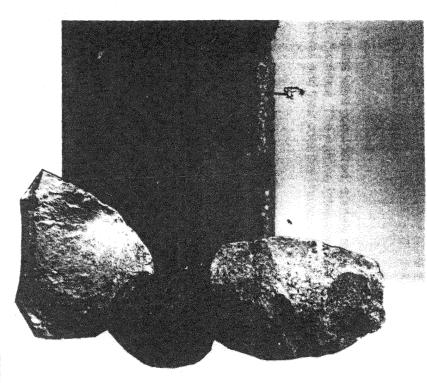
#### ENVIRONMENTAL IMPACT ASSESSMENT GAMSBERG ZINC PROJECT SPECIALIST REPORT : ARCHAEOLOGY

Researched and compiled for Envirolink

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## This is an abridged version of the report, containing:

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Baseline Description of pre-mining archaeological environment pp 8-21

Conclusions and recommendations pp 96-99

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### EXECUTIVE SUMMARY SPECIALIST REPORT: ARCHAEOLOGY

begins with a baseline description to discover what constitutes that archaeological environment assessed. Envirolink is evaluating the potential impacts of such a mine on the environment. at Gamsberg This report presents a specialist assessment of impacts on the archaeological environment. It The feasibility of establishing a zinc mine at Gamsberg near Pofadder, Northern Cape, is being

#### Baseline description

archaeological material were identified and plotted. Five sites were identified as being work had been undertaken in the region. subsequent interpretation of the archaeological significance of finds made. Minimal previous archaeologically significant and regionally important. Gamsberg. This was established by way of desktop literature survey, field reconnaissance, and baseline description details the nature During fieldwork, sites and surface and extent of archaeological resources

### Impact Assessment: Construction Phase

A number of project alternatives were considered, namely mining methods, and the location of the report. Project alternatives and their potential impacts are summarised in Table 6, page 28 range of project activities/facilities. The relative intensity of impact of each was assessed in

occurrence of significant stone age sites in the area expected to be mined Open pit mining would have high negative impact on archaeological resources because of the

summarised in Tables 77-79 on pages 74-76 significance positive impact in relation to the social aspect of the establishing a museum/information/resource centre is endorsed. Such a facility would have impact after mitigation, are summarised in Table 16 on page 40 suggestions, together with an estimation, for each activity/facility, of the overall significance of archaeological environment. Mitigation measures are recommended. These management Activities/facilities in the Construction Phase are assessed in detail in relation to of environmental impacts in relation to the archaeological environment is archaeological environment. The idea raised by I&APs of

### Impact Assessment: Operational Phase

that could not be identified in the baseline study may well be encountered (the likelihood of this archaeological environment. Sites will have been salvaged prior to this, but sub-surface features is considered to be low) at any stage of the mine's life. Mitigation measures are recommended Similarly, activities/facilities in the Operational Phase are assessed in detail in relation to the

summarised in Table 88 on page 86 overall significance of impact after mitigation, are summarised in Table 83 on page 81. It is in this phase that any possible museum/information/resource centre would come into existence The significance of environmental impacts in relation to the archaeological environment is These management suggestions, together with an estimation, for each activity/facility, of the

### Impact Assessment: Closure Phase

97 on page 95 footing, with tangible local outputs in terms of tourism and education. The significance of significance of impact after mitigation, identified in the baseline study) being encountered at this late phase in the mine's life are archaeological environment. The likelihood of further sub-surface features (that could not be any possible museum/information/resource centre should have been placed on a sustainable management suggestions, together with an estimation, for each activity/facility, of the overall environmental impacts remote, but in the event that they are, mitigation measures are recommended. In turn, these activities/facilities in the Closure Phase are assessed in detail in relation to the in relation to the archaeological environment is summarised in Table are summarised in Table 92 on page 91. In this phase

#### Conclusions

#### Sensitivity to Mining

the likelihood is low, that further archaeological material could come to light during construction impacts of high overall significance, as a result of land transformation. It is possible, although operational and closure phases of mining The report shows that five archaeological sites at Gamsberg would be lost, thus sustaining

protected I&AP concerns require that archaeological sites be conserved and Khoisan heritage be

Legal requirements in respect of heritage conservation need to be fulfilled

#### Implication for Mining

minimum mitigation measure would be the salvage of representative samples and recording of acted upon. Since archaeological sites would be destroyed through land transformation, In the event of mining proceeding at Gamsberg, recommendations for mitigation should be comprehensive information from the sites before mining commences

out the mitigation measures and, secondly, to destroy the sites in the course of mining A permit would be required from the South African Heritage Resources Agency, firstly, to carry

it is arguable that salvage of a site whose destruction becomes unavoidable is a form of Where I&AP concerns call for conserving archaeological sites and protecting Khoisan heritage conservation

measures, as also by an enhanced understanding of the past of the region. This in turn should and tourism locally serve to promote heritage awareness and should be used to generate resources for education extent by the detailed record and collections that would result from the recommended mitigation important that their in situ preservation is non-negotiable. Their loss would be balanced to some of the sites that would be destroyed. The sites in themselves are not considered to be so acceptable measure in this instance, which would be capable of achieving From an archaeological perspective the option to salvage is judged to be a reasonable and a sufficient record

material to interpret the archaeological findings for the local community, schools and tourists This report thus also strongly endorses the I&AP requirement for displays and other appropriate

