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**Phase 1 Heritage Impact Assessment for Section 24G rectification process and Water Use License Application for the chrome crushing, screening and washing plant on portion 8 of the Boshhoek 103 JQ in Rustenburg, Bojanala Platinum District Municipality, North West Province.**



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**Archaeology and Heritage Services**

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**DECLARATION OF INDEPENDENCE**

This report has been compiled by Makhosazana Mngomezulu, principal archaeologist and heritage consultant. The views expressed in this report are independent of the author and no other interest was displayed during the decision making process for the establishment of a chrome crushing, screening and washing plant.

SIGNATURE:



## TERMINOLOGY

<b>BP</b>	Before Present
<b>EIA</b>	Early Iron Age
<b>MIA</b>	Middle Iron Age
<b>LIA</b>	Late Iron Age
<b>ESA</b>	Early Stone Age
<b>MSA</b>	Middle Stone Age
<b>LSA</b>	Late Stone Age
<b>ya</b>	years ago
<b>Ibid</b>	<i>Ibidem</i> , Latin word meaning same as the previous source
<b>HIA</b>	Heritage Impact Assessment
<b>NWPHRA</b>	North West Provincial Heritage Resources Authority
<b>SAHRA</b>	South African National Resources Agency
<b>NHRA</b>	National Heritage Resources Act
<b>SAPS</b>	South African Police Services

## DEFINITIONS

ESA dates between 2 million ya to 2 00 000 BP. Industries associated with this time period includes Oldowan, Acheulean and Fauresmith. ESA stone tools include hammer stones, flakes, cores, handaxes and cleavers (Pelsler 2009).

MSA dates between 2 00 000 and 25 000 to 20 000 BP, this varies with location. Industries associated with this time period includes the Howieson's Poort. The stone tools which characterise this period include scrapers, blades, points and flake.

LSA which dates between 25 000 and 20 000 to 2 000 BP. Stone tools of this period are characterised by their small size; this includes backed knives and borers (Pelsler 2009).

EIA dates to AD 200 – 900 (Huffman 2007).

MIA dates to AD 900 – 1300 (ibid).

LIA dates to AD 1300 – 1840 (ibid).

## EXECUTIVE SUMMARY

Mineral Waste Management has established a chrome crushing, screening and washing plant for commercial purposes. In addition to the plant, the company requires water for use at the plant, thus has drilled two boreholes for use as process and portable water respectively.

According to Section 38 of the National Heritage Resources Act (Act 25 of 1999) "(1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-

"...(c) any development or other activity which will change the character of a site—

(i) exceeding 5 000 m<sup>2</sup> in extent;..." (see Appendix A for Section 38 of the Act), should conduct a Phase 1 Heritage Impact Assessment. This is to determine if there are any heritage resources within the existing operational site and how they will be impacted. If any resources are found, mitigation measures and recommendations for the protection of such resources needs to be provided. The report will be submitted to the Provincial Heritage Resources Authority of Gauteng Province for comments and for a decision as per the National Heritage Resources Act (Act No 25 of 1999).

Upon completion of the physical survey, four graves were found 13m away from the boundary of the established plant. The four graves were unmarked and only had crosses as a marker.

Graves are of high significance. It was established that all four graves are less than 60 years old however they are still protected by the National Heritage Resources Act (Act 25 of 1999)

Section 36 (see Appendix A for the Legislation).

These graves are currently not impacted on, but in a position to be possibly impacted if mitigation measures proposed are not applied. Such will occur should the contractor go beyond the current operations area.

### Impact Assessment

The following conclusions were made on the evaluation of graves found on site in relation to the project.

Heritage Resource Identified	Significance	Recommended Mitigation	Coordinates
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Graves		Conservation, mitigation not advised	25°30'1.53"S 27°04'57.97"E
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The table below indicate the extent of the impact **WITHOUT** mitigation measures.

Aspect	Description	Weight
<b>Probability</b>	Definite	5
<b>Duration</b>	Permanent	5
<b>Scale</b>	Site	2
<b>Magnitude/Severity</b>	High	8
<b>Significance</b>	Sum (Duration, Scale, Magnitude) x Probability	
	High	>60

The results showed >60; which means without mitigation measures, the graves will definitely be impacted and its impact may render the project unacceptable.

The table below indicate the extent of the impact **WITH** mitigation measures.

Aspect	Description	Weight
<b>Probability</b>	Probable	2
<b>Duration</b>	Long term	4
<b>Scale</b>	Local	1
<b>Magnitude/Severity</b>	Medium	6
<b>Significance</b>	Sum (Duration, Scale, Magnitude) x Probability	

	Low	>20≤40
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The results showed >20≤40; which means with mitigation measures, the impact on the graves may be possibly eliminated however; the score may not be brought down to below 20 given the position of the graves in relation to the plant. The impact is limited to an extent, and though it may not interfere with the progress of the project, it still require management intervention.

### Recommendation

- During the operational phase of the project, the contractor should keep within the operational boundaries to avoid impacting on the aforementioned graves.
- The applicant has two options in dealing with the graves found on site; namely, incorporating/keeping them within the operational site or relocating them.
  - Should the applicant choose to keep the graves on site, they must be barricaded by fence and gate with a distance of 5m around the graves to the fence. The gate is to allow access to the families affected should they need to visit;
  - Should the applicant choose to remove the graves, the process of graves relocation must be followed as stated in Section 36 (4); (5)(a)(b) of the NHRA (Act No. 25 of 1999) (see appendix A).
- The applicant should induct employees on the importance of these heritage resources and that they should not be impacted in any way.
- Should any heritage resources be found on site in areas that could not be thoroughly accessed due to thick vegetation, be it archaeological artifacts such as stone tools and pottery; graves and structures older than 60 years old; the applicant should immediately cease with the activity that would have exposed such and report the incident to the relevant authorities. A heritage expert should be called on site to assess the significance, the impacts and provide mitigation measures.
- The possibility of uncovering unearthed burial grounds and graves within or around the operational area should not be ruled out. Should potential human remains be found on site, the contractor who is also the applicant should immediately cease construction and the South African Police Service and the applicant should also be contacted.

## Conclusion

It is concluded based on the findings of the survey (being that the operational area will not directly impact on the identified graves near the site) that the establishment of the plant and the subsequent operation thereof may proceed provided mitigation measures are implemented. The final report will be submitted to NWPHRA for review and based on the findings we recommend that NWPHRA grant the Mineral Waste Management the approval to proceed with the operations of the chrome plant in terms of the Heritage Resources Act (Act No.25 of 1999).

