater management system should be undertaken to ensure that leachate and stormwater run-off is effectively diverted and contained on site. • Pumps will be maintained as per their specifications. • The enhanced evaporation system will be monitored and adjusted daily. • The CSP will be de-silted and precipitated solids will be removed. • Liners should be regularly monitored for degradation to due high chemical concentrations in the leachate. • Care must be taken not to damage any HDPE liners. • Where damage has occurred, a professional liner installer must repair the damage. • Personnel must avoid walking on the liners. • Tears or deep scratches to the exposed liner should be repaired where necessary by a specialist contractor. • Plastic spades must be used to remove precipitated solids. 		Specialist

7.5 Stormwater Management

Refer to the Stormwater Management measures and controls included in the Construction phase (Section 6.6) as well as the measures and control indicated below.

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
Contaminated Leachate Pond (CLP) and Contaminated Stormwater Pond (CSP)	<ul style="list-style-type: none"> • Lining of the CLP and CSP as per the recommendations of the FEP (Appendix B) where it is proposed that a triple liner system is used for the CLP and a Class B landfill system is used for the CSP. • Regular maintenance of stormwater management system should be undertaken to ensure that leachate and stormwater run-off is effectively diverted and contained on site. • V-drains and silt traps will be de-silted. • If blockages occur in the leachate drains, specialist rodding equipment will be used to unblock the drains. • Pumps will be maintained as per their specifications. • The enhanced evaporation system will be monitored and adjusted daily. • The CSP will be de-silted and precipitated solids will be removed. • Liners should be regularly monitored for degradation to due high chemical concentrations in the leachate. • Care must be taken not to damage any HDPE liners. • Where damage has occurred, a professional liner installer must repair the damage. • Personnel must avoid walking on the liners. • Tears or deep scratches to the exposed liner should be repaired where necessary by a specialist contractor. • Plastic spades must be used to remove precipitated solids. 	Weekly	SM & AM
Leachate interception	<ul style="list-style-type: none"> • Construct interception “curtain” drains along the downslope boundaries (south-west and north) of the Charlie 1 Landfill. • The “curtain” drains will extend to depths varying from 2 to 5 m below surface level. • The interception drain will collect leachate from the landfill into an HDPE pipe which directs flow to a sump located in the north-west corner of the site. • Leachate is then pumped from this sump into the CLP. 	Weekly	SM & AM
Stormwater interception	<ul style="list-style-type: none"> • Construct v-drains from concrete filled geocells along the southern, western and northern site boundaries. • Diversion berm will be constructed along the upslope eastern boundary of the site which will prevent clean run-off from entering the site. 	Weekly	SM & AM

7.6 Air Quality

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
Dust generation during operation of the Charlie 1 Landfill Site.	<ul style="list-style-type: none"> Dust must be suppressed on the dump by the regular application of water. Potable water will be used for dust suppression. Water used for this purpose must be used in quantities that will not result in the generation of run-off. Dust fallout monitoring should be conducted during operations. All site workers will need to wear the Sasol approved PPE to avoid excessive exposure to dust particles. There should be strict speed limits on site roads to prevent the liberation of dust into the atmosphere. 	Weekly	AM & Environmental Specialist

7.7 Waste Management

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
Waste handling and management	<ul style="list-style-type: none"> Licence / permit conditions stipulate that waste volumes must be reported to the relevant Environmental Authorities on a periodical basis. In addition Sasol reports waste data into the Sustainable Development (SD) report and South African Waste Information System (SAWIS). All waste managed on-site must be quantified and consolidated on a monthly basis. Records (waste manifests and safe disposal certificates) should be kept for a minimum period of 5 years. Records of all safe disposal certificates will be held by the Sasol Environmental Department. Waste inventories / registers must be reviewed and updated every 5 years. 	Monthly	Contractors & SM

7.8 Transportation of Waste

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
Transportation of waste	<ul style="list-style-type: none"> The person in control of the division transporting the waste to the disposal site must ensure that records are kept for all non-hazardous waste in blue bins and transported to the site. Any person, who awards a specific contract to a contractor for the transport of waste to the Charlie 1 Landfill, shall keep the required records (e.g. Asbestos cement, building rubble, non- 	Weekly	Contractors & SM