#### Recommendations

finds, and curation of material salvaged from Gamsberg. A programme for archaeological development in the region both during the life of the mine and after museum or resource centre for Gamsberg, which could fulfill a role with regard to tourism salvage and analysis is included. The recommendations also touch on the matter of a possible Recommendations for mitigation - the management actions outlined in the body of the report set out here in more detail with respect to the archaeological salvage of sites, analysis of

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### N BASELINE DESCRIPTION OF PRE-MINING ENVIRONMENT

measured against two sets of criteria that have been used in the management of archaeological by detailed field observations. These findings are evaluated by way of discussion, and are A baseline description is established by way of an initial desktop background survey followed resources in South Africa

## Desktop study: archaeological background to the investigation

et al. (op. cit.) and Smith (1995), have helped to provide some regional context to this study and specialist inspections were carried out for Eskom and Black Mountain Mine. While by no means in-depth, these latter surveys, together with the work of Morris & Beaumont (1991), Beaumont work had been undertaken in the region (Beaumont et al. 1995), although, recently, a few An initial survey of the literature on the Pofadder-Aggeneys area showed that minimal previous an indication of what to expect from an archaeological perspective at Gamsberg

### 2.1.1 Late Holocene and earlier sites

of Smith (1995) in their broader look at the archaeology of the Orange River and its hinterland there in 1872). These observations are in accord with the findings of Beaumont et al. (1995) and site noted (Prinsloo 1998; Morris 1999a) is a herder site with abundant stone artefacts, pottery that sites of late Holocene age are - perhaps not surprisingly - the most common. The largest of previous observations is small and limited in scope, but by initial appearances it would seem lower than in areas in the Karoo and eastern Bushmanland, to the south east, and along the Three scoping reports for Eskom (Prinsloo 1998; Morris 1999a; 1999b) and one for Black Mountain Mine (Morris 2000) describe Later Stone Age sites with and without pottery. A sparse description of this waterhole is to be found in E.J. Dunn's (Robinson 1978) account of a journey and fragments of ostrich eggshell, focussed on a waterhole known as Schuitklip (an early Orange River (Beaumont & Morris 1990; Morris & Beaumont 1991; Smith 1995). The sample impression gained from these studies is that archaeological visibility in the region is markedly surface scatter of possible Middle Stone Age lithics is noted from a farm near Pofadder. Middle and Earlier Stone Ages Both these studies refer further to earlier material from a small number of sites ascribable to the

### 2.1.2 Rock paintings at Aggeneys

isolated boulders in the Karoo (sometimes along with rock engravings), and fairly commonly in these are to be found over a wide area in the western half of the interior of South Africa, on paintings including two "star" motifs and an indented oval shaped image. Paintings similar to Quarry at Black Mountain Mine, Aggeneys (29.15.26 S; 18.48.12 E). These are simple finger A report by Deacon (1995) describes rock paintings found on a boulder next to the Aggregate eastern part of the Northern Cape Province. rock shelters in areas such as the Ghaap Escarpment, Kuruman Hills and Langeberg in the Their age and context is not well understood, but

rather than with other groups regarded as the makers of finger paintings elsewhere in the subthey appear to be associated in this region with Khoisan of approximately the last millennium, continent.

### 2.1.3 Rock engravings in the area?

for "rain animals" that images of large mammals such as the hippopotamus may well have served as metaphors an abundance of food be assured." Current understandings of Later Stone Age rock art suggest water, was shown in this way on the engraving in order that "rain would necessarily follow...and nose" (1931:46). Dunn offers an explanation suggesting that the hippopotamus, associated with dragged across the dry veldt by several Bushman people by means of a rope attached to its Bushman, Dunn recalled "near N'Ghaums [Gams], I saw an engraving of a hippopotamus being In 1872 the geologist E.J. Dunn travelled through the area (Robinson 1978). In his book,

Dunn's hippo engraving has not been relocated.

## Place names and their relevance to the investigation

uncertainty and debate as to exact meanings Local place names may provide insight into the recent past of the area - notwithstanding

- skinning and cooking meat. ||gan-i = flesh]. The most likely meaning relates to the grass literally means "Grasmond" or "Grasfontein". The grass in question is most likely to be t'Kams, meaning "tufted grass" in the Nama dialect. A local farmer, A.J. van Jaarsveld, soaam gaams = so sal ons vet ingooi, so sal ons die vleis oopvlek en braai!" [Place for Pettman, quoted by Nienaber and Raper, stated that *Kams*, from !*kam*, to fight, was the scene of a tribal battle. In another interpretation, a certain P. van Heerde, in 1965, Nienaber and Raper support this interpretation, referring to the Nama "|gâ-" and Kora "|gam", both meaning "grass", with "am" meaning "mouth" or "fountain". "|Gâ-ams" thus similarly submitted that the origin of Gams or Gaams was in the word "Tha-aams oopgevlek en gebraai het. Hulle het gesing en gedans om en by die vuur. Soaam arom, reported that Swart Jim Dixon had said: "Gaams is die plek waar hulle die vleis Anstida brevifolia (Nienaber & Raper 1977, 1980). pronounced with a click, where "Tha" means "grass", and "aams" means Gamsberg: In 1824 Thompson travelled through this area and noted the name as (Nienaber & Raper 1977, 1980) There are, however, variant accounts "mouth"
- Aroam: Derived from Nama "‡aro-" meaning wag-'n-bietjie tree (Ziziphus mucronatus) bietjiebosfontein", or waterhole surrounded by Ziziphus mucronatus or "am-s" meaning mouth. The name thus most likely means wag-n-