## Project Structure

<b>Introduction</b>	<ul style="list-style-type: none"><li>• Report background</li><li>• Methodology</li><li>• Assumptions &amp; limitations</li></ul>
<b>Project locality</b>	<ul style="list-style-type: none"><li>• Location (include mapping)</li><li>• Heritage Background</li></ul>
<b>Findings</b>	<ul style="list-style-type: none"><li>• Types of findings</li><li>• Mapping of findings</li><li>• Assessment of findings</li><li>• Level of significance</li><li>• Possible impacts</li></ul>
<b>Discussion</b>	<ul style="list-style-type: none"><li>• Evaluation of findings in relation to the existing operational site</li><li>• Evaluation of findings in relation of the historical background of the study area</li></ul>
<b>Recommendations &amp; conclusion</b>	<ul style="list-style-type: none"><li>• Mitigation measures</li></ul>
<b>Additional Information</b>	<ul style="list-style-type: none"><li>• Applicable Legislation</li><li>• Site layout and diagrams</li></ul>

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## 1. INTRODUCTION

Vungandze Projects was appointed by NTC Environmental Services to conduct a heritage impact study for the established chrome crushing, screening and washing plant for commercial purposes by Mineral Waste Management. In addition to the plant, the company requires water for use at the plant, thus has drilled two boreholes for use as process and portable water respectively. The farm was chosen as a result of previous similar activities having taken place on site, thus it would be more beneficial for Mineral Waste Management to establish their plant making use of some of the existing infrastructure and upgrading them where necessary.

According to Section 38 of the National Heritage Resources Act (Act 25 of 1999) “(1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-

“...(c) any development or other activity which will change the character of a site—

(i) exceeding 5 000 m<sup>2</sup> in extent;...” (see Appendix A for Section 38 of the Act), should conduct a Phase 1 Heritage Impact Assessment. This is to determine if there are any heritage resources within the existing operational site and how they will be impacted. If any resources are found, mitigation measures and recommendations for the protection of such resources needs to be provided.

## 2. TERMS OF REFERENCE

The approach used for this report was:

- To undertake a Phase 1 HIA in accordance with the National Heritage Resources Act, 1999 (Act no. 25 of 1999);
- To identify and map all heritage resources in the area affected and surrounds, as defined in Section 3 of the National Heritage Resources Act (Act No. 25 of 1999), including archaeological sites on or close (within 100m) to the operational;
- To assess the significance of any identified resources in terms of the heritage assessment criteria as set out in the SAHRA regulations;

- To provide mitigation measures to safeguard heritage resources; and
- To comply with specific requirements and guidelines of the North West Provincial Heritage Resources Authority (NWPHRA).

### 3. METHODOLOGY

The physical survey was conducted and completed on 18 April 2015. This report was prepared according to the National Heritage Resources Act (Act No 25 of 1999). Background research of the study area was conducted using literature such as books, journals, previously conducted Heritage Impact Assessments (HIAs) on the study area and the internet before and after the site visit. The purpose of the research prior to the physical survey was to acquire information as to what to expect in the study area, the site visit itself was completed to identify heritage resources that may be impacted on due to the existing operation.

Heritage resource means any place or object of cultural significance (NHRA No. 25 of 1999). The National Heritage Resources Act 1999 (Act No. 25 of 1999) was used as a source of reference to identify what is known as a heritage resource (see Appendix A for list of heritage resources).

The survey was conducted on foot in order to locate any heritage resources within the existing operational site. Interviews were also conducted, one with the security guard found on site and another with the local who resides near the site; and two telephonic ones with the Councillor of the area (Ms Semakane) and the property owner (Mr Comacho). The table from SAHRA Regulations will be used to grade the significance of the heritage resources found.

The determination of the effects of environmental impact on an environmental parameter is determined through a systematic analysis of the various components of the impact. This is undertaken using information that is available to the environmental practitioner through the process of the BAR and/or WULA. The impact evaluation of predicted impacts was undertaken through an assessment of the significance of the impacts. This is in line with specialist requirements as required by the client. For example, the request that:-

The impact methodology (should) concentrate on addressing key issues. This methodology to be employed in the report thus results in a circular route, which allows for the evaluation of the efficiency of the process itself.

Table 1: Site significance rating according to SAHRA.

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
National Significance (NS)	Grade 1	-	Conservation; National Site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; Provincial Site nomination
Local Significance (LS)	Grade 3A	High Significance	Conservation; Mitigation not advised
Local Significance (LS)	Grade 3B	High Significance	Mitigation (Part of site should be retained)
Generally Protected A (GP.A)	-	High / Medium Significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium Significance	Recording before destruction
Generally Protected C (GP.A)	-	Low Significance	Destruction

***The following Assessment Criteria is used for Impact Assessment***

Impacts can be defined as any change in the physical-chemical, biological, cultural and or socio-economic environmental system that can be attributed to humans. The significance of the aspects/impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

***The significance of the impacts will be determined through a synthesis of the criteria***

**below:**

**Probability:** describes the likelihood of the impact actually occurring

- **Improbable:** the possibility of the impact occurring is very low, due to the circumstances, design or experience.
- **Probable:** there is a probability that the impact will occur to the extent that provision must be made therefore.
- **Highly probable:** it is most likely that the impact will occur at some stage of the development.
- **Definite:** the impact will take place regardless of any prevention plans and there can only be relied on mitigatory measures or contingency plans to contain the effect.

**Duration:** the lifetime of the impact

- **Short Term:** the impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.
- **Medium Term:** the impact will last up to the end of the phases, where after it will be negated.
- **Long Term:** the impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.
- **Permanent:** the impact is non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

**Scale:** the physical and spatial size of the impact

- **Local:** the impacted area extends only as far as the activity, e.g. footprint
- **Site:** the impact could affect the whole or measurable portion of the above mentioned properties.
- **Regional:** the impact could affect the area including the neighbouring residential areas.