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
	<p>hazardous plant waste).</p> <ul style="list-style-type: none"> • All waste entering the site is weighed using a weighbridge. • When and if the gate clerk is uncertain about any waste entering the site, he / she will inspect the truck or container before entering the site. • All waste entering the site will be disposed at designated areas e.g. general waste, garden waste, insulation material etc. • Sasol reserves the right to conduct random audits / inspections of the trucks transporting waste to the Charlie 1 Landfill. • If unauthorised waste reaches the landfill, it will be channelled to the correct disposal site at the cost of the waste producer or be returned to the waste producer at his cost. • Waste generators may be required to remove any non-permissible waste previously disposed at the Charlie 1 Landfill and rehabilitate the affected are at the generator's cost. • Historical records of waste entering and exiting the site will be retained for a period of 5 years. • All records for waste management are maintained and held in the SM's office. 		

7.9 Health and Safety

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
<p>Health impacts due to water contamination.</p>	<ul style="list-style-type: none"> • Regular maintenance of stormwater management system should be undertaken to ensure that leachate and stormwater run-off is effectively diverted and contained on site. • Lining of the CLP and CSP as per the recommendations of the FEP (Appendix B) where it is proposed that a triple liner system or equivalent Class A barrier system be installed for the CLP. The following system will be used for the CLP: a double geomembrane system with a leakage detection layer between the two geomembranes, from which any leakage that occurs through the top geomembrane will be monitored, captured and returned to the leachate pond. • For the CSP, it is proposed that a Class B barrier system is installed. The following system will be used for the CSP: a double geomembrane system with a leakage detection layer between the two geomembranes, from which any leakage that occurs through the top geomembrane will be monitored, captured and returned to the stormwater pond. • In the maintenance of the two ponds, care must be taken not to 	<p>Bi-annually</p>	<p>SM</p>

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
	<p>damage any HDPE (black plastic) liners. Personnel should avoid walking on the liners. Scratches can compromise the service life of a liner. Tears or deep scratches to the exposed liner should be noted and repaired where necessary by a specialist Contractor. It is possible to have patches welded over damaged areas of liner. Regular inspections of the exposed liners should be carried out as part of routine maintenance. For both ponds, should desilting or removal of precipitated solids be required, absolute care must be taken not to damage the liners. Only plastic spades should be used. Care must also be taken not to damage the HDPE liners with herbicides or “weedeaters” and other grass cutting machines. Where damage is noted, the operator should call in a professional liner installer to repair the damage. The liners are UV resistant and resistant to most chemicals. However, as the quality of the leachate can vary with time, the ponds should be monitored for unexpected degradation.</p> <ul style="list-style-type: none"> • Maintenance of the both the stormwater and leachate drains should be carried out on a regular basis. • Pumps must be maintained as per their specifications. • Implementation of groundwater and surface water monitoring programmes as specified in the geohydrology and hydrology sections. 		

7.10 Visual

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
<p>Due to the proposed 20 m height increase at the Charlie 1 Landfill, 80% of the study area will be visual impacted by the landfill.</p>	<ul style="list-style-type: none"> • Utilised trees and shrubs as a screening method. • A botanist should be consulted to determine the most suitable tree and shrub species to be used for screening. • Employ concurrent rehabilitation methods (Section 17 in Appendix B) to limit visual impact. • Consultation with receptors and stakeholders should occur to prevent potential dissatisfaction or tension. 	<p>Bi-Annually</p>	<p>SM & Environmental Specialist</p>