1977:173). There are other interpretations. For example, "Plek van rooi klei" [Place of red clay], "Plek van bloed" [Place of Blood"] and "Plek waar hulle geslag het" [Place where they - i.e. Nama - slaughtered]. There is also a possibility that the "A" of Aggeneis the kloof as 'The Place of Water', as there were several natural springs there, but to this day no one is quite certain of the origin of the name Aggeneys..." (Nienaber and Raper 1977:173). There are other interpretations. For example, "Plek van rooi klei" [Place of strongholds in the mountains between Pofadder and Springbok and from these they derives from the Nama ‡ã, meaning "riet"; while a former farm-owner, A.J. Burger, Near the kloof they split into three parties which surrounded and trapped the Bushmen at a spring near the confluence of three ravines. The Bushmen were wiped out and the 1980). The origin and meaning of the name remains elusive believed Aggeneys simply meant "bergagtig" [mountainous](Nienaber & Raper 1977, kloof became known as 'The Place of Blood'. The Nama Coloureds have always known and the livestock that they had stolen to the kloof, which is today known as Aggeneys marauding Bushmen and formed a commando which followed the spoor of the Bushmen carried out raids on the farmers. Finally, the farmers could no longer tolerate the history of Aggeneys" for *The Argus* in July 1973: "Aggeneys is the name of a kloof on Vickie Burger's farm... Long before the turn of the century, the Bushmen had several Aggeneys: A variety of interpretations exists for Aggeneys/Aggeneis, which, it seems, first appeared in written records as "Achenijs" in 1859. V. Burger compiled a "brief

associated with the people who attached these names to the landscape, i.e. Nama herders is possible that the most recent of the late Holocene archaeological sites with pottery could be the Nama language, and began to be fixed in colonial naming conventions by at least 1824. It One point of significance from the above discussion is that these names derive from words in

Voigt pers.comm.). Thin-tailed sheep are depicted in rock paintings in the Limpopo basin. The a thin-tailed breed of indigenous sheep known from the eastern side of the subcontinent (E.A. south (1827:289). While fat-tailed sheep lose their fat tails under drought conditions, there is that they possessed a breed of sheep different from the fat-tailed variety that was usual further soon as rain falls, the pastures at Pella will instantly spring up, and the scattered divisions of the people will again be re-assembled" (Thompson 1827:284). Thompson interestingly observed flocks...the nature of the country is such, that a people like the Namaquas must be nomadic...as in divisions over the country wherever a spring of water exists with grass in the vicinity for their and consequent failure of pasturage [at Pella], force them occasionally to disperse themselves As it happens, George Thompson camped at *t'Kams* (Gams), where the missionary Bartlett of Pella was then temporarily stationed, on 20 August 1824. He remarked that "severe droughts, implications of these various points have yet to be explored

and commandos (1827:288, 290-291). enemies". These latter were the raiding bands of Afrikander and probably other frontier "bandits" The name of the local Nama, according to Thompson, was Obseses, which he thought was an amalgamated grouping of remnants of various "tribes", which had been "assailed by...formidable

in some of the claims for the origin of place names, above. It is possible that some Nama or other erstwhile herders seeking refuge in the kloofs might have been termed "Bushman" under There was a significant element of violence in the recent history of the region, which is reflected

such circumstances, especially if they had lost their stock.

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the spring on the eastern side of Gamsberg place between the Boers and Bushmen. The Bushmen scherms, made of stones, still remain, as well as the marks of the bullets on the rocks" (Robinson 1978:62). This could well refer to Travelling via "Ghauns" in 1872, E.J. Dunn mentioned the spring: "at this water an affray took

### 2.2 Archaeological field survey

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#### 2.2.1 Methods

the vicinity of Gamsberg - although in the event the findings at Gamsberg deviated from, or Aggeneys and at Black Mountain Minc, in particular, were thought to be useful analogues for indicated the potential for finding sites at Gamsberg. Observations made on the property called rather supplemented, the pattern that emerged at those other sites. review of the literature, summarised above, and experience of other parts of the region,

The field reconnaissance was focussed especially, but not exclusively, on areas most likely to be disturbed by the project. The Gamsberg property was traversed on foot, with particular basis of this record, and evaluated by way of matrices developed for heritage resources in potential were also examined. Sites located in the survey were plotted and described attention being paid to features that could have been foci of past human activity. Areas of lower South Africa (Deacon nd; Whitelaw 1997). relative archaeological significance, locally and in a regional context, could be discussed on the

#### 2.2.2 Observations

examined (paragraphs 3.2.2.1 and 3.2.2.2), as were the northern and western rim of the inselberg and its basin (paragraph 3.2.2.3). on the northern and western slope of the Gamsberg and the adjacent plains were

