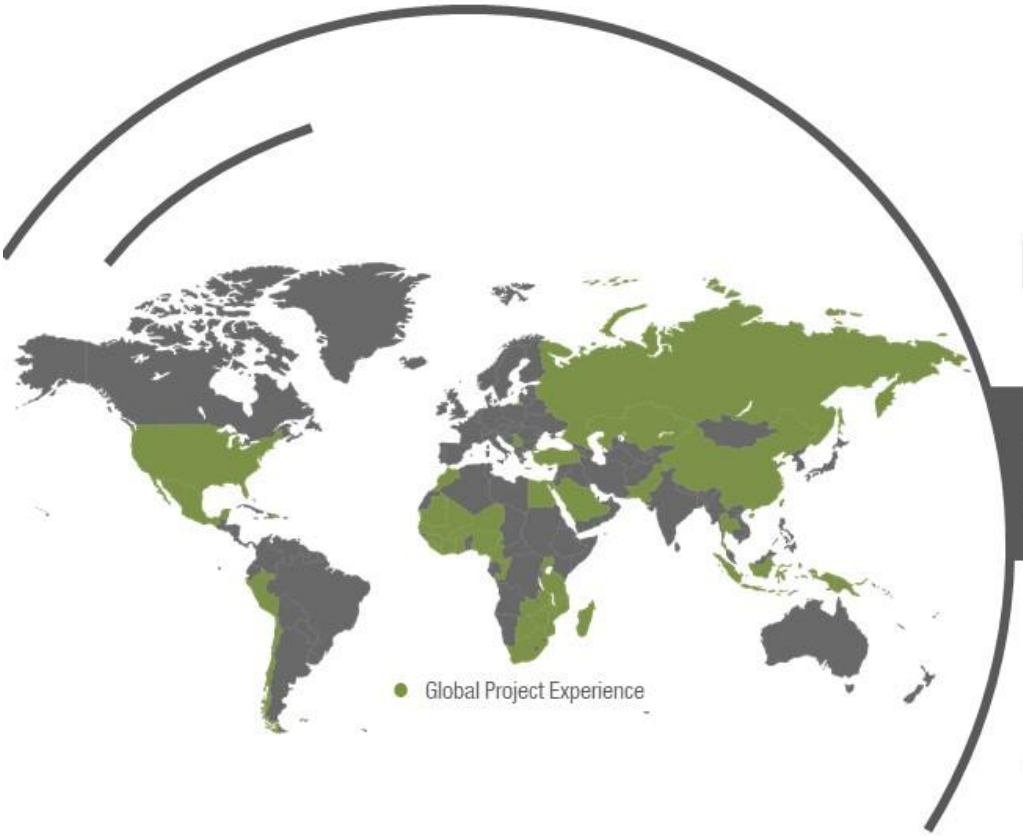

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Implementation of the Leeuspruit Risk Mitigation Measures Monitoring Plan

Chance Finds Protocol

Prepared for:
Sasol Mining (Pty) Ltd

Project Number:
SAS5202

October 2019

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ACRONYMS

BGG	Burial Grounds and Graves
CFP	Chance Find Protocol
CMP	Conservation Management Plan (*syn: HSMP*)
CS	Cultural Significance
ECO	Environmental Control Officer
HFS	Heritage Free State
HIA	Heritage Impact Assessment
HRAs	Heritage Resource Authorities
HRM	Heritage Resources Management
HSMP	Heritage Site Management Plan (*syn: CMP*)
I&APs	Interested and Affected Parties
ICOMOS	International Council on Monuments and Sites
IFC	International Finance Corporation
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	The National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID	Notification of Intent to Develop
PHRA	Provincial Heritage Resources Authority
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAPS	South African Police Service
WHCA	World Heritage Convention Act, 1999 (Act No. 49 of 1999)

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1 Introduction

Sasol Mining (Pty) Ltd (hereinafter Sasol Mining) appointed Digby Wells Environmental (hereinafter Digby Wells) to ensure that the Leeuspruit Risk Mitigation Measure Project is implemented in an environmentally sound manner in support of the mine closure process for the Sigma Defunct Colliery (Sigma). The project involves the implementation of both underground and surface mitigation measures. These are described in more detail below. All activities will be undertaken within the Leeuspruit and buffer zones.