8 Environmental Management Programme – Rehabilitation and Decommissioning

8.1 Concurrent Rehabilitation

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
Concurrent rehabilitation of the Charlie 1 Landfill.	<ul style="list-style-type: none"> The Charlie 1 Landfill needs to be rehabilitated concurrently in order to protect the side slopes of the landfill from erosion, reduce stormwater collection volumes and to lessen the visual impact of the landfill. Stormwater diversions will be implemented along the boundary of the Charlie 1 Landfill to divert clean run-off away from the site. The Charlie 1 Landfill should not be steeper than 1V:3H to ensure long term stability of the slope. The landfill will be shaped and capped in phases. Shaping and capping will take place as soon as possible so as to not impede waste deposition activities. Interim capping is to be undertaken in accordance with the development plan (Section 15 of Appendix B). Interim capping consists of a compacted 300 mm thick topsoil or cover material layer. Once waste deposition has been completed, final capping as specified in (Section 17 of Appendix B) will be applied to the Charlie 1 Landfill. 	Weekly	SM, Contractor & ECO

8.2 Decommissioning

At this point of the project planning process, the necessity for and timing of the decommissioning of the proposed project is not known as the Charlie 1 Landfill and pollution control pond area will be in operation for the next 20 years. In order to minimise the extent of rehabilitation activities required during the decommissioning phase, Sasol will ensure that constant effort is applied to rehabilitation activities throughout the construction, operation and maintenance phases of the project.

Sasol will further ensure upon site closure and decommissioning of the authorised activity, an application in terms of applicable legislation (if necessary) will be made.

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
Groundwater contamination due to decommissioning activities.	<ul style="list-style-type: none"> Concurrent rehabilitation of the Charlie 1 Landfill will be conducted. Ongoing groundwater monitoring of the Charlie 1 Landfill and pollution control pond area should be conducted. If the monitoring data indicates the need for corrective action, the magnitude of the impact must be assessed by an appropriately qualified and experienced specialist and the necessary measures put forward based on the magnitude of the impact. 	Bi-annually	SM & Environmental Specialist
Continued stormwater flows of polluted water. Surface water contamination due to decommissioning activities.	<ul style="list-style-type: none"> Concurrent rehabilitation of the Charlie 1 Landfill will be conducted. Ongoing monitoring of the Charlie 1 Landfill and pollution control pond area should be conducted. 	Bi-annually	SM & Environmental Specialist
Increased soil erosion due to decommissioning activities: <ul style="list-style-type: none"> Re-vegetating and rehabilitating the Charlie 1 Landfill. Decommissioning of infrastructure and buildings. Rehabilitation of access roads. 	<ul style="list-style-type: none"> Concurrent rehabilitation of the Charlie 1 Landfill will be conducted. The final capping of the last phase of deposition should take place as soon as decommissioning has begun to prevent soil erosion. Rehabilitation of areas affected by construction and operation activities should ideally commence at the start of the rainy season. All areas where topsoil was removed should be landscaped in order to reflect surrounding conditions. Erosion monitoring and control should be conducted. This should be in the form of inspections subsequent to rains. Topsoil should be replaced in all areas that were eroded. It is critical that adequate topsoil remains in construction areas, implying that topsoil might need to be supplemented in some areas until such time that a layer of vegetation has stabilised the soil. Vehicle movement has to be restricted to designated areas and roads in order to prevent degradation of any additional land or parts of land. Vehicle movement has to be restricted to an absolute minimum that is required for the decommissioning. Unnecessary movement of vehicles will increase the degradation of paths and dirt roads leading to an increased erosion risk. Rehabilitation of access roads should start as soon as decommissioning is initiated. 	Weekly	SM & Environmental Specialist
Dust and emissions generated by decommissioning activities.	<ul style="list-style-type: none"> There should be strict speed limits on site to prevent the liberation of dust into the atmosphere. Dust must be suppressed at the construction site and temporary 	Daily	SM & Environmental Specialist

