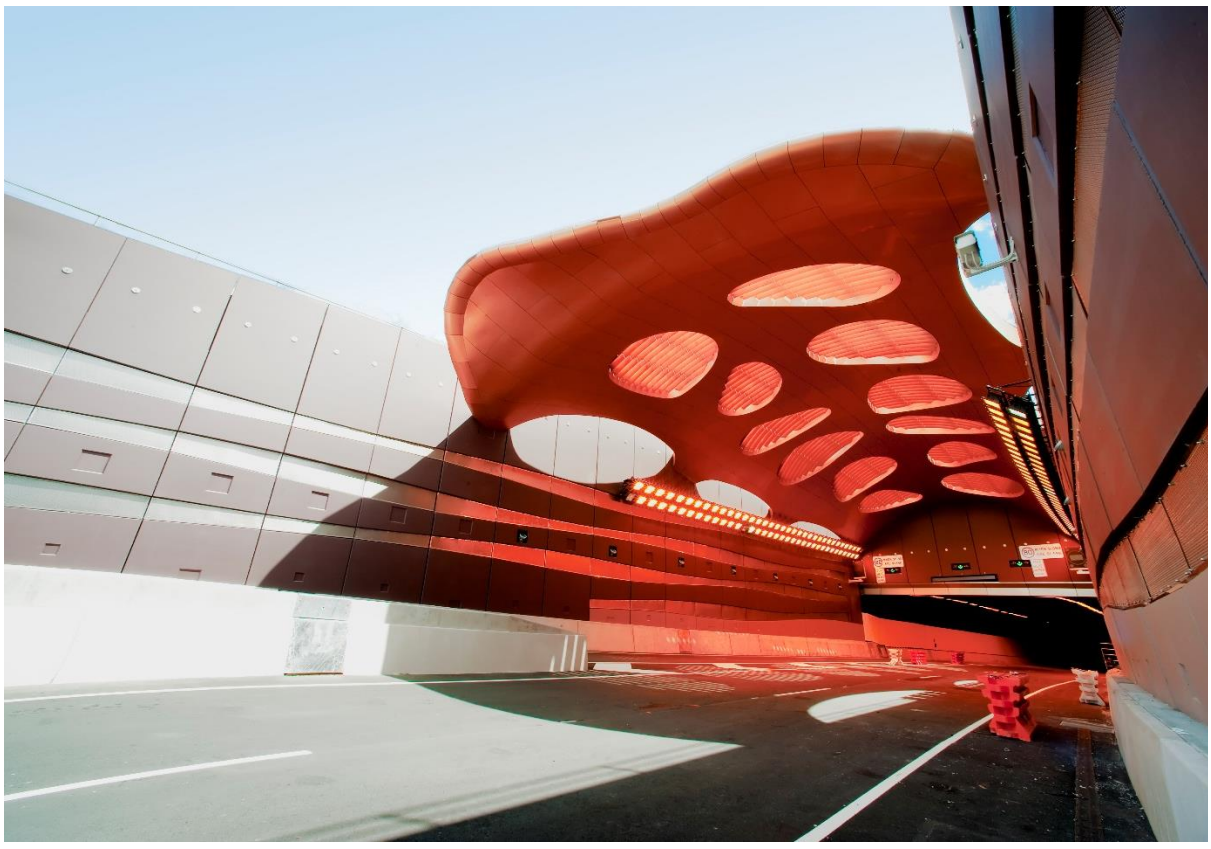
TUBATSE CHROME (PTY) LTD

ESTABLISHMENT OF FOUR COAL-FIRED BOILERS AT TUBATSE CHROME

ENVIRONMENTAL MANAGEMENT PROGRAMME

11 MAY 2018

PUBLIC



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ENVIRONMENTAL MANAGEMENT PROGRAMME

TUBATSE CHROME (PTY) LTD

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SIGNATURES

PREPARED BY

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REVIEWED BY

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Principal Consultant

Purpose and basis of preparation of this Report

This Environmental Management Programme (Report) has been prepared by WSP Environmental Proprietary Limited (WSP) on behalf and at the request of Tubatse Chrome (Pty) Ltd. (Client).

Unless otherwise agreed by us in writing, we do not accept responsibility or legal liability to any person other than the Client for the contents of, or any omissions from, this Report.

To prepare this Report, we have reviewed only the documents and information provided to us by the Client or any third parties directed to provide information and documents to us by the Client. We have not reviewed any other documents in relation to this Report and except where otherwise indicated in the Report.

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GLOSSARY OF TERMS AND ABBREVIATIONS

ABBREVIATION	DEFINITION
BAR	Basic Assessment Report
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
Emergency	An undesired event that may result in a significant environmental impact and requires the notification of the relevant statutory body such as a local authority
EMPr	Environmental Management Programme
Environment	In terms of the National Environmental Management Act (No. 107 of 1998), "environment" means 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) of (ii) and the interrelationships among and between them; and iv. the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.
Environmental Control Officer	A suitably qualified individual who would, on behalf of Tubatse, on a monthly basis monitors the project compliance with conditions of the EMPr and conditions of the environmental authorisation.
Environmental Impact	A change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services
GNR	Government Notice Regulation
Incident	An undesired event which may result in a significant environmental impact but can be managed through internal response
km	Kilometre
LEDET	Limpopo Department of Economic Development, Environment and Tourism
m	Metre
NEMA	National Environmental Management Act (No. 107 of 1998)

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1 INTRODUCTION

1.1 BACKGROUND

Tubatse Chrome (Pty) Ltd (Tubatse) is a chrome smelting operation situated in Steelpoort, Limpopo Province.

Tubatse was initially built as a three-furnace operation in 1975. The plant was expanded to five furnaces between 1989 and 1990, with the sixth furnace being built in 1996. The core business of the operation is the production of charge chrome using six Submerged Arc Furnaces, one metal recovery plant, and a Pelletising and Sintering Plant. The smelting complex includes Tubatse Chrome, a joint venture with Sinosteel and NST Ferrochrome (Pty) Ltd.

Tubatse has an existing Power Generation Plant (PGP) which comprises of six heat recovery steam generator (HRSGs) and two stream turbine generator sets and has a total design capacity of 30MW. The average generating capacity of system is currently around 7MW; only one 15MW steam turbine generator set is running and the other one is in idle state.

The HRSGs are arranged in the east and west plants, with HRSG 1, 2, 3 and 4 arranged in the east plant and HRSG 5 and 6 arranged in the west plant. Although the total design output of the six HRSGs is 148.74t/h, the total average steam output is 60t/h.

At present, the amount of steam produced is not sufficient to generate 30MW. The addition of the coal-fired boilers will increase the amount of steam available to the PGP.

In order to reduce their electricity demand from the National Grid, Tubatse proposes to install four 25t/h assembled chain grate boilers. Therefore, the proposed boilers are expected to consume 86 000 tons of coal per annum.

The 2014 EIA regulations (Government Notice Regulation (GN.R. 326), as amended and promulgated under the National Environmental Management Act (No. 107 of 1998) (NEMA), contain three Listing Notices (GN.R 324, R 325 and R 327) of activities which that either require a Basic Assessment process or Scoping and Environmental Impact Assessment (EIA) process in order to obtain Environmental Authorisation (EA) form the competent authority. If activities are listed within Listing Notice 1 and 3 (GN.R 327 and 324) a Basic Assessment (BA) process must be followed and if activities are listed within Listing Notice 2 (GN.R 325) a Scoping and EIA (S&EIA) process must be applied.

The 2014 EIA Regulations, as amended, identify the coal-fired boilers (CFBs) as an activity being subject to a BA process due to the applicability of the EIA Listing Notices, GNR 327 and 324 (07 April 2017). In order for the proposed project to proceed it will require an environmental authorisation (EA) from the Department of Environmental Affairs (DEA).

WSP Environment and Energy, Africa (WSP) has been appointed in the role of Independent Environmental Assessment Practitioner (EAP) to undertake the BA processes for the proposed project. **Table 1-1** outlines the details of the EAP and their expertise.

Table 1-1: Details of the Environmental Assessment Practitioner

NAME OF CONSULTANT:	**WSP ENVIRONMENTAL (PTY) LTD**
Contact Person:	Ashlea Strong
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E-mail:	Ashlea.Strong@wsp.com
Expertise to conduct this EIA	Ashlea is a Principal Consultant with 14 years' experience in the environmental field. She currently provides technical and strategic expertise on a diverse range projects in the environmental management field, including environmental scoping and impact assessment studies, environmental management plans, waste and water management, as well as the provision of environmental management solutions and mitigation measures Ashlea has been involved in the management of a number of large EIAs specifically within the energy sector such as the Medupi Power Station, and Pebble-Bed Modular Reactor (PBMR) and numerous Transmission Powerlines. She also has environmental auditing and training experience and expertise. Ashlea holds a Masters in Environmental Management; a BTech (Nature Conservation), and a National Diploma (Nature Conservation); She is also a Certified Environmental Assessment Practitioner of South Africa (CEAPSA).

1.2 ENVIRONMENTAL MANAGEMENT PROGRAMME STRUCTURE

Table 1-2 cross-references the sections within the EMPr with the legislated requirements as per **Appendix 4** of GNR 326 of 2017.

Table 1-2: Legislation Requirements as detailed in Appendix 4 of GNR 326

APPENDIX 4	LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 326	RELEVANT REPORT SECTION
(a)	details of-	
	(i) the EAP who prepared the EMPr; and	Section 1.1
	(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 1.1 and Appendix A
(b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 3.2
(c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Section 3.1
(d)	A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	Section 3.4 Section 4 Section 6
	(i) planning and design;	
	(ii) pre-construction activities;	
	(iii) construction activities;	
	(iv) rehabilitation of the environment after construction and where applicable post closure; and	
	(v) where relevant, operation activities;	

APPENDIX 4	LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 326	RELEVANT REPORT SECTION
(f)	a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to -	Section 6
	(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	
	(ii) comply with any prescribed environmental management standards or practices;	
	(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	
	(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable	
(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 5.3 Section 6
(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 5.3 Section 6
(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 5.1 Section 6
(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 6
(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 5.3 Section 5.4
(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	Section 5.5
(m)	an environmental awareness plan describing the manner in which-	Section 5.2
	(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and	
	(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
(n)	any specific information that may be required by the competent authority	Section 3.1 Section 7

1.3 APPLICABLE DOCUMENTATION

The following documents are to be read in conjunction with the EMPr:

- Basic Assessment Report (BAR) for the proposed CFBs;
- Environmental authorisation issued by the Limpopo Department of Economic Development, Environment and Tourism (LEDET) in terms of the National Environmental Management Act (No. 107 of 1998) (NEMA) (still to be issued); and
- Existing Tubatse Operating Procedures.

2 ENVIRONMENTAL GOVERNANCE FRAMEWORK

The environmental legislation applicable to the proposed project at Tubatse includes, but is not limited, to the following:

- The Constitution of the Republic of South Africa (No. 108 of 1996);
- National Environmental Management Act (No. 107 of 1998) and subsequent amendments;
- National Environmental Management, Waste Act (No 59 of 2008);
- National Environmental Management, Air Quality Act (No 39 of 2004);
- National Environmental Management Biodiversity Act (No. 10 of 2004);
- The National Water Act, (No 36 of 1998);
- Occupational Health and Safety Act, (No 85 of 1993);
- The Conservation of Agricultural Resources Act, (No 43 of 1983) (CARA);
- Hazardous Substances Act (No. 15 of 1973); and
- Hazardous Substances Amendment Act (No. 53 of 1992).

3 PROJECT DETAILS

3.1 PROJECT LOCATION AND GENERAL SITE DESCRIPTION

Tubatse falls within the jurisdiction of the Greater Tubatse Local Municipality, located on the Farm Goudmyn 337 Portion 6. The main towns in the area are Burgersfort and Steelpoort. The main activity in this area is the mining of chrome and platinum. There are also three chrome smelters in the area. This then means that the area is likely to have air pollutants like sulphur dioxide, nitrous oxides, chromium (VI) and particulate matter. There is also significant traffic in the area due to the transportation of minerals which introduces a substantial pollution from the vehicles. Other pollutants like pesticides can also emanate from the farms around Ohrigstad towards Burgersfort, of which the extent has not yet been determined.

Tubatse can be accessed directly off the R555. The location of the site is illustrated in **Figure 3-1**.

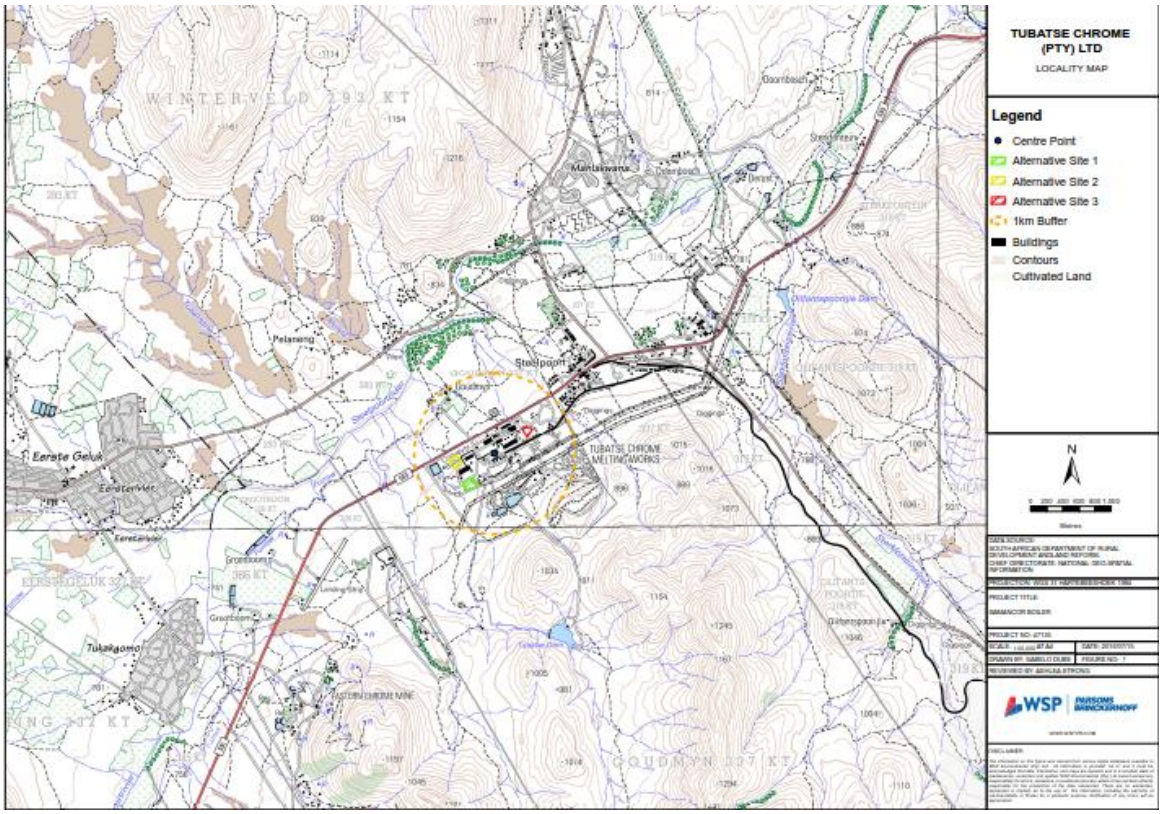


Figure 3-1: Locality Map

3.2 PROJECT DESCRIPTION

Tubatse Chrome has an existing Power Generation Plant, which has a capacity to generate 30MW, but currently runs at around 10MW. Tubatse Chrome is proposing to develop four 25t/h coal fired boilers, which would take the power generation capacity to 30MW design capacity. The boilers are expected to consume 86 000 tons of coal per annum.

It is proposed that the steam, condensate, industrial water and control system will be connected to the existing waste heat power generation system and that the power will be sourced from the 35kV substation nearby.

The components of the proposed CFBs should match with components of the existing infrastructure (**Table 3-1**).

Table 3-1: Components of the Existing Infrastructure

HRSG	STEAM TURBINE
HRSG 1, 2, 3, and 5 – Fume amount at inlet: 155000Nm3/h – Rated amount of evaporation: 23.15t/h – Working pressure of superheated steam: 2.5Mpa – Working temperature of superheated steam: 400℃ – Temperature of boiler feed water: 105℃ – Exhaust gas temperature: 163~175℃ – Design efficiency: ≥60% – Quantity: 4 sets	– Model: N15-2.35 condensing steam turbine (air cooling) – Rated power: 15000kW – Rated speed: 3000 r/min – Inlet pressure: 2.35MPa – Inlet temperature: 390℃ – Exhaust pressure: 16.67kPa – Quantity: 2 sets
HRSG 4 and 6 – Fume amount at inlet: 188000Nm3/h – Rated amount of evaporation: 28.09t/h – Working pressure of superheated steam: 2.5Mpa – Working temperature of superheated steam: 400℃ – Temperature of boiler feed water: 105℃ – Exhaust gas temperature: 163~175℃ – Design efficiency: ≥60%	

3.3 PROJECT MOTIVATION

Tubatse has an existing PGP which comprises of six heat recovery steam generator (HRSGs) and two stream turbine generator sets and has a total design capacity of 30MW. The average generating capacity of system is currently around 7MW; only one 15MW steam turbine generator set is running and the other one is in idle state.

The HRSGs are arranged in the east and west plants, with HRSG 1, 2, 3 and 4 arranged in the east plant and HRSG 5 and 6 arranged in the west plant. Although the total design output of the six HRSGs is 148.74t/h, the total average steam output is 53.21t/h.

At present, the amount of steam produced is not sufficient to generate 30MW. The addition of the four coal-fired boilers (CFBs) will increase the amount of steam available to the Power Generation Plant. Tubatse have therefore proposed to establish a four 25t/h new CFBs which will generate sufficient steam to enable the existing power generation facility to operate at its full capacity (i.e. 30MW).

3.4 FINDINGS OF THE IMPACT ASSESSMENT

A summary of the identified impacts and corresponding (initial and residual) significance ratings the preferred site ("Alternative S2") is provided in **Table 3-2**.

Table 3-2: Impacts Significance Summary – Preferred Site ("Alternative S2")

REF NO.	ASPECT	IMPACT DESCRIPTION	STATUS	SIGNIFICANCE WITHOUT MITIGATION	SIGNIFICANCE WITH MITIGATION
Construction Phase During the construction phase the CFBs and their associated infrastructure will be constructed within the boundaries of the existing Tubatse Chrome site near Steelpoort. The proposed Power Plant shall comprise, but not limited to, the following main equipment: – CFB Stream Generator – Station Mechanical Systems – Instrumentation and Control Systems During construction, the contractor will utilise existing laydown areas. The existing site workshop will be used to do most of the fabrication and sub-assemblies prior to the construction.					
C-N	Noise	The construction activities will result in some additional noise that may affect workers on site. The noise could result from increased construction traffic, welding, grinding, materials handling etc.	Negative	Medium	Medium
C-WG	Waste Generation	Construction waste will be generated during the construction of the CFBs. This waste will include steel, concrete, oil, cables, general litter etc.	Negative	Medium	Low
C-PH	Poor Housekeeping	Construction activities will result in the generation of litter.	Negative	Medium	Low
C-SC	Soil Contamination	Soil contamination could result from the spillage of hazardous substances such as fuel, oil, cement etc.	Negative	Medium	Low
C-ETL	Erosion and Topsoil Loss	The construction of the CFBs will require vegetation clearance which could lead to erosion and topsoil loss.	Negative	Medium	Low
C-WC	Water Contamination	Water contamination could result from the spillage of hazardous substances such as fuel, oil, cement etc.	Negative	Medium	Low

				SIGNIFICANCE	
REF NO.	**ASPECT**	**IMPACT DESCRIPTION**	**STATUS**	**WITHOUT MITIGATION**	**WITH MITIGATION**
C-VL	Vegetation Loss	The construction activities will require the site to be cleared of vegetation. The Tubatse site is located within the Sekhukhune Plains Bushveld which is characterised by predominantly short, open to closed thornveld with an abundance of Aloe species and other succulents. It is noted that two protected tree species can be typical of this vegetation type including *Acacia erioloba* and *Combretum imberbe*. Alternative 2 is highly degraded with approximately 30% of the site being vegetated with scattered aliens.	Negative	Medium	Low
C-HL	Habitat Loss	The construction activities will require the site to be cleared of vegetation. This will result in a loss of habitat for fauna species.	Negative	Medium	Low
C-SJO	Social – Job Opportunities	Temporary job opportunities will be created for the local community during the construction phase.	Positive	Medium	Medium
C-SGI	Social – general impacts	The construction phase will result in a number of negative social impacts such as the influx of workers into the local area, safety and security, HIV etc..	Negative	Medium	Low
C1-TSP **C1-PM_{10}** **C1-$PM_{2.5}$** **C2-TSP** **C2-PM_{10}** **C2-$PM_{2.5}$**	Air Quality – Beyond Site Boundary (C1) Air Quality – Impact at Sensitive Receptors (C2)	Emissions during construction are associated with land clearing, drilling and blasting, ground excavation, cut and fill operations and heavy vehicle traffic on temporary roads.	Neutral	Low	Low

REF NO.	ASPECT	IMPACT DESCRIPTION	STATUS	SIGNIFICANCE WITHOUT MITIGATION	SIGNIFICANCE WITH MITIGATION
Operational Phase During the operational phase the CFBs will generate steam that will be piped to the existing power generation facility to enable the facility to generate electricity up to its existing design capacity of 30MW. A built bag filter will remove the ash from the flue gas prior to the gas being emitted from the stack. It is proposed that all ash generated by the facility will either be sold to the cement and/or brickmaking industries or will be disposed of at the Tubatse hazardous Waste Facility. No alternatives assessment was undertaken for the operational phase as the impacts are identical regardless of the site position. Due to the fact that the CFBs are only available with a pollution abatement system, the Air Quality Impact Assessment only assessed the impacts of the CFBs with mitigation measures in place.					
O-WG	Waste - Generation	The CFBs will generate ash as a result of the process.	Negative	Medium	Low
O-WS	Waste – Spillage	Spillage of filtered ash could occur during the handling of waste	Negative	Medium	Medium
O-WCS	Water Contamination – Spillage	Ensure that a procedure is in place in the event that a spillage occurs.	Negative	Medium	Low
O-WCSY	Water Contamination – Stock yards	The storage of coal and lime in stock yards could result in water contamination.	Negative	Medium	Low
O-N	Noise	Noise may result from the operational vehicle movement. Noise is however not expected to exceed the limits outlined in the SANS 10103:2008 guidelines.	Negative	Medium	Low
O-SCS	Soil Contamination – Spillage	The spillage of hazardous substances such as fuel oil, petrol, diesel etc. could result in soil contamination.	Negative	Medium	Low
O-SCSY	Soil Contamination – Stock yards	The storage of coal and lime in stock yards could result in soil contamination.	Negative	Medium	Low

REF NO.	ASPECT	IMPACT DESCRIPTION	STATUS	SIGNIFICANCE WITHOUT MITIGATION	SIGNIFICANCE WITH MITIGATION
O1-AP	Air Quality – Impact beyond Site Boundary (All pollutants)	The operation of the CFBs will result in the emission of pollutants which may impact on human health beyond the site boundary.	Neutral	-	Low
O2-AP	Air Quality – Impact at Sensitive Receptors (All pollutants)	The operation of the CFBs will result in the emission of pollutants which may impact on human health at sensitive receptors.	Neutral	-	Low
O-SJC	Social – Job creation	The sale of ash to the cement and brickmaking industry may result in job opportunities for the local communities.	Positive	Medium	Medium
O1-PM_{10}	Air Quality – Impact Beyond Site Boundary (PM10)	The operation of the CFBs together with the existing plant will result in additional PM_{10} emissions which may impact human health beyond the site boundary. PM_{10} concentrations are predicted to be non-compliant (having more than 4 exceedances per annum) with the daily average standard approximately 120m beyond the site boundary. However, daily average PM_{10} concentrations are predicted to be compliant at all receptor locations. Annual average PM_{10} concentrations are compliant with the annual average standard at all receptors and across the study area. Predicted PM_{10} concentrations are compliant with the daily and annual average standard at all receptors and across the study area.	Neutral	-	Low
O1-$PM_{2.5}$	Air Quality – Impact Beyond Site Boundary (PM2.5)	The operation of the CFBs together with the existing plant will result in additional $PM_{2.5}$ emissions which may impact on human health beyond the site boundary. Daily and annual average $PM_{2.5}$ concentrations are predicted to be compliant at all receptor locations and across the study area, for all scenarios.	Neutral	-	Low
O1-NO_2	Air Quality – Impact Beyond Site Boundary (NO2)	The operation of the CFBs together with the existing plant will result in additional NO_2 emissions which may impact on human health beyond the site boundary. Annual and hourly average NO_2 concentrations are predicted to be compliant at all receptor locations and across the study area.	Neutral	-	Low

REF NO.	ASPECT	IMPACT DESCRIPTION	STATUS	SIGNIFICANCE WITHOUT MITIGATION	SIGNIFICANCE WITH MITIGATION
O1-SO_2	Air Quality – Impact Beyond Site Boundary (SO2)	The operation of the CFBs together with the existing plant will result in additional SO_2 emissions which may impact on human health beyond the site boundary. Daily and hourly average SO_2 concentrations are predicted to be non-compliant with the daily and hourly average standards approximately 360 and 140 m beyond the site boundary, respectively. However, it is noted that daily and hourly average concentrations are compliant at each of the receptor locations.	Neutral	-	Low
O2-PM_{10}	Air Quality – Impact at Sensitive Receptors (PM10)	The operation of the CFBs together with the existing plant will result in the additional PM_{10} emissions which may impact on human health at sensitive receptors. PM_{10} concentrations are predicted to be non-compliant (having more than 4 exceedances per annum) with the daily average standard approximately 120 m beyond the site boundary. However, daily average PM_{10} concentrations are predicted to be compliant at all receptor locations. Annual average PM_{10} concentrations are compliant with the annual average standard at all receptors and across the study area. Predicted PM_{10} concentrations are compliant with the daily and annual average standard at all receptors and across the study area.	Neutral	-	Low
O2-$PM_{2.5}$	Air Quality – Impact at Sensitive Receptors (PM2.5)	The operation of the CFBs together with the existing plant will result in the additional $PM_{2.5}$ emissions which may impact on human health at sensitive receptors. Daily and annual average $PM_{2.5}$ concentrations are predicted to be compliant at all receptor locations and across the study area, for all scenarios.	Neutral	-	Low
O2-NO_2	Air Quality – Impact at Sensitive Receptors (NO2)	The operation of the CFBs together with the existing plant will result in the additional NO_2 emissions which may impact on human health at sensitive receptors. Annual and hourly average NO_2 concentrations are predicted to be compliant at all receptor locations and across the study area.	Neutral	-	Low

REF NO.	ASPECT	IMPACT DESCRIPTION	STATUS	SIGNIFICANCE WITHOUT MITIGATION	SIGNIFICANCE WITH MITIGATION
O2-SO_2	Air Quality – Impact at Sensitive Receptors (SO2)	The operation of the CFBs together with the existing plant will result in the additional SO_2 emissions which may impact on human health at sensitive receptors. Daily and hourly average SO_2 concentrations are predicted to be non-compliant with the daily and hourly average standards approximately 360 and 140 m beyond the site boundary, respectively. However, it is noted that daily and hourly average concentrations are compliant at each of the receptor locations.	Neutral	-	Low
Decommissioning Phase The decommissioning phase of this project would involve the removal of the CFBs. This would involve the stripping of all materials, associated buildings, structures and concrete slabs. The impact would be closely related to those identified for the construction phase although it is likely that more waste may be generated. In terms of this project it is considered unlikely that the CFBs would be decommissioned in the very near future and that decommissioning would co-inside with the decommissioning of the Tubatse Plant as a whole. Decommissioning impacts are likely to be the same regardless of the site location.					
D-N	Noise	The decommissioning activities will result in some additional noise that may affect workers on site. The noise could result from increased decommissioning traffic, welding, grinding, materials handling etc.	Negative	Medium	Medium
D-WG	Waste Generation	Decommissioning waste will be generated during the construction of the CFBs. This waste will include steel, concrete, oil, cables, general litter etc.	Negative	Medium	Low
D-PH	Poor Housekeeping	Decommissioning activities will result in the generation of litter.	Negative	Medium	Low
D-SC	Soil Contamination	Soil contamination could result from the spillage of hazardous substances such as fuel, oil, cement etc.	Negative	Medium	Low
D-ETL	Erosion and Topsoil Loss	The decommissioning of the CFBs will require vegetation clearance which could lead to erosion and topsoil loss.	Negative	Medium	Low

REF NO.	ASPECT	IMPACT DESCRIPTION	STATUS	SIGNIFICANCE WITHOUT MITIGATION	SIGNIFICANCE WITH MITIGATION
D-WC	Water Contamination	Water contamination could result from the spillage of hazardous substances such as fuel, oil, cement etc.	Negative	Medium	Low
D-SJO	Social – Job Opportunities	Temporary job opportunities will be created for the local community during the decommissioning phase.	Positive	Medium	Medium
D-SGI	Social – general impacts	The decommissioning phase will result in a number of negative social impacts such as the influx of workers into the local area, safety and security, HIV etc..	Negative	Medium	Low
D1-TSP **D1-PM_{10}** **D1-$PM_{2.5}$** **D2-TSP** **D2-PM_{10}** **D2-$PM_{2.5}$**	Air Quality – Beyond Site Boundary (D1) Air Quality – Impact at Sensitive Receptors (D2)	Emissions during decommissioning are associated with the demolition of the CFBs infrastructure as well as heavy vehicle traffic on temporary roads.	Neutral	Low	Low

4 ENVIRONMENTAL OBJECTIVES AND TARGETS

An EMPr is defined as "an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented or mitigated, and that the positive benefits of the projects are enhanced."

This EMPr has been compiled in accordance with Appendix 4 of GNR 326, in compliance with section 24N of NEMA, with the purpose of ensuring that negative impacts are reduced and positive effects are enhanced through a process of continual improvement, during both the construction and operational phases of the Tubatse CFB project.

Due to the nature of the continual improvement process, this EMPr is seen as a working document and is therefore subject to change depending on the requirements of the various project phases. These changes are to be approved by an environmental practitioner or the appointed environmental control officer prior to the implementation onsite.

This EMPr has the following objectives:

- Identify mitigation measures and environmental specifications which are required to be implemented for the planning, construction and rehabilitation, operation, and decommissioning phases of the project in order to manage and minimise the extent of potential environmental impacts associated with the project;
- Ensure that all the phases of the proposed project do not result in undue or reasonably avoidable adverse environmental impacts, and ensure that any potential environmental benefits are enhanced;
- Identify entities responsible for the implementation of the measures and outline functions and responsibilities;
- Create management structures that address the concerns and complaints of interested and affected parties (I&APs) with regards to the proposed project;
- Propose mechanisms and frequency for monitoring compliance, and preventing long-term or permanent environmental degradation; and
- Facilitate appropriate and proactive responses to unforeseen events or changes in project implementation that was not considered in the BA process.

To facilitate compliance to the EMPr by appointed contractors and sub-contractors, it is required that all onsite personnel are aware of the requirements of the EMPr as well as the prescribed penalties should a non-conformance be identified during the construction, operation and decommissioning activities.

Further to the above, appointed contractors and sub-contractors will also be required to comply with all relevant legislation and standards.

It is recommended that environmental and social objectives (as outlined in this document) be emphasised to the appointed contractors and sub-contractors as minimum requirements. Objectives should include:

- Prevention of hazardous spillages/leaks or incidents onsite for the duration of the construction and operation periods. This must include the use of construction vehicles and plant equipment, as well as material storage;
- Avoidance of any complaints from the surrounding land users for the duration of the construction and operation periods;
- Prohibition of waste from remaining onsite for extended periods. Skips and waste receptacles need to be appropriately labelled, covered and regularly emptied;
- Reduction of waste generation;
- Mitigation against dusty conditions as much as is practicable, including regular cleaning of floor and working surfaces in the vicinity of the crusher/s to reduce fugitive dusts;
- Rigorous speed control and the institution of traffic calming measures to reduce vehicle entrainment. A recommended maximum speed of 20 km/h to be set on all unpaved roads and 35 km/h on paved roads;
- Maintenance of site aesthetics throughout the construction and operational period;
- Utilisation of natural resources sustainably; and

- Completion of work (to the required standard) timeously and prevention of work outside the legislated working hours; and management of activities according to a philosophy of "We respect the environment" and "We are committed to continually improving our processes in order to prevent pollution".