## 2.2.2.1 Gamsberg northern slope and adjacent plain

development further out on the plain and adjacent to the main road dump and low grade ore & waste stockpile, as The particular focus of investigation here was on the alternative areas indicated for the waste also the alternative areas of proposed

farms Survey of the surfaces north of the berg and on the adjoining northern slope of Gamsberg, on Gams and Aroam, revealed extremely minimal archaeological traces, namely a very few

artefacts below the surface here either. isolated stone flakes. Where erosion had cut into the surface there was no indication of any

## .2.2.2 Gamsberg western slope and adjacent plain

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<u>and</u> 70 particular focus of investigation was on the alternative areas indicated for the tailings site slimes dam pump station.

and slimes dam pump station was found to be essentially devoid of archaeological traces save was well clear of the proposed tailings site. Almost all of the area indicated for the tailings site probably representing part of a water flask cache. Pieces included a mouth fragment. The latter Stone Age flaked quartz artefacts was noted, as was an isolated scatter of ostrich eggshell for very occasional and isolated flaked stone pieces. In parts of this western side of the Gamsberg, on the farm Bloemhoek, a low density of Later

#### N N Gamsberg northern and western ridge and basin

associated mining activities and alternative activity sites in the basin. offices, detonator & accessories magazine, on the Gamsberg rim, and the The focus of investigation was on the areas indicated for the possible EMV workshop open pit and

archaeological traces, namely occasional isolated flakes. The kloof areas, settings of high Much of the northern and western ridge of the Gamsberg was found to have extremely minimal energy run-off during heavier rains, were found to be largely devoid of artefacts

remainder are in the Gamsberg basin. These were plotted and described (Fig. 1): But significant finds were made at five locales on the inselberg, representing archaeological of some regional importance. One of them is on the inselberg's northern rim, and

#### Site

discussed below (Figs. 1,2 & 3). significance of the site, which is clearly centred on a favoured raw material source, is scraped section to have a depth of at least 100 mm in at least that part of the site. The occurrence is estimated to extend over an area of >150 x 50 m, and was revealed in a artefacts are now to be found along the length of the said landing strip. The in situ regional significance. It had been identified previously by Deacon (1995). This site was quarried, moreover, for the making of a landing strip on the top of Gamsberg, so that On one portion of the northern ridge, there is a Middle Stone Age workshop site of major

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Site 2

raw material source outcropping at that point (Figs. 1, 4 & 5). first of these (Site 2) is an Acheulean (Earlier Stone Age) workshop site. Like the Middle Stone Age site on the Gamsberg rim, it is focussed on what was apparently a favoured Within the Gamsberg basin several sites were noted, almost all of Pleistocene age. The

Site

(Fig. 1). site was located, this time centred on a slightly different quality of quartzite raw material In a similar setting as, and to the south east of, Site 2, a further Acheulean workshop

material on the slope no indication of any depth of deposit at the top, but there may well be some build up of in a slight saddle, and down either side of it over a distance of 100-200 m. There was At both Sites 2 and 3 the surface spread of knapped stone is strewn from a flattish area

The significance of Sites 2 and 3 is discussed below.

Site Cluster 4, valley bottom

whether or not this is the case character from that noted at the workshop sites, but only detailed analyses can establish that some of the Acheulean material next to stream courses could be different in focussed on places where particular raw materials occur. Initial impressions suggested convenience as "Site Cluster 4", were possibly the locales where people were living, or practising subsistence-related activities - as opposed to the workshop sites which are may be expected in that setting (Figs. 1 & 5). low density of both of Middle Stone Age and Acheulean material, sometimes mixed, as Further down in the basin, along the stream courses, are scatters of varying, generally These occurrences, designated for

 I.....

Site

test trench is to be recommended to check for material within the deposit, given that "Bushmen" are known to have used caves in this region (Dunn 1931:25). there might have been some evidence of use by hunter-gatherers of the Later Stone quartz flake. The cave had been disturbed by previous mining-related activity. A small Age. There was, however, almost no trace of archaeological material, except for a single Site 5 is a small cave on the northern side of the basin (Figs 1 & 6). It was expected that

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#### 2.2.3 Discussion

traces; Middle Stone Age traces; and Earlier Stone Age traces discussed under the headings: Most recent traces; Colonial frontier traces; Later Stone Age Observations made at, and in connection, with Gamsberg are categorised by age and

### 2.2.3.1 Most recent traces

tents?), where corned beef tins (Damara Meat, Windhoek), with metric measures, would tally camp-site half way up the inside of the western rim (with circular clearings, perhaps for bellcentury mining-related activity, and include road-ways and a landing strip (GZP:1:3). Remains of various structures in and around the inselberg are linked to late twentieth mining/prospecting activity in the twentieth century. They include a prospectors' or surveyors' The most recent remains of an archaeological nature at Gamsberg are the traces of previous date of circa 1971 when geologists identified rocks of gossan type at Gamsberg

qualify as "archaeological" in terms of the National Heritage Resources Act of 1999, by virtue conserved. Some of these sites have been recorded by way of photographs is it considered critical, in this assessment, that such remains at Gamsberg necessarily be of their young age. Those remains are therefore not protected by any existing legislation. Nor Note: While "archaeological" is taken in this instance to mean literally "material traces of past human activity", and thus including the most recent past, the remains referred to above do not