Aspect and Associated Impact	Measures and Controls	Monitoring Frequency	Responsible Person/s
	<p>dirt roads and during the transportation of material during dry periods by the regular application of water or binding chemicals. Water used for this purpose must be used in quantities that will not result in the generation of run-off.</p> <ul style="list-style-type: none"> All site workers during construction will need to wear the Sasol approved PPE to avoid excessive exposure to dust particles. 		
<p>Increase in noise pollution from vehicles and staff.</p>	<ul style="list-style-type: none"> All decommissioning vehicles and equipment are to be kept in good repair. Machines in intermittent use should be shut down in the intervening periods between work or throttled down to a minimum. In general, operations should meet the noise standard requirements of the Occupational Health and Safety Act (Act No 85 of 1993). Construction staff working in areas where the 8-hour ambient noise levels exceed 75 dBA should wear ear protection equipment. 	<p>Daily</p>	<p>SM & Environmental Specialist</p>
<p>During decommissioning, there is likely to be an increase in traffic from construction vehicles.</p>	<ul style="list-style-type: none"> No person is allowed to drive more than 50 km/h on a gravel road. This is applicable only to the access roads on site. All areas within the site itself, has a reduced speed limit of 20 km/h due to the danger of driving into the pipeline. This is communicated to all persons by means of National Speed Signs. When using heavy or large vehicles / equipment, "spotters" are to be present to assist the driver with his blind spots. Any accident or damage to a vehicle is to be reported immediately as per Sasol's Policies and Procedures. 	<p>Daily</p>	<p>SM & Environmental Specialist</p>

Appendix A: Sensitivity Map

Sensitivity Map

Legend

- Main Rivers
- Proposed Stormwater & Leachate Ponds
- Proposed Landfill
- Dumping Site
- Transformed Agricultural Lands
- Property Boundaries

Scale

400 Meters

1:30 000



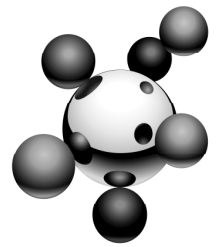
Fountain Square
78 Kalkoen Street
Monument Park Ext 2
0181
T +27 (0)12 3675800
W www.rhdhv.co.za



**Appendix B:
Feasibility Engineering Package (FEP) for the
Stormwater and Leachate Management of
Charlie 1 Landfill**

Refer to Appendix D of the Main Document

Appendix C:
Sasol Standard Operating Procedure:
Operating Charlie 1 Solid Waste Disposal Site



Standard Operating Procedure: Operating Charlie 1 solid waste disposal site

SGR-SOP-000074

Revision: 01

SAX-10029304

Purpose

The purpose of this is to define the process in which waste is managed in Sasol Secunda and to provide guideline for safe handling, transport and disposal of solid waste materials.

Applicable to:

This document is applicable to Sasol Charlie 1 solid waste disposal site in Secunda.

Document category:

Next review date:

Supersedes:

Area Specific

December 2016

New Document

Initiator \ subject matter expert:

Document owner:

Approver:

SA Mahlangu

R. Strydom

H. Storm

Document origin:

Sasol Synfuels

Water and Ash

Outside Ash

Charlie 1 Solid Waste Disposal Site

Administration:

Address written comments or suggestion to the document owner as provided on the front page of a document

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Appendices

A: Operation checklist

References

Document number	Description
SGR –MOR-000056:	Legal appointments in terms of OHS Act
SGR-SHE-000068:	Standard Operating Procedure
SGI-DMS-000001:	The requirements and management of Sasol Synfuels governance documents Sasol Charlie one risk assessments Charlie one emergency procedure

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1 Abbreviations and definitions

1.1 Abbreviations

DM	Divisional Manager
EMS	Electronic Management Systems
HAZOP	Hazard Analysis And Operability Study
ISO	Isometric (Drawings)
MFD	Mechanical Flow Diagram
MOC	Management Of Change
MSDS	Material Safety Data Sheet
PDA	Potential Deviations Analyses
PHA	Process Hazard Analysis
PPE	Personal Protective Equipment
PRA	Pipe Repair Approval
PVC	Poly Vinyl Chloride
SAP	System Application Program
SH&E	Safety Health And Environment
SOP	Standard Operating Procedure
SWP	Safe Work Procedure
VRA	Valve Repair Approval
WRF	Waste Recycling Facility

1.2 Definitions

Approver

This is the person who approves and signs the document.