5 MANAGEMENT PROCEDURES AND ADMINISTRATIVE REQUIREMENTS

5.1 ORGANISATIONAL STRUCTURE AND RESPONSIBILITY

5.1.1 FUNCTIONS AND RESPONSIBILITIES

Formal responsibilities are necessary to ensure that key management measures/procedures are executed. Specific responsibilities of the Project Manager, Site Manager and ECO are as defined in **Table 5-1**.

Table 5-1: Roles and Responsibilities

RESPONSIBLE PERSON	RESPONSIBILITIES
Project Manager	– Ensure that Tubatse and the contractor are aware of all specifications, legal constraints pertaining to the project specifically with regards to the environment – Ensure that all stipulations within the EMPr and conditions of the environmental authorisation are communicated and adhered to by Tubatse and its contractor(s) – Monitor the implementation of the EMPr and conditions of the environmental authorisation throughout the project by means of site inspections and meetings. This will be documented as part of the site meeting minutes – Be fully conversant with the EIR for the project, the conditions of environmental authorisation and all relevant environmental legislation
Site Manager	– Be fully conversant with the EIR, the conditions of environmental authorisation and the EMPr – Approve method statements – Provide support to the ECO – Be fully conversant with all relevant environmental legislation and ensure compliance thereof – Have overall responsibility for the implementation of the EMPr and conditions of the environmental authorisation – Ensure that audits are conducted to ensure compliance to the EMPr and conditions of the environmental authorisation – Liaise with the Project Manager or his delegate, the ECO and others on matters concerning the environment – Prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution and unnecessary degradation onsite – Confine construction activities to demarcated areas
Environmental Officer (EO) (Internal)	– Monitor the project compliance with the EMPr and conditions of the environmental authorisation on a weekly basis Responsibilities of the EO include: – Be fully conversant with the EIR, the conditions of environmental authorisation and the EMPr – Be fully conversant with all relevant environmental legislation and ensure compliance thereof – Ensure that periodic environmental performance audits are undertaken on the project implementation

RESPONSIBLE PERSON	RESPONSIBILITIES
	— Approve method statements — Maintain the following onsite: — A daily site incident register — A non-conformance register (NCR) — A public complaints register — A register of audits — Report to the Project Manager, including all findings identified onsite In addition, the EO will: — Convey the contents of the EMPr and conditions of the environmental authorisation to the relevant site staff and discuss the contents in detail with the Project Manager and contractor(s) — Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMPr and conditions of the environmental authorisation — Take appropriate action if the specifications contained in the EMPr and conditions of the environmental authorisation are not followed — Monitor and verify that environmental impacts are kept to a minimum, as far as possible — Ensure that activities onsite comply with all relevant environmental legislation
ECO (External)	— A suitably qualified ECO who would, on a monthly basis, audit the project compliance with the conditions of the EMPr and environmental authorisation — The costs of the ECO shall be borne by Tubatse (proof of appointment must be maintained onsite) — Remain employed until the completion of the construction activities — Report to the Project Manager, including all findings identified onsite — Ensure that activities onsite comply with all relevant environmental legislation
Contractors, Staff and Service Providers	— Complying with Tubatse's SHEQ management systems specifications — Be conversant with all EMPr and conditions of the environmental authorisation, and ensure compliance thereto — Adhering to any environmental instructions issued by the Site Manager/Project Manager on the advice of the ECO

5.2 ENVIRONMENTAL AWARENESS PLAN

Legislation requires that Tubatse must develop an environmental awareness plan that describes the manner in which Tubatse intends to inform employees of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment. In recognition of the need to protect our environment, environmental management should not only be seen as a legal obligation but also as a moral obligation.

It is important to ensure that all relevant personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental degradation and harm.

To achieve effective environmental management, it is important that employees, contractors (including subcontractors) are aware of the responsibilities in terms of the relevant environmental legislation and the contents of the EMPr, conditions of the environmental authorisation.

Tubatse will provide appropriate resources to facilitate social and environmental awareness training during the construction, operational and decommissioning phases of the project. Tubatse will require that all managers associated with the project adhere to the mitigation/management measures detailed in the EMPr and identify, evaluate, and minimise risks to the social, physical and biophysical environments. This will be implemented by

educating employees in social and environmental matters and responsibilities relating to performance of their assigned tasks. Furthermore, employees will be entrusted to maintain the necessary level of environmental performance for their activities. Contractors, and their associated sub-contractors, will also need to demonstrate compliance to mitigation/ management measures included in the EMPr.

The following methodology will be used to implement and ensure environmental and social awareness and competence:

5.2.1 INTERNAL COMMUNICATION

Internal communication of environmental and social issues to ensure environmental awareness will be achieved by using any combination of the following means:

- Meetings;
- Memos;
- Notice boards;
- Briefs;
- Reports;
- Monthly themes;
- Daily operational bulletins;
- Newsletters;
- E-mail;
- Telephone; and
- Induction training.

5.2.2 STANDARD MEETINGS

The following standard meetings will be held at specific times to ensure that environmental and social awareness; potential problems; complaints etc. are heard and addressed proactively:

- Safety, Health and Environmental Meetings will be held monthly by the Senior Management;
- Safety, Health and Environmental Meetings will be held weekly (during construction) and monthly (during operation) by the relevant personnel, environmental and social issues will form part of the agenda; and
- Communication between all personnel and Senior Management will be facilitated through the appropriate reporting lines, or by using complaint and incident forms.

5.2.3 ENVIRONMENTAL AND SOCIAL TALK TOPICS

Monthly SHEQ and social talk topics will be compiled and distributed to relevant personnel and will be displayed on appropriate notice boards. Typical topics to be covered include:

- Water Quality;
- Water Use and Consumption;
- Air Quality i.e. dust;
- Power Consumption and Energy Efficiency;
- Waste Management;
- Fauna and Flora;
- Emergency Procedures;
- Incidents Reporting;

- Systems;
- Noise;
- Landowner Etiquette; Speed Limits;
- Health Risks (such as HIV/ Aids); and
- General Awareness (e.g. World Environment Day, National Arbour Day).

5.2.4 GENERAL COMMUNICATIONS

Communication to the community, government, landowners, neighbouring farmers, environmental groups, non-government organisations and other stakeholders will be communicated to ensure environmental and social awareness by means of the following:

- Fax or E-mail;
- Telephone;
- Formal meetings; and
- Open days.

5.2.5 TRAINING

It is important to ensure that all personnel, contractors and their sub-contractors have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm. As a minimum environmental training must include the following:

- Employees must have a basic understanding of the key environmental features of the site and the surrounding environment;
- Employees will be thoroughly familiar with the requirements of the EMPr and the environmental specifications as they apply to the project.
- Employees must undergo training for the operation and maintenance activities associated with project and have a basic knowledge of the potential environmental impacts that could occur and how they can be minimised and mitigated.
- Awareness of any other environmental matters, which are deemed to be necessary by the Environmental Officer.
- Training must include the environment, health and safety as well as basic HIV/AIDS education.

The following facets to training form part of this Environmental and Social Awareness Plan:

- **Induction**: Environmental and social awareness training will be given at induction when personnel join the company and/or return from leave. Induction training will also be given to visitors entering the site. Induction training will include, *inter alia*:
  - A discussion on the environment concept, what does it comprise of and how do we interact with it;
  - A description on the components and phases of the specific renewable power generation facility;
  - A general account of how the facility and its associated activities can affect the environment, giving rise to what are called environmental impacts;
  - A discussion on what staff can do in order to help prevent the negative environmental impacts from degrading the environment i.e. environmental impact management.
- **Job Specific Training**: Job specific training programmes will be developed as and when required. The programs will be based on the significant environmental and social aspects/ impacts that are identified during regular audits and site inspections. Supervisory staff will be equipped with the necessary knowledge and information to guide their employees on environmental and social aspects applicable to performing a specific task.

- **Competency Training**: The Environmental Officer will be responsible for the environmental and social competency and awareness training of Middle Management and supervisors. This training will be performed both on a one-on-one basis and through workshops and presentations. Competence and the effectiveness of training and development initiatives will be determined through the following methods:
  - Trend analysis of incidents reported; and
  - Analysis of work areas during visits and audits.

  The process to declare competency of personnel is documented in the ISO9001:2000 procedure. This plan will be amended periodically in light of operational changes, learning experienced during its implementation and other activities that can affect the risk profiles.
- **Training Records**: Training can be done either in a written or verbal format but will be in an appropriate format for the receiving audience. Persons having received training must indicate in writing that they have indeed attended a training session and have been notified in detail of the contents and requirements of the EMPr. The attendance registers must be kept on file.

5.3 MONITORING

The internal EO will monitor the day-to-day site activities on an ongoing basis and will produce weekly monitoring reports. The external ECO will undertake monthly audits to ensure compliance with the EMPr and conditions of the environmental authorisation during the construction activities, and will report to the Site Manager should any non-compliance be identified or corrective action deemed necessary.

During the operational phase, Tubatse will establish, implement and maintain a procedure to monitor and measure, on a regular basis, the key characteristics of the operations that may have a significant environmental impact. The procedure shall include the documenting of information to monitor performance, applicable operational controls and conformity with the operation's environmental objectives and targets.

Tubatse will ensure that all instruments and devices used for the measurement or monitoring are calibrated and appropriately operated and maintained. Calibration records must be kept on site or in close proximity to the equipment for ease of availability.

All the conditions outlined in the EMPr (**Section 6**) will be subject to the required internal day-to-day monitoring and external compliance monitoring. Where required, any specific additional monitoring has been outlined in the EMPr (**Section 6**).

5.4 NON-CONFORMANCE AND CORRECTIVE ACTION

The auditing of the construction and operational activities may identify non-conformances to the EMPr and conditions of the environmental authorisation. Non-conformances may also be identified through incidents, emergencies or complaints recorded. In order to correct non-conformances, the source must be determined and corrective actions must be identified and implemented.

5.4.1 COMPLIANCE WITH THE EMPR AND CONDITIONS OF THE ENVIRONMENTAL AUTHORISATION

- A copy of the EMPr and conditions of the environmental authorisation will be available onsite at all times for the duration of the construction and operational activities;
- All persons employed by a contractor or their sub-contractors will abide by the requirements of the EMPr and conditions of the environmental authorisation;
- Any members of the workforce found to be in breach of any of the specifications contained within the EMPr and conditions of the environmental authorisation may be ordered by the Site Manager to leave the site. A contractor will not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMPr and conditions of the environmental authorisation;

- Should a contractor be in breach of any of the specifications contained in the EMPr and conditions of the environmental authorisation, the Site Manager will, in writing, instruct the contractor responsible for the incident of non-compliance regarding corrective and/or remedial action required, specify a timeframe for implementation of these actions, implement a penalty and/or indicate that work will be suspended should non-compliance continue;
- Should non-compliance continue, further written notification will be forwarded to the contractor responsible for the incident of non-compliance outlining the required corrective and/or remedial action, the timeframe for implementation, penalties and/or work will be suspended as specified previously; and
- Departmental officials will be given access to the property referred to in the EIR and EMPr for the purpose of assessing and/or monitoring compliance with the EMPr and conditions of the environmental authorisation, at all reasonable times.

5.4.2 DUTY OF CARE

All personnel involved with the construction and operational activities onsite will be responsible for implementing measures to prevent pollution or degradation of the environment from occurring, continuing or recurring. Insofar as such harm to the environment is authorised by law, or cannot reasonably be avoided or stopped, personnel shall minimise and rectify such pollution or degradation of the environment.

5.5 DOCUMENTATION AND REPORTING

The following documentation must be kept onsite in order to record compliance with the EMPr and conditions of the environmental authorisation:

- Record of complaints; and
- Record of emergencies and incidents.

The contractor will be required to report on the following:

- Environmental incidents involving contractor/ employees and/or the public;
- Environmental complaints and correspondence received from the public; and
- Incidents that cause harm or may cause harm to the environment.

The above records will form an integral part of the ECO's reports and records thereof maintained for the duration of the project. These records will be kept with the EMPr and conditions of the environmental authorisation, and will be made available for scrutiny if so requested by the Site Manager or his delegate and the ECO.

The contractor will ensure that the following information is recorded for all environmental complaints/incidents/emergencies:

- Date of complaint/incident/emergency;
- Location of complaint/incident/emergency;
- Nature of complaint/incident/emergency;
- Causes of complaint/incident/emergency;
- Party/parties responsible for causing complaint/incident/emergency;
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident/emergency;
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident/emergency;
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions;
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented; and

— Copies of all correspondence received regarding complaints/incidents/emergency.

5.6 PUBLIC COMPLAINTS

A signboard must be erected at the entrance to the project site, informing the public of the construction activities taking place. The signboard must include the following information:

— The name of the contractor; and

— The name and contact details of the site representative to be contacted in the event of emergencies or the location of the complaint registration.

6 ENVIRONMENTAL MANAGEMENT PROGRAMME

The Environmental Management Programme (EMPr) provides mitigation and management measures for the following phases of the project:

- **Construction Phase**

  This section of the EMPr provides management principles for the construction phase of the project. Environmental actions, procedures and responsibilities as required within the construction phase are specified. These specifications will form part of the contract documentation and, therefore, the contractor will be required to comply with the specifications to the satisfaction of the project manager and environmental control officer (ECO), in terms of the construction contract.

- **Operational and Maintenance Phase**

  This section of the EMPr provides management principles for the operation and maintenance phase of the project. Environmental actions, procedures and responsibilities as required from Tubatse within the operation and maintenance phase are specified.

- **Decommissioning Phase**

  This section includes principles for the decommissioning phase of the project. This section of the EMPr will be required to be revisited and updated at the time of decommissioning.

All relevant environmental legislation pertaining to the project is listed in **Section 2**. The contractor and the client are required to comply with this legislation for all phases of the project. This list is intended to serve as a guideline only for the contractor and is not exhaustive.

This EMPr includes site specific management measures for the construction and operation of a new CFB at the Tubatse Chrome Plant near Steelpoort. It must be noted that this EMPr must be read in conjunction with existing Tubatse Operating Procedures included in **Appendix A**. Both this EMPr and the Tubatse Operating Procedures will be binding to the onsite personnel working for, or on behalf of Tubatse. It is essential that both this EMPr and the Tubatse Operating Procedures are carefully studied, understood, implemented and adhered to at all times.

To simplify the EMPr requirements, each column related to the EMPr table has been described in **Table 6-1**. The EMPr identifies various actions which are undertaken throughout the construction and operational phases. Not every action will be required during the entire course of activities. Therefore, the actions identified in the EMPr have been given priority timeframes for proposed implementation.

Table 6-1: Structure of EMPr

Column	Description
Reference Number	The reference numbers link the mitigation measures to the impacts identified by the specialists in the Environmental Impact Report. Generic Mitigation measures are allocated an "EMP" number.
Activity / Impact	Highlights the various activities/aspects associated with the project i.e. the contractors' activities that will interact with the environment. Each impact / activity is cross referenced to the impacts identified in the EIA report.
Mitigation and Management Measures	Indicates the actions required to prevent and/or minimise the potential impacts on the environment that are associated with the project
Responsibility	Indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPr. Please note that the site manager will have authority to stop works if/as necessary
Development Phase	Indicates during which phase of development the actions for the specific aspect must be implemented and/or monitored

Column	Description
Condition of Authorisation	Indicates whether the specific mitigation measures should or should not be included as a condition in the Environmental authorisation
Additional Monitoring Requirements	Indicates the method and frequency of any additional monitoring requirements over and above the day-to-day monitoring undertaken by the EO and the monthly compliance monitoring undertaken by the ECO.

The following assumptions have been made in the development of the environmental specification in this EMPr:

- An environmental file containing the information/documentation required by this EMPr is to remain onsite and to be made available at the request of the auditor or similar monitoring body; and
- For ease of reference, any person(s) employed to assist in the project i.e. contractors, sub-contractor and permanent and temporary staff, will be collectively referred to as 'onsite personnel'

It should be noted that at this point of the project planning process, the necessity for and timing of the decommissioning phase is not known. It is assumed that de-commissioning will commence once the life of the Plant has been reached, and will be undertaken as part of the Plant's decommissioning processes. Decommissioning will be undertaken as required by Tubatse's closure objectives. These objectives may be required to be re-visited and supplemented closer to closure.

Table 6-2: Environmental Management Programme

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
CONTRACTOR LAYDOWN AREA AND SITE ACCESS						
Objectives: To implement measures to minimise impacts on the environment from the initiation of construction activities through planning, careful site access route selection and implementation of mitigation measures. Indicator and Compliance Mechanisms: — Health, safety, environmental and community incident and complaints management system register — Close-out on incidents — Monitoring and audit reports — Inductions training and register — Environmental awareness programme/toolbox talks — Contractor Management Procedure (TC-C-SHEQ-CON-COP-002)						
EMP1	Project Initiation of Construction Activities	Ensure construction activities remain within demarcated project footprint	ECO Contractor Project Manager	Construction	No	No additional monitoring required
C-ETL		Site clearing and topsoil removal must be limited to the footprint of the infrastructure requirements	ECO Contractor Project Manager	Construction	No	No additional monitoring required
C-ETL		Vegetation clearance must be limited to within the site boundaries.	ECO	Construction	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
D-ETL			Contractor Project Manager	Decommissioning		
EMP2		Locate firefighting measures onsite, such as fire extinguishers, and make personnel aware of fire prevention and firefighting measures. Firefighting equipment must be securely placed and inspected monthly	ECO Contractor	Construction	No	No additional monitoring required
EMP3	Contractor Management	Contractors are to comply with the requirements outlined in the Contractor Management Procedure (TC-C-SHEQ-CON-COP-002)	Contractor	Construction Decommissioning	No	No additional monitoring required
VEHICLE, EQUIPMENT AND MACHINERY MANAGEMENT						
Objectives: To implement measures to minimise impacts on the environment from poorly maintained equipment, machinery and vehicles onsite. Indicator and Compliance Mechanisms: – Health, safety, environmental and community incident and complaints management system register – Close-out on incidents – Monitoring and audit reports – Transport route delineation – Daily equipment, machinery and vehicle checklists – Incident Classification and Reporting Procedure						
EMP4	Vehicle Maintenance	Contractor vehicles are to be maintained off site, however in the event that a vehicle needs attention whilst on site maintenance work can be accommodated at Tubatse's existing workshops. Evidence of such maintenance must	ECO Contractor Operator	Construction Operation	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
		be recorded and maintained onsite for verification. Utilise drip trays where necessary.				
C2-TSP C2-PM_{10} C2-$PM_{2.5}$ O2-TSP O2-PM_{10} O2-$PM_{2.5}$ D2-TSP D2-PM_{10} D2-$PM_{2.5}$	Operation of Equipment, Machinery and Vehicles	All construction vehicles must be kept in good working order and maintained according to the relevant standards. Adequately maintain equipment, machinery and vehicles so as to: — Reduce the potential for spillages of oil, diesel, fuel or hydraulic fluid, — Ensure road-worthiness; and — Reduce emissions.	ECO Contractor Operator	Construction Operation Decommissioning	No	No additional monitoring required
EMP5		Secure vehicles transporting large loads before entering the local road network	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP6		Vehicles bearing open loads of potentially wind-borne materials must be covered or wet down in order to minimise dust entrainment	Contractor Operator	Construction Operation	No	No additional monitoring required
EMP7		Increase visibility of heavy vehicles by utilising sufficient reflectors and activating headlights during operation	ECO Contractor Operator	Construction Operation	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
EMP8		Do not allow machinery or plant equipment used onsite to pose a pollution hazard. The contractor must order any equipment to be repaired or withdrawn from use if evident that it is not operating optimally. The contractor shall inspect all vehicles, machinery and equipment every morning for defects (indicator lights, oil leaks, etc.) and excessive emissions.	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
FUEL AND CHEMICAL MANAGEMENT						
Objectives: To ensure the correct storage, handling and disposal of fuels and chemicals in order to prevent impacts to the surrounding environment. Indicator and Compliance Mechanisms: – Maintenance records – Safe Disposal certificates (if applicable) – Material safety data sheets – Health, safety, environmental and community incident and complaints management system register – Hazardous Materials Management Procedure (TC-C-SHEQ-HH-COP-005) – Emergency Preparedness and Response Procedure (TC-C-SHEQ-SAF-COP-009) – Significant Incident Reporting Procedure (TC-C-SHEQ-SAF-COP-012) – Waste Management Procedure (TC-C-SHEQ-ENV-COP-002) – Monitoring and audit reports – Training records						
EMP9	Fuel and Chemical Management	Comply with the Hazardous Materials Management Procedure (TC-C-SHEQ-HH-COP-005).	ECO Contractor Operator	Construction Operation	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
EMP10		Comply with the Emergency Preparedness and Response Procedure (TC-C-SHEQ-SAF-COP-009).	ECO Contractor Operator	Construction Operation		
EMP11		Comply with the Significant Incident Reporting Procedure (TC-C-SHEQ-SAF-COP-012).	ECO Contractor Operator	Construction Operation		
EMP12		Indicate the location of the fuel and chemical storage area on the layout plans	Contractor Operator	Construction Operation		
EMP13		Securely fence and lock the storage areas to accommodate all hazardous substances such as fuel, oils and chemicals. The storage area floor must be an impermeable surface and suitably bunded as per the requirements outlined in SANS 10089-1 (2008)	ECO Contractor Operator	Construction Operation		
EMP14		Maintain oil traps or interceptors on a regular basis and maintain records	ECO Contractor Operator	Construction Operation		
EMP15		Chemicals, hydrocarbon materials and hazardous substances maintained onsite must be managed in accordance with the Hazardous Substances Act (No. 15 of 1973) and its relevant regulations	Contractor Operator	Construction Operation		
EMP16		Label all liquids (chemicals and hydrocarbons) stored onsite for easy identification. Material safety data sheets	Contractor	Construction		

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
		(MSDS) for onsite chemicals, hydrocarbon materials and hazardous substances must be readily available. MSDS must include mitigation measures to ameliorate potential environmental impacts which may result from a spill, incorporating health and safety mitigation measures	Operator	Operation		
EMP17		Keep fuels, oils or other chemicals used outside of the bunded area to a minimum and use suitable secondary containment in the form of drip trays	ECO Contractor Operator	Construction Operation		
EMP18	Health and Safety	Display “no smoking” and “no naked flame” signs in and around the project area, as well as near the hazardous material store	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP19		Strategically place the correct types of fire extinguishers onsite and near the hazardous material store. Train key personnel on basic firefighting skills	Contractor Operator	Construction Operation		
EMP20		Frequently inspect and maintain containment facilities and retain records onsite	ECO Contractor Operator	Construction Operation		
WASTE MANAGEMENT						
Objectives: To ensure the correct handling, storage, transportation and disposal of general waste and hazardous waste. Indicator and Compliance Mechanisms:						

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
– Induction training and records – Material safety data sheets – Waste Management Procedure (TC-C-SHEQ-ENV-COP-002) – Relevant SANS Codes of Practice – Safety disposal certificates (all waste streams) – Emergency Preparedness and Response Procedure (TC-C-SHEQ-SAF-COP-009) – Significant Incident Reporting Procedure (TC-C-SHEQ-SAF-COP-012) – Waste manifest documentation – Health, safety, environmental and community incident and complaints management system register – Monitoring and audit reports						
EMP21	General Waste Management	General waste generated as a result of construction and operational activities should be managed in accordance with the Waste Management Procedure (TC-C-SHEQ-ENV-COP-002)	ECO Contractor Operator	Construction Operation	Yes	No additional monitoring required.
EMP22		Train and inform all onsite personnel regarding general waste minimisation, management and disposal as per the Waste Management Procedure	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP23		Prohibit littering and burning of waste onsite	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP24		Retain records of appropriate safety disposal certificates associated with general waste removal, transportation and disposal	ECO Contractor Operator	Construction Operation	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
EMP25		Prohibit the mixing of general waste with hazardous waste. Should general waste be mixed with hazardous waste, it will be considered hazardous waste	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP26		Recover, recycle and reuse waste where possible	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
C-WG O-WG D-WG		All waste must be managed and disposed of in accordance with Tubatse's existing waste management procedures.	ECO Contractor Operator	Construction Operation Decommissioning	Yes	No additional monitoring required.
C-WG O-WG		Ash generated by the CFBs must either be sold to the cement or brickmaking industry or transported to the Tubatse Hazardous landfill site for disposal.	ECO Contractor Operator	Construction Operation	Yes	No additional monitoring required.
C-WG O-WG		Ensure that a procedure is in place in the event that a spillage occurs.	ECO Contractor Operator	Construction Operation	Yes	No additional monitoring required.
EMP27	Hazardous Waste Management	Hazardous waste generated as a result of construction and operational activities should be managed in accordance with the Waste Management Procedure (TC-C-SHEQ-ENV-COP-002)	ECO Contractor Operator	Construction Operation	Yes	No additional monitoring required.

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
EMP28		Train and inform all onsite personnel regarding hazardous waste minimisation, management and disposal as per the Waste Management Procedure	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP29		Retain records of appropriate safety disposal certificates associated with hazardous waste removal, transportation and disposal	ECO Contractor Operator	Construction Operation		
EMP30		Chemicals, hydrocarbon materials and hazardous substances maintained onsite must be managed in accordance with the Hazardous Substances Act (No. 15 of 1973) and its relevant regulations	ECO Contractor Operator	Construction Operation		
EMP31		Comply with the Emergency Preparedness and Response Procedure (TC-C-SHEQ-SAF-COP-009).	Contractor Operator	Construction Operation		
EMP32		Ensure that waste manifest documentation (as per the draft Classification and Management Regulations, GNR.614 of 2012) is prepared and maintained for the generation, transportation and disposal of hazardous waste	Contractor Operator	Construction Operation		
SOIL AND LAND MANAGEMENT						
Objectives: To prevent any disturbance, erosion or contamination of soil resources. Indicator and Compliance Mechanisms:						

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
— Induction training and records — Waste Management Procedure (TC-C-SHEQ-ENV-COP-002) — Significant Incident Reporting Procedure (TC-C-SHEQ-SAF-COP-012) — Health, safety, environmental and community incident and complaints management system register — Monitoring and audit reports — Stormwater Management Plan						
C-SC	Stockpile Management	Adequately maintain stockpiled material to prevent becoming a source of air pollution (windblown dust)	ECO Contractor	Construction	No	No additional monitoring required
C-SC		Level and shape the area designated for the deposition of stockpiled material to ensure the efficient drainage of the site. No general or hazardous waste may be disposed of at this site	ECO Contractor	Construction		
C-SC		Stormwater control systems must be implemented within the site and should be managed and maintained to ensure no contamination of soil reserves	ECO Contractor	Construction		
O-WCSY		Coal and lime stock yards must be located on impermeable surfaces. Stockyard must be bunded with relevant sumps and pumps that link to the existing Tubatse dirty water system.	ECO Contractor	Operation		
C-SC C-WC O-SCS O-WCS	Soil and Land Management	Soils excavated during construction of the facility must be appropriately stored in stockpiles which are protected so as to limit the loss of soils. The topsoil is expected to have a higher fertility than the subsoil horizons, and contains the vegetation seeds. As a result, the topsoil must be stored separately from the subsoils	ECO Contractor	Construction	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
D-SC D-WC		Due to the potential for soil compaction due to vehicles, traffic must be limited to existing or proposed roadways as far as possible. Where soil compaction outside of the designated development areas occurs, this needs to be rehabilitated to the pre-development soil permeability to maintain infiltration. Vegetation removal must be kept to a minimum and limited to the area of development. Where an impact to the vegetation outside of the development footprint occurs, rehabilitation measures must be undertaken to maintain the baseline vegetation population and health.	ECO Contractor	Construction		
		Mixing of hazardous substances should be conducted in a manner that will not impact on the soil surface.	ECO Contractor	Construction Decommissioning		
		All hand mixing to be undertaken on an impermeable surface within a demarcated area.	ECO Contractor	Construction Decommissioning		
		Drip trays (or other suitable method) must be placed under construction machinery (while standing) to avoid soil contamination.	ECO Contractor	Construction Operation Decommissioning		
		Contaminated soil must be excavated and disposed of at a suitable hazardous waste landfill site.	ECO Contractor	Construction Operation Decommissioning		
		All hazardous substances to be stored in appropriately bunded facilities where applicable	ECO Contractor	Construction Operation		

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
				Decommissioning		
		Coal and lime stock yards must be located on impermeable surfaces. Stockyard must be bunded with relevant sumps and pumps that link to the existing Tubatse dirty water system.	ECO Contractor	Construction Operation Decommissioning		
		Large areas of soil excavation and vegetation removal must be phased to limit the erosion potential during rainfall events.	ECO Contractor	Construction		
		Machinery must be regularly checked to ensure hydrocarbon leaks (including fuel and hydraulic fluids) are not occurring. Drip trays must be used where necessary. Fuels and oils must be stored within bunded areas. Parking areas for staff vehicles should ideally be placed on hardstanding to limit the impacts of oil leaks to the soil environment Drip trays (or other suitable method) must be placed under decommissioning machinery (while standing) to avoid soil contamination.	ECO Contractor Operator	Construction Operation Decommissioning		
EMP33		On-site ablutions must be made available during site construction and decommissioning	ECO Contractor	Construction Decommissioning		
EMP34		Weed and invader species growth needs to be appropriately monitored and managed, both during the site operations and after decommissioning	ECO Contractor Operator	Construction Operation Decommissioning		