### 2.2.3.2 Colonial frontier traces

in the colonial frontier period and these remain as a vestige from an era when the landscape on the Gamsberg project site (some were noted at a waterhole site on Aggeneys - see 2.2.3.3 below). George Thompson and E.J. Dunn travelled through the area in 1824 and 1872 (Thompson 1827; Dunn 1931; Robinson 1978). Indigenous place names, too, came to be fixed respectively, and their observations shed some light on the local history of those times names, 2.1.4 above) and environmental features within it were understood in Khoisan terms (see discussion of place From the colonial frontier era, of the eighteenth to nineteenth centuries, no artefacts were found

### 2.2.3.3 Later Stone Age traces

Stone Age sites were the predominant archaeological signature noted in albeit limited surveys elsewhere the Aggeneys-Pofadder region. Stone Age presence was to be found at Gamsberg, not least because late Holocene Later in the area. On the face of it, it was something of a surprise that so little evidence of a Later The records of the early travellers are of value for interpreting the final Later Stone Age traces

absence of these additional features in areas examined suggests that, if there was a Later are usually present (none found on Gamsberg; only a few on a dune immediately west of the material noted on Gamsberg). Moreover, fragments of ostrich eggshell from broken water flasks invariably have lithics made from exotic fine-grained river pebbles (no artefacts on this raw Age sites, as local assemblages of the period are dominated by stone artefacts made from such nodules. But known sites in the vicinity (documented at Aggeneys and Black Mountain) also strewn over most of the surfaces surveyed, could have hampered identification of Later Stone the archaeological record Stone Age presence within the project area, it was so ephemeral as to leave minimal traces in The considerable "background noise" of massively preponderant small nodules of white quartz, Most of the known Later Stone Age sites in the region also have pottery.

An important comparative observation was made at a Later Stone Age herder site on the farm Aggeneys, west of the Koa Valley dunes. Thin, grit tempered pottery, typical of ceramics linked themselves (Trekboers or others such as the "Bastaards"), used the site subsequently to colonial encroachment. An overprinting of porcelain fragments shows that either herders accumulation from return visits by the latter people, perhaps in the last several centuries prior exploiting grazing away from the Orange River. The debris on the site could reflect an in a parched region - for hunter-gatherers and, more especially (in this instance), for herders grinding grooves were noted at numerous points on granite outcrops at the Aggeneys site. These outcrops formed hollows where water collects, turning this into something of an oasis -Valley side of the Black Mountain inselberg to the north west (Morris 2000). analogous material was located on the sandy flanks of a non-perennial watercourse on the Koa with Cape coastal and Orange River herders, was found along with stone artefacts made from quartz and flaked river pebbles. There was a fair quantity of ostrich eggshell fragments. Closely in trading contact with frontiersmen from the Cape, or those frontiersmen "Boat-shaped"

including possible remains of an ostrich eggshell water flask cache, and a single stone flake in No similar Later Stone Age sites - excepting the sparsest of traces west of the inselberg the small cave, Site 5 - were discernable at Gamsberg itself.

at the stronger springs such as Pella, is that such groups would disperse during periods of this archaeologically). A further process attested by Thompson (1824), for herder groups settled following good rains, herders themselves moved into the hinterland (the Aggeneys site reflects sleeping, or around the seasonal pans" (Beaumont et al. 1995:264). It is clear that, possibly water sources] have failed to yield any signs of human occupation, except around the granite Bushmanland, probably mainly in the last millennium, and focussed their foraging activities on the limited number of water sources in the region. "Surveys of large areas away from [such and ultimately to marginalisation of hunter-gatherers, of herders in the Orange River Basin, Beaumont et al. argue, led to competition over resources "much higher productivity and carrying capacity of these bottom lands". "Given choice," they substantial herder encampments along the Orange River floodplain itself, which reflected the Bushmanland sites so far located appear to be ephemeral occupations by small groups in the hinterland on both sides of the [Orange] river" (1995:263). This was in sharp contrast to the inselbergs extruding above the peneplain,...the red dunes which produced clean sand for Beaumont et al. (1995) have shown, with reference to the Later Stone Age, that "virtually all the "the optimal exploitation zone for foragers would have been the Orange River". The advent some of whom then occupied

drought. At such times competition between groups over resources, and stress within already marginalised forager society, must have intensified

### 2.2.3.4 Middle Stone Age traces

gneiss and ubiquitous small surface nodules of quartz. In such an environment, something of a premium must have been placed on those rocks with good or suitable flaking qualities, and favoured in Middle Stone Age times. The surrounding plains are strewn, predominantly, with The extraordinarily rich Middle Stone Age workshop site, Site 1, at the top of the ridge defining the northern rim of the Gamsberg inselberg, is thus far a regionally exceptional feature. What show a wider distribution here were carried away at least as far as the Gamsberg basin, and regional surveys may well this no doubt accounts for the extensive use of this localised Gamsberg source. Artefacts from appears to be certain is that the site was focussed on a form of raw material apparently

uncommon in Bushmanland" (1995:241): and those that have been documented thus far have generally yielded only small samples (Morris & Beaumont 1991; Smith 1995). Age sites at a The significance of the site can be gauged in part from the known distribution of Middle Stone regional scale. Beaumont et al. have shown that "substantial MSA sites are