**Magnitude/Severity: Does the impact destroy the environment, or alter its function**

- **Low:** the impact alters the affected environment in such a way that natural processes are not affected.
  - **Medium:** the affected environment is altered, but functions and processes continue in a modified way.
  - **High:** function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

**Significance:** This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

- **Negligible:** the impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.
- **Low:** the impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.
- **Moderate:** the impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.
- **High:** The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

The significance is calculated by combining the criteria in the following formula:

Sum (Duration, Scale, Magnitude) x Probability (*Table -2*)

S = Significance weighting; Sc = Scale; D = Duration; M = Magnitude; P = Probability

*Table 2: The significance weighing for each potential impact are as follows:*

Aspect	Description	Weight
<b>Probability</b>	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
<b>Duration</b>	Short term	1
	Medium term	3
	Long term	4
	Permanent	5

<b>Scale</b>	Local	1
	Site	2
	Regional	3
<b>Magnitude/Severity</b>	Low	2
	Medium	6
	High	8
<b>Significance</b>	Sum (Duration, Scale, Magnitude) x Probability	
	Negligible	≤20
	Low	>20≤40
	Moderate	>40≤60
	High	>60

The significance of the graves will be rated without mitigation measures (WOM) and with mitigation (WM) measures for the operational phase.

### 3.1 Assumptions

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It is assumed that the study area (operational area) may yield no heritage resources since the site is already disturbed. It is further assumed that on the farm area there might be other burial grounds and graves given that prior to the site visit, the client brought it to our attention that there are informal graves next to the operational area.

### 3.2 Limitations

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No limitations were encountered on the actual operational area, however, during the physical survey the surrounding area that marks the entire farm was not easily accessible due to dense vegetation. This made it difficult to identify any other heritage resources (apart from identified graves) that could possibly be on site.

#### 4. LOCALITY AREA

The established chrome crushing, screening and washing plant is located on Portion 8 of the farm Boshhoek 103 JQ in the Rustenburg area (see figures 1 and 2).

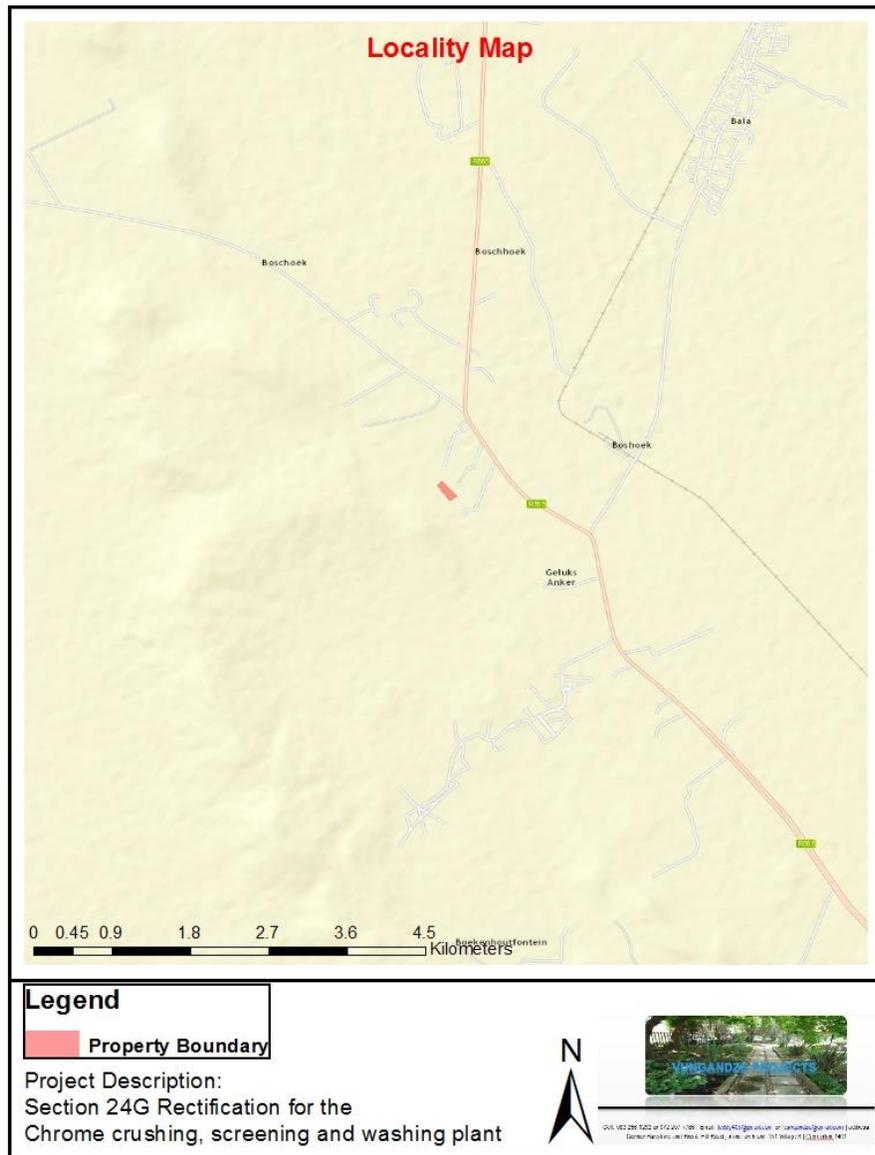


Figure 1: Locality map of the study area.

**Commented [KM1]:** The square next to the road in the middle is the study area (see legend). It is zoomed out to show the entirety of the area. The authorities require 1:50 000 map to show if the specialist is not hiding anything that is potential of heritage significance, hence I would include this map and the aerial which is more focused to show the area under study. There are sites nearby as discussed in the literature that are known of have archaeological thus we need to show they are not close enough to be affected



Figure 2: Aerial view of the study area.

**5. IMAGES OF THE RECEIVING ENVIRONMENTAL OF THE EXISTING OPERATIONAL PLANT**



*Figure 3: Material found on site.*



*Figure 4: North view of the study area*



*Figure 5: West view of the study area*



Figure 6: East view of the study area.



Figure 7: South view of the study area



Figure 8: Access roads to the site



Figure 9: Borehole southeast of the operational area.

## 6. HISTORICAL BACKGROUND OF THE STUDY AREA

History of human activity in South Africa, as in all parts of the world, dates back to millions of years. It is important to elaborate as far back in time to enable the reader to understand what is meant by archaeological material and why is it declared a heritage resource. Archaeological materials are divided into two periods, the Stone Age and the Iron Age. Late Iron Age marks the transition between prehistory and history, a period of colonial era until recent.