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
WATER MANAGEMENT						
Objectives: – To implement measures to prevent the contamination on surface and groundwater resources. – To prevent erosion and loss of topsoil. Indicator and Compliance Mechanisms: – Induction training and records – Waste Management Procedure (TC-C-SHEQ-ENV-COP-002) – Significant Incident Reporting Procedure (TC-C-SHEQ-SAF-COP-012) – Environmental awareness programme/toolbox talks – Stormwater Management Plan (to be developed) – Water Use Licence						
EMP35	Surface Water Management – Stormwater Management	To appropriately manage storm water, a Storm Water Management Plan needs to be compiled and implemented, including the following recommendations incorporating measures outlined in the DWA GN704 and Best Practice Guidelines: – To prevent contamination, it must be ensured that there is no storage and handling of materials (i.e. raw materials and waste material) within the designated "clean areas". – Channels must be checked monthly and after any major rainfall events to ensure that there are no blockages and that the water will not be restricted in any way. – Spills must be appropriately managed on site, including within the bunds.	ECO Contractor Operator	Construction Operation	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
		– At the outlet of the stormwater channel discharging to the environment, erosion protection is required. – Sediments that accumulate within the stormwater management system must be routinely removed to ensure the design capacity is maintained. Should sediments be expected to contain contamination, this sediment must be appropriately handled and disposal must be undertaken to an appropriate waste disposal facility. – To reduce the velocity of runoff generated from site, velocity dissipation infrastructure must be constructed at the point of stormwater discharge to the environment. Any areas of erosion must be suitably rehabilitated. – Relevant inspection procedures must be in place to ensure pipelines and storage facilities are well maintained.				
EMP36	Surface Water Management – Water Quality	Large areas of soil excavation and vegetation removal must be phased to limit the erosion potential during rainfall events	ECO Contractor	Construction	No	No additional monitoring required
EMP37		To limit erosion, it must be ensured that the soils are rehabilitated to their pre-development characteristics as far as is practicable to ensure infiltration and vegetation rooting. The vegetation health must be returned to the baseline health where practically feasible	ECO Contractor	Construction	No	No additional monitoring required
C-WC O-WCS D-WC		Machinery must be regularly checked to ensure hydrocarbon leaks (including fuel and hydraulic fluids) are not occurring. Drip trays must be used where necessary. Fuels and oils must be stored within bunded areas. Parking areas for staff vehicles should ideally be	ECO Contractor Operator	Construction Operation Decommissioning	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
		placed on hardstanding to limit the impacts of oil leaks to the soil environment.				
C-SGI D-SGI		On-site ablutions must be made available during site construction and decommissioning.	ECO Contractor	Construction Decommissioning		
EMP38	Groundwater Management	Areas with the potential to contaminate the groundwater must be underlain by hardstanding of suitable integrity	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP39		Place a roof over coal, lime and ash storage facilities to prevent rain from interacting with coal, lime and ash	Operator	Operation	No	No additional monitoring required
EMP40		Coal, lime and ash facilities should be underlain by a hardstand surface to prevent seepage into the underlying soil and groundwater	Operator	Operation	No	No additional monitoring required
EMP41		Runoff from coal, lime and ash storage areas should be considered dirty water and unacceptable for discharge. It should be directed to the plant's dirty water system	Operator	Operation	No	No additional monitoring required
O-WCSY		Coal and lime stock yards must be located on impermeable surfaces. Stockyard must be bunded with relevant sumps and pumps that link to the existing Tubatse dirty water system.	Operator	Operation	No	No additional monitoring required
EMP42	Potable Water Management	Onsite staff are to be provided with an appropriate potable water supply, safe and healthy sanitary facilities	Project Manager Site Manager	Construction Operation	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
		and protection against exposure to environmentally dangerous or unhealthy situations or conditions	ECO Contractor Operator			
EMP43		Onsite staff should be made aware and encouraged to use water sparingly such that there is no water wastage	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
BIODIVERSITY MANAGEMENT						
Objective: To ensure that impacts to the biodiversity (fauna and flora) of the surrounding environment are ameliorated Indicator and Compliance Mechanisms: – Induction training and records – Waste Management Procedure (TC-C-SHEQ-ENV-COP-002) – Significant Incident Reporting Procedure (TC-C-SHEQ-SAF-COP-012) – Stormwater Management Plan (to be developed) – Environmental awareness programme/toolbox talks						
C-PH C-PH D-PH	General Management	A dedicated litter control programme shall be compiled by the ECO. The implementation of this litter control programme shall be the responsibility of respective contractors.	ECO Contractor Operator	Construction Operation Decommissioning	No	No additional monitoring required
		The litter must be disposed in the portable waste bins on site and later disposed at a relevant landfill site.				
		The decommissioning workers must be inducted and trained about the housekeeping by ECO				

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
EMP44	Fences and Demarcation	Demarcate construction areas by semi-permanent means/ material, in order to control movement of personnel, vehicles, providing boundaries for construction and operational sites and prevent unnecessary impacts outside authorised areas	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP45		No painting or marking of rocks or vegetation to identify locality or other information shall be allowed, as it will disfigure the natural setting. Marking shall be done by steel stakes with tags, if required	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP46		Boundaries shall not be demarcated by spoils heaps or the use of natural materials	ECO Contractor Operator	Construction Operation		
EMP47	Fire	The Project team will compile a Fire Management Plan (FMP) and Contractors directed by the ECO will submit a FMP. The Project FMP shall include inter alia aspects such as relevant training, equipment on site, prevention, response, rehabilitation and compliance to the National Veld and Forest Fire Act, Act No. 101 1998	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP48		Prevent all open fires	ECO Contractor Operator	Construction Operation		
EMP49		Provide demarcated fire-safe zones, facilities and suitable fire control measures. No smoking shall be allowed in areas of natural habitat where accidental fires could occur	ECO Contractor	Construction Operation		

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
			Operator			
EMP50		All activities where a threat of potential fire is identified shall comply with minimum fire control regulations	ECO Contractor Operator	Construction Operation		
EMP51		Use of branches of trees, shrubs or any vegetation for fire making purposes is strictly prohibited	ECO Contractor Operator	Construction Operation		
C-VL	Vegetation Clearance and Operations	Conduct a protected species survey prior to the commencement of construction activities. Results of this survey will guide permitting requirements for the removal of protected and conservation important plants from the areas that will be affected. This survey will be conducted by a suitable ecologist that is familiar with the environment and the plants under consideration	ECO Contractor	Construction	No: Alternative 2 is sparsely vegetated and has a high density of alien vegetation.	No additional monitoring required
C-VL		Contractor and worker awareness information should include reference to conservation principles and objectives and advise against unlawful harvesting of plants, with particular reference to conservation important plant taxa	ECO Contractor	Construction	No	No additional monitoring required
EMP52		All required permits should be approved prior to the removal/ relocation of any plant.	ECO Contractor	Construction	No	No additional monitoring required
		The client/ project must immediately take steps to remove alien vegetation as per Conservation of Agricultural Resource Act (No. 43 of 1983). This should be done	ECO Contractor	Construction Operation	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
		based on an alien invasive management procedure that should be compiled by a locally knowledgeable ecologist. The plan must make reference to: – Uprooting, felling or cutting – Treatment with a weed killer that is registered for use in connection with such plants in accordance with the directions for the use of such a weed killer – The application of control measures regarding the utilisation and protection of veld in terms of regulation 9 of the Act – The application of control measures regarding livestock reduction or removal of animals in terms of regulations 10 and 11 of the Act – Any other method or strategy that may be applicable and that is specified by the executive officer by means of a directive. – According to the Conservation of Agricultural Resource Act (No. 43 of 1983) as amended, the person applying herbicide must be adequately qualified and certified as well as registered with the appropriate authority to apply herbicides	Operator			
EMP53		The size of areas subjected to land clearance will be kept to a minimum	ECO Contractor	Construction	No	No additional monitoring required
C-VL		A suitably qualified ecologist must walk the site prior to construction to ensure that there are no species of special concern.	ECO Contractor	Construction	No	No additional monitoring required
C-VL C-HL		All exposed soil must be re-vegetated at the end of the construction phase.	ECO Contractor	Construction	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
C-VL C-HL		Construction activities must be limited to within the site boundary and laydown areas.	ECO Contractor	Construction	No	No additional monitoring required
EMP54		Only areas as instructed by the Site Manager, as per the authorisation, must be cleared.	ECO Site Manager Contractor	Construction	No	No additional monitoring required
EMP55		Cleared vegetation and debris that has not been utilised will be collected and disposed of to a suitable waste disposal site. It will not be burned on site	ECO Contractor	Construction	No	No additional monitoring required
EMP56		All vegetation not required to be removed, will be protected against damage.	ECO Contractor	Construction	No	No additional monitoring required
EMP57		Removal of vegetation/ plants shall be avoided until such time as soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible.	ECO Contractor	Construction	No	No additional monitoring required
EMP58		Remove and store topsoil separately in areas where excavation/ degradation takes place. Topsoil should be used for rehabilitation purposes in order to facilitate regrowth of species that occur naturally in the area.	ECO Contractor	Construction	No	No additional monitoring required
EMP59		Stored topsoil will be free of deleterious matter such as large roots, stones, refuse, stiff or heavy clay and noxious weeds, which would adversely affect its suitability for rehabilitation purposes	ECO Contractor	Construction	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
EMP60		No spoil material will be dumped outside the defined site.	ECO Contractor	Construction	No	No additional monitoring required
EMP61		Exotic weeds and invaders that might establish on the re-vegetated areas should be controlled to allow the grasses to properly establish	ECO Contractor Operator	Construction Operation Decommissioning	No	No additional monitoring required
EMP62	Fauna	No animal may be hunted, trapped, snared or captured for any purpose whatsoever. Fences and boundaries should be patrolled weekly in order to locate and remove snares/ traps	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP63		Compile a graphic list of potentially dangerous animals and present this to all workers as part of site induction, with particular reference to snakes and scorpions	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP64		Include suitable operational procedures in the event of encountering potentially dangerous animals on the site	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP65		No animal shall be killed. Should any animal be identified within the development site, all work shall be stopped in order for the safe capture and removal of the animal from the site	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP66		All animals should be only handled by a competent person, with particular reference to snakes and scorpions	ECO	Construction	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
			Contractor Operator	Operation		
EMP67		No domestic pets should be allowed on the site, with particular reference to feral cats and dogs	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
AIR QUALITY						
Objectives: To ensure that impacts to air quality of the surrounding environment are ameliorated. Indicator and Compliance Mechanisms: – Complaints register – Incident reporting system – Health, safety, environmental and community incident and complaints management system register – Amended AEL – Small Boiler Registration Certificate – Significant Incident Reporting Procedure (TC-C-SHEQ-SAF-COP-012) – Dust fallout monitoring campaign						
C1-TSP C1-PM_{10} C1-$PM_{2.5}$	Dust	Wet suppression and wind speed reduction are common methods used to control open dust sources at construction sites as a source of water and material for wind barriers tend to be readily available	ECO Contractor	Construction	No	No additional monitoring required
C2-TSP C2-PM_{10}		Vegetation is a very effective form of reducing dust emissions. Retain as much existing vegetation as possible	ECO Contractor	Construction	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
C2-$PM_{2.5}$		Activities with high dust-causing potential, such as topsoil stripping, should not be carried out in sensitive areas during adverse wind conditions. When necessary, topsoil should be stripped in discrete sections, allowing buffer strips (windbreaks) between clearings	ECO Contractor	Construction	No	No additional monitoring required
		Speed limits on site must be enforced to limit the levels of dust pollution.	ECO Contractor	Construction	No	No additional monitoring required
C1-TSP C1-PM_{10} C1-$PM_{2.5}$ C2-TSP C2-PM_{10} C2-$PM_{2.5}$ O1-AP O1-TSP O1-PM_{10} O1-$PM_{2.5}$ O1-NO_2 O1-SO_2 O2-AP O2-TSP O2-PM_{10}		Material stockpiles are capable of generating large amounts of dust. In particular, fine materials stored in stockpiles can be subject to dust pick-up. Materials being loaded onto conveyor belts or into trucks are also potential sources of dust emissions. Dust emissions from material stockpiles can be minimised through the use of the following procedures: – Locate stockpiles in sheltered areas. Otherwise, stockpiles should be covered. – Where stockpiles are located in open areas, limit the height and slope of the stockpiles to reduce wind pick up, orient stockpiles lengthwise into the wind so they offer the minimum cross-sectional area to prevailing winds, install wind barriers on three sides of the stockpile. – Limit activity to the downwind side of the stockpile. – Limit drop heights from loading facilities and use closed conveyors where possible. Transfer points should also be minimised. It is recommended that existing and proposed mitigation techniques are maintained and that abatement machinery is regularly serviced according to supplier specifications.	ECO Contractor Operator	Construction Operation		

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
O2-$PM_{2.5}$ O2-NO_2 O2-SO_2		It is recommended that dust fallout monitoring is continued to ensure compliance.				
		Watering is applicable to almost every aspect of site operations, from reducing dust entrainment from roads and other traffic areas and during earthworks, to controlling dust during movement of materials such as loading/offloading and transportation of materials. Watering is a very effective short-term measure. However, its efficiency decreases as wind velocity and evaporation rate increase. Dust emissions can be minimised using the following watering procedures: The surface should be dampened to prevent dust from becoming airborne but should not be wet to the extent of producing run-off. Alternatively, wetting agents could be used, particularly for non-wetting soils Watering is more effective when undertaken prior to strong breezes Use watering sprays on materials to be loaded and during loading In cases where severe water restrictions are imposed, other measures like the use of wetting agents such as chemical stabilisation or hydromulch, could be considered. Due to the low predicted SO2 concentrations no SO2 mitigation is required. However it is recommended that existing and proposed mitigation techniques are maintained and that abatement machinery is regularly serviced according to supplier specifications.	ECO Contractor	Construction		

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
		Covering truck loads and paving of access areas on-site	ECO Contractor	Construction	No	No additional monitoring required
		Regular sweeping/flushing of the paved roads on-site. Options include vacuum sweeping, water flushing or broom sweeping and flushing	ECO Contractor	Construction	No	No additional monitoring required
D1-TSP D1-PM_{10} D1-$PM_{2.5}$ D2-TSP D2-PM_{10} D2-$PM_{2.5}$		Dust suppression techniques must be implemented as required. Dust emissions during decommissioning can be minimised using the following watering procedures: – All decommissioning vehicles must be kept in good working order and maintained according to the relevant standards. – Speed limits on site must be enforced to limit the levels of dust pollution.	ECO Contractor	Decommissiong	No	No additional monitoring required
EMP68	Volatile Organic Compounds and Other Emissions	All equipment, machinery and vehicles should be fitted with appropriate emission control equipment, are maintained frequently and serviced to the manufacturers' specifications	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP69		Ensure incident and complaint registers are established and maintained	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP70		Prohibit burning of waste or vegetation onsite	ECO Contractor	Construction Operation	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
			Operator			
EMP71	Reporting Requirements	Provide a complaints register to report any excessive dust incidents. Manage all complaints as per the Incident Classification and Reporting Management Procedure	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP72		Ensure compliance to AEL reporting requirements	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
EMP73		Retain equipment, machinery and vehicle maintenance/inspection registers onsite	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
NOISE MANAGEMENT						
Objectives: To ensure that noise impacts to the surrounding environment are minimal or mitigated. Indicator and Compliance Mechanisms: — Maintenance records — Incident reporting system — Induction training and records — Health, safety, environmental and community incident and complaints management system register — Monitoring and audit reports — Records of PPE — Significant Incident Reporting Procedure (TC-C-SHEQ-SAF-COP-012)						

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
C-N O-N D-N	Noise	Fit equipment, machinery and vehicles generating excessive noise with appropriate noise abatement measures and undergo regular maintenance to ensure optimum efficiency during operation	ECO Contractor Operator	Construction Operation Decommissioning	No	No additional monitoring required
		Provide a complaints register to report any excessive noise incidents. Manage all complaints as per the Incident Classification and Reporting Management Procedure	ECO Contractor Operator			
		Onsite employees must be provided relevant personal protective equipment (PPE). Onsite personnel are responsible for maintaining their PPE and implementing it during the decommissioning and demolition activities	ECO Contractor Operator			
		Enclosure of continuous noise sources (i.e. pumps) within sound absorbing enclosures	Operator			
		Regular maintenance of equipment to reduce the generation of additional unwanted noise	Operator			
		Ensure that all workers are issued with and use the correct PPE, especially with regards to ear plugs. In addition, all construction areas should be designated as noisy areas. Construction vehicles and equipment must be monitored and maintained in good working condition.	ECO Contractor Operator			
		In order to ensure that the ambient noise does not exceed the required limits it is recommended that all machinery and equipment is maintained in good working order and operating within allowable legal limits.	ECO Contractor Operator			

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
		Tubatse must also ensure that all employees continue to wear the relevant PPE for noisy areas.	ECO Contractor Operator			
		Ensure that all workers are issued with and use the correct PPE, especially with regards to ear plugs. In addition, all decommissioning areas should be designated as noisy areas. Decommissioning vehicles and equipment must be monitored and maintained in good working condition.	ECO Contractor Operator			
HEALTH AND SAFETY						
Objectives: – To ensure communication with members of the public to promote safety awareness. – To prevent public access to construction sites and storage areas. – To ensure safety for all onsite personnel. Indicator and Compliance Mechanisms: – Induction training and records – Health, safety, environmental and community incident and complaints management system register – Monitoring and audit reports – Significant Incident Reporting Procedure (TC-C-SHEQ-SAF-COP-012) – PPE Register – Occupational health and safety plan – Health and safety protocol						
C-SGI	Health and Safety	All onsite personnel are required to undergo induction training and regular toolbox talks in order to raise awareness of the conditions contained herein	ECO Contractor	Construction Operation	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
			Operator			
C-SGI		The ECO will be responsible for continuously monitoring safety conditions during construction activities	ECO	Construction	No	No additional monitoring required
C-SGI		The appointed contractor will be responsible for the development of a comprehensive health and safety protocol which must be adhered to	Contractor	Construction	No	No additional monitoring required
C-SGI		Provide and wear appropriate PPE onsite	Contractor Operator	Construction Operation	No	No additional monitoring required
C-SGI		Train all onsite personnel handling chemical or hazardous substances in the use of such substances and the environmental, health and safety consequences of incidents	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
C-SGI		Provide onsite personnel with sufficient potable water for drinking	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
C-PH		The Construction workers must be inducted and trained about the housekeeping by ECO.	ECO Contractor Operator	Construction Operation	No	No additional monitoring required
C-SGI		All construction activities to be limited to within the site boundaries.	ECO Contractor	Construction Operation	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
			Operator			
C-SGI	Public Safety	Restrict public access	Contractor Operator	Construction Operation	No	No additional monitoring required
C-SGI		Ensure that onsite personnel are trained in order to prevent public access where necessary	Contractor Operator	Construction Operation	No	No additional monitoring required
SOCIO-ECONOMIC ENVIRONMENT						
Objectives: – To ensure that the negative socio-economic impacts are mitigated and managed – To ensure that the positive socio-economic impacts are enhanced Indicator and Compliance Mechanisms: – Induction training and records – Health, safety, environmental and community incident and complaints management system register – Monitoring and audit reports – Significant Incident Reporting Procedure (TC-C-SHEQ-SAF-COP-012) – PPE Register – Occupational health and safety plan – Health and safety protocol – HIV/AIDS awareness and prevention program						
C-SJO C-SGI	Local Awareness Training	It is recommended that any potential influx of outside job-seekers is mitigated as far as possible through the following means: – Ensuring local communities (through formal channels such as ward councillors and Department	Project Manager Contractor Operator	Construction Operation	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
		of Labour) are made aware of the potential opportunities available during construction in order for expectations to be managed appropriately – Prioritisation of local labour through implementing contractor policies – Ensuring that labour and staff brought into the area (by contractors or the developer) can be accommodated within exiting or proposed formal housing, through discussions with the Housing and other relevant social services divisions at the local municipality				
C-SJO C-SGI O-SJC	Local Economic Development	It is proposed that ash generated by the CFB Boiler is sold to the local cement and brickmaking industry. Ensure that local HDI companies or individuals are considered for any opportunities that may be created.	Project Manager Operator	Construction Operation	No	No additional monitoring required
C-SJO C-SGI D-SJO D-SGI		Ensure that the contractor is required to utilise a relevant percentage of local labour	Project Manager Contractor Operator	Construction Decommissioning	No	No additional monitoring required
C-SJO C-SGI		Liaising with local business forums to ensure that they are aware of what materials and services are required in advance of the construction phase	Project Manager Operator	Construction Operation	No	No additional monitoring required
C-SGI D-SGI	Social Infrastructure	It is assumed that the labour force will be able to find sufficient housing within the existing accommodation options.	Project Manager Operator	Construction Operation Decommissioning	No	No additional monitoring required

REF	ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
		Sufficient ablution facilities must be available on site for construction workers. All construction activities to be limited to within the site boundaries.				
C-SGI	Public Health	All contractors must, 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	Project Manager Contractor Operator	Construction Operation	No	No additional monitoring required
C-SGI		The developer and contractors must make HIV/AIDS awareness and prevention program development and implementation a condition of contract for all suppliers and sub-contractors	Project Manager Contractor Operator	Construction Operation	No	No additional monitoring required

7 CONCLUSION

The proposed project involves the establishment of four CFBs at the Tubatse Chrome Plant near Steelpoort in the Limpopo Province. The CFBs will generate steam to be utilised in the existing power generating facility in order to enable the facility to generate its full generating capacity of 30MW.

Three alternative sites were identified within the boundary of the Tubatse Plant. The preferred site is located in close proximity to the existing Tubatse power generation facility. The preferred site is a highly degraded site which is sparsely vegetated with both indigenous and alien species. The site is easily accessible and in close proximity to the existing Tubatse power generation facility. This close proximity enables easy linkage to the power facility for steam pipelines etc.

The impact assessment of all phases indicates that potential impacts which are associated with the proposed project can be mitigated and reduced from medium to low level. The most notable impacts included:

- The loss of vegetation and top soil due to vegetation clearance;
- Erosion due to vegetation clearance;
- Noise from construction vehicles;
- Soil and water contamination from hazardous substances and the storage of coal and lime;
- Air quality impacts due to the additional emissions from the boiler as well as dust and exhaust emissions; and
- Social impacts such as job creation, safety and security issues and the influx of workers.

All the identified impacts were classified as medium prior to the implementation of mitigation and management measures. Subsequent to the implementation of mitigation the significance of all the impacts was reduced. Mitigation and management measures are outlined in the EMPr.

The findings of the Air Quality Impact Assessment include:

- **Construction and Decommissioning Phase**
  - Impacts associated with the construction and decommissioning phases are likely to be low, as associated particulate emissions result in localised concentrations and are limited to the duration of the construction and remediation period. Should there be reason for concern, emissions can be effectively reduced with the use of wet suppression and wind speed reduction mitigation techniques.
  - For Scenario 1 (Existing Plant) point sources are the main source of NO_2, SO_2, PM_{10} and $PM_{2.5}$ emissions. Currently, wind erosion (17%) and crushers (13%) are the second and third highest contributors to PM_{10} emissions, while all other fugitive sources have negligible contributions.
  - For Scenarios 5, 6 and 7 (Proposed Plant) point sources are still predicted to be the main source of NO_2 and SO_2 contributions, with an increase in percent PM_{10} and $PM_{2.5}$ emissions. Following the expansion, crushers (13%) become the second highest contributors to PM_{10}, while wind erosion emissions decrease to 9%. All other fugitive sources have negligible contributions.
- **Operational Phase**
  - PM_{10} and $PM_{2.5}$ Concentrations
    - Ambient PM_{10} concentrations are predicted to be non-compliant (having more than 4 exceedances per annum) with the daily average standard approximately 120 m beyond the site boundary for Scenarios 1, 5, 6 and 7. However, daily average PM_{10} concentrations are predicted to be compliant at all sensitive receptor locations. Annual average PM_{10} concentrations are compliant with the annual average standard at all sensitive receptors and across the study area for Scenarios 1, 5, 6 and 7. For the remaining scenarios (2, 3 and 4), predicted PM_{10} concentrations are compliant with the daily and annual average standard at all receptors and across the study area
    - Daily and annual average $PM_{2.5}$ concentrations are predicted to be compliant at all sensitive receptor locations and across the study area, for all scenarios.
    - Particulate emissions associated with the crusher appear to be the main contributor to ambient concentrations, with fugitive emissions from materials handling and storage having the second highest contribution. Overall, particulate concentrations associated with proposed CGBs and

BADD are lower than those estimated in the original AQIA (WSP, 2016) including the (then proposed) CFB.

- SO_2 Concentrations
  - Daily and hourly average SO_2 concentrations are predicted to be non-compliant with the daily and hourly average standards approximately 360 and 140 m beyond the site boundary, respectively, for scenarios 1, 5, 6 and 7. However, it is noted that daily and hourly average concentrations are compliant at each of the receptor locations for scenarios 1, 5, 6 and 7. For scenarios 2, 3 and 4, daily and hourly average concentrations are very low and thus compliant at all receptors and across the study area. Annual average concentrations are predicted to be compliant at all receptor locations and across the study area for all scenarios.
  - Point sources are noted as the main contributor to ambient SO_2 concentrations, with negligible changes observed with the addition of the proposed boilers. Overall, SO_2 concentrations associated with proposed CGBs and BADD are lower than those estimated in the original AQIA (WSP, 2016) including the (then proposed) CFB.
- NO_2 Concentrations
  - Annual and hourly average NO_2 concentrations are predicted to be compliant at all receptor locations and across the study area, for all scenarios. Overall, NO2 concentrations associated with proposed CGBs and BADD are lower than those estimated in the original AQIA (WSP, 2016) including the (then proposed) CFB.

Since construction and decommissioning phases are associated with temporary emission sources, impacts are expected to be medium to low. Though potential impacts are likely to be localised, these may be effectively reduced with the use of wet suppression and wind speed reduction mitigation techniques. As such, impacts are expected to be low for the construction and decommissioning phases post mitigation. Incremental impacts associated with the proposed expansion at site alternatives 1, 2 and 3 only (Scenarios 2, 3 and 4), are expected to be low. Cumulative NO_2 and $PM_{2.5}$ impacts associated with the proposed plant (Scenarios 5, 6 and 7) are predicted to be low. Cumulative SO_2 and PM_{10} impacts associated are expected to be medium beyond the site boundary and low at sensitive receptors.

Based on the findings of the air quality impact assessment, it is recommended that existing and proposed mitigation strategies are maintained and that mitigation equipment is serviced according to supplier specifications. It is recommended that dust fallout monitoring is continued to ensure compliance beyond the site boundary. It is further recommended that wet suppression and wind speed reduction mitigation strategies are employed during the construction and decommissioning phases of the project.

In terms of biodiversity it was noted that the Tubatse Plant is located within the Sekhukhune Plains Bushveld. *Acacia erioloba* and *Combretum imberbe* are two trees that can be associated with this veld type. Due to the degraded nature of the preferred site, these trees were not specifically noted however, it is recommended that a suitably qualified vegetation specialist undertakes a site walkover prior to the clearance of any vegetation in order to verify whether or not these trees are present.

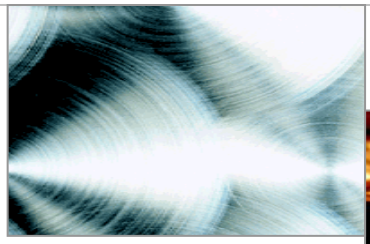
In summary, the basic assessment process assessed both biophysical and socio-economic environments and identified appropriate management and mitigation measures. The biophysical impact assessment revealed that there are no environmental fatal flaws and no significant negative impacts associated with the Proposed Project should mitigation and management measures be implemented.

WSP is of the opinion that should the identified mitigation and management measures be implemented, the Proposed Project ought to proceed.

APPENDIX

A TUBATSE OPERATING PROCEDURES

PR-CRC-SHEQ-011 Management of Significant Incidents



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1. DOCUMENT REVISION CONTROL

REVISION NUMBER	PAGE NUMBER/S	CHANGE EFFECTED	DATE OF CHANGE
5.2	5	Revised & Updated	July 2015

PURPOSE

To ensure that there is a standardised process to be followed once a significant incident occurs. This will ensure that triggers are identified, notification done, information collected, investigation planned and completed and that learning's are shared and actions are managed.

BRIEF DESCRIPTION OF CHANGE

Revision 5.2

Page 5 - Event/Incident Trigger Reaction Criteria 3.1.1

APPROVAL SIGNATURES RECORD

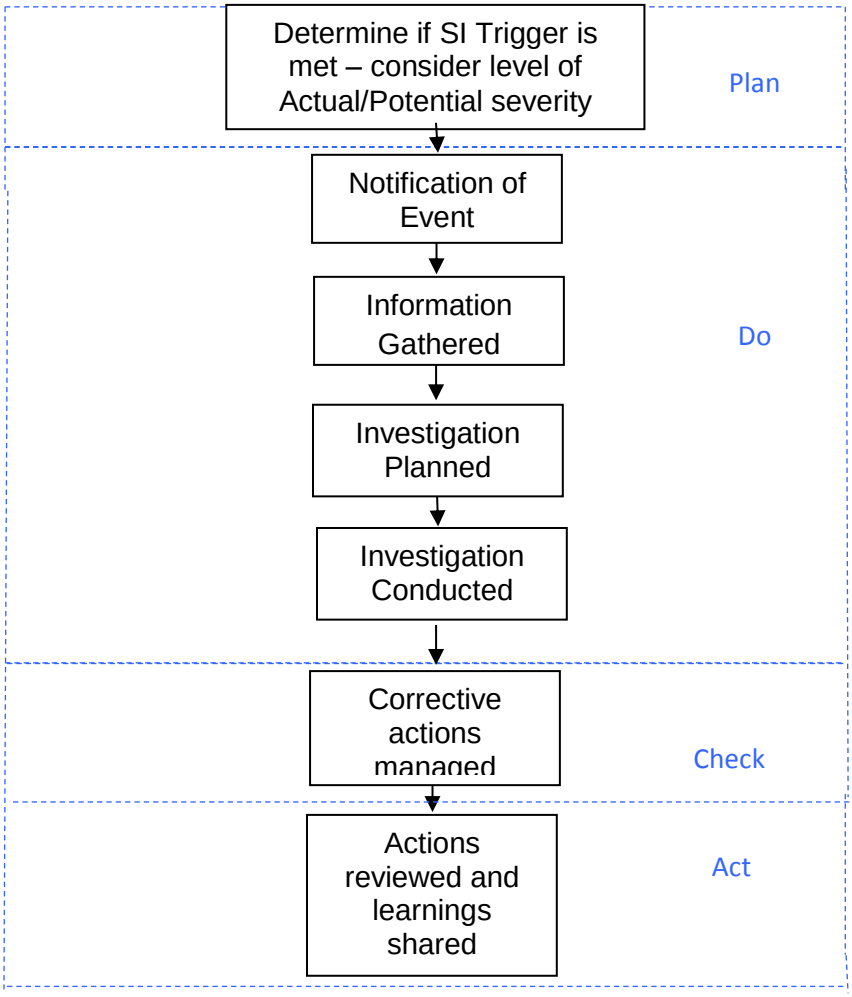
REVIEWER ROLE	NAME	SIGNATURE	DATE
Document Owner	SHEQ Council	Hard Copy Signed	
Reviewer 1	Chief Financial Officer	Hard Copy Signed	
Reviewer 2	Head of SHEQ	Hard Copy Signed	
Reviewer 3	COO	Hard Copy Signed	
Reviewer 4	Head of Corporate Affairs and Transformation	Hard Copy Signed	
Reviewer 5	General Manager, FMT	Hard Copy Signed	
Reviewer 6	General Manager, MFC	Hard Copy Signed	
Reviewer 7	General Manager, TFC	Hard Copy Signed	
Reviewer 8	General Manager, ECM	Hard Copy Signed	
Reviewer 9	General Manager, WCM	Hard Copy Signed	
Reviewer 10	Group Training and Development Manager	Hard Copy Signed	
Reviewer 11	Group Procurement Manager	Hard Copy Signed	
Administrator	Group SHEQ Administrator	Hard Copy Signed	
APPROVED BY	CEO	Hard Copy Signed	

2. OBJECTIVES

The Management of Significant Incidents is to ensure that:

- Significant Incidents are recorded and the information regarding the significant incident is shared throughout the group
- Root causes are identified through the application of intensive investigation techniques and learnings shared throughout the group.
- Incident recurrences are avoided as far as reasonably practicable through well directed controls

2.1 Significant Incident Management Process Flow Diagram



3. SIGNIFICANT INCIDENT TRIGGER CRITERIA

3.1. Introduction

This first section of this document provides trigger criteria, which represent the events that require notification and investigation. These trigger criteria apply to all Samancor Chrome's operations including activities involving contractors.

3.1.1. Required Event Triggers

The following table indicates required trigger criteria at various levels. These levels are defined in the Samancor Chrome Consequence Severity Table which is part of the Samancor Chrome Reporting Manual:

Event/Incident Trigger Reaction Criteria

Near Miss Report (Hazard, Near Hit or Complaints)	Layered Audit, Field Audit, Safe Behaviour Observation	Critical/Planned Task Observation	Significant Incident Report	Event Potential	Matrix Actual/ Potential Level	Discretion	Level of ICAM
Only **potential no contact events** are reported through this system. Followed up by line management, discussed, addressed and closed out If a trend is identified and/or the potential severity is considered by line management to have a potential level of ≥ 3+ then elevate the NMR to a SIR	Issues identified during these activities are identified by Line Management who participates in these pier on pier initiatives, issues are pro-actively identified during audits or observations and evaluated as to the potential severity should an event realize. Line management to consider whether the finding have a potential level of ≥ 3+ then elevate the finding to a SIR alternatively if remedial needs are obvious, correct and communicate.	Issues identified during these activities are identified by Superintendents/Supervisors who participates in these initiatives, issues are pro-actively identified during observations and evaluated as to the potential severity should an event realize. Needs are identified and addressed	Source: (1) pro-active initiatives following analysis of SHEQ Toolbox activities or (2) actual impact/loss evens. The actual event and potential is measured against the Severity Matrix and classified as such.	Minor	0-1	Supervisor	Closed out as discussed or Mini ICAM if so directed
					2	Line Management	Mini ICAM if so directed. Depending on the potential of the event can be elevated to a SIR with 0 actual and potential ≥ 3+ severity
				Serious/Medium	3	On Management Discretion assign a responsible person to conduct an Investigation	Full ICAM
				Fatal/Major	4	Investigation Mandatory	Full ICAM
					5	Investigation Mandatory	Full ICAM

Note: All **injuries irrespective of severity** will be fully investigated

The following are examples of the application thereof:

Example 1: A site has an injury that requires first aid treatment. However the potential was a loss time injury. What trigger applies?