1.1 Underground Mitigation Measures

This component comprises the ash backfilling project. Sigma received an Environmental Authorisation (EA) ***(FS 6/2/2 (693) EM)***, Water Use Licence (WUL) **(10/C22K/CGIJ/4608)** and Waste Management License (WML) **(12/9/11/L1369/2)** for the ash backfilling project. The project aims to backfill mine voids with ash to stabilise old underground mine workings beneath the Leeuspruit which are considered to have a high potential risk for pillar failure and therefore may result in subsidence.

1.2 Surface Mitigation Measures

This component comprises the river diversion and construction of berms. Sigma received a Water Use Licence (WUL) **(10/C22K/CGIJ/4608)** from the Department of Water and Sanitation (DWS) for the Surface Mitigation Measure Project. However, the EA must still be obtained before the project may go ahead. The project aims to implement surface mitigation measures which include diversion canals and flood protection berms to channel the Leeuspruit away from areas identified to have a significant potential hazard for pillar failure which will result in subsidence, and which cannot be mitigated by means of ash backfill.

1.3 Heritage Assessments

Digby Wells submitted two separate heritage assessments to the Heritage Resource Authorities (HRAs) online via the South African Heritage Resources Information System (SAHRIS). Table 1 summarises the details of these submissions. Sasol Mining intends to implement the project as soon as possible and must comply with the conditions of the EA.

This document serves as the project-specific Chance Find Protocol (CFP) for the Leeuspruit Risk Mitigation Project[1] in partial compliance with the conditions of the EA and in response to the Final Comments[2] issued by the South African Heritage Resources Agency (SAHRA).

[1] Digby Wells compiled a CFP as part of the heritage assessment for the ash backfilling mitigation strategy in 2014. This document serves as an updated CFP that is applicable to the Leeuspruit Risk Mitigation Project.

[2] Final Comment issued in response to Case ID 13062 dated 24 January 2019. Accessible at: https://sahris.sahra.org.za/node/520154

Final Comment issued in response to Case ID 5035 dated 17 November 2014. Accessible at: https://sahris.sahra.org.za/node/181881

Table 1: Details regarding the previous EA Applications

Component	Digby Wells Reference	File Reference Number SAMRAD	SAHRIS Case ID
Underground (ash backfilling)	SAS5184	FS 6/2/2 (693) EM	5035[3]
Surface (river diversion)	SAS5250	FS 6/2/2 (693) EM	13062[4]

2 Report Aims and Objectives

This document provides Sasol Mining with the appropriate response guidelines to the identification of heritage resources. These guidelines have been extracted and adapted from the NHRA and the NHRA Regulations, 2000 (GN R 548). Other policies and legislation considered in the compilation of these guidelines include:

- The World Heritage Convention Act, 1999 (Act No. 49 of 1999) (WHCA);
- The International Council on Monuments and Sites (ICOMOS) International Charter for the Conservation and Restoration of Monuments and Sites, 1964 (*Venice Charter*);
- The ICOMOS Charter for the Protection and Management of the Archaeological Heritage, 1990;
- The ICOMOS Xi'an Declaration on the Conservation of the Setting of Heritage Structures, Sites and Areas, 2005;
- The ICOMOS Quebec Declaration on the Preservation of the Spirit of Place, 2008;
- Operational Guidelines for the Implementation of the World Heritage Convention, 12 July 2017; and
- International best practice guidelines including the Work Bank guidelines, Equator Principles, and the International Finance Corporation (IFC) Performance Standards (PS).

The aim of this protocol is to provide Sasol Mining with the necessary tools for implementation during construction and operational phases of the Project in a way that reduces the intensity of manifested impacts to previously unidentified cultural and fossil heritage resources that may be exposed through project activities.

The objective of this protocol is to avoid or reduce operational risks that may result due to chance finds, whilst considering international best practice.

[3] Accessible at: https://sahris.sahra.org.za/cases/sasol-mining-sigma-colliery-ash-backfilling-project

[4] Accessible at: https://sahris.sahra.org.za/cases/sas5250-sasol-surface-mitigation-project-river-diversion

3 Definitions

Table 2 presents the definitions of terms applicable to this protocol. Where applicable, these definitions follow the definitions presented in Chapter 2 of the NHRA.