### 6.1 Stone Age Archaeology:

The Stone Age is a time period that dates between 2 million years ago (ya) to 2000 ya. Due to the vast character found within stone tools of this period, it was then divided into three phases; Early Stone Age (ESA), Middle Stone Age (MSA) and the Late Stone Age (LSA). ESA dates between 2 million ya and 2 00 000 Before Present (BP). Industries associated with this time period includes Oldowan, Acheulean and Fauresmith. ESA stone tools include hammer stones, flakes, cores, handaxes and cleavers (Pelsner 2009). The more refined stone tools appeared during the MSA. MSA dates between 2 00 000 and 25 000 to 20 000 BP, this varies with location. Industries associated with this time period includes the Howieson's Poort. The stone tools which characterise this period include scrapers, blades, points and flake. Lastly is the LSA which dates between 25 000 and 20 000 to 2 000 BP. Stone tools of this period are characterised by their small size; this includes backed knives and borers (Pelsner 2009).

## 6.2 Iron Age Archaeology

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According to Huffman (2007) Iron Age marks the early evidence of farming community in southern Africa. Animal husbandry, crop farming, pottery and metal working were introduced which in due time liberated hunter gatherers to change their way of life which is less mobile (Carruthers 1990). Due to vast technological discrepancies and settlement pattern within this period, it was divided into three. The Early Iron Age (EIA) dates to AD 200 – 900, Middle Iron Age (MIA) dates to AD 900 – 1300, and the Late Iron Age (LIA) dates to AD 1300 – 1840 (Huffman 2007).

Rustenburg, known as 'the richest tribe in Africa' because of their mineral wealth, the Fokeng have been based at Phokeng north of Rustenburg since the end of the 17th century. They now speak Tswana, but archaeological evidence indicates an earlier Nguni origin in KwaZulu-Natal.

According to oral traditions, their legendary place of origin is the hill Ntsuanatsatsi just south of the Vaal River. There in the Free State, a diagnostic type of stonewalling and pottery characterised early Fokeng settlements (see pre-history of Bloemfontein). Known as Type N walling and Ntsuanatsatsi pottery, the distribution of this complex marks the movement of people in the 'Fokeng cluster' north across the Vaal River into the Gauteng and North West provinces. This movement probably dates to the mid 16th century, predating the lifespan of meaningful oral traditions about specific leaders.

Once in the greater Rustenburg area, Fokeng met various Sotho-Tswana people. Through intermarriage and other forms of interaction, the Fokeng were 'Sotho-ised'. As part of this process, their type of walling changed somewhat to what is now called Klipriviersburg and the pottery to Uitkomst. Besides Fokeng, groups today with this second complex of stonewalling and pottery include Tlokwa and BaPo. In the early 19th century, the BaPo had their capital at the base of Wolhuterskop southeast of Rustenburg. Their historic leader, Mogale, gave his name to the Magaliesberg (Carruthers 2000). Together these groups form the 'Fokeng cluster'.

As a result of the interaction, Sotho-Tswana speakers adopted stonewalling. In the Rustenburg area, they built the Molokwane type, named after a well-known settlement (also called Selonskraal) west of Rustenburg. In the late 19th century, Molokwane was the capital of the Modimosana Mmatau BaKwena, and housed up to 20 000 people. Archaeologists have excavated a small part of Molokwane and most of a similar settlement near the Olifantspoort Dam (Pistorius 1992). One of the walling differences has to do with the location of small stock

kraals. In the two types of Fokeng settlements, sheep/goat kraals were attached to the outer wall, and thus at the back of the residential area. In contrast, sheep and goats were penned at the front of the residential zone in Sotho-Tswana settlements. Further, stone arcs in the outer wall marked the back of a married woman's household at Molokwane and Olifantspoort. This 'bi-lobial' arrangement characterises all Sotho-Tswana settlement patterns, and this feature was adopted by Fokeng as they became more Sotho-like.

The large size of Molokwane and other contemporaneous settlements was a reaction to the troubled times known as the difaqane (Sotho), or mfecane (Nguni) that started in the late 18th century. At this time, Sotho-Tswana people aggregated around their leaders for mutual defence. Since then, urban clusters (rather than dispersed homesteads) have been a characteristic of Sotho-Tswana life.

Another kind of stonewalled settlement also dates to the Late Iron Age in the Rustenburg region. Located on hill slopes, stone-lined cattle tracks and house terraces follow a front/back axis that identifies the occupants as Southern Nguni. These people were probably the ancestors of present-day Tlhako, neighbours of the Fokeng.

When Mzilikazi moved from KwaZulu-Natal to here in about 1826, he incorporated many local people, including Fokeng. This combined nation created another stonewalled type, called Doornspuit (after the farm where it was first recognised). From the air, these recent settlements resemble a beaded necklace: long scalloped walls enclosed houses, kitchens and small stock, while cattle stayed inside wooden byres inside a large open space. This pattern appears to be a stonewalled version of a Zulu military kraal.

A favourable environment is one of the reasons why African farmers moved into the Rustenburg area. The underlying igneous rocks produce a rich, dark soil ideal for sorghum cultivation. Although the area suffers occasional dry spells, as elsewhere, the numerous hills ensure that it is generally well watered, and it suffers few frosts. In addition, the availability of iron and copper ores was another attraction. The Tlokwa was one group to exploit these mineral resources. Tlokwa mined copper ores from a shallow deposit not far from their capital town of Marothodi west of the Pilanesberg (Boeyens & Hall 2009). Archaeologists have uncovered numerous iron and copper smelters there in the 'no man's land' in between the stonewalled homesteads. Metal workers, on the other hand, worked secondary crucible furnaces for copper in small enclosures attached to the outer wall of the residential zone. This location is probably part of a complex of

ideas that associate women with copper and men with iron. Research here has helped to clarify copper production at farming settlements elsewhere in southern Africa that lack stonewalling.

Research here has also helped to bridge the gap between history and archaeology. Oral traditions, early historic records and archaeology all point to a complex mix of Sotho-Tswana (Kwena) as well as Southern (Tlhako) and Northern Nguni people (Fokeng, BaPo and Tlokwa) before Europeans entered the area. Historical archaeologists are now actively researching the complexity of this ethnic mix.

In the Magaliesberg area, evidence of smelting and metal working comes mainly from three sites; Broederstroom in Pretoria, Uitkomst in Krugersdorp and; Olifantspoort in Rustenburg. The area of Magaliesberg extends from the west of the Rustenburg to the east of Pretoria in the Transvaal. This area is rich in two main resources that are needed in metal working; ore and wood. Hills and Ridges such as the Timeball Hills and Daspoort Ridges consisted of ironstone and (was) very densely wooded, which meant enough wood supply required for charcoal (Friede 1977). The remains found in the Olifantspoort settlement dated from MIA (1000AD) to LIA (1800AD). Such remains include a smelting furnace and some slag-like material.