Answer to Example 1: Firstly, the site trigger (level 1) for actual impact was met and site notification should be done. Secondly, the Chrome business trigger (level 3+) for Classified Injuries was met for potential impact. This means that notification should be done on both Site and Chrome Business level.

Example 2: A site had a near miss that could have resulted in a single fatality. What trigger applies?

Answer to Example 2: Firstly, the site trigger (level 1) for potential impact was met. Secondly, the Chrome business trigger (level 4+) for potential Classified Injury and

the potential of a Fatality was met. This means that notification needs to be done on Site, and Corporate level.

3.2. Site Notification

All significant incidents shall be recorded in the site's Integrated Management System (IMS), from where the automatic notification of all significant incidents will be generated to listed members via Outlook.

3.3. Chrome Business Notification and SIR Management

Significant Incident Reporting and Discussion Process Flow

		Resp. Person	Frequency
Notification	Report all L3 and higher potential/ actual incidents to the relevant manager	Relevant Superintendent	Immediately
	Report all L3 and higher potential/actual incidents to the General Manger	Relevant Manager	Immediately
	Report all actual level 3 and above SHEQ incidents to the CEO, COO and Head of SHEQ	General Manager	Immediately
	Complete part 1 of the SIR in IMS	Relevant Superintendent	Within 24 hours
	Verify correctness of entries made and allocate responsibility to investigate before the next SIR notification report is run by IMS	Relevant Manager	Before 08:00 on the day following the entry
	IMS will automatically extract new SIRs logged during the previous 24 hours and circulate to members on the circulation list	IMS	08:00 on the day following the entry
Investigation	Investigate and complete the SIR (include a relevant photo to support/explain the situation) on IMS	Designated Investigator	Within 10 days of incident occurrence
	Verify quality of investigation and if satisfied marked the investigation as closed	Relevant Manager	
Notify	IMS will automatically extract SIRs marked as closed and circulate to the members on the circulation list	IMS	08:00 on the day following the entry
SIR Discussion	Closed SIR information will be submitted in PDF format to the Group SHEQ PA, who will forward to the Head of SHEQ, COO and CEO's for discussion at the BU Report and SIR discussion session	SHEQ Manager PA Group SHEQ	25th of every month
	Corrective actions flowing from SIR Telecom discussions must be captured in the IMS system on the relevant Re-opened SIR for follow up and closure	Operational Manager SHEQ Manager	When required

3.4. Notification to Authorities

Each site shall ensure that there is a system in place to notify authorities when and where required as per relevant legislation. The means of reporting shall be as per legal requirement and all reports must be confirmed in writing. Where the Samancor Chrome Legal Counsel was involved in dealing with the Incident they must be copied on all communication with departments. The General Manager of each site must consult with the Chrome Legal Advisor before any privileged information is passed on to the Departments. (Refer to the SHEQ Reporting Manual, PR-CRC-SHEQ-020, for guidance in terms of individuals to report to).

4. INFORMATION GATHERED

Before any investigation, the following information shall be gathered as per ICAM methodology:

- People
- Environment
- Equipment
- Procedures
- Organisation

Appendix 1 is an example of a checklist that can be used.

5. PLAN INVESTIGATION

The following must be considered in the planning of the investigation:

- Investigation Team Composition (see Appendix 2 for levels of participation in investigations) – The Head of SHEQ will attend all Actual Level 4+ SHEQ SI investigations. When external parties will be involved, the COO of Samancor Chrome must be consulted on:
- Where it will be held
- When it will be held
- Travel and accommodation arrangements, where applicable
- Communication of the investigation details

6. CONDUCT INVESTIGATION

For all significant actual or potential Level 1 and 2 incidents, the Minicam or similar investigation techniques shall be used (refer to Appendix 3 for guidelines). For all

significant actual and potential level 3 and above incidents the full ICAM methodology shall be used. Appendix 4 to 7 is examples of tools that can be used during the investigation. It is however still the prerogative of the site General Manager to elevate the level of investigation for an event, should the event potential warrant it.

7. MANAGEMENT OF CORRECTIVE ACTIONS

The IMS system will be the only system used for the capturing and control of corrective actions that will have the following minimum requirements:

- Registration of all actions (whom, what, by when)
- Tracking of actions
    - Status (not started, completed, open, overdue, re-opened)
- Verification that actions has been successfully resolved

8. REVIEW AND SHARE LEARNINGS

8.1. Review

- Each facility shall have a system in place to review all significant incidents on at least a monthly basis.
- On the 25th of each month the site SHEQ Managers must submit a list of closed SIRs to the Personal Assistant of the Head of SHEQ for inclusion in the SIR discussion appointments that will be conducted on during BU Report discussion sessions.
- Selected actual and potential level 3 and above SHEQ significant incidents shall be reviewed each month between each site General Manager, the CEO/COO of Samancor Chrome or his delegates and the Head of SHEQ.
- The CEO/COO of Samancor Chrome and the Head of SHEQ shall review progress on actions from fatal injuries and potential fatalities within 3 months after the incident. This review shall be conducted on site.

8.2. Shared Learnings

- Each facility shall have a system in place to:
    - Share learnings with facilities on the same site
    - Share relevant learnings with other Chrome sites

9. TRAINING

Each facility shall ensure that an adequate number of Significant Incident Investigation Facilitators are trained in the ICAM methodology.

10. DEFINITIONS AND ABBREVIATIONS

10.1. Definitions:

10.1.1. Chrome Significant Incident Trigger Criteria

The Significant Incident Trigger Criteria is the level at which notification and investigation is required as explained in 3.1.1 and 3.3 of this document. Chrome Trigger criteria are set as minimum Samancor Chrome expectations. Sites may elect more conservative trigger points based on the value perceived.

10.1.2. Significant Incident (SI)

Any occurrence that has actually resulted or had the potential to result in the descriptions outlined in the Samancor Chrome SHEQ Consequence Severity Table (see Reporting Manual). The level of notification and investigation will be determined by the relevant trigger criteria as explained in 3.3 in this document.

10.1.3. Significant Incident Report (SIR)

Is the IMS report referred to within the Samancor Chrome SHEQ Reporting Manual? This report shall be used for the documentation of all SI's irrespective of trigger criteria. Distribution will however be limited according to the notification requirements.

10.2. Abbreviations

The following abbreviations are applicable to this process.

TERM	DESCRIPTION
GM	General Manager
SIR	Significant Incident Report
SI	Significant Incident
ICAM	Incident Cause Analysis Method
IMS	Incident Management System
RCA	Root Cause Analysis
CA	Corrective Action
SHEQ	Safety, Health, Environment, and Quality
SCR	Samancor Chrome

COO	Chief Operating Officer
CEO	Chief Executive Officer

11. RESPONSIBILITIES

ROLE	RESPONSIBILITY	TYPICAL
Initiator	• Identifies and responds appropriately to triggers as defined.	All Employees
SI Sponsor	• Ensures that RCA's are conducted as defined in the trigger criteria. • Reviews and approves findings from RCA's.	GM's, Managers, Superintendents, Supervisors
SI Facilitator	• Leads the investigation by facilitating one or more individuals in Root Cause Analysis. • Documents findings and corrective actions in IMS and review with RCA Sponsor.	Any person trained and experienced in investigation techniques
SI Coordinator(s)	• Implements RCA and processes at a site level. • Arranges training • Assists with development or triggers.	SHEQ Manager, Superintendent or Specialist

12. APPENDIX

Attachment	Document	File
1	Checklist for information gathered	Checklist for information gathered.d
2	SIR Levels of participation in investigations	F:\EBMS HQMS\4 Group One Pagers\Sa
3	Minicam Manual, Courtesy BHPB	
4	Example ICAM Chart	ICAM Template.xls
5	Example of Presentation, Courtesy BHPB	C:\ICAM Presentation.ppt
6	Example of Timeline	Timeline Template.doc
7	Signed Approval Signature Record	

samancor Cr		CODE OF PRACTICE	
Document No.:	**TC-C-SHEQ-CON-COP-002**	Revision date:	**May 2017**
National Unit Standard Reference number:			

DOCUMENT TITLE
Contractor Management

APPROVAL SIGNATURE RECORD		
Reviewer	**Title**	**Signature / Date**
Format and layout approver	Document Controller	
Document Owner / Originator	SHEQ Superintendent	
Reviewer 1	Contractor Practitioner	
APPROVED BY	SHEQ Manager	
Filing of final document	Tubatse Chrome Document Controller	

Index

1. Purpose

The purpose of the procedure is to outline the processes of on-boarding and the associated SHEQ requirements for different types of Contractors coming to do work at TC.

2. Scope

This procedure covers the following:

- Prerequisites for site access once an order has been placed
- Prerequisites for commencing work
- Contractor operational management
- Contract completion and hand over

3. References

Reference to documents:	Risk Assessment & Hazard Identification: TC-C-SHEQ-RSK-COP-001
	Hazardous Work Permits: TC-C-ENG-TC-SOP-003
	Management of Significant Incidents: PR-CRC-SHEQ-011
	SHEQ reporting manual: PR-CRC-SHEQ-020
	Medical Treatment & Surveillance: TC-C-SHEQ-HH-COP-002
	Access control: TC-C-ADM-SEC-SOP-001
	Personal protective equipment programme: TC-C-SHEQ-SAF-COP-013
	Fatal Risk Control Protocols
	SHEQ Policy: TC-C-SHEQ-TC-POL-001
	Life preserving rules
	Occupational Health and Safety Act (Act 85 of 1993)
	Construction regulations guideline for operations: PR-CMC-ENG-003
	Portable Electrical Equipment: TC-C-ENG-TC-COP-012

4. Abbreviations/Definitions

Approved Contractor: A person, organisation, their employees or a nominated representative approved to carry out work for Tubatse Chrome in a contract for service arrangement (supported by an official order number).

On Site Service Provider: An organisation that fulfils an inherent function for the business and that is for all intents and purposes "continuously" on site for at least a year.

Ad-Hoc Contractor: Contractor that is awarded work from time to time for maintenance, repairs or small projects through a purchase requisition procurement process. Contractor will only have site access if an order has been placed with the contractor, project owner needs to complete template (TC-C-SHEQ-CON-TEM-013) for each project to request access for the contractor's personnel. For longterm contracts the above mentioned form only needs to be completed once for the contracted period.

Project Contractor: Contractor that is awarded the responsibility to perform work related to capital or refurbishing projects either as part of the project or for the project in entirety. Contractor will only have site access if an order has been placed with the contractor, project owner needs to complete template (TC-C-SHEQ-CON-TEM-013) for each project to request access for the contractor's personnel.

Contractor Manager/Supervisor: The responsible person appointed by the contracting company to oversee their safe operations and work on site.

Project Owner: The TC employee officially responsible to work with the contracting company to ensure compliance to regulations and laid down procedures while on site.

CD	Compact Disc
CP	Contractor Practitioner
GM	General Manager
MSDS	Material Safety Data Sheets
OHSA	Occupational Health and Safety Act
OM	Operations Manager
OSSP	On-site service provider
PPE	Personal Protective Equipment
FRCP	Fatal Risk Control Protocol
TC	Tubatse Chrome
SHEQ	Safety Health Environment Quality
PO	Project Owner
SOP	Standard Operating Procedures
SP	SHEQ Practitioner
SSu	SHEQ Superintendent
C_{OSSP}	Contractor On Site Service Provider
C_{AH}	Contractor Ad-Hoc
C_{PROJ}	Contractor Projects
COP	Code of practice
FTE	Full time employee
PTW	Permit to work
RA	Risk assessment
PO_{OSSP}	Project Owner On-site service provider
PO_{AH}	Project Owner Ad Hoc
PO_{PROJ}	Project Owner Projects

5. Responsibilities

5.1. SHEQ Manager:

- The SHEQ Manager has overall responsibility for the implementation of procedures on contractor management in terms of SHEQ requirements.

5.2. SHEQ Superintendent:

- Responsible for performance management and review of the Contractor Practitioner KPIs
- Following tender processes (identification of possible suppliers, compilation of scope of work, technical evaluation of tenders) for on-site service providers related to SHEQ functions
- Overview and approve all standards and procedures related to contractor management
- Involved in MOC for all capital and refurbishing projects
- SHEQ Requirements to be specified during MOC for the specific project
- Determine project specific SHEQ Requirements for capital or refurbishing projects in coordination with Project Owner or as required/requested by any Project Owner

5.3. Contractor Practitioner:

- Conduct an annual review of SHEQ Requirements related to all contractors
- Conduct scheduled and un-scheduled audits on contractors
- Key performance areas are the management of contractor site access, legal appointments, contractor files, basic training and monitoring of on-site service providers in terms of SHEQ compliance
- Maintain an up to date contractor index indicating the status of the contractor / service provider letter of good standing. The index will be easily accessible on EBMS to all persons wanting to source a contractor for work on site.
- Ensure that all contractor employees attend medical and contractors' induction on an annual basis
- For existing contractors that have been awarded work, review of the safety file for continued applicability and compliance
- For new contractors compilation of a safety file, taking into consideration the scope of work, complexity of the work, related hazards, controls needed and training requirements
- Timeous communication with both the contractor and the project owner on the status of the safety plan and any problems encountered

- Ensure that training matrices for all on-site service providers have been completed and are updated. Verify proof of training during regular audits
- Ensure completion of safety files with all required signed legal appointments, contracts, policies and standards
- Grant contractors permission to work on site after successful scrutiny of safety plan
- Communicate with Security Administrator on contractors to be granted access to site.
- Ensure that all ad-hoc and project contractors access to site liaison with the security and access control administrator.
- Facilitate initial and on-going vehicle and tool inspections by Security personnel
- Ensure that all on-site service providers are placed on IMS and all applicable targets are met, actions are effectively closed-out and all deviations/incidents are effectively dealt with
- Perform regular scheduled audits on on-site service providers. Construction workers should be audited monthly against their safety plan in coordination with site SHEQ Practitioners.
- Schedule and conduct FRCP gap assessments and emergency drills for on-site service providers
- Ensure that statutory inspections are performed on all tools and equipment of on-site service providers by Services department
- Regularly audit that statutory inspections have been included for all applicable contractor tools and equipment
- Maintain a register of contractor containers on site and perform initial compliance inspections.
- Maintain a list of all construction work in progress onsite, liaise with On-site allocated SHEQ practitioners to ensure audits regular audits are completed.

5.4. SHEQ Practitioner (On-site area allocated):

- All SHEQ related matters and audits
- Assist the Project Owner with legal compliance audits
- Handling of other safety related issues, including day to day safety management of the contractor
- Ensure that statutory inspections are performed on tools and equipment for all contractors performing work in area of responsibility (this includes on-site service providers).
- Ensure that continuous risk assessments and permits to work are completed for all contractors performing work in area of responsibility (this includes on-site service providers)

- Conduct regular audits on all work performed by contractors in area of responsibility. Construction workers should be audited on a monthly basis against their safety plan (See annexure 1 for list of construction work)
- Ensure that all contractor containers in area of responsibility is inspected
- Perform site-specific induction for all Contractors working in area of responsibility
- Verify that emergency preparedness is in place
- Inputs in the contractors monthly safety meetings

5.5. Project Owners (PO)

A PO is appointed based on his/her area of responsibility. The PO must at least be on a C Upper level and must be fully aware of the full ambit of the SHEQ requirements of the contract.

In the case where a contractor is performing construction work the (PO) must inform both the contractor SHEQ practitioner and the SHEQ practitioner responsible for the area in which the construction work will take place.

5.5.1. Project Owner (On-Site Service Providers)

- Identify the need for a service
- Liaison with the SHEQ department on all matters that may affect the management of contractors and associated risks
- Compile initial scope of work for service to be provided. This scope should include the SHEQ requirements related to the project. The scope and SHEQ requirements should be communicated to the contractor during the purchase requisition creation process
- Following tender processes as prescribed by procurement department (identification of possible suppliers, technical evaluation of tenders) for on-site service providers
- Review the contractor index on EBMS and ensure the required contracting company has a valid contractor's safety file on site. If a file exists, but is no longer valid, inform the Contractor Practitioner at least one week prior to contractors coming to site.
- If no file exists, the Project Owner should promptly provide details of the proposed contractor to the SHEQ Practitioner (Contractors). This should be done at least one week prior to contractors coming to site
- For new contractors, regularly verify progress status of SHEQ safety file and when required assist with negotiations with contractor to expedite compilation

- Regularly evaluate quality of service delivered by Contractor against contractually agreed standards
- Project owners must ensure that where applicable notification of construction work must be completed by contractors performing construction work, see point 7.6 of this COP.

5.5.2. Project Owner (Ad-hoc Contractor)

- Identifying the need for a service
- Responsible for day to day compliance to SHEQ related matters on site, including risk assessments and permits to work
- Liaison with the SHEQ department on all matters that may affect the management of Contractors and associated risks
- Compile initial scope of work for service to be provided. This scope should include the SHEQ requirements related to the project. The scope and SHEQ requirements should be communicated to the contractor during the purchase requisition creation process
- Review the contractor index on EBMS and ensure the required contracting company has a valid safety file on site. If a file exists, but is no longer valid, inform the Contractor Practitioner at least one week prior to contractors coming to site.
- If no file exists, the Project Owner should promptly provide details of the proposed contractor to the SHEQ Practitioner (Contractors). This should be done at least one week prior to contractors coming to site
- Complete template (TC-C-SHEQ-CON-TEM-013) to ensure that contractors will be given access for the period that they are needed to do work onsite. This form needs to be sent to the security and access control administrator at least 48 hours before access is required.
- For new contractors, regularly verify progress status of SHEQ safety file and when required assist with negotiations with contractor to expedite compilation
- Ensure that continuous RA and PTW is conducted for contracting work in area of responsibility
- Regularly audit all SHEQ related aspects while work is being conducted
- Project owners must ensure that where applicable notification of construction work must be completed by contractors performing construction work, see point 7.6 of this COP.

5.5.3. Project Owner (Capital and Refurbishing Contracts)

- Identifying the need for a project

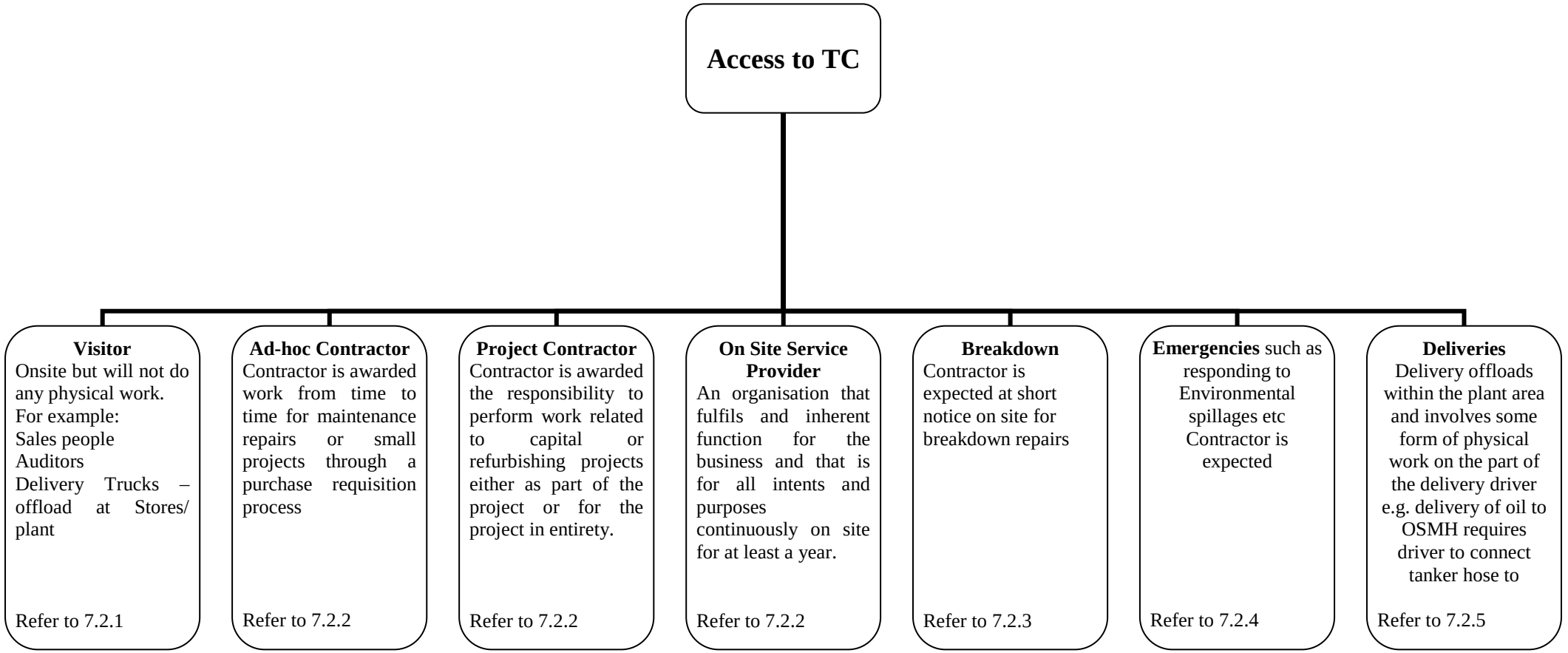
- Responsible for day to day compliance to SHEQ related matters on site, including risk assessments and permits to work
- Compile initial scope of work for service to be provided. This scope should include the SHEQ requirements related to the project. The scope and SHEQ requirements should be communicated to the contractor during the purchase requisition creation process
- Following tender processes as prescribed by procurement department (identification of possible suppliers, technical evaluation of tenders)
- Liaison with the SHEQ department on all matters that may affect the management of contractors and associated risks
- Register and complete a MOC for the project if not scheduled maintenance
- Review the contractor index on EBMS and ensure the required contracting company has a valid contractor's safety file on site. If a file exists, but is no longer valid, inform the Contractor Practitioner at least one week prior to contractors coming to site.
- If no file exists, the Project Owner should promptly provide details of the proposed contractor to the SHEQ Practitioner (Contractors). This should be done at least one week prior to contractors coming to site
- Complete template (TC-C-SHEQ-CON-TEM-013) to ensure that contractors will be given access for the period that they are needed to do work onsite. This form needs to forward to the security and access control administrator at least 48 hours before access is required.
- For new contractors, regularly verify progress status of SHEQ safety file and when required assist with negotiations with contractor to expedite compilation
- Determine Project Specific SHEQ Requirements for capital or refurbishing projects in coordination with SHEQ Specialist (Safety)
- Conduct monthly scheduled audits of contractor activities against their safety plan
- Perform a post-project evaluation of contractor, including compliance to SHEQ requirements
- Project owners must ensure that where applicable notification of construction work must be completed by contractors performing construction work, see point 7.6 of this COP.

6. Document Revision Record

Document revision record						
Rev No:	**Date:**	**DESCRIPTION OF REVISION/CHANGE**	**Severity of changes**		**Training required**	
			Major	**Minor**	**Yes**	**No**
0	31/03/2011	Change from SOP to COP		X	X	
01	12/04/2012	Review COP	X		X	
01.1	12/06/2012	Revised for compliance to ISO and OSHAS System requirements		X		X
02	29/05/2013	Amended Contractor Management Framework	X		X	
02.1	08/05/2014	Minor changes		X		X
02.2	26/09/2014	Updated section 10 SHEQ Performance Monitoring and Incident Management.		X		X
03	23/11/2015	Included access control requirements and incident management	X		X	
04	29/11/2016	Change of template Contractor file contents Clarification on contractor types and route to work	X		X	
04.1	08/05/2017	Update template references		X		X

7. Description of Code

7.1 Access to site by type of contractor



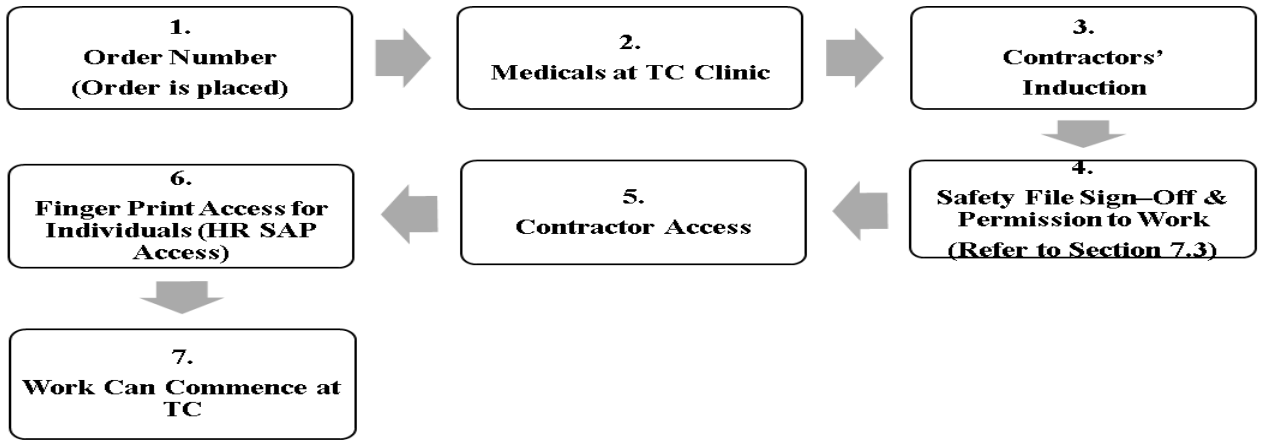
7.2 Route to Work:

7.2.1 Route To Work: Visitors

A Visitor will be expected to undergo the Visitors' Induction; and will be collected at Security, signed in and escorted by the person they visited the entire time they are onsite. They are also expected to wear full PPE should they wish to access High-Risk areas.

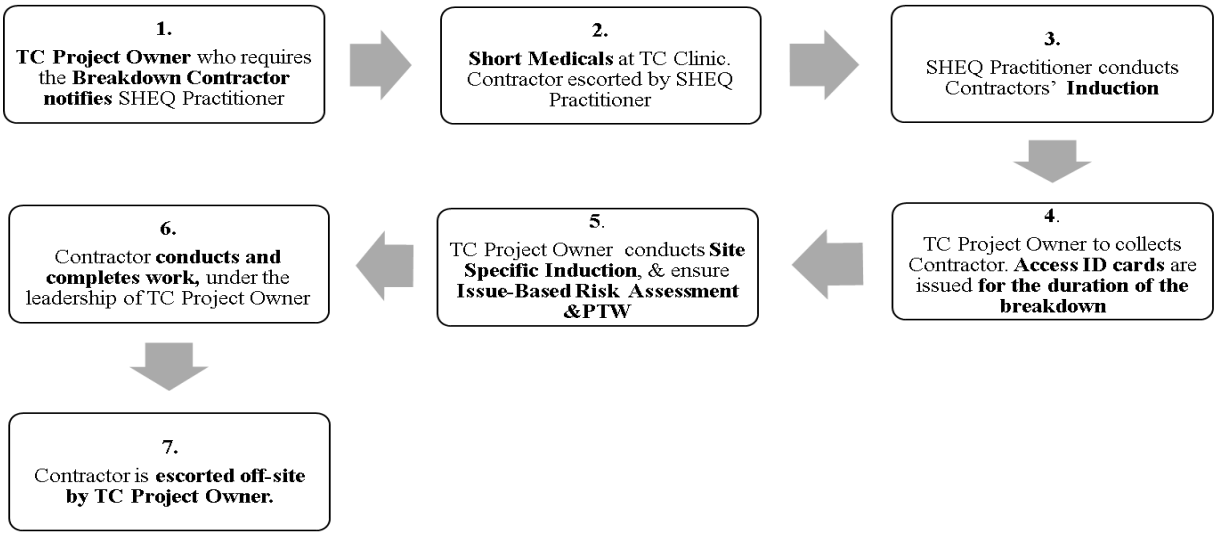
7.2.2 Route To Work: Ad Hoc Contractor, Project Contractor, On-Site Service Provider

The Ad Hoc Contractors, Project Contractors and On-Site Service Providers must follow the following process to gain access to TC:



7.2.3 Route to Work: Breakdown Contractor

It is preferable that Breakdown Contractors are approved vendors on the Vendor List, and that they already have a compliant Safety File, such that when expected to respond to a breakdown they would be able to follow this shortened route to work as shown below:



7.2.4 Route To Work: Emergencies

- During emergency situations such as fires, injuries, hazardous chemical spills and community unrest, all emergency personnel and personnel from other companies assisting in these emergencies will be allowed onsite and their activities will be considered as monitored activities.
- Security or the on-site Emergency Response Team must escort these personnel to and from the location where they are required, as these personnel will not have the necessary knowledge of;
  - FRCP 1: Light Vehicles
  - FRCP 2: Surface Mobile Equipment and;
  - The Tubatse Traffic Management Plan (TC-C-PRO-OSMH-SOP-013).
- All access and activities mentioned under section 7.2.4 of this COP must be approved by Tubatse SHEQ management on D-upper level or higher

7.2.5 Route to Work: Deliveries

- Hazardous material deliveries to site, whose drivers and assistants are required to exit their vehicles, are classified as ad hoc contractors. (Refer to Section 7.2.2)
- Routine deliveries to Stores require Visitors' induction.
- Routine plant deliveries and collection (such as raw materials) refer to Access Control procedure (TC-C-ADM-SEC-SOP-001)
- Project material deliveries to on site locations:
  - Security phones the project owner and then escorts the supplier to site.
  - The Project Owner is responsible for the offloading of the delivery after following the risk assessment processes.

7.2.6 Route to Work: Delivery Vehicle/Equipment Breakdown on Site

- In the case where delivery vehicles breakdown or become stranded on site, repair/recovery personnel will be allowed to enter the site with the correct PPE, after a visitors' induction has been completed, in order to repair the vehicle or remove the vehicle off-site. Tubatse personnel responsible for this area will complete a Risk Assessment and a Permit to work and oversee the work; all work being done will be considered monitored activities.

7.2.7 Exemptions

- Where you cannot comply with any of the requirements as outlined in this procedure, an exemption may be obtained for the work to be conducted.

- Exemption can only be granted temporarily and after careful considerations of the risks related to the specific service/task required. An exemption letter will be drafted outlining which of the requirements could not be met.
- The exemption letter *(TC-C-SHEQ-SAF-TEM-027)* will be co-signed by the General Manager (or the SHEQ Manager in his absence) and the Departmental Manager responsible for the work to be done.
- This letter will only allow the service provider a once-off entry to the plant, after which the service provider must go through the process of opening an own safety file.
- **No contractor will be exempted from a valid 37.2 agreement and Letter of Good Standing.**

7.3 Safety File Requirements

Safety File requirements are governed by legal, site and other requirements defined by the type of work being conducted. It is expected of Contractors coming to conduct work at TC to have a Safety File, and the Safety File requirements are as listed below:

Contractor Requirement	Guidelines for the Contractor
Company Information	
1. Permission to Do Work on Site (TC-SHEQ-CON-TEM-009)	Document that is signed by Contractor Practitioner when the contractor has satisfactorily proven compliance with TC requirements
2. 37(2) Signed Legal Agreement 3. 5(1)k Principal Contractor Appointment 4. Construction Permit (If applicable) Templates found in PR-CMC-ENG-003 5. Order Number/Contract 6. Vendor Assessment 7. Letter of Good Standing 8. Tax Clearance Certificate 9. BBBEE Certificate	
Sub-Contractors	
10. List of Sub-Contractors	List of all mandatories that will be conducting work under the responsibility of the principle contractor
Personnel Information	

Contractor Requirement	Guidelines for the Contractor
11. Name List of Employees on Site 12. Copy of RSA I.D or passport of each person 13. Proof of Medical Fitness 14. Proof of Competency (TC-C-SHEQ-CON-TEM-011) 15. Proof of Contractors' Induction Training – Copy of attendance register 16. Proof of Training – TC Basic Safety Aspects • FRCP Guidelines • Traffic Management Plan • Life Preserving Rules • Four Steps to Safety (TC-C-SHEQ-CON-TEM-010) 17. Training Matrix – Proof of training a per matrix (For OSSPs)	Included in this file for each person is the following proof of competency: • All trade or tertiary certificates • Any other operating training certificate • Mobile equipment operator training certificate • Driver's licenses • Crane operator training certificate • Scaffold builder/erector/and or inspector certificate • Valid First Aid certificates if >10 employees Training Matrix template provided by Contractor Practitioner (TC-C-SHEQ-CON-REG-001)
Legal Appointments	
18.	