Table 2: Definitions Applicable to this Protocol

Archaeological	Any material remains that were produced or created by humans or that resulted from any human activity and that are unused and older than 100 years. This includes artefacts, human and hominid remains and artificial features and structures. Archaeology also refers to Rock Art that is defined as any form of painting, engraving or other graphic representation on fixed rock surfaces or loose rocks or stones that was made by humans and that is older than 100 years, including a 10 m area surrounding such site. Archaeology also includes: • Any wrecks or parts thereof that were wrecked in South Africa more than 60 years ago, including any cargo, debris or artefacts found or associated with it; and • Any features, structures and artefacts older than 75 years that are associated with military history, including the sites on which they are found.
Archaeologist	A trained professional who uses scientific methods to excavate, record and study archaeological sites and deposits.
Cultural Significance (CS)	As defined in Section 3(3) of the NHRA, the aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. A heritage may have cultural significance or other special value because of its: • Importance in the community, or pattern of South Africa's history; • Possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage; • Potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage; • Importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects; • Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group; • Importance in demonstrating a high degree of creative or technical achievement at a particular period; • Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons; • Strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and • Significance relating to the history of slavery in South Africa.

Excavation	The scientific excavation, recording and retrieval of archaeological deposit and objects using accepted archaeological procedures and methods, and excavate has a corresponding meaning.
General Protection	General protection is afforded to: • Objects protected in terms of laws of foreign states; • Structures older than 60 years; • Archaeological and palaeontological sites and material and meteorites; • Burial grounds and graves; and • Public monuments and memorials.
Grave	The place of interment (burial ground) and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such *place*.
Heritage Resource	Any place of cultural significance.
Heritage Resources Authority (HRA)	The South African Heritage Resources Agency (SAHRA), established in terms of Section 11, or, insofar as the NHRA is applicable in or in respect of a province, a provincial heritage resources authority, in this instance the Heritage Free State (HFS).
Heritage Site	Any place declared to be a national heritage site by SAHRA or a place declared to be a provincial heritage site by a provincial heritage resources authority.
Living/Intangible Heritage	The intangible aspects of inherited culture that could include cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems, the holistic approach to nature, society and social relationships.
Major Find	If the resource cannot feasibly be rescued in a specified timeframe without compromising the detailed material recovery and contextual observations, the resource is considered a Major Find.
Object	Any movable property of cultural significance that is protected in terms of the NHRA, including: • All archaeological artefacts; • All palaeontological and rare geological specimens; • All meteorites; and • Any other object referred to in section 3 of the Act.
Owner	Includes the owners of the land on which a heritage *object* or *place* is located and/or such owner's authorised agent and any person with a real interest in the property.

Palaeontological	Any fossil remains or traces of animals or plants that were alive in the geological past, and any site that contains such fossils. Fossil fuels such as coal, and fossiliferous rock intended for industrial use are, however, excluded.
Palaeontologist	A trained professional who uses scientific methods to excavate, record and study fossils and palaeontological sites.
Place	A place may include: • (a) The *site*; • (b) A *structure* such as a stonewall or historic building; • (c) A group of structures such as a werf; and • (d) In relation to the management of a place, includes the immediate surroundings of a place.
Site	Any area of land, including land covered by water, and including any *structures* thereon.
Structure	Any works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.

4 Roles and Responsibilities

Table 3 outlines the roles and responsibilities of the persons responsible for the implementation of the CFP.

Table 3: Primary Positions and Responsibilities

Position	Responsibilities
Site Manager	• Responsible for ensuring this CFP is implemented; • Bring to the attention of the Environmental Control Officer (ECO) the requirements encapsulated within this CFP and within a Conservation Management Plan (CMP), should one exist for the Project area; • Work directly with the ECO to ensure the necessary assessment and requirements are implemented; and • Ensure all relevant staff receive the necessary training to implement the CFP and other requirements encapsulated within the CMP.
Sasol-appointed Environmental Control Officer (ECO)	• Responsible for ensuring all activities and the potential risks to cultural heritage are considered by thorough implementation of this CFP. This includes the allocation of appropriate resources to undertake such assessments. These can include, but are not limited to: • External specialist consultants; and

Position	Responsibilities
	• Internal specialists; and • On-site inspection of earth moving activities during construction and/or operational phases in areas of archaeological sensitivity.