technocomplex" (Beaumont et al. 1995:241). Volman's (1984) scheme places the MSA1 in Oxygen-isotope Stage 6 (cold with warm oscillations, ending at 128 000 B.P.), the MSA3 in 32 000 B.P.). Bushmanland] appear to be largely confined to either the MSA3 or late MSA1 phases of that Stage 5a-3 (late Last Interglacial through Last Glacial, cold with warm oscillations, c 82 000 to suggested that "the relatively few [sites] that have been discovered

uncertain. Two scenaria are possible: that glacial conditions resulted in a higher incidence of generally higher biomas and intensity of human occupation (MSA2). in a marked westward shift of summer rainfall (summer of 1999/2000 writ large), to support a occupation (MSA1 or MSA3); or that warmer than present Last Interglacial conditions resulted winter rainfall, further inland, than at present, to support increased intensity of human it would be possible to resolve the environmental context of the Gamsberg occupation is light on the later Pleistocene occupation of the western interior of South Africa. Whether or not Examination of the massive number of artefacts at Gamsberg Site 1 could shed significant new

tentatively, to either MSA1 or, perhaps more strongly, MSA2 ascription, as characterised by Volman (1984). But what Volman earlier called "Early MSA" (MSA1, MSA2) and "Late MSA" indication of butt reduction, regarded as evidence for hafting. These features point, very A preliminary look at a small sample of the material from Gamsberg Site 1 shows the presence of flake blades, unretouched points (Fig. 2), and minimal retouch as a whole. There is some (MSA3) are not readily distinguishable on the basis of their artefacts alone (Volman 1981).

recommended In terms of likely mining impacts, the significance of the site is high and mitigation measures <u>a</u> 10

### 2.3.5 Earlier Stone Age traces

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outcropping raw material on the western side of the Gamsberg basin. These are amongst the regional significance very few known Acheulean sites in Bushmanland, and for this reason alone they are of high Gamsberg Sites 2 and 3 are Earlier Stone Age Acheulean workshop sites that are centred on

separated out by abrasion state into a fresh component of Middle Stone Age with prepared at Olyven Kolk, quartzite cobbles, were derived from the Dwyka till. Systematic collections of this material made Pleistocene age across areas of Bushmanland to the south east, where raw materials, mainly incidence of handaxes and creavers Stone Age. Beaumont et al. (1995:240-241) note a widespread low density stone artefact scatter of blades and points; and a larger aggregate of moderately to heavily weathered Earlier The latter included Victoria West cores on dolerite, long blades, and a very low south west of Kenhardt, and Maans-Pannen, east of Gamoep,

than today. This is suggested by the known greater reliance of people in Acheulean times on distribution of sites quite restricted these artefacts reflect must have occurred at times when the environment was more hospitable The Middle (and perhaps in some instances Lower) Pleistocene occupation of the region that ecological ranges, with proximity to water being a recurrent feature in the

stone tool manufacture undoubtedly the raison d'etre for Sites 2 and 3, was the availability of suitable raw material for must have been the case at Gamsberg, where, clearly, another draw-card, and

production in the Acheulean is known to be relatively restricted to the Karoo, western Free known occurrence of Victoria West then being the vast site of Nakop near the Namibian border western and eastern regions of the subcontinent" (Sampson 1974:121); the western-most in evidence in the southern Cape; nor is it found north of the Limpopo. However, writing in the spread within the interior of the subcontinent (Sampson 1974; Volman 1984). The method is not The artefacts found at these two Gamsberg sites include handaxes (Fig. 4) and Victoria West proto-Levallois cores. The distribution of the rather specialised Victoria West method of tool (Brain & Mason 1955; Sampson 1974). The evidence from Gamsberg has the potential to shed early 1970s, Levallois technique yet further westwards important light on this question, and for now at least extends the known distribution of the proto-Trans-Vaal and parts of the Northern Cape Province - in short, a certain geographical Sampson noted that "nothing is yet known of the [Acheulean] typology of the

Current efforts to date a phase of the Acheulean characterised by Victoria West cores at

indications suggesting a Lower Pleistocene date of greater than 800 000 years B.P. Canteen Kopje at Barkly West may help position these industries in time, with provisional

workshop Sites 2 and 3 investigation, courses at the bottom of the Gamsberg basin (Site cluster 4). In the absence of more detailed Earlier and Middle Stone Age material was noted in a low density scatter alongside the water it was not clear how the Acheulean component, in particular, relates to the

### 2.2.4 Measuring archaeological significance

archaeological resources. This section of the report seeks assessment matrices adapted from models developed by Deacon (nd) and Whitelaw (1997) The above discussion demonstrates, qualitatively, something of the value of these sites as to evaluate the sites within

### 2.2.4.1 Estimating site potential

such as the world renowned rock art site Driekopseiland, near Kimberley, which is on landform estimating the potential for archaeological sites (after J. Deacon, National Monuments Council). potential, in the light of such variables, thus requires some interpretation. Type 3 sites tend to be those with higher archaeological potential. There are notable exceptions, The first of these (Table 1) is a classification of landforms and visible archaeological traces for L1 Type 1. Generally, moreover, the older a site the poorer the preservation. Estimation of

1 and 2) (See Table 3, paragraph 2.2.4.3 for characterisation of the Gamsberg sites in terms of Tables

### 2.2.4.2 Assessing site value by attribute

archaeological significance of a site, with Type 3 attributes being those of highest significance aspects of this matrix remain qualitative, attribute assessment is a good indicator of the general a site's archaeological value by ranking the relative strengths of a range of attributes. While selecting sites meriting heritage recognition status in KwaZulu-Natal. It is a means of judging The second matrix (Table 2) is adapted from Whitelaw (1997), who developed an approach for

(See Table 3, paragraph 2.2.4.3 for characterisation of the Gamsberg sites in terms of Tables 1 and 2)

Table 1. Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon, National Monuments Council).