Change / modifications

This is any temporary or permanent alteration, addition, removal or demolition to any part of plant, equipment, systems (soft and hardware), facilities, or in material and procedures, or personnel structure that affects the manufacturing facility other than replacement in kind.

Clearance for operation

A document from the relevant maintenance discipline to operations / production stating that work has been completed and that the equipment is safe for re-commissioning.

Environmental incident

Means 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.

Hazardous waste

Based on the national environmental management Act 59 of 2008; waste act definition means any waste that contains organic or inorganic elements or compounds that may that may, owing to inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

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Hot work

Any operation that presents an ignition source such as but not limited to: use of open flame / spark. Producing equipment, welding, torch cutting, brazing, chipping, grinding and abrasive blasting. The use of non-intrinsically safe electrical tools, explosive power cartridges, internal combustion engines, or other activities in hazardous classified locations which produce internal sparks, hot surfaces or other ignition sources are also examples of hot work.

Management of change (MOC)

A systematic procedure for the review of proposed changes to the documented process technology and / or facilities or personnel, considering potential hazards brought onto the process, materials, equipment or operation, and their elimination or control.

Management of change authorization (MOC) package

The collection of MOC documentation for each project that could include the change request form, hazard identification studies, feasibility studies, operability studies, impact studies, data sheets, material specifications certificates, PRA's, VRA's, MFD's, ISO's, PDA's, quotations, exemptions, drawings (transmittal forms), plot plans, hot tapping and X-ray reports, certificates of acceptance, certificates of compliance, etc. Such documentation will be stored in a document management system. Hazard identification studies, management approval and approval for commissioning will be complete, signed and included in the MOC package which will be filed on completion of the change.

Operator

The area responsible for operating the waste disposal sites and where enquiries may be made is made about the acceptability of waste at that site.

Operating procedures (Standard Operating Procedures)

Written, step-by-step instructions and associated information (cautions, notes, warnings) for safely performing a task within operating limits.

Process unit

An independently supervised division of a site that has only one production group and is normally supported by a single maintenance group and a single technical group for day-to-day activities.

Production

The discipline or persons in charge of a production process or process equipment, transfer lines, storage tanks, etc. This includes the term operations.

Refresher training

Documented, periodic re-training and testing done by the employer to determine if employees are still capable of adhering to the current operating procedures of the process.

Safe maker

A competent person who is designated by the permit issuer to ensure that the safe making of equipment and area is carried out according to the requirements of the permit for a specific task.

Safety critical task

A task that if not performed correctly (i.e. according to safe work practices) may lead to an unsafe situation, which could cause injury to persons, damage to equipment or a release of a hazardous chemical.

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Safe working practices

Practices that are non-routine operations and often require special authorization (e.g. hot work permit). Safe work practices are more generic than procedures and describes a program and an approach for conducting an activity (e.g. confined space entry or lock-out / tag-out, etc.) Both operating procedures and safe work practices are required for safe operation. (S1.4)

Sasol

Sasol Ltd or any Sasol business unit / division / joint venture.

Standby

A trained person designated on the permit by the issuer of the permit to perform stand-by duties during specific activities, to ensure permit conditions are maintained for the duration of such work. This includes safety watchers, hole watchers and fire watchers.

Waste means

Any substance whether or not that substance can be reduced, re-used, recycled and recovered. That is surplus, unwanted, rejected, discarded, abandoned or dispose of which the generator has no further use of for the purpose of production that must be treated or dispose of, or that is identified as a waste by the ministry by notice in the gazette.

Waste generator

Means any person whose actions, production processes or waste management activities creates or results in waste.

Waste transporter / collector

The contractor contracted to collect, transport and dispose the waste at the designated site / area.

Waste manager

Means any person that re-uses, recycles, recovers, co-processes, treats or disposes of waste, including the waste generator itself or a person acting on the waste generators behalf.

2 Scope

This procedure relates to the safe handling, keeping, transport, collection and disposal of all waste generated Sasol Secunda site.