5 Potential Chance Finds

The greater study area[5] is known to comprise tangible and intangible heritage resources ranging from palaeontological through to the historical period. This section details the potential tangible cultural heritage resources that may be identified or accidentally exposed through implementation of the project.

5.1 Palaeontological Resources

Palaeontological resources are associated with specific geological contexts. These may manifest as fossil heritage exposed through surface outcrops or during construction activities. The Project area is underlain by the *Vryheid Formation*, a geological unit of very high palaeosensitivity. This formation is well-known for its abundant fossil plants. Common fossil plants that could be expected within the geological unit include *Glossopteris* leaves, roots and inflorescences and *Calamites* stems.

Table 4 presents a list of the fossils that may be exposed in the project area and Figure 1 below presents photographs depicting examples of select fossils.

5.2 Archaeological Resources

The regional cultural landscape is dominated by heritage resources attributed to the historical period, burial grounds and graves. This notwithstanding, the following archaeological resource types have been identified within the larger study area:

- Middle Stone Age (MSA) lithic artefacts;
- Later Stone Age (LSA) lithic artefacts; and
- Late Farming Community (LFC) stonewalling (although ceramics may also be present in the regional study area).

There is therefore potential to encounter these heritage resources through project activities. Figure 2 provides examples of the types of heritage resources that may be encountered in the project area.

[5] Refer to the heritage assessments completed as part of the EA processes outlined in Section 1 for a description of the study areas and the cultural heritage landscape.

Table 4: List of Possible Fossils

Plant group – Vryheid Fm	Genus and Species
Sphenophytes (horsetails)	*Sphenophyllum speciosum*
	Raniganjia kilburnensis
	Phyllotheca australis
	Phyllotheca lawleyensis
	Phyllotheca wetensis
	Schizoneura gondwanensis
Ferns	*Sphenopteris lobifolia*
Glossopterids	*Plumsteadia natalensis*
	Plumsteadia gibbosa
	Estcourtia vandijksii
	Estcourtia bergvillensis
	Rigbya arberioides
	Lidgettonia africana
	Lidgettonia mooiriverensis
	Lidgettonia inhluzanensis
	Lidgettonia lidgettonioides
	Lidgettonia elegans
	Glossopteris symmetrifolia
	Glossopteris loskopensis
	Ottokariaceae
	Lidgettoniaceae
Incertae sedis	*Noeggerathiopsis hislopi*
	Pagiophyllum vandijkii
	Taeniopteris estcourtiana
	Benlightfootia mooiensis