Cass	Rocky	Type 1  Bedrock exposed	Type 2  Some soil patches	Type 3 Sandv/grassy patches
5 =	surface	Far from water	In floodplain	On old riv
2	Ploughed land	Far from water	In floodplain	On old river terrace
ြ	Sandy ground, inland	Far from water	In floodplain or near feature such as hill	On old river terrace
4	Sandy ground,	>1 km from sea	Inland of dune cordon	Near rocky shore
	coastal			
5	Water- logged deposit	Heavily vegetated	Running water	Sedimentary basin
[6	Developed urban	Heavily built-up with no known record of early settlement	Known early settlement, but buildings have basements	Buildings without extensive basements over known historical sites
<u> </u>	Lime/dolo- mite	>5 myrs	<5000 yrs	Between 5000 yrs and 5 myrs
8	Rock shelter	Rocky floor	Sloping floor or small area	Flat floor, high ceiling
Class	Archaeo- logical traces	Type 1	Type 2	Type 3
A1	Area previously excavated (archaeological)	Little deposit remaining	More than half deposit remaining	High profile site
A2	Shell or bones visible at surface	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick; shell and bone dense
A3	Stone artefacts or stone walling or other feature visible at	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick

Table 2. Site attributes and value assessment (adapted from Whitelaw 1997)

Class	Attribute	Type 1	Type 2	Type 3
entente entre entr	Length of sequence/context	No sequence Poor context Dispersed	Limited sequence	Long sequence Favourable context
		Dispersed distribution		High density of arte/ecofacts
N	Presence of exceptional elements (incl regional rarity)	None	Limited	Major significance
ယ	Degree of organic preservation	None	Limited	Major
4	Potential for future archaeological investigation	Low	Medium	High
S	Potential for public display	Low	Medium	High
σ	Aesthetic appeal	Low	Medium	High
7	Potential for implementation of a long-term management plan	Low	Medium	High

## Estimating archaeological potential and significance at Gamsberg

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2.4

imaginative display and interpretation could enhance their interest - the fascination of sites of this nature, to the general public, is by no means self-evident); and high for attribute 7. into the equation, all the sites in themselves would score low for attributes 5 and 6 (although Table 3 presents a combined summary indicating where the Gamsberg sites fall within these two matrices, with comments having reference to site attributes. Attributes 5, 6 and 7 from Table 2 are taken to be essentially irrelevant given the mining context, but were they to be factored

Table 3. Gamsberg sites 1-5 characterised in terms of Tables 3 and 4.

regional ESA site	n T3 17 17 173	A3 Type 1 T3 (May occur in sediment down-slope)  A3 Type 1 T1 T3
<b>は</b>	<b>3</b>	T1 T3 T3 T2 T1 T2

#### 2.3 Source of data

The above sections 2.1 and 2.2 indicate the sources of data in terms of existing indications prior to the investigation, and of detailed fieldwork and evaluation of observations at Gamsberg. All references cited are given at the conclusion of this report.

## 6. CONCLUSIONS AND RECOMMENDATIONS

### 6.1 Sensitivity to Mining

construction, operational and closure phases of mining. Provision is suggested for this although the likelihood is low, that further archaeological material could come to light during sustaining impacts of high overall significance, as a result of land transformation. It is possible, report shows that all of the archaeological sites 1-5 at Gamsberg would be lost, thus

protected I&AP concerns require that archaeological sites be conserved and Khoisan heritage be

Legal requirements need to be fulfilled.

### 6.2 Implication for Mining

In the event of mining proceeding at Gamsberg, recommendations for mitigation should be acted upon. Since archaeological sites would be destroyed through land transformation, a comprehensive information from the sites before mining commences. minimum mitigation measure would be the salvage of representative samples and recording of

the mitigation measures and b) to destroy the sites in the course of mining A permit would be required from the South African Heritage Resources Agency a) to carry out

conservation. Where I&AP concerns call for conserving archaeological sites and protecting Khoisan heritage. arguable that salvage of a site whose destruction becomes unavoidable is a form

result from the recommended mitigation measures, but also by an enhanced understanding of would be balanced to some extent by, not only the detailed record and collections that would important that their in situ preservation can easily be characterised as non-negotiable. of the sites that would be destroyed. The sites in themselves are not considered to be so From an archaeological perspective the option to salvage is judged to be a reasonable and acceptable measure in this instance, which would be capable of achieving a sufficient record used to generate resources for education and tourism the past of the region. This in turn should serve to promote heritage awareness and should be

material to interpret the archaeological findings for the local community, schools and tourists This report thus also strongly endorses the I&AP requirement for displays and other appropriate

## 6.3 Recommendations for mitigation measures

representative samples recovered by archaeological excavation, and by way of test trenches at two further sites which the survey shows may be significant. The report additionally makes proposals concerning curation of the material recovered If mining proceeds at Gamsberg, this report proposes the salvage of three sites by way of