<table>
<tr><th>Contractor Requirement</th><th>Guidelines for the Contractor</th></tr>
<tr><td>a) Organogram
b) Emergency Contact details of:
Company Owners, Managers, Supervisors and Safety personnel</td><td></td></tr>
<tr><td>19. Legal Appointments</td><td>Appointments must be done prior to commencement of work on site:
<table>
<tr><td colspan="2">Mandatory legal appointments</td></tr>
<tr><td>Chief Executive Officer</td><td>OHS Act, Sect. 16(1)</td></tr>
<tr><td>Incident Investigator</td><td>GAR – 9(2)</td></tr>
<tr><td>H&S Representative</td><td>OHS Act, Sect. 17</td></tr>
<tr><td>H&S Committee Member</td><td>OHS Act, Sect. 19(3)</td></tr>
<tr><td colspan="2">Voluntary legal appointments</td></tr>
<tr><td>Employer Representative</td><td>OHS Act, Sect. 16(2)</td></tr>
<tr><td>Manager</td><td>OHS Act, Sect. 16(2)</td></tr>
<tr><td colspan="2">Best Practice appointment</td></tr>
<tr><td>Supervisor/ Foreman</td><td>OHS Act, Sect. 8(2)(i)</td></tr>
<tr><td>Stacking Supervisor</td><td>GSR - 8</td></tr>
<tr><td>H&S Committee Chairperson</td><td>OHS Act, Sect. 19</td></tr>
<tr><td>First Aiders</td><td>GSR – 3(4)</td></tr>
<tr><td colspan="2">Construction regulation appointments</td></tr>
<tr><td>Designer – Temporary works</td><td>CR 12.(1)</td></tr>
</table></td></tr>
</table>

Contractor Requirement	Guidelines for the Contractor	
	Construction Manager	CR 8.(1)
	Assistant Construction Manager	CR 8.(2)
	Acting Construction Manager	CR 8.(1)
	Contractor (Company)	CR 7.(1) (c)
	Sub - Contractor [contractors contractor] (Company)	CR 7.(2) (c)
	Health and Safety Officer	CR 8.(5)
	H&S - Combo x 3	CR 8.(5) & 9.(1) & 10.(1)(A)
	Risk Assessor	CR 9.(1)
	Trainer	CR 9.(3)
	Responsible Person – Fall Protection Plan	CR 10.(1) (a)
	Construction Supervisor (General)	CR 8.(7)
	Assistant Construction Supervisor (General)	CR 8.(8)
	Excavation Supervisor	CR 13.(1) (a)
	Demolition Supervisor	CR 14.(1)
	Scaffolding Supervisor	CR 16.(1)
	Suspended Platform Supervisor	CR 17.(1)
	Suspended Platform Inspector	CR 17.(8)(c)
	Ropes Assess Supervisor	CR 18. (1)(a)
	Material Hoists Inspector	CR 19.(8)(a)
	Bulk Mixing Plant Supervisor	CR 20.(1)

Contractor Requirement	Guidelines for the Contractor
	Explosive actuated fastening device - Controller — CR 21.(2)(g) Designated Person – Electrical Installations — CR 24.(1)(c) Stacking and Storage Supervisor — CR 28. (1)(a)
Vehicle/Equipment and Tools	
20. Vehicle Inspection checklist	Vehicles coming on site should be/will as per Fatal Risk Control Protocols have: • Roadworthy and licensed • Windscreen and windows in good order • All lights must be working, including indicators and emergency indicators • In possession of a amber strobe light on the roof • Equipped with a reverse hooter/siren • Yellow reflector strips all around • Equipped with a whip flag with the highest point no less than 3 metres from ground level • A fire extinguisher which is easy accessible in case of fire • Clearly marked to indicate which company they are from Security will inspect the vehicle and if found in order, Security will issue a red licence disk valid for three months. The disk must be clearly displayed on the windscreen. Only licensed drivers that are trained on TC Traffic Management Plan (TC-C-PRO-OSMH-SOP-013) are

Contractor Requirement	Guidelines for the Contractor
	allowed to drive vehicles on the TC site.
21. Contractor Container Checklist	• Container must be well structured (Like a shipping container) • The door must be lockable • There must be shelves in the container • There must be easy access to the entrance of the container • Should people need to be in the container for long periods there should be sufficient ventilation of air conditioning. • Container must be clearly marked to indicate which company it belongs to
22. Tool List (Tools brought to site- To be inspected before bringing onto site)	Tool lists will include a list of all tools brought onto site, including but not limited to: • Hydraulic Equipment a) Test Certificates. Certificates must be < 12 months old. b) Performance tests c) Test Certificates on pressure vessels • Lifting equipment such as: a) Slings b) Chain blocks c) Coffin hoists d) Fork lifts

Contractor Requirement	Guidelines for the Contractor
	e) Mobile cranes • Electrical Tools a) Tubatse electrician inspects and tags as per (TC-C-ENG-TC-COP–012)
Contractor Work Planning Documentation	
23. Contractor Safety Policy	On Contractor's letterhead
24. Contractor Safety Plan	Outlines the methodologies employed by the contractor to ensure that the objectives of its SHEQ policy is met. This plan must be written to comply with TC standards
25. Fall Protection Plan	
26. Scope of Work	As detailed on the Purchase Order.
27. Baseline Risk Assessment	• A generic baseline risk assessment must be conducted, and signed off before the commencement of work on site. Contractor must use own template which allows for: a) identification of control measures and, b) an acceptable risk rating methodology. • All contractors' employees must be made fully aware of the contents of the risk assessment and a register must exist to verify this.
28. Safe Work Procedures /Standard Operating Procedures (as required by the Scope of Work and Risk Assessment and where not addressed by TC procedures)	The Contractor must have Safe Work Procedures (Standard Operating Procedures) for work that they will be conducting on site

Contractor Requirement	Guidelines for the Contractor
29. Register of hazardous chemical substances and Safety Data Sheets	The Safety Data Sheets must have the 16 point system and not be older than 5 years

7.4 Operational Files

Once a Contractor is on site, it is expected that they will, in addition to the Safety File, also maintain Operational Files. It is the responsibility of the contractor to open and maintain operational files. The contents of such a file must include the following:

Content of Operational File	Guidelines for the Contractor
1. Proof of Tubatse Chrome Site Specific Induction	Facilitated by either the TC SHEQ Practitioner or Project Owner
2. PPE Issue register and Inspection Register	• PPE Issuing Register: TC-C-SHEQ-SAF-TEM-017 • Monthly PPE Checklist: TC-C-SHEQ-SAF-TEM-019
3. Daily Green Area Meeting minutes	Daily green area meetings must take place and proof of such meetings must be available on the Operational File. Meetings may be incorporated with TC green area meetings. These meetings must discuss all communications from the SHEQ Department, Work planning for the day, Incidents recorded from other areas etc.
4. Risk Assessments and Permit To Work (Including Lifting studies)	• A Pre Work Hazard Identification and Risk Assessment must be completed before the start of each task (TC provides a Risk Assessment Book); and every employee that is going to execute a task must acknowledge the contents and understanding of risk assessment by his/her signature. • A permit must be obtained before any work commences. (TC provides a Permit book)

5. Near-miss reports; Safe Behaviour Observations	• OSSPs use IMS • All other contractors who do not have access to IMS, should report it to the Tubatse Project Owner or SHEQ practitioner.
6. Planned Task Observations/Critical Task Observations	• OSSPs use IMS • All other contractors who do not have access to IMS, should report it to the Tubatse Project Owner or SHEQ practitioner.
7. Monthly Internal Safety Meetings	The Contractor must hold monthly safety meetings. This meeting must be formal and a copy of the minutes must be kept in the Operational File.
8. Safety Audits	OSSPs and Project contractors must conduct their own internal audits.
9. Statutory Inspection Registers for tools and equipment	To be completed on a monthly basis for contractors on site.
10. TC Emergency Contact List	Supplied by TC

7.5 Applicable Tubatse Chrome Procedures

A contractor must familiarise themselves with the contents of the below procedures.

Applicable Policies & Procedures - TC Operational Controls: Safety Management	
11. Traffic Management Plan (All drivers who will be operating vehicles at TC must write a test)	TC-C-PRO-OSMH-SOP-013
12. Alcohol & Substance Abuse	TC-C-HR-ER-COP-001
13. General colour coding and demarcation	TC-C-ENG-TC-COP-001
14. Equipment Guarding	TC-C-ENG-TC-COP-005

15. Ladders	TC-C-ENG-TC-COP-007
16. Working at Heights	TC-C-ENG-TC-COP-021
17. Management of Significant Incidents	PR-CRC-SHEQ-011
18. Isolation & Lockout	TC-C-ENG-TC-SOP-001
19. Emergency Preparedness & Response	TC-C-SHEQ-SAF-COP-009
Applicable Policies & Procedures - TC Operational Controls: Environmental Management	
20. Waste Management	TC-C-SHEQ-ENV-COP-002
21. Hydrocarbon Spill Kits contents	TC-C-SHEQ-ENV-OP-003
22. Chemical Spill Kit contents	TC-C-SHEQ-ENV-OP-004

7.6 Construction Regulations

For all construction related activities, it is the responsibility of the Tubatse Project Owner to ensure that procedure PR-CMC-ENG-003 is followed.

7.7 Communication

7.7.1 Contractors Internal Communication

- Safety Meetings – It is the responsibility of On-site service providers to hold a monthly safety meeting. This meeting must be formal and a copy of the minutes and attendance registers must be kept on the Operational File.
- Daily green area meetings must take place and proof of such meetings must be available on the Operational File. Meetings may be incorporated with TC green area meetings

7.7.2 Communication with contractors and other visitors to the workplace.

A monthly contractors meeting will be held at Tubatse Chrome for all On-site service providers. During this meeting, the following aspects will be addressed:

- Monthly IMS Stats.
- Discussion of applicable incidents.
- Issues raised in the contractor's monthly report.
- Ad Hoc Topics.

7.7.3 Consultation with contractors where there are changes that affect their OH&S.

- The Contractor practitioner communicates changes or concerns with contractors by means of the weekly SHEQ Communication which includes SHEQ Issues identified during the previous week.
- Changes that might affect the contractors OH&S, are communicated when the permit issuer reviews their Risk assessment which occurs prior to the permit being issued.

7.8 SHEQ Performance Monitoring and Incident Management

- Contractor's compliance with applicable SHEQ standards, procedures and requirements must be monitored.
- Any incidents logged against a contractor, must be investigated by at least the responsible PO, departmental SHEQ Practitioner and Contractor.

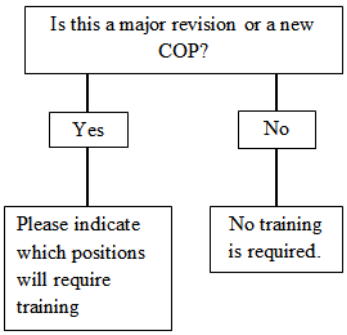
- Contractors shall participate in the incident investigations where applicable
- Contractors will be expected to take disciplinary action against employees who exhibit unsafe behaviour.
- Contractor non-compliance to their own SHEQ Plan or TC standards and requirements may result in vendor complaints or contractors denied any further access to TC site. Action taken will depend on the nature of the non-compliance, but will normally result from serious non-compliance or repeated non-compliance.

8. Records/Documented Information

Doc ID	Indexed by	Type of Record	Where Stored	Period Retained	Disposal Method	Resp. for Record
TC-C-SHEQ-CON-COP-002	CON	COP	Document Control Store	1 year	Shredding	Document Controller
TC-C-SHEQ-CON-TEM-001	CON	TEM	HQMS	1 year	Obsolete	Document Owner
TC-C-SHEQ-CON-TEM-003	CON	TEM	HQMS	1 year	Obsolete	Document Owner
TC-C-SHEQ-CON-TEM-004	CON	TEM	HQMS	1 year	Obsolete	Document Owner
TC-C-SHEQ-CON-TEM-005	CON	TEM	HQMS	1 year	Obsolete	Document Owner
TC-C-SHEQ-CON-TEM-006	CON	TEM	HQMS	1 year	Obsolete	Document Owner
TC-C-SHEQ-CON-TEM-008	CON	TEM	HQMS	1 year	Obsolete	Document Owner
TC-C-SHEQ-CON-TEM-009	CON	TEM	HQMS	1 year	Obsolete	Document Owner
TC-C-SHEQ-CON-TEM-010	CON	TEM	HQMS	1 year	Obsolete	Document Owner
TC-C-SHEQ-CON-TEM-011	CON	TEM	HQMS	1 year	Obsolete	Document Owner
TC-C-SHEQ-CON-TEM-013	CON	TEM	HQMS	1 year	Obsolete	Document Owner

TC-C-SHEQ-CON-TEM-015	CON	TEM	HQMS	1 year	Obsolete	Document Owner
TC-C-SHEQ-CON-REG-001	CON	REG	HQMS	1 year	Obsolete	Document Owner

9. Profiles that should be considered for training/retraining on Code if applicable



Designation	Training required	
	Yes	No
Departmental Manager		X
Superintendent	X	
Specialist	X	
Supervisor	X	
Artisan		X
Appointed First Aider		X
SHE Representative		X
Practitioner	X	
General Labour		X
Departmental Administrator		X

10. Appendix

None

samancor		**CODE OF PRACTICE**	
Document No.:	**TC-C-SHEQ-ENV-COP-002**	Revision date:	**March 2017**
National Unit Standard Reference number:			

DOCUMENT TITLE
WASTE MANAGEMENT

APPROVAL SIGNATURE RECORD		
Reviewer	**Title**	**Signature / Date**
Format and layout approver	Document Controller	
Document Owner / Originator	SHEQ Specialist (Environment)	
Reviewer 1	SHEQ Superintendent	
APPROVED BY	SHEQ Manager	
Filing of final document	Tubatse Chrome Document Controller	

Index

1. Purpose

To ensure that all waste created at the industrial site of Tubatse Chrome (TC) is properly collected, controlled and disposed of in an effective and responsible manner

2. Scope

This procedure describes the responsibilities and activities involved from identification of solid waste products, classification, collection, sorting, transporting and disposal thereof.

3. References

Reference to documents:	National Environmental Management Act, Act 107 of 1998
	National Environmental Management: Waste Act 59 of 2008.
	Minimum Requirements Series, 2nd ed, 1998 (Department of Water Affairs)
	SANS 10234
	Occupational Health and Safety Act, Act 85 of 1993_Asbestos Regulations
	GN R.634: Waste Classification and Management Regulations, August 2013
	GN R.635: National Norms and Standards for the Assessment of Waste for Landfill Disposal, August 2013
	GN R.636: National Norms and Standards for Disposal of Waste to Landfill, August 2013
	GN R.625: National Waste Information Regulations, August 2012
	Norms and Standards for the Storage of Waste of 29 November 2013

4. Abbreviations/Definitions

HCRW : Health Care Risk Waste
WEEE : Waste Electrical and Electronic Equipment
CRP : Chrome Recovery Plant
PGP : Power Generation Plant
PSP : Pelletising and Sintering Plant

Waste

Any substance, whether or not that substance can be reduced, re-used, recycled and recovered:

- that is surplus, unwanted, rejected, discarded, abandoned or disposed of;
- which the generator has no further use of for the purposes of production;
- that must be treated or disposed of; or
- that is identified as a waste by the Minister by notice in the *Gazette*,
- and includes waste generated by the mining, medical or other sector, but -
  - a by-product is not considered waste; and
  - any portion of waste, once re-used, recycled and recovered, ceases to be waste;

General Waste

Means waste that does not pose an immediate hazard or threat to health or to the environment, and includes:

- domestic waste (paper, glass, plastic etc.;
- building and demolition waste;
- business waste; and
- inert waste;

Industrial Waste

Industrial waste in the context of this document refers only to non-hazardous waste created through activities at TC. Process waste is excluded from this group. Industrial waste arise mainly from maintenance, upgrading and construction activities on site and typical examples include fan belts, conveyor belt, rubber, non-metallic pipe and screens, used refractory, uncontaminated building rubble (ad hoc and in small quantities only), wood pallets.

Hazardous Waste:

Means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment;

E waste

Discarded electronic appliances such as mobile phones, computers, and televisions etc.

5. Responsibilities

General Manager	Assign waste management responsibilities to Managers.
Manager	Ensure waste is correctly sorted in area of responsibility. Identify waste elimination and reduction opportunities, register as improvement plan (EMP) and assign responsibilities for execution.
Departmental Waste Management Representative	Single point of contact for the respective departments. Coordinate waste management in his or her department. (See Waste Management Contact List).
Process Superintendents	Compile removal schedule for process waste for OSMH Superintendent.
OSMH Superintendent	Transport and tip process waste at designated area as per arrangement with Process Superintendents.
Projects Superintendent	Ensure waste management planning is done prior to the start of all projects. Ensure waste management execution is done according to plan.
Services Superintendent	Single point of contact in terms of Contractor Management. Manage waste contractors to ensure effective service is rendered different departments.
Environmental Specialist	Advise and assist different departments with waste management planning. Audit waste management system for compliance and continual improvement opportunities.
Stores Controller (SC)	Check and sign gate release for scrap and industrial waste loads.
All employees	Sort and dispose of waste as described in this procedure. Initiate near misses and incident reports for waste management deviations and participate in discussions and investigations.
Cleaning and Garden Maintenance service provider	Deliver waste removal services as stipulated in the Cleaning and Garden Services Contract.
Scrap Metal and Industrial Waste service provider	Deliver waste removal services as stipulated in the Scrap Metal and Industrial Waste Services Contract.
Hazardous Waste service provider/s	Deliver waste removal services as stipulated in the Hazardous Waste Services Contracts.

6. Document Revision Record

Document revision record						
Rev No:	**Date:**	**DESCRIPTION OF REVISION/CHANGE**	**Severity of changes**		**Training required**	
			Major	**Minor**	**Yes**	**No**

06.1	May 2011	Changed SHERQC to SHEQ. Transfer information onto a new format.		X		X
06.2	June 2012	Included new waste bin colour coding and stickers, WTP waste, and haz process waste. Removed Appendix 10.9 and 10.10.				
06.3	March 2013	Made minor administrative changes. Changed Training requirements.		X		X
07	March 2016	SANS 10234 waste classification, Waste Classification and Management Regulations National Waste Information Regulations, August 2012 National Norms and Standards for Disposal of Waste to Landfill, 2013 August 2013Included filter cake and biological wastes Updated onsite waste management sites	X		X	
08	March 2017	Changed template Included E waste disposal Specified bund capacity labelling	X		X	

7. Description of Code

REQUIREMENTS	STANDARD		REASON / MOTIVATION OPERATIONAL TACTICS PILLARS
ACTIVITY/ ASPECT YOU HAVE TO PERFORM/ CONSIDER	**HOW DO YOU DO IT?**	**WHEN MUST YOU DO IT?**	**WHY MUST YOU DO IT? WHAT SAFETY, HEALTH OR QUALITY ASSURANCE AND ENVIRONMENTAL CONSEQUENCES COULD RESULT?**
Waste hierarchy	• Strive to eliminate all waste streams. • Whatever waste you produce, you should aim to consume. • If you can't consume it, attempt to source another process that can. • If it can't be consumed, dispose responsibly. • Adopt a waste management hierarchy as a basis for waste management principles. • Waste generators must ensure that their waste is reused, recycled, recovered, treated and or disposed of within 18 months of generation	Continuously evaluate waste producing activities	Alignment with Best Practice to ensure natural resources are optimally used striving to no wastage. Protection of the natural environment against pollution and degradation, thereby ensuring that human health is not put at risk.

REQUIREMENTS	STANDARD		REASON / MOTIVATION OPERATIONAL TACTICS PILLARS
ACTIVITY/ ASPECT YOU HAVE TO PERFORM/ CONSIDER	**HOW DO YOU DO IT?**	**WHEN MUST YOU DO IT?**	**WHY MUST YOU DO IT? WHAT SAFETY, HEALTH OR QUALITY ASSURANCE AND ENVIRONMENTAL CONSEQUENCES COULD RESULT?**
Waste Identification and Classification.	List all the types of waste that might be created for activities to be undertaken. This is a compulsory field in the risk assessment form that needs to be performed for every new activity or revision of existing risk assessments. Determine the waste classification of all waste streams identified (see appendix 10.3). Consult the SHEQ department for assistance should any of the potential waste streams not be described in this procedure. Waste handling is grouped into four groups on site (see process flow chart) namely general waste, scrap metal and industrial waste (non-hazardous waste), hazardous waste (excluding process waste), and process waste. These groupings are related to the different service providers.	Before the start of any activity that has the potential to create waste.	Listing the waste streams is a very important step that should form part of the planning of any project and should become standard practice in the all departments, especially the Projects Department. Projects like a furnace rebuild generate abnormal quantities of waste and special arrangements are needed to manage the waste effectively (example shown in appendix 10.4). Waste classification is necessary to ensure that waste, in particular hazardous waste, can be effectively controlled from generation until its safe disposal. Waste must be regarded as **HAZARDOUS** where there is any doubt about potential danger to man and environment (Precautionary Principle).

REQUIREMENTS	STANDARD		REASON / MOTIVATION OPERATIONAL TACTICS PILLARS
ACTIVITY/ ASPECT YOU HAVE TO PERFORM/ CONSIDER	**HOW DO YOU DO IT?**	**WHEN MUST YOU DO IT?**	**WHY MUST YOU DO IT? WHAT SAFETY, HEALTH OR QUALITY ASSURANCE AND ENVIRONMENTAL CONSEQUENCES COULD RESULT?**
Waste Management Infrastructure and area	Each department shall be responsible to determine its bin/ container requirement for Waste Management. The standard for waste bins/ containers for the different types of waste are shown in Appendix 10.5. The standard also indicates where bins can be obtained. Waste bins provided shall be colour coded. Waste bin areas shall be clearly demarcated as described in the standard for waste bin area (appendix 10.6). A site map (appendix 10.1) and area maps of each department (appendix 10.2) is attached indicating the position of waste bins and waste collection areas. Signage for the waste bins is described in the standard for waste signage (appendix 10.7).	All the time.	Scrap Metal and Industrial Waste Removal Contractor

REQUIREMENTS	STANDARD		REASON / MOTIVATION OPERATIONAL TACTICS PILLARS
ACTIVITY/ ASPECT YOU HAVE TO PERFORM/ CONSIDER	**HOW DO YOU DO IT?**	**WHEN MUST YOU DO IT?**	**WHY MUST YOU DO IT? WHAT SAFETY, HEALTH OR QUALITY ASSURANCE AND ENVIRONMENTAL CONSEQUENCES COULD RESULT?**
Collecting, sorting and disposal solid waste	<u>General Waste</u> Waste shall be sorted according to description provided (appendix10.3, 10.5). Waste from general waste containers (offices, kitchens) are removed to designated areas and bins by Cleaning and Garden contractor. The responsible contractor shall then move general waste from site to the waste sorting yard where recyclable items shall be separated from non-recyclable items. Recyclable material is then sold to local buyers and non-recyclable material is moved to Burgersfort landfill site.	Cleaning and Garden Maintenance service provider empty waste bins on daily basis. The relevant contractor removes waste as per schedule in contract.	All recyclable material must be recovered to reduce volumes of waste disposed to landfill.

REQUIREMENTS	STANDARD		REASON / MOTIVATION OPERATIONAL TACTICS PILLARS
ACTIVITY/ ASPECT YOU HAVE TO PERFORM/ CONSIDER	**HOW DO YOU DO IT?**	**WHEN MUST YOU DO IT?**	**WHY MUST YOU DO IT? WHAT SAFETY, HEALTH OR QUALITY ASSURANCE AND ENVIRONMENTAL CONSEQUENCES COULD RESULT?**
	<u>Scrap Metal & Industrial Waste</u> Waste shall be sorted according to description provided (appendix 10.3and 10.5). Scrap Metal and Industrial Waste service provider shall remove waste to Waste Sorting Yard. An empty bin shall be placed before a full bin is removed. . The relevant Contractor shall be notified through the Contract Manager for any special waste management requirements. A truck with a grab will be used for items too big to place in a bin.	Service bins at least once per week.	Poor housekeeping is one of the symptoms of poor waste management.
	<u>Hazardous Non-Process Waste</u> Waste shall be sorted according to description provided (appendix 10.3and 10.5). Water/ oil separators shall be inspected to determine the volume of sludge and to detect any problems with effluent quality. Oil Separation Recycling shall remove hazardous waste on site at regular intervals or on request from the operating department.	Inventory inspections should be compiled on at least on a weekly basis. Water/ oil separator shall be inspected two weekly. Hazardous Waste service provider/s.	Sorting is beneficial as the removal and disposal cost of the different types of hazardous waste differ (appendix 10.10). Separation into the different types would make removal and disposal more cost effective compared to unsorted hazardous waste.

REQUIREMENTS	STANDARD		REASON / MOTIVATION OPERATIONAL TACTICS PILLARS
ACTIVITY/ ASPECT YOU HAVE TO PERFORM/ CONSIDER	**HOW DO YOU DO IT?**	**WHEN MUST YOU DO IT?**	**WHY MUST YOU DO IT? WHAT SAFETY, HEALTH OR QUALITY ASSURANCE AND ENVIRONMENTAL CONSEQUENCES COULD RESULT?**
	<u>Hazardous Process Waste</u> Bag filter dust and WTP filter cake shall be collected, treated and disposed by Hazardous Waste service provider. The responsible business unit can also contact Hazardous Waste service provider/s should cleaning services be needed. This service does not form part of the contract cost and shall be negotiated separately.	Daily removal of waste.	No capacity exists to dispose of the material on site.
	Hazardous Process Waste (Re-processed) Furnace heavy dust is removed only by OSMH for processing at the PSP. It may only be transported from the furnace heavy dust dropout bunker to the dedicated bunker at PSP. Silt from the process water and storm water channel must be transported by OSMH to PSP low value ore bunker. If the PSP is unable to accommodate the waste volumes, waste must be regarded as hazardous and disposed as such.	Only on request from the furnaces. Only during cleaning and on request from the relevant Superintendent or manager.	To ensure safe handling and disposal of hazardous process waste.

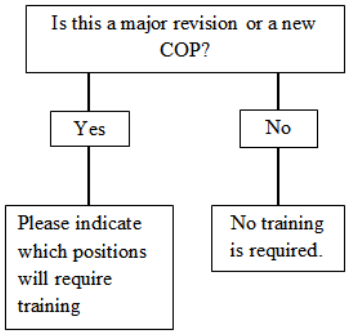
REQUIREMENTS	STANDARD		REASON / MOTIVATION OPERATIONAL TACTICS PILLARS
ACTIVITY/ ASPECT YOU HAVE TO PERFORM/ CONSIDER	**HOW DO YOU DO IT?**	**WHEN MUST YOU DO IT?**	**WHY MUST YOU DO IT? WHAT SAFETY, HEALTH OR QUALITY ASSURANCE AND ENVIRONMENTAL CONSEQUENCES COULD RESULT?**
	Non-Hazardous Process Waste Down pipe dust will be collected by OSMH as per arrangement with the respective Process Superintendents. The material will be tipped at the designated storage area. Laboratory waste raw material and final product sample waste will be handled as described in appendix 10.3.	As per arrangement with business unit.	
	Waste Electronic Electrical Waste Printer cartridges are handled as described in appendix 10.3.	Special bin placed at Admin building. SHEQ department should be contacted when full to schedule removal by recycler.	To ensure safe handling and disposal of e waste.
Documentation and Reports	An approved contractor shall provide permits or authorization to dispose waste at landfill sites if applicable. Weigh bridge tickets, waybill and dump certificates must be provided by the Contractor for each load of waste taken out of the premises and each load dumped on a licensed landfill site.	At the end of each month and upon request.	To allow for timely information, control, auditing and follow-up if needed. ISO 14001 requirement.

REQUIREMENTS	STANDARD		REASON / MOTIVATION OPERATIONAL TACTICS PILLARS
ACTIVITY/ ASPECT YOU HAVE TO PERFORM/ CONSIDER	**HOW DO YOU DO IT?**	**WHEN MUST YOU DO IT?**	**WHY MUST YOU DO IT? WHAT SAFETY, HEALTH OR QUALITY ASSURANCE AND ENVIRONMENTAL CONSEQUENCES COULD RESULT?**
Security Access Control	The waste contractor should not load any waste on sites without the knowledge of the department involved.	All the time.	The management of waste and access control.
	Weighbridge slips and waybills must be produced of each transaction at security gates before exit is allowed.	When exiting the premises of the company.	
	Security conducts searches.	When exiting the premises of the company	
Deviations, complaints and recommendation for improvement.	All deviations and complaints shall be reported and discussed with the Contract Manager. The matter can be escalated to the next level, with the knowledge of the Contract Manager, **only** if the complaint cannot be resolved. A vendor complaint shall only be logged after the matter has been discussed with the Contract Manager and shall be forwarded to the Procurement department for processing. The near miss and incident system can be used to ensure deviations and complaints are recorded. Opportunities for improvement could be forwarded to the Contract Manager.	As the need arises.	To ensure effective handling of deviations and complaints. The improvement plans developed from deviations and complaints will ensure continual improvement and aim to prevent reoccurrence.

8. Records/Documented Information

Doc ID	Indexed by	Type of Record	Where Stored	Period Retained	Disposal Method	Resp. for Record
TC-C-SHEQ-ENV-COP-002	SHEQ	COP	Document Control Store	3 Years	Shredding	Document Controller
TC-C-SHEQ-ENV-TEM-002	SHEQ	TEM	HQMS	3 Years	Obsolete	Document Controller

9. Profiles that should be considered for training/retraining on Code if applicable



Designation	Training required	
	Yes	No
Departmental Manager		x
Superintendent		x
Specialist		x
Supervisor	X	
Artisan		x
Appointed First Aider		x
SHE Representative	X	
Practitioner	X	
General Labour		X
Departmental Administrator		x

10. Appendix

APPENDIX 10.1: TFC SITE LAYOUT.

APPENDIX 10.2: PLACEMENT OF HOOK-UP SKIP BINS IN THE PLANT.

Plant Area	Steel	Domestic	Industrial	Hazardous	Process
Stores	1	0	1	0	0
Estates WS	1	0	1	0	0
EP Baghouse	0	0	0	0	1
EP Furnace Building - West	2	0	2	0	0
East Plant Mechanical Engineering Workshop	1	0	1	1	0
CRP Workshop	2	0	1	1	0
CRP Crusher Plant	1	0	1	0	0
RRP	1	0	1	0	0
Services Logistics Coal	0	0	1	0	0
Services Logistics Plant	1	0	1	0	0
Laboratory	0	0	1	0	0
OSMH	1	0	2	2	0
PSP Plant – waste management area	1	1	1	1	0
PSP – next to dust scrubber 3	1	0	0	0	0
WP Engineering Workshop	1	1	1	1	0
WP Furnace Building	1	1	1	1	1
Tubatse Village	0	1	0	0	0
Water Treatment Plant Silt Trap	0	0	0	4	2
Water Treatment Plant Workshop	1	1	1	1	0
Plant Laydown Area	0	0	1	0	0
Tyre Area	1	0	0	0	0
East Plant Control	1	0	0	0	0
PGP	2	0	1	0	0
TOTAL:	20	5	19	12	4

APPENDIX 10.3: CLASSIFICATION OF WASTE (SANS 10234) AND AREA/METHOD OF DISPOSAL.