## 7. FINDINGS

During the physical survey, four graves were found approximately 13m west from the boundary of the established chrome crushing, screening and washing plant (see figure 10). According to Ms Diphney Semakane, a community leader of the area, three burials belong to the Maboyane family and the other to their relative, the Makgakge family. She further explained that the graves date to the 1990s and to the best of her knowledge, there are no any other graves on site.

Furthermore, a borrow pit was found approximately 50m northeast of the graves. According to the current landowner, Mr Alex Comacho, the borrow pit was as a result of the construction of the road nearby.

These graves are less than 60 years old however are still protected by the NHRA, Act 25 of 1999 Section 34 (see Appendix A the legislation).



*Figure 10: Four graves found on site.*



*Figure 11: Borrow pit found on site.*



Figure 12: Aerial map depicting the location of graves in relation to the boundary of the established plant.

## 8. IMPACT ASSESSMENT

As per the telephone communication with Ms Semakane and Mr Comacho, the area was previously leased to a plant operator and later to a contractor for the extraction of road construction material, hence the borrow-pit. Both the leaseholders were made aware of the existing graves. Similarly, the current lease holder (Mineral Waste Management, has been made aware of the graves and has subsequently excluded the grave area in his site plan.

The chrome crushing, screening and washing plant currently in operation has the possibility of impacting the graves found on site. This section evaluate the extent of these impacts in relation to the project under study.

Using table 1, the structures identified on site can be rated as follows:

Table 3: Rating of the structures found on site.

Heritage Resource Identified	Significance	Recommended Mitigation	Coordinates

Graves		Conservation, mitigation not advised	25°30'1.53"S 27°04'57.97"E
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Table 4: Evaluation of the impacts of the chrome crushing, screening and washing plant on the graves **WITHOUT** mitigation measures.

Aspect	Description	Weight
<b>Probability</b>	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
<b>Duration</b>	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
<b>Scale</b>	Local	1
	Site	2
	Regional	3
<b>Magnitude/Severity</b>	Low	2
	Medium	6
	High	8
<b>Significance</b>	Sum (Duration, Scale, Magnitude) x Probability	
	Negligible	≤20
	Low	>20≤40
	Moderate	>40≤60
	High	>60

Results:  $5+2+8 \times 5 = 75$  i.e  $>60$

This means without mitigation measures, the graves will definitely be impacted and its impact may render the project unacceptable

Table 5: Evaluation of the impacts of the chrome crushing, screening and washing plant on the graves **WITH** mitigation measures.

Aspect	Description	Weight
<b>Probability</b>	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
<b>Duration</b>	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
<b>Scale</b>	Local	1
	Site	2
	Regional	3
<b>Magnitude/Severity</b>	Low	2
	Medium	6
	High	8
<b>Significance</b>	Sum (Duration, Scale, Magnitude) x Probability	
	Negligible	$\leq 20$
	Low	$>20 \leq 40$
	Moderate	$>40 \leq 60$
	High	$>60$

Results:  $4+1+6\times 2 = 22$  i.e.  $>20 \leq 40$

This means with mitigation measures the impact on the graves may be possibly eliminated however; the score may not be brought down to below 20 given the position of the graves in relation to the plant. The impact is limited to an extent, and though it may not interfere with the progress of the project, it still require management intervention.

### 8.1 Site Significance

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The level of significance of the site and the cultural resources varies between social, historical, spiritual, scientific and aesthetic value.

**Social value** is when a place has become a focus of spiritual, political, national, or other cultural sentiments to a majority or minority group. This may be because the site is accessible and well known, rather than particularly well preserved or scientifically important (SAHRA Regulations). There was no physical evidence of religious activities such as well-used areas where people worship; white-washed stones that designate areas of worship, etc. The study area appears to have social value. The family whose graves belong to identify the place as having social value. It has spiritual significance due to ancestral beliefs.

**Historical value** refers to areas where historical events took place, and such events have high significance either locally, regionally, provincially or nationally. The area showed no historical significance where the chrome plant operates.

**Scientific value** refers to the importance of the study area for research purposes. The study area seemed to have no scientific value.

**Aesthetic value** refers to the unique beauty of the site. The study area showed no structures of aesthetic value.

Based on the above conclusions, the site yield heritage significance and social value with spiritual attachment, therefore the heritage resources found will be impacted by the operations of the chrome plant.

## 9. DISCUSSION

The study area is surrounded by areas with known history; areas that have been well recorded and contain rich prehistoric sites. Rustenburg is well known for its mineral wealth which have been mined since the 18<sup>th</sup> Century. The availability of iron and copper ore was one of the attractions that drew Iron Age farmers to the area apart from the underlying igneous rock which produce rich dark soil ideal for sorghum cultivation. One of the known groups to settle in the area was the Tlokwa, and it is this group that exploited these mineral resources. Tlokwa mined copper ores from a shallow deposit not far from their capital town of Marothodi west of the Pilanesberg. Archaeologists have uncovered numerous iron and copper smelters there in the 'no man's land' in between the stonewalled homesteads. Pilanesberg is located approximately 30km north of the area under study.

Other sites known to have evidence of Iron Age settlers was in the area of Olifantspoort. Stonewalling with characteristics of the N type was found in these sites. Type N walling is associated with the Fokeng. The Fokeng are a group which have been based at Phokeng north of Rustenburg since the end of the 17th century. They now speak Tswana, but archaeological evidence indicates an earlier Nguni origin in KwaZulu-Natal. The type N walling derives its name from the Ntsuanatsatsi, a hill south of the Vaal River where they are known to have originated. Olifantspoort is located approximately 50km southeast of the study area.

Although these sites are situated far from the study area, they are deemed important in a sense that they assist in understanding the receiving environment of the Rustenburg area close to site and possibly the movement of people within the area. As the study area is situated between Pilanesberg and Olifantspoort, there is a possibility that the area under study was once in contact with the Iron Age farmers; however, under the research conducted nothing confirms such.

As per the telephonic confirmation, the existence of the graves found on site is known. All operations, existing and old have avoided the graves. Although the graves are in close proximity to the established chrome plant, their impact can be lowered by implementing the proposed mitigation measures.