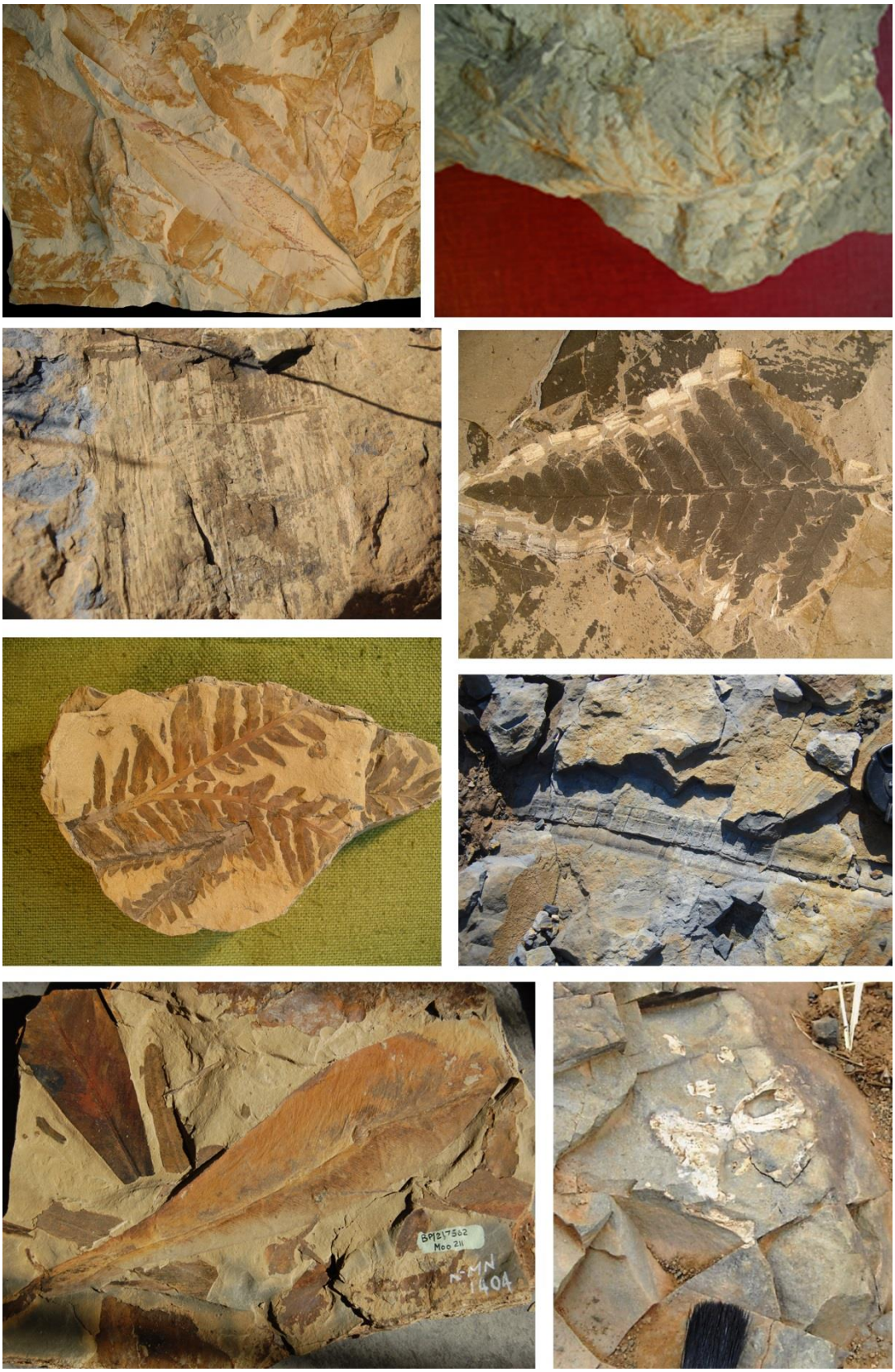
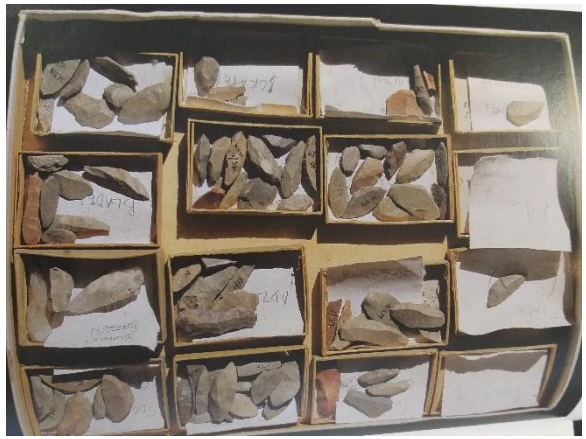


Figure 1: Selection of Fossil Plant Impressions of the *Glossopteris* flora

Figure 2: Examples of Potential Archaeological Resources and Graves

Example of MSA Lithics

Adapted from Esterhuysen & Smith (2007)



Examples of LSA Lithics

Adapted from Esterhuysen & Smith (2007)

Example of Stonewalling

Example of pottery sherds

Adapted from Huffman (2007)

Example of a concrete foundation which may be associated with the historical built environment

Example of burials marked with stone piles

Examples of burials with headstones

Example of a burial marked by a soil pile

6 Chance Finds Protocols

To reduce the intensity of potential impacts to unidentified palaeontological and archaeological resources, the procedure described in Figure 3 must be adopted and implemented during the construction and operational phase of the Project. This procedure is applicable to all resources defined in Section 3.

Figure 4 presents the project-specific Fossil Finds Procedure (FFP) and Figure 5 presents the Project-specific archaeological CFP. In these figures, PHRA stands for the Provincial Heritage Resources Authority. In this case, the PHRA is HFS.