Classification key;

Type 0	Very high Risk
Type 1	High Risk
Type 2	Moderate Risk
Type 3	Low Risk
Type 4	Very Low Risk

WASTE	ORIGIN/ RESPONSIBILITY	AREA/METHOD OF DISPOSAL	SANS 10234 CLASSIFICTION
Asbestos	Furnace 1-6, Old Buildings	Place in double black bags in waste container. *Take note of requirements for the disposal of asbestos as stipulated in section 20 of the Asbestos Regulations*.	**Does not require classification in terms of 10234**
Baghouse Dust	East and West Plant	To be removed by Hazardous Waste service provider	**Hazardous, Type 0**
Batteries	All Business Units	Batteries to be returned to supplier. Leaking or damaged batteries must be emptied or contained.	**Hazardous**
Building Refuse (that does not contain hazardous waste or hazardous chemicals)	All Business Units	To be removed from offices by Cleaning and Garden Maintenance service provider to designated bins and areas to Burgersfort landfill site or where possible used for backfilling.	**Does not require classification in terms of 10234**
Conveyor Belts	All Business Units	To be placed in the correct Industrial waste bin. Scrap Metal and Industrial Waste service provider to transport to Waste Sorting Yard.	**Non Hazardous**
CRP Silt	Chrome Recovery Plant	Silt disposed at permitted slag dump area with the possessed slag	**Hazardous, Type 3**
Crucibles	Laboratory	Wash out thoroughly and dispose in building refuse or industrial waste bin.	**Does not require classification in terms of 10234**

WASTE	ORIGIN/ RESPONSIBILITY	AREA/METHOD OF DISPOSAL	SANS 10234 CLASSIFICTION
Domestic Waste (General Waste)	All Business Units	Placed in to black bags or directly into domestic waste bins provided. Domestic waste bins removed by the relevant contractor transported to the	**Does not require classification in terms of 10234**
		waste sorting yard to separate recyclables. Non -recyclable is then disposed of at Burgersfort landfill site.	
Empty Ferrous Chloride Drums	CRP Plant, Water treatment plant	Ferrous chloride drums to be picked up by supplier, other drums. Put next to metal bin remove by Waste Contractor.	**Hazardous**
Empty 25l & 210l Oil Drums	All business units	Store in designated bunded area in different business units. To be removed by Hazardous Waste service provider/s.	**Hazardous**
Electrical Wire	All Business Units	Disposed in a Scrap Metal bin. The relevant service provider to transport to his premises.	**Hazardous**
Electrode Stubs	East and West Plant	Business unit to arrange for collection by CHARGOLD for recycling.	**Hazardous**
Electronic Components	Instrumentation/IT	Place components in black bag and in Domestic waste bin. To be removed by the waste management contractor for recycling and/or proper disposal.	**Non Hazardous**
Filter Bags	Furnaces (bag filter plant)	Place on bag house removal trucks and removed with bag filter dust.	**Hazardous**
Globes And Neon Tubes	General	Specially designed drum, which crushes it. To be removed by the by hazardous waste removal service provider. Steps shall be taken to ensure unit does not leak dust between the drum and crushing mechanism.	
Garden Waste	General	Cleaning and Garden Maintenance service provider is responsible for the garden maintenance and waste shall be	**Does not require classification in terms of 10234**

WASTE	ORIGIN/ RESPONSIBILITY	AREA/METHOD OF DISPOSAL	SANS 10234 CLASSIFICTION
		disposed at Burgersfort Landfill site.	
Grease Cloth (Oil rags)	All Workshops	210L hazardous waste drum or 2m3 hazardous waste skip.	**Hazardous**
H:H Evaporation Pond Water	Services	Pump back to H: H disposal facility.	**Hazardous**
Hydrocarbon Contaminated Soil	All Workshops	210L hazardous waste drum or 2m3 hazardous waste skip.	**Hazardous**
Laboratory Waste (Sump And Chemicals)	Laboratory	Neutralisation and disposal into process water channel	**Hazardous**
Manganese Steel	All Business Units with Crushing Operations	Scrap Metal bin. Scrap Metal and Industrial Waste service provider to transport to Waste Sorting Yard, sort waste and recycle.	
Medical Waste Clinic	Clinic	Removed by an approved service provider and disposed as per regulatory requirement. Refer to Contracting OH Provider procedures.	**Does not require classification in terms of 10234**
Biological Waste	Sewage plant screenings	Removed by an approved service provider and disposed as per regulatory requirement.	**Hazardous**
Mixed Scrap Metal	All Business Units	Mixed scrap metal bins. Would consist mainly mild steel, sub grade and sheeting, stainless steel and electrical wire may also be disposed into this bin. Scrap Metal and Industrial Waste service provider to transport to Waste Sorting Yard, sort waste and recycle.	
Oil Filters	Workshops and Garage	210L hazardous waste drum or 2m3 hazardous waste skip.	**Hazardous**
Oil Separator Sludge	Workshops and Garage	Contact Oil Separation Solutions for removal and servicing of the Oil Separator.	**Hazardous**

WASTE	ORIGIN/ RESPONSIBILITY	AREA/METHOD OF DISPOSAL	SANS 10234 CLASSIFICTION
Used Oil	OSMH Workshop	Contact Oilkol to remove	**Hazardous**
E waste	All business units	Special bin placed at Admin building. SHEQ department should be contacted when full to schedule removal by recycler.	
Radio-Active Waste	Instrumentation	Contact the Radiation control officer. Waste will be kept in locked steel cabinet and to be removed by Atomic Energy Corporation. Permission must be obtained from the Department of Health prior to disposal.	**Hazardous**
Spent Laboratory Samples	Laboratory	Spent raw materials to be placed in designated bin at Laboratory. Reclam to tip bin at designated raw material bunker for re-processing through the furnaces.	**Non Hazardous**
Reagent Bottles	Laboratory	Washed thoroughly and make holes to prevent reuse before disposal in domestic waste bin. To be moved from designated waste bin area to Burgersfort landfill site. Unwashed reagent bottles will be regarded as hazardous	**Non hazardous**
Refractory Material	East and West Plant	Crush to pieces smaller than 300mm in diameter. Dispose into Industrial Waste bin. Scrap Metal and Industrial Waste service provider to transport to Waste Sorting Yard, sort waste, recycles and disposes non-recycle items to Burgersfort landfill site.	**Non Hazardous**
Rubber/ Pipes	All Business Units	Industrial waste bin. Scrap Metal and Industrial Waste service provider to transport to Waste Sorting Yard, sort waste, recycles and disposes non-recycle items to Burgersfort landfill site.	**Non Hazardous**

WASTE	ORIGIN/ RESPONSIBILITY	AREA/METHOD OF DISPOSAL	SANS 10234 CLASSIFICTION
Sewage Effluent	Services	Plant sewage effluent will report to the balancing dam were it is blended with process water, treated thought the WTP and re-processed.	**Non Hazardous**
Sewage Sludge Drying Bed Material	Tubatse WTP	Analysed and classified by Frazer Alexander. Can be used for agricultural use at agronomic rates	**A1a (Guidelines for Utilisation & Disposal of Wastewater Sludge, volume 1)**
Sewage Sludge Drying Bed Material	Annex WTP	Analysed and classified by Frazer Alexander. Can be used for agricultural use at agronomic rates however may not be suitable for some crops with edible parts below the soil surface	**B1a (Guidelines for Utilisation & Disposal of Wastewater Sludge, volume 1)**
WTP Brine	Services (WTP)	Disposed in onsite authorised brine dams.	**Hazardous**
Spent Electrode Paste	East and West Plant	Responsible business units to arrange for removal by Hazardous Waste service provider/s.	**Hazardous**
Slag	Furnace 1-4 Furnace 5-6	Remove from slag runners to designated area for cooling. OSMH to transport to CRP.	**Non-Hazardous, Type 4**
Stainless Steel	All Business Units	Mixed scrap metal bin. Scrap Metal and Industrial Waste service provider to transport to Waste Sorting Yard. Scrap Metal and Industrial Waste service provider shall be notified when the metal is not placed in bins. Scrap to be in reasonable size for the relevant contractor to collect with a grab truck.	**Non Hazardous**
Tyres	All Business Units	Return to supplier when new tyres are purchased. Tyres are not accepted at landfill sites and shall therefore not be placed in	**Does not require classification in terms of 10234**

WASTE	ORIGIN/ RESPONSIBILITY	AREA/METHOD OF DISPOSAL	SANS 10234 CLASSIFICTION
		any of the waste bins on site.	
Uncontaminated Building Rouble (concrete)	All Business Units	Small quantities generated on an ad hoc basis can be disposed into the industrial bin. Large quantities of building rubble from Projects shall be the responsibility of Civil Construction Contractor.	**Does not require classification in terms of 10234**
Wood	All Business Units	Industrial waste bin. Scrap Metal and Industrial Waste service provider to transport to Waste Sorting Yard, sort waste, recycles and disposes non-recycle items to Burgersfort landfill site.	**Non Hazardous**
Filter Cake	Water Treatment Plant	To be removed by Hazardous Waste service provider	**Hazardous, Type 3**

APPENDIX 10.4: EXAMPLE OF A WASTE MANAGEMENT PROGRAM FOR A PROJECT AT TUBATSE CHROME. TAKE NOTE THAT THIS ONLY SERVES AS AN EXAMPLE.

Project: Furnace Rebuild.

Items	Quantities	Types of waste	Waste Management Area	Responsible for disposal	Disposal Site
Shell steel	100 T	Scrap steel	In front of furnace	Jet Demolition	Scrap metal dealer
Refractory material	214 T	FeCr metal	Opposite F2 crane	EP Production	Metal picking
		Refractory waste	Opposite F2 crane	EP Production	Industrial waste
Loose mix	42 T	FeCr metal	Opposite F2 crane	EP Production	Metal picking
		Raw material waste	Opposite F2 crane	EP Production	Industrial waste
Metal/Slag	500 T	FeCr metal	Opposite F2 crane	EP Production	Metal picking
		Slag	Opposite F2 crane	EP Production	Unknown
Concrete	300 T	Concrete	Opposite F2 crane	Unknown	Unknown
Scrap steel	50 T	Scrap steel	Smaller pieces into bin. Larger pieces to be cut up by Scrap Metal and Industrial Waste service provider.	Scrap Metal and Industrial Waste service provider	Waste sorting yard, recycling
General waste	100 T	Industrial waste	Pending on the project	Scrap Metal and Industrial Waste service provider	Waste sorting yard, Burgersfort

Comments

1. Make sure you know where the waste is disposed (cradle to grave). Ask the SHEQ department to assist in this regard.

2. No corrosive or oxidising materials will go to landfill. No flammable wastes, chemically unstable waste, reactive wastes, untreated HCRW, batteries, solvents or WEEE to landfill

APPENDIX 10.5: STANDARD FOR WASTE CONTAINERS.

Description	Picture	Where will you obtain them?
General waste (Domestic Waste - Unsorted) Colour Coding – Yellow. Unsorted domestic waste includes paper, plastic, cans etc.		Supplied by the waste management contractor (Reclam)
General Waste (Paper) Dedicated only for paper		Supplied by the waste management contractor (Reclam)
General Waste (Food Waste) Dedicated only for paper		Supplied by the waste management contractor (Reclam)
Scrap metal & Industrial waste 6 m^3 steel bin with hooks to be picked up by bin loading truck. Bins supplied by Scrap Metal and Industrial Waste service provider as part of their contract.		Communicate your requirements to the Contract Manager.
Hazardous non process waste • 210L drums (drums are supplied on an exchange basis) • 1.98 m^3 skips (suitable for high volume generation of hazardous waste).		• Purchase initial requirement of drums. • Rented at monthly cost specified in appendix.
Fluorescent tubes • 210 L drum with sealable lid. Take note that the tube breaking mechanism should seal tight onto the drum.		Oil separation recycling • Purchase initial requirement of drums. Complete units also available.

Light (silo) dust 6 m^3 steel bin with hooks to be picked up by bin loading truck. Bins supplied by Baghouse Dust Removal service provider as part of their agreement		Supplied waste management contractor (Enviroserve)
Filter Cake 6 m^3 steel bin with hooks to be picked up by bin loading truck. Bins supplied by Baghouse Dust Removal service provider as part of their agreement		Supplied waste management contractor (Enviroserve)
E waste Dedicated only for e waste		Supplied by the waste management contractor

APPENDIX 10.6: COLOUR CODING OF WASTE BINS

Note: At least 150 mm band of the corresponding colour will surfice as the minimun standard. The following are recommended regarding the type of bins required:

SIGNAGE COLOUR CODE	DESCRIPTION OF CONTENTS OF WASTE BINS
BLUE	**INDUSTRIAL WASTE (non hazardous)** • Tyres, fan belts, wire coatings, screens, conveyer. • Refractory material • Uncontaminated building rubble
BLACK	**MIXED SCRAP STEEL** • Scrap metal, screens and cables • Subgrade, drums and sheeting.
YELLOW	**GENERAL WASTE (DOMESTIC WASTE)** • Paper, glass and plastic
WHITE	**GENERAL WASTE (PAPER)** • Paper and cardboard.
GREEN	**GARDEN AND FOOD WASTE** • Grass, leaves and garden refuse • **No** sand, stones or building rubble • Any food left overs
RED FLUORESCENT TUBES	**FLUORESCENT TUBE BREAKER (HAZARDOUS WASTE)** Fluorescent tubes and globes
RED HAZARDOUS WASTE	**HAZARDOUS WASTE** • Oil filters • Oil or grease cloths • Saw dust, woodchips and spill sorb. • 25L and 210L oil drums • Paint & paint drums • Chemical containers

SIGNAGE COLOUR CODE	DESCRIPTION OF CONTENTS OF WASTE BINS
BIOLOGICAL WASTE 	**BIOLOGICAL WASTE** • Sewage plant screenings
	**HAZARDOUS WASTE** • ASBESTOS WASTE. Labelling of container as specified in the Asbestos Regulations 19(c).
GREEN BAGHOUSE LIGHT DUST	**BAGHOUSE LIGHT DUST**
GREEN FILTER CAKE	**FILTER CAKE**

SIGNAGE COLOUR CODE	DESCRIPTION OF CONTENTS OF WASTE BINS
BLACK 	**E WASTE**

APPENDIX 10.7: STANDARD FOR WASTE MANAGEMENT AREAS

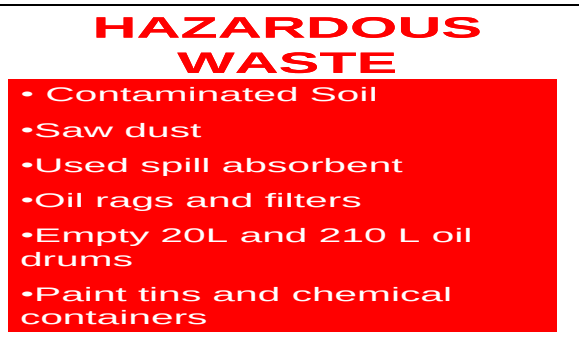
Scrap Metal and Industrial Waste

1. The surface area shall be concreted or paved.
2. Clear demarcation between different bins (see attached picture as example). The front should be left open to prevent build-up of water.
3. An empty bin shall be placed before a full bin is removed. Provision shall be made within the demarcation of each bin type to accommodate the additional bin to allow for the least handling of bins at the collection area.
4. Waste signs shall be erected to indicate the type of waste for each bin.
5. The area shall be easily assessable for bin truck.
6. No significant safety risks shall exist for service provider when accessing the different plant areas.

Graphical illustration of the requirements for a bin area.

Hazardous waste

1. Waste shall be stored in a bunded area.
2. The capacity of the bunded area shall be 110% of the volume of the waste stored in the area.
3. Both the bund wall capacity as well the maximum quantity permitted to be placed within bund wall shall be displayed on the label as specified below
4. The bunded area shall be sealed with a sealant or paint that will prevent contaminants from penetrating the surface.
5. Where liquid waste is stored the bund volume and the maximum allowable volume of the chemical must be clearly indicated.
6. Waste containers should be covered to prevent rainwater from entering the containers. A roof could also be placed over the bunded area where practical.
7. Signage as described in this document shall be erected.
6. The area shall be easily assessable for the service provider. No significant safety risks shall exist for service provider when accessing the different plant areas.



Bunded area for hazardous waste

Bund capacity labeling

Bund Capacity:
Maximum Quantity Permitted within bund wall:

APPENDIX 10.8: STANDARD WASTE SIGNS

Waste signs – Skip bins

Size: 500mm x 500 mm. Complete with 25mm square tubing frame with lugs top centre & bottom centre
Printing: Chromadek, colours as indicated below (only for skips).

INDUSTRIAL WASTE • Tyres •Fan belts • Wire coatings •Screens (non metal) •Conveyor •Refractory material •Uncontaminated building bubble	**MIXED SCRAP STEEL** • Scrap metal •Metal screens •Electrical cable •Sub grade (sheeting) •Wire •Stainless steel •Crusher linings (Mn metal)	**DOMESTIC WASTE** • Food leftovers •Paper •Glass •Plastic
GARDEN WASTE • Grass •Leaves No sand, stone, building rubble, damaged pipe and redundant garden tools.	**HAZARDOUS WASTE** • Contaminated Soil •Saw dust •Used spill absorbent •Oil rags and filters •Empty 20L and 210 L oil drums •Paint tins and chemical containers	

Take note that the signs are not drawn to scale. All these signs in the above table have the size dimensions although it might not appear differently in the table above.

Waste signs stickers (To be placed on 210L waste drums and wheelie bins)

Size: 500mm x 250 mm. Complete with 25mm square tubing frame with lugs top centre & bottom centre
Printing: Chromadek, colours as indicated below.

HAZARDOUS WASTE • Oil rags •Oil filters	**HAZARDOUS WASTE** • Contaminated Soil •Saw dust •Used spill absorbent	**FLUORESCENT TUBE BREAKER** • Fluorescent tubes •Fluorescent globes
HAZARDOUS WASTE • Empty 25l and 210l drums No paint tins and chemical containers	**HAZARDOUS WASTE** • Paint tins •Chemical containers	**BIOLOGICAL WASTE** Sewage plant screenings 

Take note that the signs are not drawn to scale. All these signs in the above table have the size dimensions although it might not appear differently in the table above.

		
HAZARDOUS WASTE • Oil rags •Oil filters	**ASBESTOS WASTE** 	E waste (WEEE)

samancor		**CODE OF PRACTICE**	
Document No.:	**TC-C-SHEQ-HH-COP-005**	Revision date:	**August 2017**
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DOCUMENT TITLE
Hazardous Materials Management

APPROVAL SIGNATURE RECORD		
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Reviewer 1	SHEQ Specialist (Environmental)	
Reviewer 2	SHEQ Practitioner	
APPROVED BY	SHEQ Manager	
Filing of final document	Tubatse Chrome Document Controller	

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1. Purpose

To minimize the risk of fatalities, injuries and impact events that may arise from the storage, handling, production, transport, recycling and disposal of hazardous materials.

2. Scope

The scope covers all hazardous materials brought onto Tubatse Chrome for storage, use, or for testing. All containerized gasses which can have a detrimental effect on health and safety is also included in this procedure.

3. References

Reference to documents:	Occupational Health and Safety Act, Act 85 of 1993.
	SANS 10231:2014, Edition 4_Transport of Dangerous Goods, by road – operational requirements
	SANS 10228:2012_Identification and Classification of Dangerous Goods for Transport by road or rail modes
	GN R 1179 Regulations for Hazardous Chemical Substances; Occupational Health and Safety Act, Act 85 of 1993.

4. Abbreviations/Definitions

TERM	DESCRIPTION
HCS	Hazardous Chemical Substances
HMC	Hazardous Material Coordinator
HMM	Hazardous Materials Management
MSDS	Material Safety Data Sheet
FRCP 5	Fatal Risk Control Protocol 5 – Hazardous Material Management
COP	Code of Practice
PR	Purchase Requisition
TC	Tubatse Chrome

TERM	DESCRIPTION
PPE	Personal Protective Equipment
MRP	Manual Re-order Point

Hazardous Material: Material (Solid, gas, or liquid) that have the potential to lead to harm to people, the environment, or to the community, either in an incident involving loss of control, or in normal controlled activities (Storage, handling, production, transport, recycling and disposal.)

Hazardous Chemical Material: Any toxic, harmful, corrosive, irritant or asphyxiant substance, or a mixture of such substances for which –

a) An occupational exposure limit is prescribed; or
b) An occupational exposure limit is not prescribed, but which creates a hazard to the health.

Mock emergency: Practicing emergency scenarios/ Emergency drills

5. Responsibilities

POSITION TITLE	ROLE	DESCRIPTION OF TASK
Hazardous Materials Coordinator	Overall coordination of HCS	Ensure that an up to date register is compiled and maintained of all HCS stored and applied at the plant
	Implementation of the HMM COP	Evaluate and approve all proposed new HCS purchases
		Ensure required health risk assessment are performed
		Overall integration, implementation & management of the HMM COP.
Stores Controller	MSDS Collection	Maintain correct levels of HCS quantities in stores
		Ensure all store employees involved in the receipt, transport; handling, storage and issue of HCS are trained and familiar with the PPE requirements, control, handling, decanting, storage, issuing and medical treatment of contact with HCS.
		Keep a hard copy of MSDS's
SHEQ Practitioners	Plant Specific HCS Management	Assist with the implementation of the HCS COP.
		Verify if persons using HCS can comply with MSDS
		Verify that the application, storage, decanting and PPE requirements are clearly defined and applied at all times.
		Ensure that MSDS are available for all chemicals used in your area of responsibility on the electronic register and plant specific registers.

POSITION TITLE	ROLE	DESCRIPTION OF TASK
Foreman / Supervisor	Plant Specific HCS Management	Assist SHEQ Practitioner in his duties as and when required
		Ensure that proper storage facilities are provided for the storage of HCS
		Ensure employees working with Hazardous Materials are trained.
		Ensure that HCS stores are provided with signage, access control, ventilation, storage facilities, signage, fire fighting equipment, first aid equipment, record systems, spill containment materials and facilities.
Contractor Practitioner	HCS Control regarding contractors	Obtain required information on HCS from both Short & Long term contractors
SHERQ Specialist (Health and Hygiene)	Link HCS exposure & Clinic	Ensure link between HCS exposure, Medical Surveillance in Clinic and Emergency Response.
HR	General training	Provide HCS training in line with HCS Regulation, reg 3

6. Document Revision Record

Document revision record						
Rev No:	**Date:**	**DESCRIPTION OF REVISION/CHANGE**	**Severity of changes**		**Training required**	
			Major	**Minor**	**Yes**	**No**
03	Jun 10	Removed the sections on chemical specific training, public health and plant specific procedures. Administrative changes. Training and Records		X	X	
04	Jun 12	Transferred information to new COP format. Removed several sections which were not applicable or duplicated in other procedures. Included section on dangerous goods off-loading.	X			
05	Oct 15	Updated legal reference	X		X	
06	Aug 17	Changed to new COP template and included new Bund signage standard	X		X	

7. Description of Code

7.1 Managing Procurement and Distribution of Hazardous Chemicals

7.1.1 Chemicals purchased on Purchase Requisition for non-stocked items (ZD)

- Before submitting a Purchase Requisition (PR) to the Purchasing Dept for the purchasing of chemicals, the originator shall ensure that the relevant Materials Safety Data Sheets (MSDS) are available and copies attached to the PR.
- Any PR received without the relevant Materials Safety Data Sheets shall be returned to the requisitioner.
- All Materials Safety Data Sheets shall comply with the requirements as set in the Hazardous Chemical Substance Regulations, Regulation 9A.
- No chemical shall be used for any other purpose than for the purpose it was formulated and purchased for.
- The originator shall ensure that for any new HCS purchased that the MSDS is forwarded to the HMC for inclusion on the site wide electronic HCS register (refer to section 6.16 Testing of new chemical).

7.1.2 Chemicals purchased as stocked items (V1)

- Items already placed on stock will be re-ordered through the material re-order point (MRP) process on SAP. In the case of a HCS not having a material number, it must be treated as a new chemical, and handled in accordance with 6.1.6: Testing of a new chemical.

7.1.3 Chemicals received against a valid order placed

- The receiving department will only receive against a valid purchase order number.
- Upon receipt the receiving department will distinguish between stocked (V1) and non-stocked (ZD) items.
- Stocked items will be received and placed into the allocated storing area immediately by the store receiving department.
- Non-stocked receipts will be re-directed with the delivery company to the applicable department in the plant who will receive and store the items immediately.

7.1.4 Delivery & receipt of hazardous chemicals

- All chemical containers shall be clearly marked and labeled, so that the content, hazard and safe practices for handling, storage and first aid treatment are available.
- Any chemicals delivered to the stores without required markings or labeling shall be returned to the supplier.
- Any HCS container that shows any signs of damage or evidence that it was tampered with will be returned to the supplier.
- The following information must be listed on the label:
    - Nature of substance
    - Nature of hazard e.g. poison, fire hazard etc.
    - Precautions in handling
- All chemicals shall be stored in the designated chemical storage area.
- HCS shall be stored according to group and HCS that may interact must be stored separately.

7.1.5 Issuing of hazardous chemicals

- The issuing department shall only issue hazardous chemicals against a reservation created in SAP.

7.1.6 Testing of new chemicals

- No chemicals shall be brought onto site for testing without the approval of the Hazardous Materials Coordinator.
- The "APPLICATION FOR ACCEPTING A NEW CHEMICAL" form (refer to TC-C-SHEQ-HH-TEM-001 available on HQMS) shall be completed by the requestor and approved by the HMC before any chemical is brought onto site for testing.
- The HMC shall consider the product MSDS and application risk assessment to verify whether the chemical will be compatible with the plant operations in terms of environmental and health protection criteria prior to giving consent for chemicals to be tested.
- The relevant manufacture's Materials Safety Data Sheet (MSDS) shall accompany all request forms submitted.
- No empty containers shall be disposed of in any way other than in the appropriate hazardous waste bins provided for the purpose.
- The following will be considered prior to approval of a hazardous substance for use:
    - the potential threats to health, fire, explosion and environment;
    - the measures that would need to be taken to protect an employee against any risk from exposure;
    - the potential that the HCS may have if it is exposed to other HCS used in the plant;
    - the precautions to be taken by a worker to protect himself against the health risks relating to exposure, including the wearing and use of protective clothing and the correct respiratory protective equipment;
    - the necessity, correct use, maintenance and potential of safety equipment, facilities and engineering control measures to be provided;
    - the necessity of personal air sampling and medical surveillance;
    - the procedures required for the use, handling, storage and labeling of the hazardous substances;
    - the necessary containment and treatment of spillages, disposal and decontamination provisions;
    - the necessary emergency response procedures to be followed in the event of spillages, leakages or any similar emergency situation.
    - verify whether the necessary controls, training and procedures are in place for the particular hazardous substance.
- Addition or changes to the MSDS electronic register:
    - When a request is made for a new stocked item to be added or existing one to be amended a Stores Stock Instruction (SSI) must be completed. The requestor must attach a copy of the MSDS from the supplier for the hazardous substances required to the SSI.
    - The SSI must then be routed for approval as indicated on the SSI. Only approved SSI's will be processed by the store.
    - Non-stocked requirements – The requisitioner must indicate on the Purchase Requisition created whether the item ordered is a hazardous substance and that a MSDS is required. The procurement department (buyer) must obtain a copy of the MSDS from the supplier.

7.2 Contractors on site

- All contractors, both Short Term and Long Term, working on site shall ensure that they have an MSDS available for chemicals used on site.

- Chemicals used by On Site Service Providers (Long term contractors) will also be added to the electronic MSDS data base. Chemicals used by short term contractors will not be added to the electronic MSDS register, but must be reviewed and be available at point of use.

- Contractors must prove competence to handle the said HCS and provide the necessary spill containment and disposal equipment and materials where required.
- Contractors shall ensure that all their personnel on site, using hazardous chemicals, have been trained in the use of the correct PPE, correct application, control, storage and medical treatment in event of ingestion or contact.
- The onus lies with all responsible persons using chemicals to make sure that all personnel under their supervision are properly trained in the safe use of hazardous chemicals.
- All contractors shall ensure that all their empty containers are disposed correctly.

7.3 Material Safety Data Sheets

a. Format for MSDS
   - The MSDS provided by the suppliers must meet the requirements as set out in OHSAct, Regulation 9A of the Hazardous Chemical Substance Regulations.

b. Availability to employees
   - An up to date electronic MSDS register must be available to all employees who use; handle, transport, store or come into contact with such chemicals as well as First Aiders and Medical Personnel.
   - A hard copy MSDS file must be available at the first aid box of each section consisting of an alphabetic index of chemicals used in that area and a hardcopy MSDS for each chemical (filed according to the said index).
   - A similar hardcopy file must also be available at the main store of Tubatse Chrome with MSDS sheets for all chemicals used on site.

7.4 Training and training records.

- General Hazardous Chemical Substance training which meets all of the requirements as stated in HCS-Regulations, Regulation 3, must be given to all employees who use, handle, transport, store or come into contact with such chemicals
- Documented records of this training must be sent to the HR department for filing kept on the employees' personal file.
- Behaviour based observations shall be carried out personnel working with hazardous materials.

7.5 Risk Management.

- A written Risk Assessment, done by a competent person, must be in place, which has considered all chemicals on site with regard to:
  - The long term and short term consequences to health due to exposure to hazardous substances
  - The level of the risk associated with the hazardous material.
  - Controls required to reduce the risk to levels which are as low as reasonably practicable.
  - The performance requirements (reliabilities and capabilities) or specific equipment and systems included in these controls.
- Control systems shall ensure that the potential for personnel to be exposed to hazardous materials are removed where possible, or reduced to as low as reasonably practicable.

- Where reasonably practicable risks shall be reduced using the hierarchy of controls starting with most preferable controls:
    - Limit amount of hazardous chemical used;
    - Limit number of persons exposed to hazardous chemical;
    - Limit exposure period to hazardous chemical;
    - Substituting with a chemical which is less hazardous;
    - Engineering means such as:
        - Process separation, automation, or enclosure;
        - Installation of various forms of ventilation systems;
        - Use of wet-methods;
        - Separate workplaces for different processes;
        - The use of Administrative means, such as work-procedures;
        - Personal protective equipment if none of the abovementioned methods has proved to be successful in sufficiently reducing exposures.

7.6 Plant and equipment requirement.

7.6.1 Existing and new facilities.

- HAZOP studies (if not done before) shall be done on all parts of existing facilities where hazardous materials are handled as part of a process. This shall include Risk Assessments.
- The Management of Change process shall be followed for all new Facilities or modifications to existing facilities. HAZOP studies will be conducted for all new installations that have hazardous materials as part of their process.

7.6.2 Emergencies

- Emergency drills on chemical spills and related events shall be conducted depending on the outcome of the Risk Assessments done on the Hazardous Material Facilities. These mock emergencies shall form part of the emergency procedures and shall take place on a scheduled frequency.
- The infrastructure should be such that adequate ventilation and safe drainage of hazardous material can take place.
- Emergency equipment shall be installed depending on the nature of the hazardous material. This should include but is not limited to:
    - Equipment and material for spillage containment, recovery and disposal of Hazardous Material.
    - Respiratory equipment and Emergency Assembly Points.
    - Fire fighting
    - Suitable PPE for handling the type of material in case of an emergency.

7.6.3 Identification/markings

- All containers, storage vessels and tanks shall be clearly marked to identify the Hazardous Material contained therein.
- No chemical shall be decanted into unmarked containers or stored in any area except in a designated chemical store.
- All pipelines shall be marked to identify the Hazardous Material contained in it.
- Safe operating limits shall be marked on equipment e.g. Red line on gauges indicating maximum limit.

7.6.4 Access Control

Access to all areas associated with the Hazardous Materials shall be controlled appropriate to the risks identified. Access control shall be included in a plant-specific SOP's where relevant.