## 10. RECOMMENDATIONS

Four graves were found 13m away from the boundary of the established plant. The four graves were unmarked and only had crosses as a marker. Graves are of high significance. All four graves are less than 60 years old but they are still protected by the National Heritage Resources Act (Act 25 of 1999) Section 36 (see Appendix A for the Legislation).

These graves are currently not impacted but in a position to be possibly impacted if the proposed mitigation measures are not applied. Such will occur should the applicant go beyond the current operation area. The following mitigation measures are proposed:

- During the operational phase of the project, the contractor should keep within the operational boundaries to avoid impacting on the aforementioned graves.
- The applicant has two options in dealing with the graves found on site; namely, incorporating/keeping them within the operational site or relocating them.
  - Should the applicant choose to keep the graves on site, they must be barricaded by fence and gate with a distance of 5m around the graves to the fence. The gate is to allow access to the families affected should they need to visit;
  - Should the applicant choose to remove the graves, the process of graves relocation must be followed as stated in Section 36 (4); (5)(a)(b) of the NHRA (Act No. 25 of 1999) (see appendix A).
- The applicant should induct employees on the importance of these heritage resources and that they should not be impacted in any way.
- Should any heritage resources be found on site in areas that could not be thoroughly accessed due to thick vegetation, be it archaeological artifacts such as stone tools and pottery; graves and structures older than 60 years old; the applicant should immediately cease with the activity that would have exposed such and report the incident to the relevant authorities. A heritage expert should be called on site to assess the significance, the impacts and provide mitigation measures.
- The possibility of uncovering unearthed burial grounds and graves within or around the operational area should not be ruled out. Should potential human remains be found on site, the contractor who is also the applicant should immediately cease construction and the South African Police Service and the applicant should also be contacted.

**Commented [TN2]:** As part of fencing the graves, should they not be marked in consultation with the family members if they can be located???

**Commented [KM3R2]:** Not necessarily. Remember the fence is only a buffer to protect the graves from the site operations, no harm done. And looking at the history of the area under study, these graves are known and have been avoided during past operations. The proposed mitigation is only a precautionary measure for the applicant who by the way know and have avoided the graves. Besides, the property owner and the local leader are well aware of the operation, therefore should there be any changes that will affect the graves, they can be first point of contact; and based on conversation with both of them, the families are known/traceable.

## 11. CONCLUSION

It is concluded based on the findings of the survey (being that the operational area will not directly impact on the identified graves near the site) that the existing plant may proceed provided mitigation measures provided are implemented. The final report will be submitted to NWPHRA for review and based on the findings we recommend that NWPHRA grant the Mineral Waste Management the approval to proceed with the operations of the chrome plant in terms of the Heritage Resources Act (Act No.25 of 1999).

## 12. REFERENCES

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**APPENDIX A**  
LIST OF LEGISLATION APPLICABLE TO THE SITE

## 13. LEGISLATION

National Heritage Resources Act 25 of 1999

### 13.1 Section 3 of the NHRA 25 of 1999

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According to Section 3 under National Estate of the National Heritage Act 25 of 1999 the heritage resources in South Africa includes the following:

“(1) For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.

(2) Without limiting the generality of subsection (1), the national estate may include –

- (a) places, buildings, structures and equipment of cultural significance;
- (b) places to which oral traditions are attached or which are associated with living heritage; (c) historical settlements and townscapes;
- (d) landscapes and natural features of cultural significance;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and paleontological sites;
- (g) graves and burial grounds, including—
  - (i) ancestral graves;
  - (ii) royal graves and graves of traditional leaders;
  - (iii) graves of victims of conflict;
  - (iv) graves of individuals designated by the Minister by notice in the Gazette;
  - (v) historical graves and cemeteries; and
  - (vi) other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);

(h) sites of significance relating to the history of slavery in South Africa;

(i) movable objects, including:

(i) objects recovered from the soil or waters of South Africa, including archaeological and paleontological objects and material, meteorites and rare geological specimens;

(ii) objects to which oral traditions are attached or which are associated with living heritage;

(iii) ethnographic art and objects;

(iv) military objects;

(v) objects of decorative or fine art;

(vi) objects of scientific or technological interest; and

(vii) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

(3) Without limiting the generality of subsections (1) and (2), a place or object is to be considered part of the national estate if it has cultural significance or other special value because of –

(a) its importance in the community, or pattern of South Africa's history;

(b) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;

(c) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;

(d) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;

(e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;

(f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;

(g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;

(h) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and

(i) sites of significance relating to the history of slavery in South Africa”.

### **13.2 Section 36 of NHRA 25 of 1999**

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According to Section 36 under Burial grounds and graves of the National Heritage Act 25 of 1999 the graves in South Africa are protected as follows:

- (1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.
- (2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.
- (3)(a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—
  - (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
  - (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
  - (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.
- (4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation

and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.

- (5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection (3)(b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority—
  - (a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and
  - (b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.
- (6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—
  - (a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and
  - (b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.
- (7)(a) SAHRA must, over a period of five years from the commencement of this Act, submit to the Minister for his or her approval lists of graves and burial grounds of persons connected with the liberation struggle and who died in exile or as a result of the action of State security forces or agents provocateur and which, after a process of public consultation, it believes should be included among those protected under this section.
- (b) The Minister must publish such lists as he or she approves in the Gazette.

- (8) Subject to section 56(2), SAHRA has the power, with respect to the graves of victims of conflict outside the Republic, to perform any function of a provincial heritage resources authority in terms of this section.
- (9) SAHRA must assist other State Departments in identifying graves in a foreign country of victims of conflict connected with the liberation struggle and, following negotiations with the next of kin, or relevant authorities, it may re-inter the remains of that person in a prominent place in the capital of the Republic.

### **13.3 Section 38 of NHRA 25 of 1999**

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According to Section 38 under Heritage resources management of the National Heritage Act 25 of 1999 the heritage resources in South Africa should be managed in the following:

“(1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50 m in length;
- (c) any development or other activity which will change the character of a site—
  - (i) exceeding 5 000 m<sup>2</sup> in extent; or
  - (ii) involving three or more existing erven or subdivisions thereof; or
  - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
  - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (d) the re-zoning of a site exceeding 10 000 m<sup>2</sup> in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

(2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection (1)—

(a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or

(b) notify the person concerned that this section does not apply.

(3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:

(a) The identification and mapping of all heritage resources in the area affected;

(b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;

(c) an assessment of the impact of the development on such heritage resources;

(d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;

(e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;

(f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and

(g) plans for mitigation of any adverse effects during and after the completion of the proposed development.