3 Introduction

Sasol standard operating procedure is one of the most critical building blocks in any effective operation and SH&E management system. The complexities of Sasol plants and the limitations of human capabilities necessitate the development of an effective means to assist process personnel to safely, efficiently and effectively control plant functions. It is not sufficient to depend on an operator's memory and experience exclusively. These procedures enable process personnel to perform tasks in a consistent manner and to the same standard every time.

Furthermore, procedures ensure that human intervention with a system occurs in a timely and effective manner. Procedures provide the basis for handling low frequency activities where training may have been forgotten. Primarily, procedures SGR-SHE-000068: should support process personnel in the safe and effective performance of their duties.

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3.1 Principles

- 3.1.1 Standard operating procedures and safe working practices aid process personnel to perform tasks in a consistent manner and to the same standard every time.
- 3.1.2 Safety critical tasks that can significantly impact on SH&E, including the process hazard analysis and relevant emergency plan elements should be identified. The outcome should be included in the procedures to be developed.
- 3.1.3 Sasol considers standard operating procedures as a written record of our organisational learning, aimed at continual risk reduction and safety improvement.
- 3.1.4 Standard operating procedures assist Sasol to operate their plants within safe operating limits.
- 3.1.5 Changes to the content of standard operating procedures and safe work practices require a management of change (MOC). SGR-SHE-000068: process and training of affected personnel on the changes.

4 Responsibilities and authorities

- 4.1 The departmental managers are ultimately responsible for ensuring that waste is managed in accordance with legislative requirements.
- 4.2 Site, line managers or nominated representatives, are responsible for compliance with this procedure.
- 4.3 Each department is responsible for ensuring that all waste they produce during their activities on Sasol site is managed safely and in accordance to legislative requirements.
- 4.4 Contractors / service providers have the responsibility to ensure all waste they produce during their activities on the Sasol sites is managed safely and in accordance with legislative requirements.
- 4.5 It is the responsibility of all employees to segregate and store waste in the appropriate containers / bins at designated areas.

5 Requirements

Requirements for standard operating

5.1 Charlie 1 plant overview



Aerial picture overview of Charlie 1 dumping site.

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5.1.1 Charlie 1 dumping site standard operating procedures includes the following:

a) Waste handling

- i)** Items classified as waste will be handled with duty of care in accordance with legislative requirements.
- ii)** Wherever practicable, waste should be compacted before placing it in a storage container / bin for off-side disposal / recycling.
- iii)** All waste will be stored in a safe and secure manner pending collection by third party contractors / service provider’s recovery, recycling or disposal.
- iv)** All waste will be stored in a manner that prevents its escape.
- v)** Wherever possible, access to waste containers will be restricted to the plants / department designated employees, contractors and contracted waste collection contractors.
- vi)** Waste produced by contractors / service providers will be stored in designated areas and designated containers as provided by the contractor, unless otherwise agreed by the site manager. Contractors will demonstrate a duty of care over any waste produced by them on the site.
- vii)** At locations where provision is made for waste containers, containers will be clearly and appropriate labelled.
- viii)** All personnel coming to dispose waste will be required to wear their normal Sasol approved PPE or as per their trade when required.

b) Transportation, disposal and collection

- i)** Waste produced by Sasol and service providers, will only be transported off-site by a registered waste collection contractor.
- ii)** All waste and vehicles / trucks entering the site will be recorded on a register for waste confirmation and the driver will sign next to their names.
- iii)** When and if the gate clerk is uncertain about any waste entering the site, he / she will inspect the truck or container before entering the site.
- iv)** All waste entering the site will be disposed at designated areas e.g. general waste, garden waste, insulation material etc.
- v)** Historical records of waste entering and exiting the site will be retained for a period of 3 years.
- vi)** All waste that is recyclable will be collected by or sent to an approved contractor on site for recycling.
- vii)** All waste that is unacceptable on site, waste producer will be advised on how to dispose of it safely or refer to Sasol waste management procedure SAX 10029304
- viii)** All recycled waste will be weighed at WRF weighbridge before being dispose off.