### 6.3.1 Archaeological salvage of sites

amassed by way a relatively small excavation. density is possible spatial patterning. There was no evidence of organic preservation. Artefact recover a sample from the site which is sufficient to assess, at the least, typology and Site 1: MSA site on northern ridge of inselberg. This report recommends excavation to such that an assemblage of up to 30 000 pieces artefacts could well be

Estimated time needed for field salvage: 12 days

the lower portions of the sites recommended to assess whether there is any depth of deposit containing artefacts on systematic surface to record of the sites. At least two test trenches in each case are appeared to be little deposit on either of these sites, so that the report recommends 2 and 3: Two Acheulean workshop sites inside western ridge of inselberg. There

Estimated time needed for field salvage: 12 days

of these accumulations relative to workshop sites on the sides of the Gamsberg basin. Gamsberg basin. A test trench(es) is recommended to recover and assess the nature Site cluster 4: Acheulean and MSA material in the stream courses in the bottom of the

Estimated time needed for field salvage: 5 days

preserved there stratigraphy. A test trench is recommended to assess whether any cultural material is Possible ephemeral LSA occupation in small cave ž with possibility 0

Estimated time needed for field salvage: 3 days.

### 6.3.2 Programme for archaeological salvage

session), with breakdown of fieldwork tasks as follows (see also Table 98): material would need to be transported to Kimberley for analysis and curation at the end of each If permitted by the South African Heritage Resources Agency, it should be possible to achieve above salvage of sites in three fieldwork sessions (a sizable expected load of excavated

- Session 1 (12 days): Excavation at Site 1.
- Session 2 (12 days): Systematic collection and excavation at Sites 2&3
- Session 3 (8 days): Test trenches at Sites 4&5.

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individuals, commence in the field It is recommended that unskilled labour be recruited locally to assist with this task. preferably able to read and write, would be sufficient. Marking of artefacts could Four

Table 98. Programme for archaeological mitigation measures, Gamsberg

Duration	3000	Task	S				
Allow six weeks in three sessions of estimated at 12, 1 days respectively				Field session	(See 6.3.	Salvage	Stage 1
Allow six weeks including three sessions of fieldwork estimated at 12, 12 and 8 days respectively		session 2	Field		(See <b>6.3.1 - 6.3.2</b> , page 97)	Salvage of sites: Gamsberg	
Sluding eldwork and 8	Field session				page 97)	amsberg	
Six months including three months for curatorial tasks		Curatorial tasks - marking artefacts, packaging, accessioning and shelving	Museum, Kimberley	Analysis and description of salvaged material, Archaeology Lab McGregor	(See <b>6.3.3 - 6.4</b> , pages 98-99)	Analysis and curatorial	Stage 2
Twelve months or longer depending on decisions re possible museum/ information/resource centre	Generate display brief for posters and for exhibition in possible museum/information/resource centre in Gamsberg area	Provide advice where necessary re possible museum/information/resourc e centre in Gamsberg area	Generate material suitable for use in local schools and/or for tourists where appropriate	Generate reports, professional and popular	(See <b>6.4</b> , page 99)	Reports, outputs	Stage 3

## 3.3 Analysis and curation of salvaged material

would be compiled. The South African Heritage Resources Agency is likely to stipulate, in any Museum, where requisite archaeological curatorial and archival standards are met. In that case permit issued for this work, that material be housed at an institution, such as the McGregor Kimberley. A detailed report describing the sites and the assemblages salvaged from them Salvaged material would need to be analysed, marked and boxed at the McGregor Museum in all notes, analyses and interpretations would also be archived there

packaging in transit, and for packaging and shelving in storage. Assistance would be required Provision would need to be made for transportation of material from Gamsberg; for suitable

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for analysis, marking and curation: one individual, who is literate, to complete the marking, and one individual preferably with computer experience, to assist with curatorial aspects; both to be employed in Kimberley for a period of three months.

## 6.4 A museum or resource centre for Gamsberg

strongly endorses the idea), it is recommended that a Heritage Committee or equivalent body nature of the facility and to formulate plans for its establishment. be formed, with project, local community and specialist representation on it, to decide on the If the Project deems formation of a museum/information/resource centre to be viable (this report

and information sheets may be prepared on the archaeology of Gamsberg, for display and As an interim measure, and in response to I&AP concerns, temporary exhibits by way of posters distribution locally.

objects and panels, Permanent displays, which contain examples of the excavated material, and other relevant (See GZP Scoping Report Volume 2 Appendix 3, Proceedings of Open Days: pages 20-21; 25). could follow in due course if a museum or information facility is established.

It is anticipated that such a facility would require staff. The articulation between such a facility having some bearing on the matter. Cape Museums legislation, and the accepted minimum standards for museums in South Africa interested and affected parties is an issue that would need to be decided, with draft Northern the project, the local community, museum authorities, tourism authorities and other

landscape, through many thousands of years, some of the details of which are only now coming the stark and singular natural environment, and, not least, a history of human survival in a harsh a number of unsung attractions, such as the historic mission settlement and cathedral at Pella development in the region, both during the life of the mine and after. It is an area blessed with museum or similar facility could fulfill an important role for tourism and community

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