7.7 Storage and Disposal of Hazardous Chemicals

7.7.1 Storage of Hazardous Chemicals

- Measures must be taken to ensure that all HCS are properly stored and warehoused in accordance with prescription of the MSDS.
- Metal drums containing chemicals shall be stored in such a way to prevent damage or possible corrosion.
- Corrosive chemicals shall not be stored above other HCS containers.
- All chemicals must be stored in a proper manner to prevent environmental pollution.
- Chemicals stored in drums must be in a bunded area that has a 10% more capacity than the chemical contained therein, to prevent pollution in the event of a spillage.
- Bulk storage areas shall be risk assessed to determine the possibility of spillage by applying the worst case scenario consideration and bunded areas shall be constructed to contain the foreseeable spillages that may occur plus 10%.
- Spillage shall be prevented when opening containers and decanting chemicals into smaller containers.
- To prevent any environmental pollution the area shall be cleaned immediately after any spillage.
- A flammable liquid store must be established, where all flammable substances are kept.
- Flammable liquids that are decanted must be provided with earthing between the receptacle and the bulk container.
- Caution must be taken to ensure that chemicals are stored in accordance to their compatibility (See Appendix A for guidance).

7.7.2 Empty Containers

- Empty hazardous chemical containers shall either be sent back to the supplier (at their cost), or disposed of by depositing it in the Hazardous Waste Bins provided at each plant.
- Empty oil drums must be stored in dedicated bunded areas until it can be collected by the approved service provider for disposal.
- NO empty hazardous chemical container shall be washed out and used for any other purpose.
- Disposal of empty containers must be done in accordance with the Tubatse Waste Management Procedure, and by the approved service providers.

7.8 Personal Protective Equipment (PPE)

- Where the risk of exposure to HCS is not reduced adequately, appropriate PPE must be issued
- PPE used with toxic HCS must be disposed of as per hazardous waste disposal protocol.

- All PPE not in use must only be stored in a place which is specifically provided for this purpose.

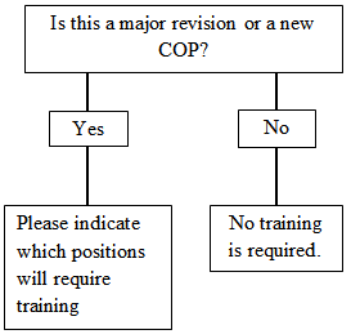
7.9 Loading and Off-loading of Dangerous Goods.

- Plant specific procedures shall be in place for the loading and/or off-loading of dangerous goods.
- Service providers used for the transporting of dangerous goods shall:
  - Ensure compliance with the relevant legal requirements in term of transporting, loading and off-loading of dangerous goods;
  - Ensure that vehicle drivers and/or personnel supervising the off-loading of dangerous goods have the required training and qualifications.
- Where applicable, contractual agreements with service provider transporting dangerous goods shall specify compliance with applicable legislation and proof of applicable legal certification shall be recorded on HQMS.

8. Records/Documented Information

Doc ID	Indexed by	Type of Record	Where Stored	Period Retained	Disposal Method	Resp. for Record
TC-C-SHEQ-H&H-COP-005	SHEQ	COP	Doc Control Store	3 years	Shredding	Document Controller
TC-C-SHEQ-H&H-TEM-001	SHEQ	TEM	HQMS	3 years	Obsolete	Document Controller

9. Profiles that should be considered for training/retraining on Code if applicable



Designation	Training required	
	Yes	No
Departmental Manager	X	
Superintendent	X	
Specialist	X	
Supervisor	X	

Artisan	X	
Appointed First Aider	X	
SHE Representative		
Practitioner	X	
General Labour		X
Departmental Administrator	X	

10. Appendices

Appendix A: Guide to Chemical Incompatibility by Hazard Class

Chemical Hazard Always refer to the SDS	Flammable	Acid	Base	Oxidizer	Toxic
Flammable					
Acid					
Base					
Oxidizer					
Toxic					

Storage of Hazardous Substances

Certain substances or classes of substances react violently when in contact with each other, therefore they are not to be stored together.

KEY:

 **: Allowed to be stored together**

: Isolate, do  **not store together**

Appendix B: Bund Standard (Refer to TC-C-SHEQ-ENV-COP-001)

Note:

1. The capacity of the bunded area shall be 110% of the volume of the waste stored in the area.
2. Both the bund wall capacity as well the maximum quantity permitted to be placed within bund wall shall be displayed on the label as specified above.

samancor		**CODE OF PRACTICE**	
Document No.:	**TC-C-SHEQ-SAF-COP-009**	Revision date:	**March 2016**
National Unit Standard Reference number :		Risk Assessment 2219	

DOCUMENT TITLE
Emergency Preparedness and Response

PURPOSE & SCOPE
To ensure the effective and efficient response to any emergency situation that might occur on or off site.

APPROVAL SIGNATURE RECORD		
Reviewer	**Title**	**Signature / Date**
Format and layout approver	Document Controller	
Document Owner / Originator	SHEQ Specialist (Safety)	
Reviewer 1	SHEQ Superintendent	
APPROVED BY	SHEQ Manager	
Filing of final document	Tubatse Chrome Document Controller	

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1. Objective/Scope.

This procedure describes the responsibilities and activities involved in the response to accidents and general emergency situations that might occur at Tubatse Chrome. This procedure further aims to:

- Identify and list possible emergency situations.
- Describe a logical approach on how to react to the emergency situations.
- Minimize damage to the environment.
- Control and prevent escalation in incidents.
- Inform the appropriate authorities.
- Protect vital equipment and assets.
- Prepare the organisation to react to all eventualities on site.

2. Responsibilities/Authorities.

General Manager (GM)	Must ensure that appropriate resources are made available to facilitate an effective emergency response service. Takes overall responsibility for the response and external communication in the case of serious incident or emergency situation.
Business Unit Manager	Takes overall responsibility for management any emergency situation in his AOR. Must ensure that this procedure is effectively implemented and trained in his AOR.
Section Superintendent (SST)	Implement the procedure and ensuring the effective management of emergency situations.
SHEQ Manager	Implement the procedure and ensuring the effective management of emergency situations. Identify and appoint suitable persons to take control of certain functions.
Clinic Doctor (CD) Clinic Sister (CS)	Effective medical treatment of employees sustaining injury as a result of work related and natural occurrences.
Evacuation Leader.(EL)	Co-ordinate the emergency activities in the plant in case of emergency such as fire, flood, strikes and natural disasters. Participate in practice drills.
Emergency Response Team (ERT)	Active Response to emergency situations: • Maintaining the fire prevention programme at optimum level. • Identifying possible fire risks and taking action to eliminate or reduce these as far as possible. • Coordinator must perform inspection on firefighting equipment as per the firefighting standards; co-ordinate the fire / emergency team and ensure train of the team for all emergencies and advice management on any deviations and\or requirements. • Attend appropriate training. • Ensure maintenance of equipment.
SHEQ Safety Specialist	Liaise with government agencies to co-ordinate the aspects of the emergency plan which concerns or benefits both parties. Revision of laid down emergency procedures

SHEQ Specialist (Environment)	Coordinate applicable response to environmental incidents where/when required. Inform the relevant authorities in case of an incident.

3. Abbreviations.

EP & R	-	Emergency Preparedness and Response
MR	-	Management Representative
ERT	-	Emergency Response Team
AOR	-	Area of Responsibility

Building Rescue – Any rescue attempt necessary due to the occurrence of natural or unnatural disasters. (Fire, floods, gas leaks, seismic activity where people or equipment have to be removed from damaged buildings etc.).

4. Definitions

None.

5. Procedure.

5.1 General overall Emergency Response Actions.

5.1.1. Detection and Early Warning Systems

Warning systems are used to provide warnings to employees, who may be affected by a safety, health or environmental emergency.

On site detection systems include:

Type of detector	Location	Type of alarm/sound	Testing procedures	Frequencies of maintenance
Fire Suppression	Plant Wide refer to list TC-R-SHEQ-SAF-REG-004	Installed	Annual	Annual service
Gas Badge Pro Personal Single-gas Monitor or MX4 iQUAD Multi-gas Monitor (equipped with a CO gas sensor)	East plant Dayshift Process Practitioner Refer to TC-C-SHEQ-SAF-COP-017 Carbon Monoxide for use and maintenance	Audible	Monthly testing and calibration	When Required
Gas Badge Pro Personal Single-gas Monitor or MX4 iQUAD Multi-gas Monitor (equipped with a CO gas sensor)	West plant Dayshift Process Practitioner Refer to TC-C-SHEQ-SAF-COP-017 Carbon Monoxide for use and maintenance	Audible	Monthly testing and calibration	When required
Manual fire alarms	Plant wide for each responsibility area	Audible/Siren	Monthly test by SHEQ Practitioner	When required

5.1.2. Communication Systems

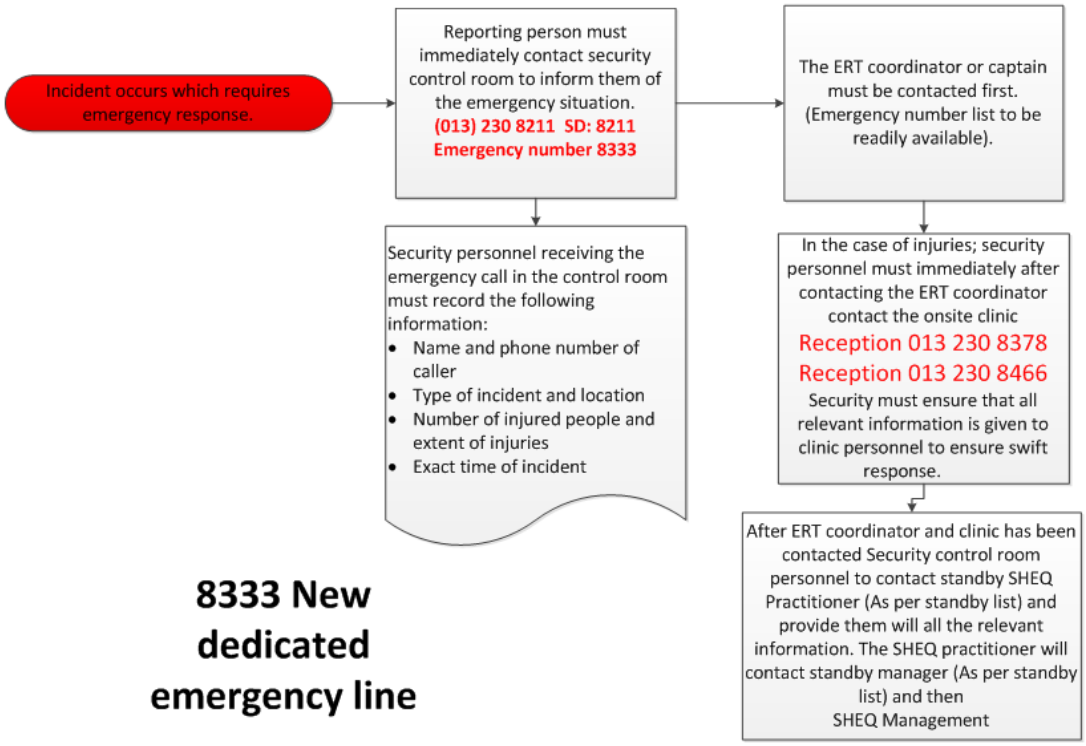
TFC makes us e of the following communication systems:

- Telephones
- HF Radios
- Hand held radios
- Cellular telephones

5.1.2.1.Notification/Communication flow chart for all emergencies

(a) Telephone System

In the event of an emergency then, the emergency notification process will work as follows:



The Emergency control room is located at security and all calls for any emergency will be routed via this control room.

(b) **Two way radios**

All Surface Mobile Equipment make use of two-way radio communications. Also all plants have a radio communication system allowing for communication amongst operators, supervisors and the Plant Control room. The radio system is therefore another way of communicating emergencies.

5.1.2.2. Effectiveness of communication Systems

All Communication Systems will be tested during simulation exercises/mock-up drills which as per PMO2 schedule.

5.1.3. Emergency Medical Care

5.1.3.1.Arrangements for Emergency Medical Care

(a) First Aid

Each Section or Plant will have First Aid Equipment as detailed in TC-C-SHEQ-SAF-TEM-033 Life Clinic Checklist for a First Aid Box.

Each Manager will ensure that the required persons in their area of responsibility are trained in First Aid.

It should be noted that the following situation a person will not be moved or allowed to walk to the clinic.

- When a person has a fracture or supported fracture of a limb, spine, neck or skull.

- When a person has fallen from heights.
- When a person has suffered burn wounds in size bigger than the size of a hand to a body area.
- When a person has or is suspected to have inhaled hot gas.
- When a person has suffered wounds with severe bleeding.
- When a person is unconscious for any length of time.
- When a person has suffered a snake bite.
- When a person has loss of sight evident after the foreign material was rinsed from the eye with water.
- When a person has any physiological disorders (e.g. disorientation, aggressiveness, suicide attempts).
- If chemicals was ingested.

(b) Medical Facilities

The medical facility at Tubatse is situated at the TFC Complex and is run by a contracting company Life Occupational Services, who have a suitably qualified Occupational Medical Practitioner (OMP) and nursing staff. Medical staff is available on call 24 hours a day in case of emergencies.

The medical facility is equipped with a trauma room and examination rooms. The trauma room is fully equipped with an ECG machine, defibrillator machine, ventilator and oxygen.

An Ambulance service is available for the transport of patients. The ambulance service is operated by Basic Ambulance Assistants (Paramedics).

(c) Responsibility of Medical Personnel

When an emergency call is made to the clinic, the medical personnel that respond must do the following:

i. Find out how serious the incident is, i.e. establish if there is a possibility of a fatality /multiple fatalities

ii. Send ambulance to affected area

iii. Contact OMP /standby doctor

iv. Prepare trauma room

v. Receive patients and arrange for next steps as required (e.g. transportation of injured to Hospital etc.)

5.1.4. Evacuation & Rescue Plans

Evacuation plans provide the road map which personnel must use during an emergency. A copy of the evacuation plan which is applicable to a section must be displayed at each Plant/Section's notice board.

The plans must show:

- Fire extinguishers
- Telephones
- Emergency Assembly
- Safe Escape Route

5.1.5. Emergency Response Measures

5.1.5.1. Rescue and Response Capabilities

(a) Emergency Response Team

TFC will maintain at least one Emergency Response Team (with no less than 10 persons). The team will consist of a Captain and Vice-Captain and other members.
The team will function as per specifications of TC-C-SHEQ-SAF-COP-033 Guidelines to Emergency Rescue Team Strategies.

5.1.6. Emergency response training

Training and practice drills are essential to ensure personnel are familiar with emergency procedures, emergency equipment, and local conditions, medical and support services and the emergency reporting structure.

The success of an emergency response will depend significantly upon the effectiveness and frequency of emergency response training. Identified employees must take part in emergency drills or emergency training exercises as per COP requirements to keep awareness at optimum levels of efficiency. The General Manager and the SHEQ Manager must be notified one day in advance by mail of intended Emergency Drill.

Training should include:

- Firefighting training,
- Assistant Ambulance training,
- Basic first aid,
- Response for emergencies such as bush fires, snake bite and missing party,
- HAZMAT training.

5.2 Emergency Scenarios

5.2.1 Emergency Environmental spill inclusive of the following

- hydrocarbon (diesel, oil, grease, solvents)
- Any chemical spillage Chemicals include diesel, nitric acid, caustic soda, ferrous chloride, hydrochloric acid, water treatment chemicals, bag house filter dust and contaminated water.
- Over flow or leakage of hazardous waste storage i.e. evaporation ponds, brine dams, and laboratory sump.
- Process water storage overflows and discharges off site (e.g. balancing dam overflow, silt traps and sewage plant effluent overflow).

Emergency Drills

Responsible: All departments
Frequency: Yearly

5.2.2 Environmental Spill. – Chemical.

- Report spill immediately to the SHEQ Specialist (Environment), via the control room or directly, who will in turn initiate the correct course of action.
- Contain the spillage as soon as possible, by placing sand or suitable materials around the spillage.

- Barricade area off with barrier tape or traffic cones and restrict access to all but the emergency services/response personnel.
- Initiate clean-up of the spillage after responsible person has visited the area. Any area of spillage must be cleaned and rehabilitated to accepted practices. No employee is to make any statements regarding the incident to any outside party (except for safety and rescue purposes), without approval of the General Manager.
- Report the incident to senior management as per incident reporting procedure.
- Where required the SHEQ Specialist (Environment) must ensure that emergency incidents are reported to the relevant authorities, as required by section 30 of the National Environmental Management Act, Act 107 of 1998 and/or part 5, section 20 of the National Water Act, Act 36 of 1998.

5.2.3 Effluent Discharge

-
- In the event of the overflow of effluent or contaminated water to the environment or water resource, the SHEQ Specialist (Environment) must be informed, who will then inform the appropriate authorities: Department of Water Affairs (DWA), the Limpopo Department of Economic Development, Tourism and Environmental Affairs (LDEDET), the South African Police Service (SAPS) and the Department of Environmental Affairs and Tourism (DEAT) if, and as required by section 30 of the National Environmental Management Act, Act 107 of 1998 and/or part 5, section 20 of the National Water Act, Act 36 of 1998.
- Spillage must be contained and prevented from causing further damage.
- Clean-up operations must be initiated, and all effluent or contaminated materials are to be disposed of in accordance to procedures and legislation.
- No employee is to make any statements regarding the incident to any outside party (except for safety and rescue purposes) without approval of the General Manager.
- Effluent Discharge.

Emergency Drills
Responsible: Environmental team
Frequency: Every 2 years - Discussion

5.2.4 Hazardous waste and dirty water impoundment liner failure

- When it is detected that the liner of a hazardous waste facility (H:H Cell) or dam containing contaminated water (Brine Dams, Storm water Dam or Balancing Dam) has failed, the line manager responsible for the management or operation of that facility will notify the SHEQ Specialist (Environment) immediately.
- The SHEQ Specialist (Environment) and management shall ensure that adequate action is taken to limit the pollution to the environment to the absolute minimum
- The SHEQ Specialist (Environment) will inform the relevant authorities as required by section 30 of the National Environmental Management Act, Act 107 of 1998 and/or part 5, section 20 of the National Water Act, Act 36 of 1998.

Emergency Drills
Responsible: Environmental Team
Frequency: Every 3 years – Discussion

5.2.5 Waste Dump Stability and Slope Failure

- In the event that there is a slope or high wall failure at a waste dump facility (Slag site, Capped Facility or H: H Cell) the incident should immediately be reported to the control room.
- The control room shall notify the ERT and SHEQ Specialist (Environment).
- "Refer to point 5.2.12 for procedure to follow in case a person was engulfed (or possibly engulfed) with material".
- The SHEQ Specialist (Environment) shall assess the situation and after consultation with management ensure that required action is taken to limit the impact to the environment as far as possible
- The Environmental Specialist shall inform the relevant authorities if and as required by section 30 of the National Environmental Management Act, Act 107 of 1998 and/or part 5, section 20 of the National Water Act, Act 36 of 1998

Emergency Drills
Responsible: Environmental Team
Frequency: Every 3 years – Discussion

5.2.6 Transporters spillages

- In the event of a spillage while transporting our goods, the transporters will contact the SHEQ Specialist (Environment) who will take down all the necessary information and then contact the correct personnel.
- The transporters are responsible to initiate containment of the spill and to ensure that the area is barricaded off effectively, combat any possible fires if able to do so, and ensure that no unauthorised persons enter the potentially hazardous area.
- The transporters must ensure that there is no risk to oncoming traffic, and if possible re direct traffic around the spill.
- Clean up procedures must be initiated as soon as possible and the entire area must be left as it was prior to the incident.
- The SHEQ Specialist (Environment) must confirm that the site has been adequately cleaned.

Emergency Drills
Responsible: Environmental Team
Frequency: Every 3 years – Discussion

5.2.7 Emergency venting

- All venting occurrences, both planned and unplanned shall be logged on IMS with details of the event. The severity of the event will determine whether it will be logged as a SIR or near-miss.

Planned Venting

- If venting of furnace is unavoidable, notice shall be given at least two days in advance of the planned venting.
- The responsible line manager shall notifying the SHEQ Manager and the SHEQ Specialist (Environment) via e-mail and telephonically, who will then notify the relevant authorities and the Samancor Group Environmental Superintendent of the planned venting (via e-mail), stating the reasons therefore as per the National Environment Management Air Quality Act 39 Of 2004, Section 30.

Unplanned Venting

- If an unplanned venting of furnaces takes place, immediate attention shall be taken by responsible line manager to assess the problem and implement required action to limit the venting time and environmental impacts to the absolute minimum.
- The responsible line manager will immediately inform the SHEQ Specialist (Environment) of any incident which resulted in the venting of furnace emissions directly to the atmosphere.
- The SHEQ Specialist (Environment) shall notify all relevant authorities, as required by the National Environment Management Air Quality Act, Act 39 of 2004, Section 30 and Air Emission Licence (AEL) conditions.
- The responsible line manager must log an incident and determine the root causes of the failure to prevent re-occurrence and future preventative measures to such failures.
- (Emergency drills are not practicable for this type of emergency. The actions taken during emergency venting will be audited to ensure that the correct procedure is followed.)

Emergency Drills

Responsible: Environmental Team
Frequency: Every 2 years – Discussion

5.2.8 Dam failure

- **Loss of containment.**
  - Contact emergency control centre and report the dam failure, giving details as may be required by the emergency controller.
- **Emergency control function.**
  - Emergency control will contact the relevant emergency personnel and management as per requirements.
- **Ensure no persons were injured.**
  - Emergency personnel are to ensure that no persons were working or were caught in the flood at the time of the release.
- **Ensure traffic is not disrupted.**
  - Engineering manager must check the integrity of all roads and bridge structure for soundness and safe use by road users. The side wall embankments must be checked for severe erosion and soundness.
- **Ensure pump station is secure.**
  - Engineering teams must prepare a pumping system to ensure water supply for the processes if the pump station has been damaged beyond immediate repair.
  -

- **Ensure potable water source is uncontaminated.**
    - Sample testing of potable water shall be arranged by the SHEQ Specialist (Environment) to verify whether or not the sudden loss of containment has polluted the underground water table and potable water for the smelter and community, exposing the entire community to diarrhoea and other water borne illnesses.
- **Follow up actions.**
    - When all the respective investigative material has been concluded and the local authorities have concluded their investigations follow up actions will be followed as per environmental procedures. Any area of spillage must be cleaned and rehabilitated to accepted practices.
- **Press statements.**
    - No employee is to make any statements regarding the incident to any external party (except for safety and rescue purposes) without approval of the General Manager.
- **Reporting incident.**
    - Complete the significant incident report within 24 hrs.

Emergency Drills

Responsible: Environmental Team/ ERT
Frequency: Every 3 years – Discussion.

5.2.9 Injuries

- In the event of an injury the injured, or a witness, must contact the immediate supervisor, who in turn will summon the certified first-aider in the section and notify the control room of the injury. Control room will notify the clinic. The certified first aider will administer emergency first-aid if required, however anybody with basic first aid training can initiate first aid. Incident must be reported during the same shift in which the incident occurred.
- If the injury is not potentially severe, the injured must immediately be transported via ambulance to the clinic for further assessment and treatment. First aid must still be continued until the arrival of the medical staff.
- NOTE: It is a legal requirement to report the incident within the same shift – Failure to do so would result in disciplinary action and/or jeopardize the possibility of compensation.
- SIR must be logged on IMS on the same day and investigated within 7 days.

Emergency Drills

Responsible: All departments

Frequency: Yearly

Lost Time Injury / (Classified Injuries)

- The emergency staff (Sister) must notify regional supporting emergency medical services if there is a possibility of more than one person being severely injured, whilst proceeding to the scene of the accident by ambulance. The clinic staff member/s will stabilize the patient and transport the injured to the clinic for further assessment and treatment, or to the nearest private hospital.
- The clinic sister will contact the company Medical Practitioner to confirm treatment.
- The clinic sister will complete form WCL2 (E) and if necessary, arrange transfer of the injured to hospital accompanied by qualified medical staff.

- If the injury is of a severe nature and the forms cannot be completed beforehand, arrangements must be made with the hospital and the form must be completed at the hospital.
- The sister will then arrange for follow up consultants, treatment and rehabilitation, if required. All injured persons must see the company Medical Practitioner.
- Clinic staff will inform the line supervisor should any fitness restrictions apply or if the injured is referred for off-site treatment or recuperation

Fatal Injury's (single or multiple) level 4 and 5

- In the case of a fatality, cover the body and notify the control room. The control room will notify the responsible persons to arrange for the following:

  - Ambulance,
  - Medical practitioner,
  - South African Police Services,
  - Inform the Chief Inspector of the Dept. of Labour telephonically and by fax or e-mail,
  - Photograph the scene of the accident and the body,
  - The Departmental Manager will initiate the investigation, and complete the Significant Incident report in conjunction with supervisory level immediately after being notified,
  - The responsible manager / superintendent / engineer will ensure that the key lessons learned are shared with all relevant site personnel, for consideration & action (including health & safety committees) immediately after being informed of all the facts surrounding the incident.

- In the event of a fatality, the Evacuation Leader on duty will contact the following personnel without delay and in the following sequence:

  - The General Manager.
  - The Departmental manager.
  - The human resources manager.
  - The SHEQ Manager.
  - The SHEQ superintendent.
  - The SHEQ Practitioner on duty or on standby.
  - The resident doctor.

- In the event of a fatality, the General Manager will as soon as possible contact and update senior management and shareholders of the fatality. This includes the following people:

  - CEO,
  - Group SHEQ Manager,
  - Group Legal Advisor,
  - Dept. of Labour,
  - SAPS,
  - HR Manager.

- The General Manager will contact the victim's next of kin (or designate persons to perform this function) and make all the necessary supporting arrangement, including access to the

employee assistance program (EAP). The EAP service provider must be notified and requested to debrief directly affected personnel on-site.

- Part1 of the significant incident report must be completed and circulated to all persons on the SHEQ Significant report reporting group list on the global address list (GAL) immediately after the victim has been verified as deceased and until such time as all the evidence has been obtained and the inspectors have visited the site.
- The relevant Group SHEQ Manager shall circulate a memo to all employees expressing condolences with the loss of life; this will be done as soon practicable but at least within 48hrs.
- The General Manager shall ensure that all flags excluding the South Africa flag are flown at half-mast for a period of 24hrs after the incident.
- The Departmental manager is to initiate the preliminary investigation, and complete Significant Incident Report.
- The responsible manager / superintendent / engineer will ensure that the key lessons learned are shared with all relevant site personnel, for consideration & action (including health & safety committees).
- The SHEQ Specialist will ensure that the scene of the incident is not disturbed in any way, other than removing the injured persons and controlling secondary incidents.
- If anything at the scene constitutes a hazard, all other persons in the area must be removed and the site secured.

5.2.10 Electrical Shock

- Note that due to the effect of shock, it is best practice to first stabilize an injured person at the scene using first aid, and wait for the ambulance rather than to rush a person to the clinic.
- If the injury is potentially severe, the witness will immediately call the Emergency control room to notify the emergency staff on duty of the nature of the injury and of the site location. (Nearest Ambulance pick up point as indicated on evacuation plan displayed on notice board).
- In the event of any injury (First aid case, Medical treatment case or Classified Injury) a Significant Incident Report with section 1 on IMS must be initiated as soon possible and the following persons notified by the supervisor: Departmental Manager and the SHEQ Manager.
- As much evidence e.g. photographs and sketches as possible must be collected immediately after the incident before the scene is disturbed.

Emergency Drills

Responsible: CRP/PSP/EP/WP/Services
Frequency: Yearly

5.2.11 Electrocution

- In the event of an electrocution report or get someone else to report the incident to the emergency control centre, the emergency control officer will contact the necessary personnel.
- Ensure your own safety. Isolate the power supply immediately. Do not touch the victim for he/she may still be in contact with an electrical source.
- If power source cannot be isolated, leave scene as is until emergency personnel arrives.

- The site of the incident must not be disturbed, except with the view of saving another life.
- Clear the surrounding area to enable emergency personnel easy access.

5.2.12 Fire

- **If controllable:**

- Phone the emergency control room,
- Make verbal alarm,
- When required, the area must be evacuated immediately to prevent injuries and possible loss of lives,
- Switch off all electronic equipment if possible,
- Extinguish the fire using applicable fire extinguishing equipment,
- Complete Significant Incident Report document,
- All incidents must be reported for proper investigation and implementation of preventive controls.

- **If uncontrollable:**

- Phone the Emergency control room stating your name and exact location and extent of the fire.
- Sound the fire alarm designated to your department.
- Switch off all electronic equipment if possible to prevent excessive oxygen from fanning the flames and creating a larger fire.
- Close all doors and windows where possible whilst evacuation is in progress.
- Phone the control room stating your name and exact location and extent of the fire.
- Evacuate the area and assemble at the allocated assembly point for roll call.
- Supervisors to conduct roll call.
- Let the Emergency Rescue Team take control of the situation.
- Complete the Significant Incident report document.
- Record of firefighting equipment utilised must be forwarded to the responsible supervisor to ensure recharges or replacements are sourced.

Emergency Drills
Responsible: All departments
Frequency: Yearly

5.2.13 Bush/Felt fires

- **Bush fires** must be tackled with care and consideration of many aspects. Wind direction, dryness of the bush. Vehicle access and water supply are all contributing factors which can have disastrous effects if ignored.
- **The Emergency Rescue Team must ensure that apparatus to combat bush fires are adequate.**

- **Back burn:**

  - Back burns are the first line of attack in any bush fire.
  - Back burn against the wind at an adequate distance from the main fire.

- **Escape routes:**

  - Never let escape route be blocked off by fire.
  - Watch the wind direction at all times, fire generates its own adverse weather conditions.
  - Funnel burn where possible to ensure adequate escape routes for vehicles and personnel.
  - Escape routes which become blocked by fire will contribute to smoke inhalation, suffocation and the loss of life and equipment, with the possibility of multiple fatalities.
  - Emergency Drills

  Responsible: ERT
  Frequency: Yearly

5.2.14 Explosion.

- **Report Situation Whenever an explosion occurs:**

  - Phone the emergency control centre stating your name, exact location and extent of the incident.
  - Sound the emergency Alarm - continuous sound or 2 minutes.

- **Evacuate:**

  - If necessary, evacuate the area and assemble at the allocated assembly point for roll call.

- **Medical treatment/CI.**

  - In case of injuries, apply first aid and phone the emergency control centre who will in turn contact the clinic personnel.

- **Emergency procedures:**

  - In case of a gas leak, all supplies must be shut off at nearest control valve and test for leaks must be carried out by skilled staff. The system must be purged of excess gasses to prevent a reoccurrence.
  - If there is a fire, all pipes, containers and equipment must be kept cool with water.
  - Ensure neighbouring pipes, storage tanks or equipment is also kept cool.
  - Barricade the area and limit entrance to all but the emergency services and supervisor of such area.
  - When all the appropriate information has been gathered but not later than 24 hours after the situation has been brought under control, a Significant Incident Report must be completed.

- Geiger counter must be used to determine if any radiation leaks has occurred.
- If there is any leak, evacuate the immediate area and contact the responsible radiation control officer.

Emergency Drills
Responsible: EP/WP/ERT
Frequency: Yearly

5.2.15 Bomb Threat

- **Receiving information.**

  - When reported write down as much information as possible, and try to establish the location of the bomb and the reason(s) for the threat.

- **Reporting condition.**

  - Phone Emergency control room giving exact information about the details taken.

- **Emergency control.**

  - The emergency control will contact the Evacuation Leader

- **Evacuation.**

  - Always treat a bomb scare as a positive threat and evacuate the building. Never assume it is false. Only when the area has been declared safe may you proceed with your duties.
  - Always evacuate the area and assemble at the allocated assembly point, leaving all windows and doors open.

- **Report.**

  - Complete Significant Incident Report document and follow reporting procedure.

Emergency Drills
Responsible: Admin
Frequency: Every 2 years

5.2.16 Civil Unrest / Riots and Strike action.

- **Report condition.**

  - When reported or noticed, note down as much information as possible, and try to establish the location and the reason(s) for it.