c) Safety and health considerations

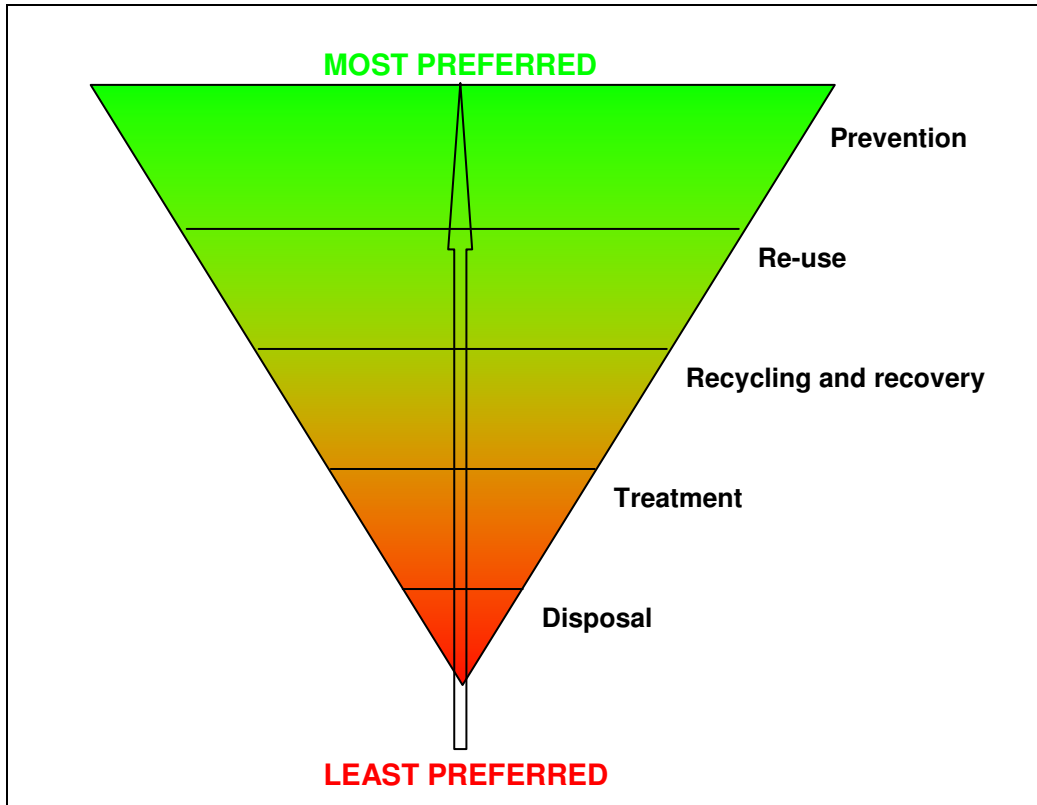
i) Waste types covered in Charlie 1 dumping site includes the following:

- 1)** Domestic, household waste;
- 2)** Cardboard / packaging / wood;

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- 3) Other office waste;
- 4) Builders waste rubble;
- 5) Scrap furnisher, machinery and equipment(non electrical);
- 6) Metals;
- 7) Insulation material(excluding asbestos containing material);
- 8) Garden waste; and
- 9) Asbestos cement.

ii) **Waste hierarchy**



iii) **Operating hours**

- 1) Monday-Friday 07H00-16H00;
- 2) Saturday 08H00-16H00;
- 3) Sunday 08H00- 12H00; and
- 4) Open Sat and Sun only on the 2nd weekend of each and every month.

6 Accessibility

- 6.1 All records for waste management are maintained and held in foremen office and environmental department.

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7 Charlie 1 operating procedure checklist

7.1 See appendix A

8 Record management

Record matrix

Record nr.	Record description	Responsibility	Medium	Storage location	File	Retention period	Disposal method
None	None	Sipho Mahlangu	Paper	Outside Ash foremen office and environmental department	Hard copy	1 year	Scan, archive and shred

Note: Files with hard copies are kept in the document store while the product / customer are active - thereafter it is archived. Electronic data is stored on the server and is backed up as per the IT procedures.

9 Amendment

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00	All	New document

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