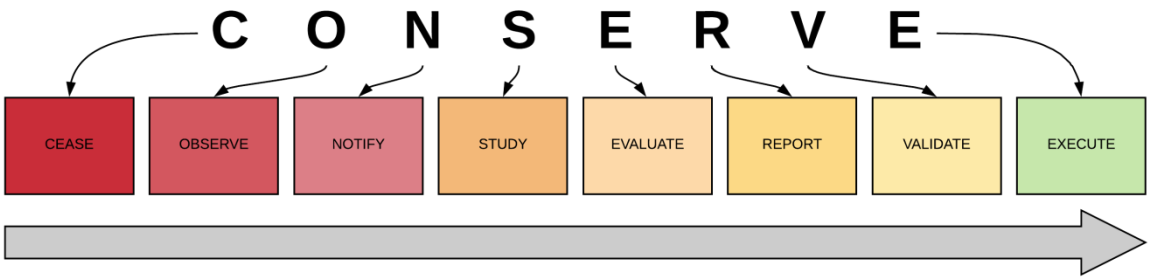
6.1 Burial Grounds and Graves

In the event that burial grounds and graves are accidentally exposed during construction and/or operational activities, Sasol must implement the CONSERVE Procedure. In addition to the steps outlined in Figure 3, the following additional requirements are applicable:

- The responsible person (Site Manager) must notify the South African Police Service (SAPS) and SAHRA Burial Grounds and Graves (BGG) Unit;
- The SAPS and SAHRA BGG Unit[6] must inspect the grave(s) to determine:
  - The temporal context of the graves, i.e. whether the burial is forensic, an authentic burial grave (an informal grave or a grave older than 60 years and which is afforded general protection under Section 36 of the NHRA) or archaeological (older than 100 years and afforded general protection under Section 35 of the NHRA); and
  - Whether additional graves or burials exist in the vicinity of the recently-identified grave(s).

[6] It must be noted, however, that SAHRA generally delegate their responsibility to archaeologist to inspect the grave site and submit a report on the findings to the SAHRA BGG Unit for consideration. Should this be required, Sasol must enlist the services of a suitably-qualified specialist to inspect the exposed burial(s) in consultation with the SAPS.

Figure 3: The CONSERVE Procedure



Cease	Upon identification of any heritage aspect, all works in the immediate vicinity must cease
Observe	The approximate extent of the chance find must be determined and protected from further disturbance. Where necessary, establish access controls and place visible markers and signage to identify the find.
Notify	In the absence of a specialist, i.e. palaeontologist or archaeologist, the identifier must inform the Site Manager / ECO of the find, and immediate management measures. A palaeontologist and/or archaeologist must then be notified by the Site Manager.
Study	A qualified specialist must complete a cursory assessment of the chance find. This can be accomplished through: • Telephonic correspondence with the ECO – verbal descriptions; • Emails - photographs; and • Site inspection by the specialist.
Evaluate	The qualified specialist will evaluate the chance find to determine the extent of the exposure, whether any protections in terms of Sections 34, 35 or 36 are applicable, and what minimum management and/or mitigation measures are required.
Report	The designated responsible person must ensure suitable reporting and documentation is undertaken. Documentation must start with the initial find report and include records of all action taken, persons involved and contacted, comments received and any findings. All records must be supplied to SAHRA and HFS for adjudication.
Validate	SAHRA and HFS must validate the preceding steps through issuing of formal comment to: • Prescribe additional management and/or mitigation measures required; • Consent to continuation of work in the immediate vicinity of the chance find.
Execute	Execute the required management and/or mitigation measures or recommence with work.