- **Evacuation.**

  - When management makes the decision that the situation is beyond control and evacuation may be necessary.

- In the case of evacuation, employees will then report to their respective emergency assembly points where alternative plans will be made.

- **Reporting.**
  - Complete Significant Incident Report and follow reporting procedure Management will make the decision as to contact the SAPS a relevant security support services.

Emergency Drills

Responsible: Security.
Frequency: Every 2 years

5.2.17 Flooding and building rescue

- **Reporting condition.**

  - In the case of flooding of any buildings or, where building rescue is required, report the incident to the Emergency control centre.
  - Security will inform the ERT.

- **Assist injured or trapped people In case where building rescue is required, report the incident to the Supervisor. Give assistance to any trapped or injured employees.**

- **Control if possible.**
  - Call the emergency control centre and give full details on the situation.
  - Try to dyke the water flow or redirect it if possible.

- **Report investigation findings.**
  - Complete the Significant Incident Report and forward it via the correct channels.

- **Clean-up operations.**
  - Initiate clean- up when the area is safe to work in and ensure situation is safe to work in.

Emergency Drills
Responsible: ERT
Frequency: Every 2 years – (Discussion)

5.2.18 Snake bite.

- Always assume that all snakes are poisonous and avoid all contact. Immediately after a snake bite has occurred the emergency control centre must be contacted and all relevant questions answered accordingly. The emergency centre will notify the clinic immediately.

- Give a description of the snake to the emergency control officer, describing colours, body form, and head form and scales pattern. Positive identification of the snake is essential. Take care not to expose any person to further risk while taking measures to assist in identification (kill, retention, photograph)

- Treatment prior to the arrival of medical assistance.
  - Shock is a major problem when bitten by a snake, keep the victim calm, do not panic, apply direct pressure on the bitten area, or apply a firm bandage from the bite area down the limb and back up again.
  - Watch the victim for signs of panic, if the victim loses consciousness apply ABCDE.
  - Airway, Breathing, Circulation, Danger and Environment.
  - Do not wash the bitten area
  - Do not elevate the limb.
  - Do not remove the bandage.
  - Do not allow the victim to run or walk.
  - Do not make an incision or suck the wound to remove venom.
  - Wait for the ambulance to transport the victim to the nearest hospital.
  - Complete the significant incident report.

Emergency Drills
Responsible: Services (WTP)
Frequency: Every 3 years

5.2.19 Vehicle Accident.

- Report the vehicle accident to the emergency control centre. The Emergency control room will notify the Clinic and the Emergency Response team coordinator.
- Give as much information as possible in prompt from the emergency control officer.
- Ascertain the number of injured and report it to the emergency control officer.
- In the case of an accident off site, the Emergency control Centre will telephone the local SAPS, Security Manager, Clinic and Standby emergency rescue team coordinator on standby and advise them of the accident.
- The responsible emergency personnel will respond to the call and go directly to the scene of the accident. All call-outs are reported to the SHEQ Superintendent or the SHEQ Manager. An incident further than a 60km radius from TFC will only be responded to after permission is granted by the SHEQ Manager.
- Ensure that there are no secondary accidents by barricading the area and posting someone to warn oncoming traffic before they arrive at the scene.
- Extinguish any possible fires and neutralize any fuel spillages.
- Do not move the injured passengers to a safe area unless absolutely necessary, stabilize the victim until medical assistance arrives.
- Ensure injured persons are not in shock and wait for emergency personnel to arrive on site.
- Complete the significant incident report should the injured be an employee.

Emergency Drills
Responsible: ERT
Frequency: Yearly

5.2.20 Engulfment

(Buried person, either through floods, falling into hoppers, crushers, tailings facilities or any other source.)

- Report or get someone else to report the incident to the emergency control centre, the emergency control officer will contact the necessary personnel.
- Assess the situation before trying to assist the victim.
- If the victim is visible, try and reach him or her by spreading your weight evenly over as wide an area as possible, use a board if available.
- Ensure you have a buddy to assist. Attach a safety harness to your person with a rope to a secure point out of the hazardous area to enable rescue should something go wrong.
- Attach a rope or harness around the victim and calm the victim down, reassure the victim that all is under control. Get the victim to lie prone so that the emergency team can reach the victim.
- If the victim is not visible, attempt to dig him or her out, shoring up the sides of the excavation, brace the sides of the excavation with shuttering and scaffold pipes as you go deeper.
- If victim is unconscious, check for pulse and apply CPR after ensuring that the airway is free of obstructions.
- Continue CPR until emergency teams arrive on the scene.
- Disperse any gathering persons who are not part of the emergency services or the investigation team, and barricade the area off with barrier tape or something similar.
- Complete accumulation of evidence as soon as possible and report the incident to the relevant management representatives.

Emergency Drills

Responsible: CRP/PSP/Logistics
Frequency: Yearly

5.2.21 Missing person

- **Overdue and missing person could involve vehicle accident, personal injury, vehicular mechanical failure, hi- jacking.**

  - When concern is raised about a person's absence, report missing person to emergency control room, the emergency controller on duty will notify the respective persons.

- **Make contact**

  - Attempt to make contact with the missing person either by radio, Cellular or home telephone.

- Check with fellow employees and supervisory level as to his or her possible whereabouts. Talk to supervisor and fellow workers as to whether they know of the employee's direction or task he or she was busy with.

- **Follow up on the information received.**

  - Physically check area where employee would be working or the road he or she would be travelling.

- **Contact local authorities**.

  - If the person is still missing after 24 hours, a person delegated by the General Manager must contact the local SAPS for an extended search of the surrounding area.
  - Contact hospitals in major towns on route of his or her destination to verify admission in case of road accident or hi-jacking.

- **Reports**

  - **Complete the significant incident report within 24 hrs.**

Emergency Drills
Responsible: ERT
Frequency: Every 3 years – Discussion.

5.2.22 Catastrophic loss of electrical power supply.

- **Contact.**
  - When Emergency control center is to contact the personnel as listed on the standby list to ensure that emergency and essential services are put into place as soon as possible.

- **Access control.**
  - SHEQ Superintendent will arrange for all gates to be manned and secure all entrance and exit to sensitive areas, e.g. admin, clinic and stores. Remove booms from main entrance. Bring in extra personnel to assist with possible emergencies and security initiatives.

- **Clearance of equipment.**
  - Ensure clearance of all equipment leaving site (Gate Release).

- **Employee exit and entry.**
  - Access control SOP must be followed control employee entry and exit.

- **Catastrophic loss of electrical power supply - Engineering department's active response**.

  - Ensure emergency backup services by obtaining a list of expected VIP visitors and expected contractors.

- Contact possible suppliers of backup generator sets as on the vendor list and arrange immediate departure of generator sets to ensure power to the following areas. Clinic, Admin, Security Building, Main stores.

- **Catastrophic loss of electrical power supply - Team allocation and control.**

  - Emergency Illumination lights are working and back up batteries are in stable condition. Ensure that effective emergency conditions can be achieved and adequate response can be achieved to any emergency situation.
  - Artisans and helpers are to be divided into separate teams and supervisors are to allocate specific tasks to each team with strict orders to report immediately by cell phone or hand held radio any prevailing conditions.
  - Emergency Rescue team coordinators / captains are to ensure that all emergency equipment is secure and available.

- **Catastrophic loss of electrical power supply – Admin**

  - Contact possible VIP visitors and possible contractors expected to arrive and postpone visits until further notice.
  - Ensure UPS batteries are functioning and that all entrances to the admin building are secure.

- **Catastrophic loss of electrical power supply – Engineer needs to ensure the following;**

  - Emergency water systems - Ensure process water is available and in circulation.
  - Stoking cars - Inspect all conveyor systems for damage and fires. Check and ensure stoking cars are not in a hazardous location.
  - CO gas- Ensure CO gas monitors are functioning and personnel monitors are worn in locations where CO gas may be present.
  - LPG gas - Ensure LPG Gas supply is closed off effectively and that there is no LPG gas leaks evident.
  - Furnace electrodes - Lock FCE Electrodes in place, to prevent the electrodes from slipping into the furnace.
  - Mass control - Ensure manual mass control is possible and functioning properly.
  - Sewerage Emergency plan - Ensure water supplies and electrical power supply to sewerage facilities.

- **Catastrophic loss of electrical power supply - Power supply returned to normal.**

  - Decommissioning of generator sets - Electrical engineer must ensure that all generator sets are properly decommissioned when the power supply is returned to normal.
  - Uncouple generator sets - Electrical engineer must co-ordinate the uncoupling of power supplies and the return of all the respective generator sets to the suppliers.
  - Lifting of generator sets - Ensure mobile crane availability to lift generator sets onto the low beds transport. Re instate all disrupted supplies and ensure effective and safe production again.
  - Reporting – Complete significant incident report.

Emergency Drills
Responsible: Services/EP/WP
Frequency: Every 2 years

5.2.23 Furnace burn through.

- Report Furnace burn through to the emergency control room, the Evacuation Leader on duty will notify the respective Emergency rescue team coordinator and clinic.
- Make sure area is made safe.
- Evacuate personal immediately
- Build berms if possible to prevent the metal flow from progressing into other areas where severe damage can result immediately and after all personnel have been removed from the immediate area.
- Furnace superintendent is to physically ensure that all personnel have been removed from the area and that no persons or machinery enter the risk area. This is done to ensure that no unauthorised personnel or equipment is exposed to potentially hazardous situations and in so doing minimize the potential for further losses.

- **Switch out Furnace**.

  - Follow the switching out procedure if possible to switch out. Switching out the furnace will reduce the flow from the ruptured shell and in so doing minimize the extent of the spillage and reduce the possible risk of additional risk losses.

- **Assess situation and determine action plan.**
  - Check position of the burn through in relation to other equipment and decide whether to bund the spillage or the spray the spillage with fine water spray to congeal the crust and stop the hot metal flow, to enable the spillage to be contained in as small an area as possible to prevent major property loss and loss of life, and to minimise the impact to the environment, process and facilities on site.

- **Tap furnace if possible**.
  - Tap hot metal as per normal procedure and reduce the levels of hot metal in the furnace this is done to reduce the financial loss resulting from the spilled hot metal and clean up procedures.
- **Assess if metal flow can be stopped safely.**
  - Assess whether the situation is safe to use water or if conditions are too severe for water and alternative bunding methods are to be considered.
- **Stop metal flow and cool hot metal flow down.**
  - Create a crust on the spillage to prevent it from spreading by spraying the spillage with a fine water spray and DO NOT spray water directly into the spillage as this will cause an explosion of superheated steam and molten metal. Alternatively build a sand bund wall to contain the spillage to specific areas and to prevent spreading.

- **Clean area**
  - Use mobile machinery to remove the solid waste and clean the area of any tripping or slipping hazards.
- **Repair shell and get Furnace back into operation.**
  - As per maintenance procedures.
- **Report Incident.**
  - Report the incident to responsible management.

Emergency drill

Responsible: EP/WP
Frequency: Yearly

5.2.24 Fall from heights

- Contact.
  - Report the incident height to the emergency control room.
- Give information.
  - Give as much information as possible from the emergency control officer. Ascertain whether there are any fatalities and the number of persons involved.
- Emergency personnel respond.
  - The emergency personnel will respond to the call and go directly to the scene of the incident.
- Secure the scene and initiate emergency rescue.
  - Ensure that there are no secondary incidents, remove standards from the area and begin high angle rescue operations.
- Anchor Gotcha Rescue Device to anchor point that will bear a load of 15kN per person attached to the device.
  - Secure Purple attachment sling of Gotcha kit to anchor point. Deploy Gotcha kit to recover fallen victim.
  - The anchor rope must be safely secured to enable both the rescuer and the victim's weight to be suspended.
- Rescue personnel lower or raise the victim.
  - Bring person to a safe place by lowering or raising the person to a platform or a floor.

- **If Gotcha Rescue is not Possible**
  - Victim is relieved from the harness to increase blood circulation. A trained rescuer has to reach the victim by climbing or abseiling to attach a rescue harness, release the victim and lower or raise the victim to a safe area.
  - Lower victim to ground level, or lift him or her to the platform from which he or she fell. "BE VERY CAREFUL TO BRING THE PERSON TO A HORISONTAL POSITION WHEN HE HAS BEEN SUSPENDED FOR MORE THAN 5 MINUTES, IT MAY BE FATAL. DO IT IN STAGES AND SLOWLY".

- The victim must then be transported to the clinic via the ambulance for further medical assessment.

Emergency drill
Responsible: Services/EP/WP/PSP/CRP
Frequency: Yearly

5.2.25 Surface Mobile Equipment - Electrification and Tyre Fires.

- **Immediate actions when emergency is observed:**

  Call Emergency control room and state the following;

  - Emergency experienced,
  - Name and location,
  - Nature of emergency.

  Emergency drill

  Responsible: OSMH
  Frequency: Yearly

- **WARNING:**

  A tyre can explode at any moment after the application of heat to the tyre or rim, example through truck electrification or tyre fire. Deflating a tyre, including the use of automatic pressure relief – valve devices, does not remove the risk of a tyre explosion.

  - Park the truck or vehicle immediately, if possible, in an area where it creates the least exposure to manned facilities or passing traffic.
  - Ensure it is clear of power lines
  - Ensure that there is room to evacuate to the front of the vehicle
  - Shut down the truck
  - Activate the fire suppression system if it is fitted. DO NOT USE PORTABLE EXTINGUISHERS

- Evacuation of the vehicle
  - Exit the cabin via the door opposite to the danger area.
  - Dismount vehicle using stairs and steps. Keep clear of the danger area.
  - Move away from truck directly ahead or behind the vehicle, to at least 200 meters away. DO NOT TRY AND EXTINGUISH THE FIRE USING PORTABLE EXTINGHUISHERS AS THIS BRINGS YOU TOO CLOSE AND WITHIN THE KILLING ZONE OF THE EXPLOSION.

- Fire fighters to extinguish the fire.
  - Using water and foam, extinguish the fire from angle not directly in line with flying debris, and as far as possible from the fire.

- If the tyres are still inflated, isolate the vehicle for 24 hours before gas testing and further actions.
  - Explosive gas such as Butadiene which is more flammable than jet fuel is formed at temperatures over 250 C, barricade area and cool tyres with water.

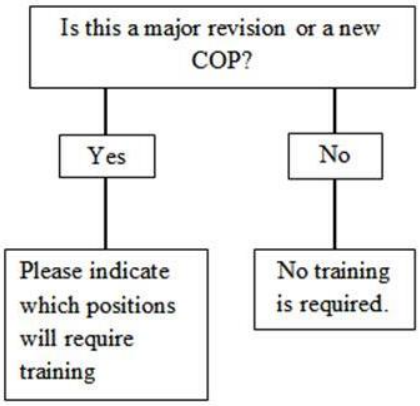
6. References:

Reference to documents:	TC-C-SHEQ-TC-OP-001 Emergency Telephone numbers

7. Document revision record:

Document revision record						
Rev No:	**Date:**	**DESCRIPTION OF REVISION/CHANGE**	**Severity of changes**		**Training required**	
			Major	**Minor**	**Yes**	**No**
03	May 2010	Change to document control format. Include all applicable one page standards	X		X	
04	May 2011	Format document to COP standard. Include waste site stability/slope failure and liner failures.		X		X
04.1	Aug 2011	Frequency of drills distinguished.		X		X
04.2	Mar 2013	Re-evaluate control measures on emergency response situations.		X		X
04.3	Mar 2014	No Major changes		X		X
04.4	Mar 2015	No Major changes		X		X
05	Mar 2016	As per highlighted sections in content	X		X	

8. Profiles that should be considered for training / retraining on Code if applicable.



Designation	Training required	
	Yes	No
Departmental Manager	Yes	
Superintendent	Yes	
Specialist	Yes	
Supervisor	Yes	
Artisan	Yes	
Appointed First Aider	Yes	
SHE Representative	Yes	
Practitioner	Yes	
General Labour	Yes	
Departmental Administrator	Yes	

9. Document Control:

Doc ID	Indexed by	Type of Record	Where Stored	Period Retained	Disposal Method	Resp. for Record
TC-C-SHEQ-SAF-COP-009	SHEQ	COP	Document control store	1 Year	Shredding	Document control

samancor	CODE OF PRACTICE	
Document No.:	**TC-C-SHEQ-SAF-COP-012**	Revision date: **April 2015**
National Unit Standard Reference number :		

DOCUMENT TITLE
Significant Incident Reporting Procedure

PURPOSE & SCOPE
To ensure that there is a standardized process to be followed once a significant incident occurs. This will ensure that triggers are identified, notification done, information collected, investigation planned and completed and that learning's are shared and actions are managed

APPROVAL SIGNATURE RECORD		
Reviewer	**Title**	**Signature / Date**
Format and layout approver	Document Controller	
Document Owner / Originator	SHEQ Specialist	
Reviewer 1	SHEQ Superintendent	
APPROVED BY	SHEQ Manager	
Filing of final document	Tubatse Chrome Document Controller	

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1. Objective/Scope.

To ensure that Significant Incident Reports are submitted and controlled in a structured and coordinated way.

The ultimate is to ensure that:

- Significant Reports are initiated as per the required criticality or potential criticality, recorded with the document controller.
- Investigated by the responsible department.
- Privileged information is shared on a controlled basis.
- The root causes identified and the remedial actions recorded and closed out.
- Cross site learning's are shared.

2. Responsibilities/Authorities.

Role	Responsibility	Typical
SIR Initiator	Identifies and responds appropriately to triggers as defined.	All Employees report to supervisor who will initiate SIR reporting process.
Close out SIR	Ensures that RCA's are conducted as defined in the ICAM process. Reviews and approves findings from ICAM's and RCA's.	GM's, Managers, Superintendent, Supervisors
SIR Facilitator	Leads the investigation by facilitating the investigation team in the ICAM Investigation process.	Any person trained and experienced in investigation techniques

3. Abbreviations.

Term	Description
GM	General Manager
SIR	Signifiant Incident Report
SI	Significant Incident
ICAM	Incident Cause Analysis Method
RCA	Root cause analysis
CA	Corrective Action
SHEQ	Safety, Health, Environment, Quality
CSG	Customer Sector Group

4. Definitions.

- **Contractor -** Any individual, company or other legal entity that carries out work or performs services pursuant to a contract for service.

- **Corrective Action -** An action implemented to eliminate the cause of a non-conformance or incident in order to prevent a recurrence. The corrective action is commensurate with the severity of the non-conformance or incident.

- **Directly Supervise -** Where Tubatse Chrome personnel have the ability to monitor the application of the SHEQ Standards through a direct reporting line and by a presence on site.

- **Employee -** An individual who works for the Company under a contract of employment.

- **Enforce -** Tubatse Chrome has the contractual ability to stop work if SHEQ standards are not being met.

- **Environment -** Surroundings in which Tubatse Chrome operates, including air, water, land, natural resources, flora, fauna, habitats, ecosystems, biodiversity, humans (including human artefacts, culturally significant sites and social aspects) and their interaction. The environment in this context extends from within an operation to the global system.

- **Quality -** A Quality management System is a system deployed to direct the organisation. Quality is the degree to which a set of inherent characteristics fulfil requirements.

- **Exposure Hours -** The total number of hours worked carrying out controlled activities.

- **Fines -** Financial "penalty" imposed by regulation agency due to breach of legislation, regulation, licenses and permits. Fines could be imposed without prosecution.

- **Harm -** A significant and/or long-lasting adverse impact on people, the environment or the community.

- **Hazard -** The intrinsic potential for an agent, activity or process to lead to harm. A hazard is not an incident.

- **Incident (SHEQ) -** Any occurrence that has resulted in, or had the potential to result in, harm to people, the environment, property or reputation, or a combination of these.

- **Influence -** Where Tubatse Chrome can exert pressure to improve SHEQ performance through their involvement in the activity but do not have the contractual ability to enforce SHEQ standards.

- **Likelihood -** A qualitative description of probability or frequency, in relation to the chance that something will occur.

- **Near Miss (SHEQ) -** A near miss is an incident which potentially could have caused adverse consequences to people, the environment, property or reputation, or a combination of these but which did not.

- **Occupational Illness -** An occupational illness is any abnormal condition or disorder other than one resulting from an occupational injury caused by exposures to factors associated with employment. It includes acute or chronic illnesses or diseases, which may be caused by inhalation, absorption, ingestion or direct contact.

- **Determining whether an illness is occupational -** As the interface between occupationally induced and community induced disease may be grey it is important to have rationale to apply in such cases. Examples of questions to be asked are as follows:

  - Has an illness clearly been defined?
  - Was the event reported to the clinic/supervisor on the same day prior to the end of the shift.
  - Does it appear that the illness is caused, or mainly caused by, suspected agents or other conditions at work?
  - Are these suspected agents present in the work environment?
  - Was the exposure to a sufficient degree and/or duration to result in the illness condition?
  - Was the illness attributable mainly to a non-occupational exposure?

  The OSHA criteria for Occupational Illness are the minimum Tubatse Chrome reporting requirement. Local legislation criteria shall be used for reporting purposes where it exceeds OSHA requirements

- **Prosecution -** An action received from regulation agency due to breach of legislation, regulation, licenses and permits. Prosecution might result in fines imposed by the regulators.

- **Repeat Incidents -** A repeat incident is one that occurs under the same basic conditions.

- **Risk -** The risk of an activity/product/service is the product of likelihood of an impact on the health and safety of people, the environment, the community or property, and the severity of that impact. A significant risk is a risk that results in or has the potential to result in a significant SHEQ impact.

- **Significant (SHEQ) Incident**

  A Significant (SHEQ) Incident is any occurrence that has actually resulted in or had the potential to result loss.

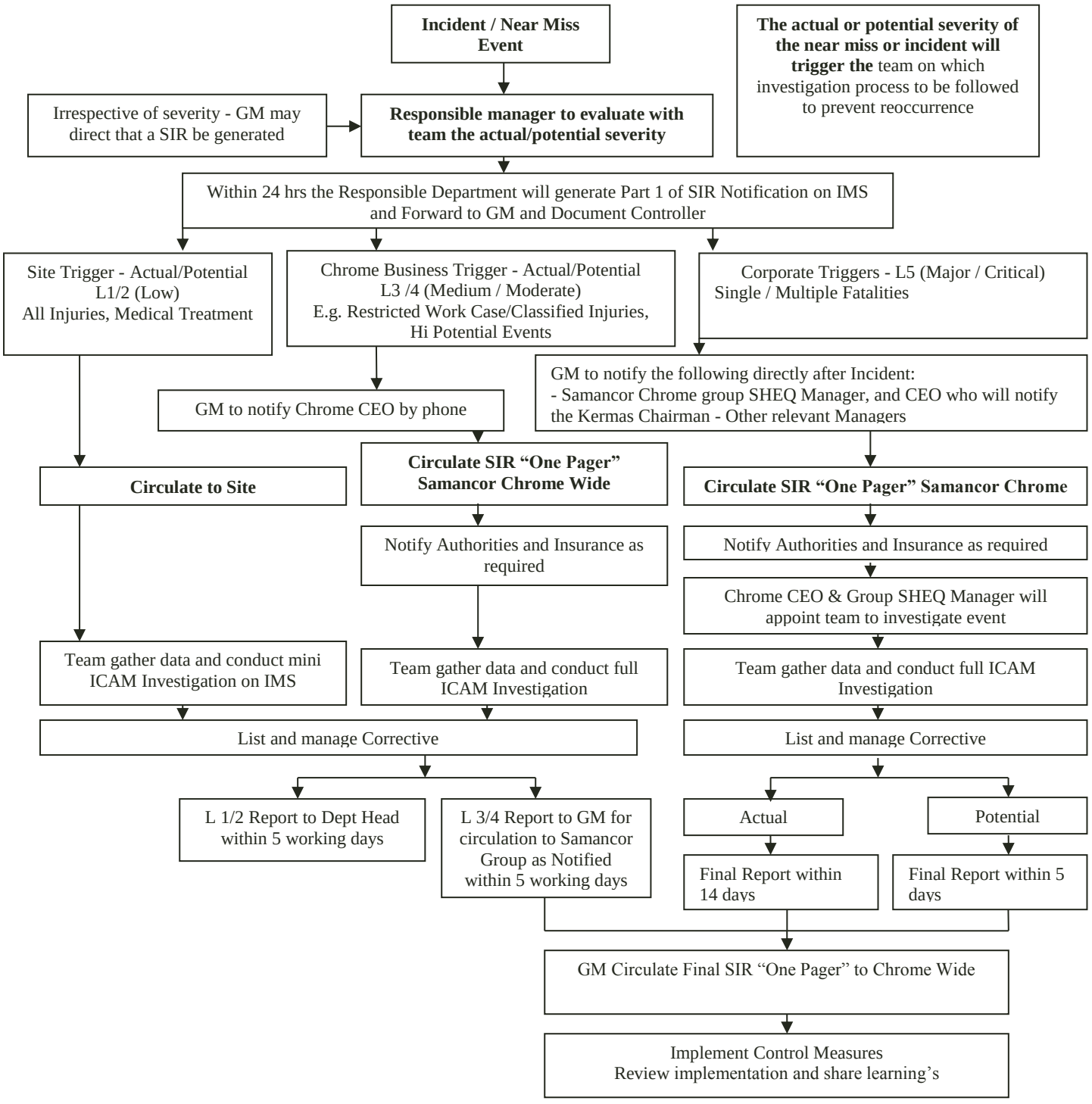
  - Actual/Potential L1/2 (Low)- All Injuries, Medical Treatment.
  - Actual/Potential L3 /4 (Medium / Moderate) E.g. Restricted Work Case/Classified Injuries, Hi Potential Events.
  - L5 (Major / Critical) Single / Multiple Fatalities.

- **Spills -** Any unauthorized discharges to the environment (beyond the primary containment).

- **Visitor -** A person visiting a Tubatse Chrome site who is not a Tubatse Chrome employee or contractor at that site.

5. Procedure.

5.1 Significant Incident Report Flow Diagram.



5.2 Actual incident or potentially serious incident:

5.2.1 Actual incident or potentially serious incident.

- Injury, sickness, environmental pollution or damage, unplanned operational disruption, warning indicators such as trends in audit data, repetitive near misses etc.

- When the situation of an incident is under control, the consequence of the incident whether actual or potential is measured and compared to the consequence severity table and a decision taken whether a SIR must be completed or not.

- A proper investigation must be initiated based on incidents or potential incidents so that the root causes can be identified and control can be implemented. This will reduce the chances of such incidents recurring. It will also aim at mitigating the severity of the consequences of potential similar events, should they happen.

5.2.2 Consequence severity.

- Use the Samancor Chrome Consequence severity table

- The following are a few examples of the application thereof:

  - Example 1: A site has an injury that requires first aid treatment. However the potential was a loss time injury. What trigger applies?
  - Answer to Example 1: Firstly the site trigger (level 1) for actual impact was met and site notification should be done. Secondly the Chrome business trigger (level 3<) for Classified Injuries was met for potential impact. This means that notification should be done on both Site and Chrome Business level.
  - Example 2: A site had a near miss that could have resulted in a single fatality. What trigger applies?
  - Answer to Example 2: Firstly the site trigger (level 1) for potential impact was met. Secondly the Chrome business trigger (level 3<) for potential fatality was met. Thirdly the Corporate trigger (level 5) for potential single fatality was met. This means that notification needs to be done on Site, Chrome Business and Corporate level.

5.2.3 Site Notification.

- The supervisor of the person/area where the event occurred must notify the relevant Superintendent and Departmental/Stand by Manager and the SHEQ department and/or SHEQ Practitioner on standby.

- In the event of an injury, the Clinic must also notify the SHEQ Manager.

- The Departmental/Stand by Manager must notify the GM.

5.3 Notification of CEO: Chrome.

- The GM must make a phone call to the CEO and Group SHEQ Manager as soon as possible to notify them of the following incident:
  For consequence severity that are as follows:

  - Safety and Health Severity < 3 (All CI)'s.

  - Environmental, Social 'Cultural heritage, Community /Government /Media/ Reputation, Legal , Operational impact: severity greater than 3.

5.4 Chrome Notification.

- Departmental Head ensures that Part 1 of the SIR and the SIR "One Pager" on IMS is completed and that the General Manager distributes within 24 hours the SIR "One Pager" to the following persons.

- Within 5 days a full investigation report shall be completed. Distribution of the final SIR "One Pager" report shall be done in person by the General Manager or in his/ her absence by the responsible Manager:

  - CEO Chrome
  - All other Chrome General Managers
  - Chrome Legal Advisor
  - Alexander Forbes where applicable
  - Group SHEQ Manager Chrome

5.5 Samancor Chrome Notification.

- Follow the Samancor Chrome Reporting Manual for Incidents with severities as follows:

  - Environmental: Severity greater than 3.
  - Safety and Health, Social 'Cultural heritage, Community /Government /Media/reputation, Legal, Operational impact: Severity greater than 4.

5.6 Investigation.

5.6.1 Gather Information: Checklist for information gathered – TC-C-SHEQ-SAF-TEM-009

- Before any investigation, the following information shall be gathered as per ICAM methodology:
  People
  Environment
  Equipment
  Procedures
  Organisation

5.6.2 Plan Investigation:

- Investigation Team Composition – Where the Corporate Trigger Criteria was met, the Group SHEQ Manager and CEO, Chrome shall be consulted.
- Who will form part of the team? (Where applicable the Health and Safety Representative for the area must be invited to the investigation)
- Where it will be held.
- When it will be held.
- Travel and accommodation arrangements where applicable.
- Communication of the investigation details.

5.6.3 Conduct Investigation:

- For all significant incidents that meets the site trigger criteria Mini Icam shall be used. For all incidents that met the Chrome Business trigger criteria the full ICAM methodology shall be used.

5.6.4 Manage corrective actions:

- The corrective actions must be coordinated and implemented by the responsible persons and signed off electronically on IMS Action management.

5.6.5 Review Significant Incidents:

- Significant Incidents corrective actions must be reviewed on at least a monthly interval.
- Significant incidents that met the Chrome Business trigger criteria shall be reviewed each month between each site GM and the Corporate SHEQ Manager. On a meeting or teleconference arranged between the Corporate SHEQ Manger and the GM.
- The Corporate SHEQ Manager shall review progress on actions from fatal injuries and potential fatalities within 60 workdays after the incident. This review shall be conducted on site.

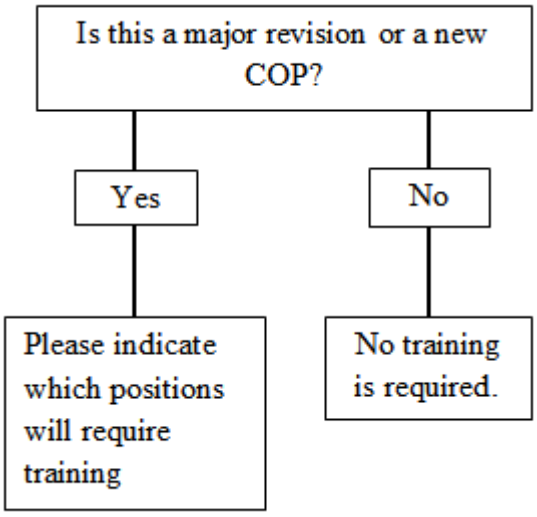
6 References.

Reference to documents:	Checklist for information gathered – TC-C-SHEQ-SAF-TEM-009
	Business Rules Chrome Smelters

7 Document revision record:

Document revision record						
Rev No:	**Date:**	**DESCRIPTION OF REVISION/CHANGE**	**Severity of changes**		**Training required**	
			Major	**Minor**	**Yes**	**No**
04	May 2009	Change document number. Change standard operating procedure to Code of practice. Relocate templates linked to COP to Template folder.				
05	May 2011	Change to new template.	X		X	
05.1	Mar 2014	Revise and amend information.		X		X
05.2	Mar 2015	Revise and amend information.		X		X

8 Profiles that should be considered for training / retraining on Code if applicable



Designation	Training required	
	Yes	No
Departmental Manager		X
Superintendent		X
Specialist		X
Supervisor		X
Artisan		X
Appointed First Aider		X
SHE Representative		X
Practitioner		X
General Labour		X
Departmental Administrator		X

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