(4) The report must be considered timeously by the responsible heritage resources authority which must, after consultation with the person proposing the development, decide—

(a) whether or not the development may proceed;

(b) any limitations or conditions to be applied to the development;

(c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;

(d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and

(e) whether the appointment of specialists is required as a condition of approval of the proposal.

(5) A provincial heritage resources authority shall not make any decision under subsection (4) with respect to any development which impacts on a heritage resource protected at national level unless it has consulted SAHRA.

(6) The applicant may appeal against the decision of the provincial heritage resources authority to the MEC, who—

(a) must consider the views of both parties; and

(b) may at his or her discretion—

(i) appoint a committee to undertake an independent review of the impact assessment report and the decision of the responsible heritage authority; and

(ii) consult SAHRA; and

(c) must uphold, amend or overturn such decision.

(7) The provisions of this section do not apply to a development described in subsection (1) affecting any heritage resource formally protected by SAHRA unless the authority concerned decides otherwise.

(8) The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.

(9) The provincial heritage resources authority, with the approval of the MEC, may, by notice in the Provincial Gazette, exempt from the requirements of this section any place specified in the notice.

(10) Any person who has complied with the decision of a provincial heritage resources authority in subsection (4) or of the MEC in terms of subsection (6) or other requirements referred to in subsection (8), must be exempted from compliance with all other protections in terms of this Part, but any existing heritage agreements made in terms of section 42 must continue to apply.

SITE LAYOUT AND DIAGRAMS OF THE ESTABLISHED PLANT

14. SITE LAYOUT AND DIAGRAMS

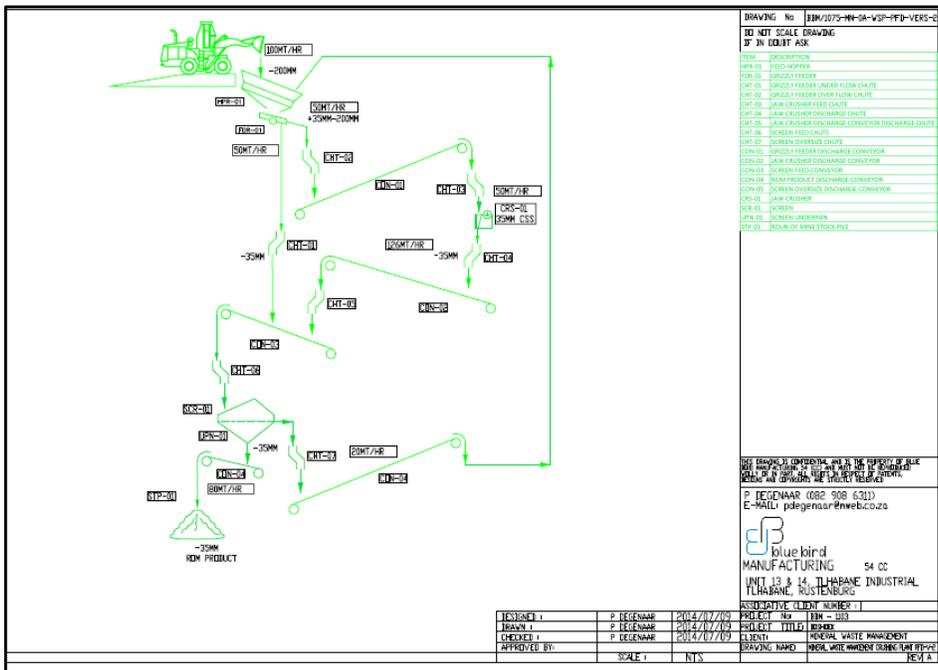


Figure 13: MWM Crushing.

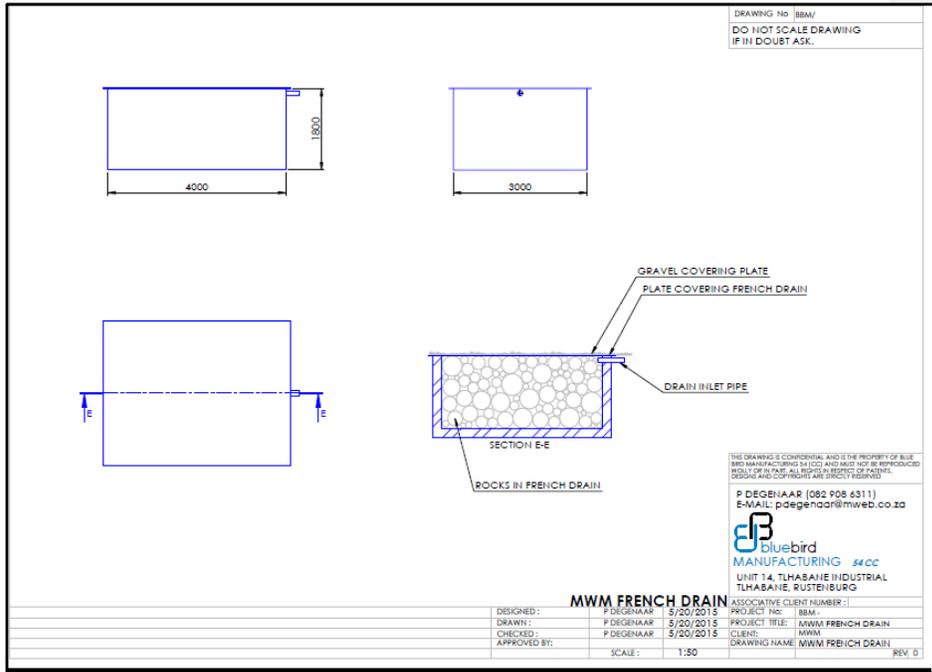


Figure 14: MWM French Drain.