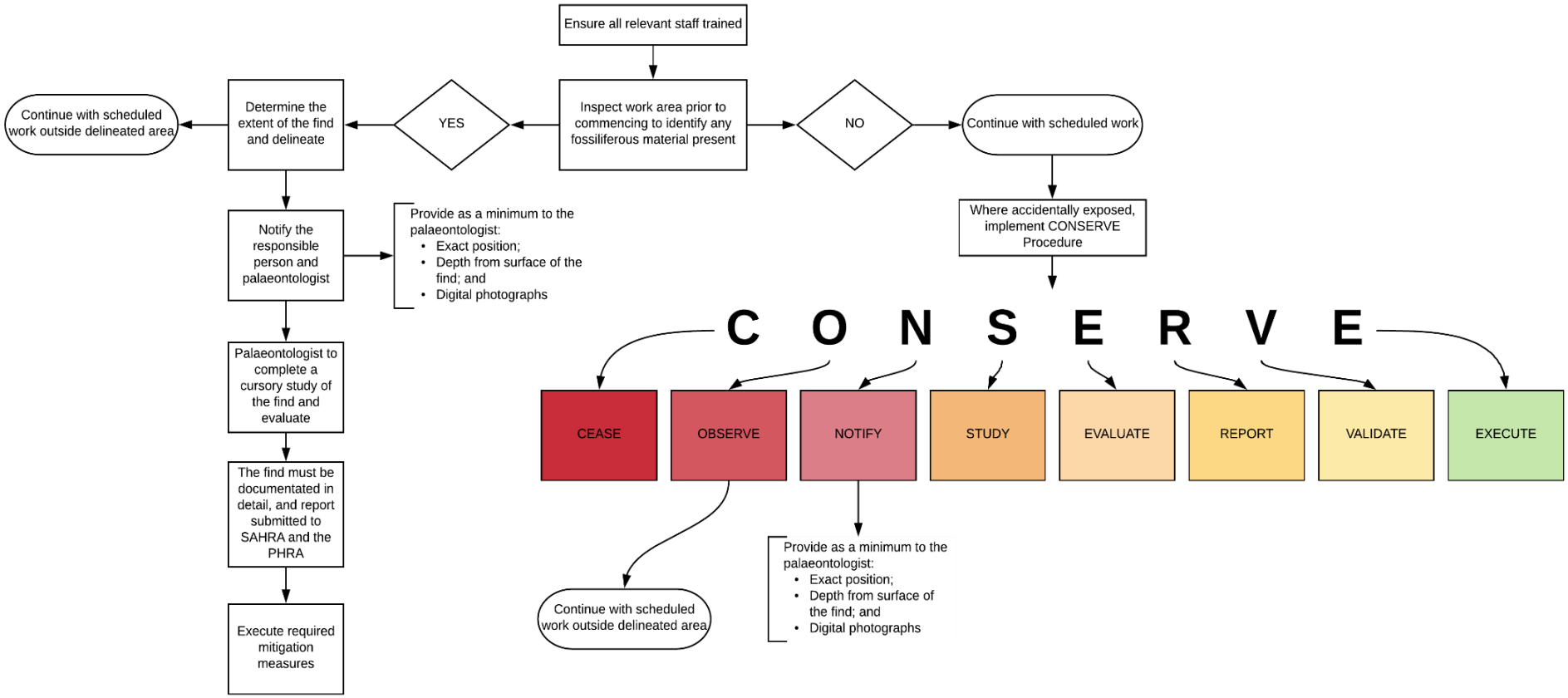


Figure 4: Recommended Fossil Finds Procedure

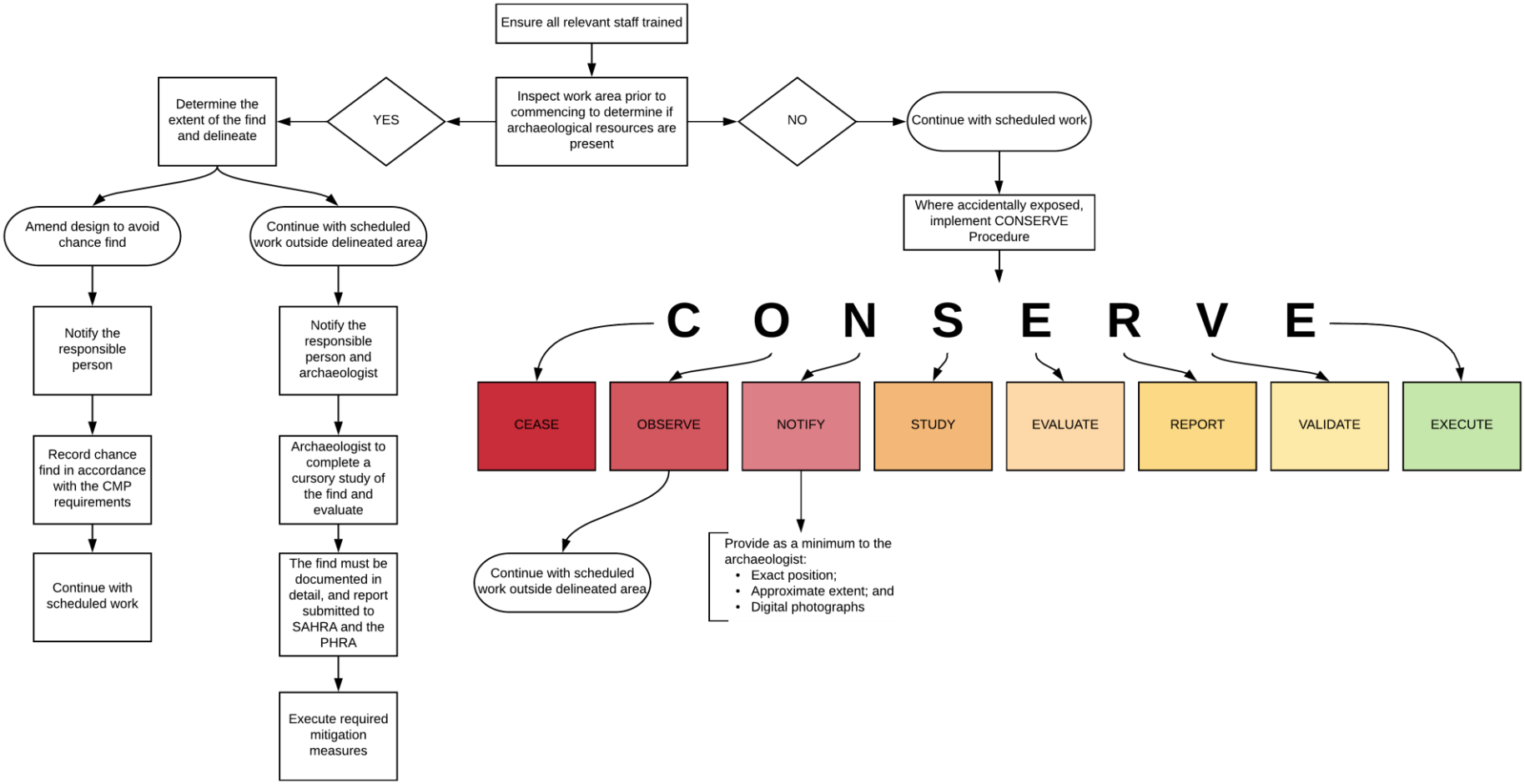


Figure 5: Recommended Archaeological Finds Procedure

7 Rescue Excavation and Major Finds

A rescue excavation refers to a mitigation strategy wherein palaeontological or archaeological resources are removed from the context in which they were identified within a short timeframe. This applies to finds where the amount of finds or the significance of the find(s) is circumscribed, and it is feasible to remove the material without compromising the contextual data. The strategy employed during these mitigations depends on several factors regarding the find and its context. The time span for these excavations is less than one week and is usually between one and three days.

If the resource cannot feasibly be rescued in that timeframe without compromising the detailed material recovery and contextual observations, these resources are considered a Major Find. These require a more careful, controlled excavation. In the event a Major Find is encountered, there are two options:

- *Avoidance*: the Major Find is avoided through a redesign of the project and layout or a relocation of project infrastructure. This ensures minimal impact to the site. The find site will require site-protection measures, including the demarcation of the site, stabilising the site and refilling the excavation. This option is preferred should the excavation of the find site be delayed substantially or indefinitely; or
- *Emergency Excavation*: this refers to a situation in which avoidance is not possible due to design, financial and/or time constraints. This option can delay construction and add time constraints to the excavation, which could lead to irrevocable compromise of the quality of scientific information of the find. The emergency excavation is generally not the preferred option for a Major Find.

These alternatives must be discussed and decided upon in conjunction with the relevant responsible persons before the mitigation measure is implemented for the Major Find. A Major Find must be reported to SAHRA as per the CONSERVE protocol. Should an *emergency excavation* be necessary, Sasol Mining must obtain the correct permit issued in terms of Section 35 of the NHRA and in compliance with the requirements of Chapter IV of the NHRA Regulations.

8 Conclusion

The CFPs presented in this document serve as an international best practise policy for the accidental discovery of palaeontological and archaeological resources. Based on the definitions within this document and the proposed lines of communication, Sasol Mining will be able to mitigate the accidental exposure of heritage resources, palaeontological resources and burial grounds and graves throughout the construction and operational phases of the project. Where necessary, the Digby Wells HRM Unit is available to assist with the recommendations for the mitigation of accidental discoveries or the exposure of chance finds.