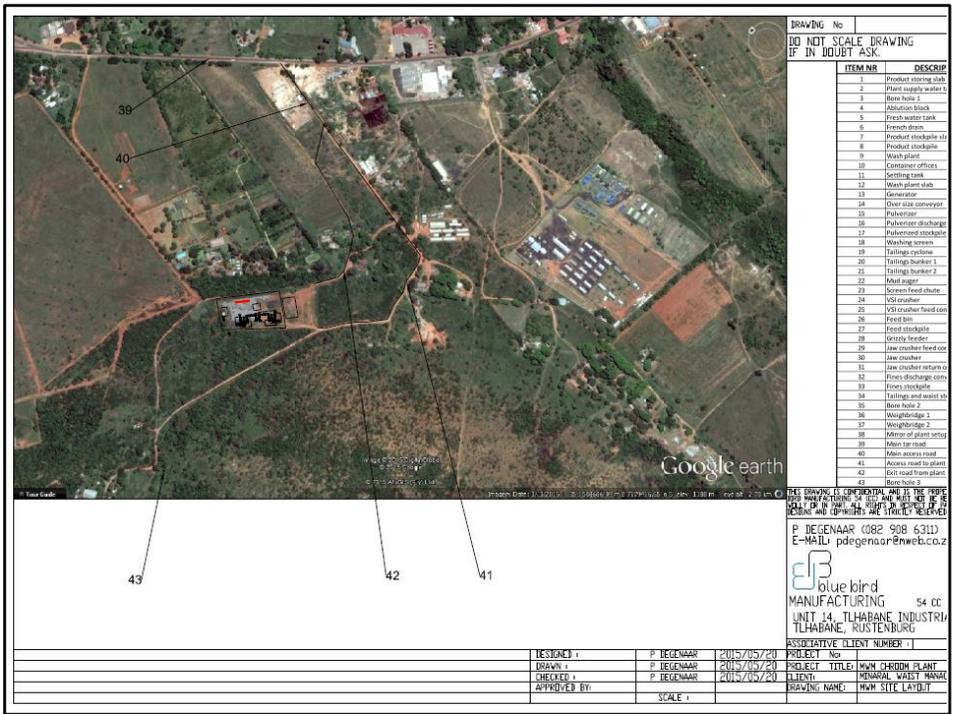
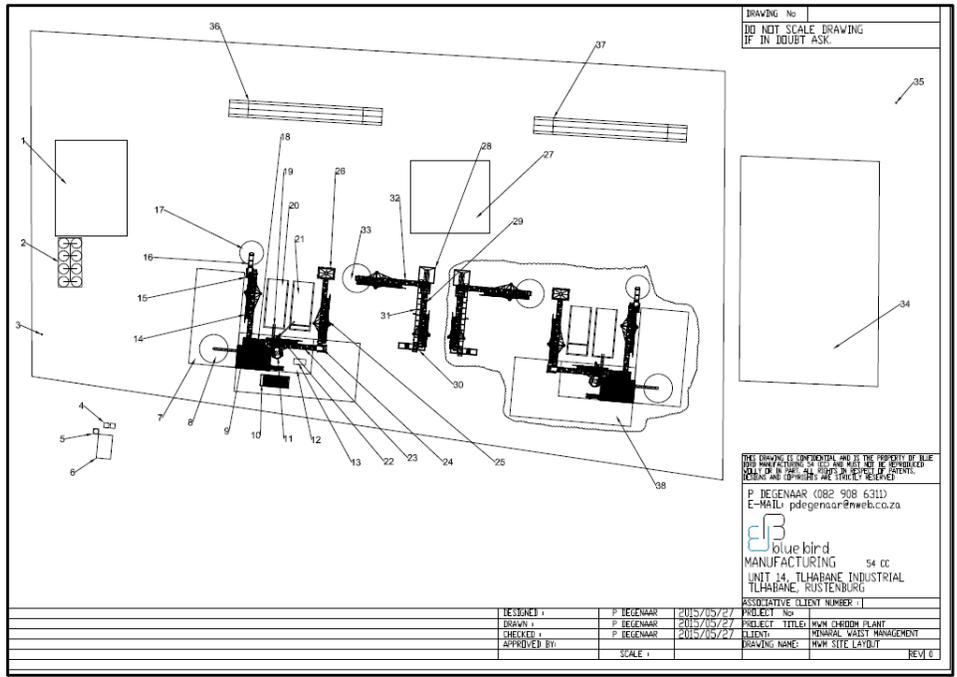


Figure 15: MWM New Site Layout 1.



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**blue bird**  
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 UNIT 14, TILHABANE INDUSTRIAL  
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DESIGNED BY:	P. DEGENAAR	2015/05/27	PROJECT No:	
DRAWN BY:	P. DEGENAAR	2015/05/27	PROJECT TITLE:	MWM CHROMIUM PLANT
CHECKED BY:	P. DEGENAAR	2015/05/27	CLIENT:	MINERAL WAIST MANAGEMENT
APPROVED BY:			DRAWING NAME:	MWM SITE LAYOUT
	SCALE:			REVISION:

Figure 16: MWM Site Layout 2.



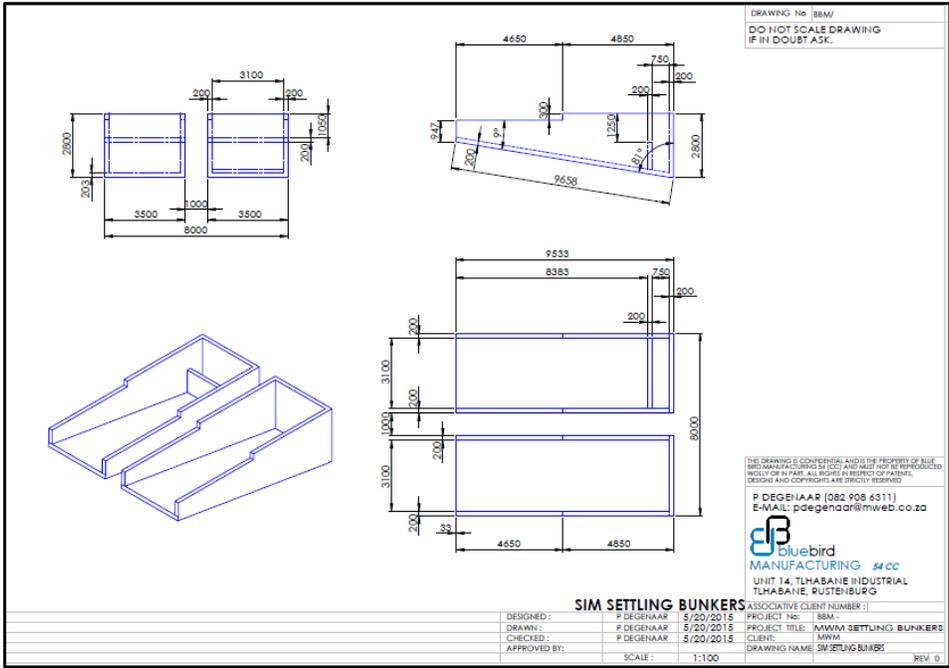


Figure 18: SIM Settling Bunkers.