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SCOPING ARCHAEOLOGICAL IMPACT ASSESSMENT: PROPOSED PROSPECTING ON KOOKER'S GRAFS VLAKTE 221 AND SLINGERS FONTEIN 491 (SITE 45), FRASERBURG, NORTHERN CAPE.

(Assessment conducted under Section 38 (8) of the National Heritage Resources Act No 25 of 1999)

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EXECUTIVE SUMMARY

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The Archaeology Contracts Office at the University of Cape Town was appointed by Tasman Pacific Minerals Limited prior to the approval of an amended EMP for drilling rights for uranium on Kooker's Grafs Vlakte 221 and Slingers Fontein located between Fraserburg and Carnarvon in the Northern Cape.

A literature survey indicated that very little was known of the archaeology of the area. A baseline archaeological survey was conducted by Lita Webley and Tim Hart on the 13 May 2010 and failed to find any significant heritage resources. The size of the two drill areas meant that we were unable to conduct a detailed foot survey and we had to target specific areas which we considered more likely to contain archaeological sites. This included ridges, pans and river valleys. We are confident that we covered the most sensitive areas and that a detailed AIA is unlikely to produce significantly more sites.

Prospecting on the farms will involve drilling holes some 14cm in diameter every 10000m² to 250m² in designated drill areas. The proposed drilling programme is designed to identify the aerial extent of any subsurface mineralisation as quickly as possible and once the margins of the mineralisation is identified further lateral drilling away from the target will be terminated. In all cases, the drill areas are a considerable distance from the farm house and associated farm buildings and these are not threatened in any way.

On **Kooker's Grafs Vlakte** we identified a number of Middle and Later Stone Age artefact scatters. Of interest was the recovery of a single "Lockshoek" scraper. There was also a small stone kraal and stone "oven" suggesting that a shepherd may have lived in the area for a while, presumably during the 20th century. No significant archaeological sites are threatened inside the drill area and prospecting should be allowed to continue with the proviso that if mining does take place, care should be taken to retain the stone structure.

On **Slingers Fontein** we examined the dolerite boulders on the ridge running along the eastern margins of the drill area, but found no engravings. We identified a few scatters of stone tools (Early and Middle Stone Age) on the site; however the densest accumulation of stone tools occurred outside the drill area around a large pan. We ascribe the lack of archaeological remains inside the drill area to a lack of water. We also identified a stone structure, presumably a shepherd's overnight hut dating to the 20th century, on a ridge in the drill area. No archaeological sites are threatened inside the drill area and prospecting should be allowed to continue, with the proviso that if mining should take place, care should be taken to retain the stone structure.

There are no significant issues which would prevent prospecting on these two properties. Finally, we advise that prospecting work should cease if any of the following are uncovered:

- Human remains/graves
- Concentrations of stone tools or faunal remains

- • Stone walling or any sub-surface structures Fossils

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GLOSSARY

- ESA: Early Stone Age The archaeology of the Stone Age between 700 000 and 2500 000 years ago.
- Khoekhoen: Pastoralist groups, with cattle, sheep and pottery who settled in southern Africa around 2000 years ago.
- Khoisan: Collective term relating to both the Khoekhoen and the San.
- LSA: Later Stone Age The archaeology of the last 20 000 years associated with fully modern people.
- MSA: Middle Stone Age The archaeology of the Stone Age between 300 000 – 20 000 years ago associated with early modern humans.
- NHRA: National Heritage Resources Act, No 25 of 1999.
- SAHRA: South African Heritage Resources Agency
- San: Indigenous hunter-gatherer groups who lived in small bands spread across a wide area of southern Africa.

1. INTRODUCTION

The Archaeology Contracts Office at the University of Cape Town was approached by Tasman Pacific Minerals Limited to undertake an Archaeological Impact Assessment prior to the approval of an amended EMP to allow drilling on the farm Kooker's Grafs Vlakte 221 and Slingers Fontein 491, situated half way between Fraserberg and Carnarvon in the Northern Cape (Figure 1 & 2). The Department of Minerals and Energy in Kimberley advised that in terms of the legislation an Archaeological and Palaeontological Impact Assessment would be required.

These two farms are located off the gravel road between Fraserberg and Carnarvon. The owner of the portion of Slingers Fontein identified for prospecting lives on the adjoining farm of Vischgat 223, known locally as Davidskolk.

2. BACKGROUND TO PROSPECTING

The client, Tasman Pacific Minerals Limited, intends to conduct a series of drilling programmes to prospect for uranium and molybdenum ores.

The client has applied to amend their existing, approved Environmental Management Plans and Prospecting Work Programmes to allow drilling activities to occur within 12 designated drilling project areas scattered throughout the Karoo region of South Africa.

Drilling will be conducted from truck mounted drilling rigs and will occur in two phases. The first phase will see holes drilled on pre-determined 100 m x 100 m grid arrays. This initial drilling array will be used to delineate the location and aerial extent of any subsurface mineralisation. Should such subsurface mineralisation be identified then a closer spaced 50 m x 50 m grid will be drilled in the immediate area of that mineralisation on so as to be able to more accurately quantify the thickness and uranium/molybdenum grade distribution within the deposit.

The nature of the planned drilling means that the largest hole diameter on surface will be $5\frac{1}{2}$ inches (approximately 14 cm diameter hole every 250 m²). Thus, there will not be extensive disruption of the land surface (i.e. No trenching, pitting or test mining is allowed under these amended EMPs or PWPs).

On all sites there are existing farm roads providing access directly to, or near by the drilling project areas. No new graded roads are proposed to be manufactured. Drill rigs will be wheel mounted and, thus, any vehicular traffic will produce "twin spoor: tracks. Vehicular traffic will only be allowed along (and not between) pre-designated pathways. Accordingly, most of the veld will never be subjected to vehicular traffic (i.e., two parallel wheel tracks every 50m at worst).

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At all times during the drilling programme there will be (as stipulated in the amended EMP for each area) a designated Environmental Control Officer whose role it will be to ensure compliance with the criteria within the EMP. This officer will be the site geologist and, as such will have a background that will enable them to identify any fossils that might be located at the proposed borehole positions or along the tracks utilised by vehicles. Should any be located then the borehole would be relocated to avoid damage or the fossil assessed by a suitably qualified professional and if appropriate excavated and lodged with an appropriately accredited organization.

The drill areas provided to ACO are the same as those included within the amended Prospecting Work Programme (PWP) and Environmental Management Plan (EMP) documents submitted to the Department of Minerals and Energy. These are the only areas within the total extent of the Prospecting Rights held by Tasman Pacific in which any disturbance of the Earth's surface will be allowed. Thus, these are the only locations within the Prospecting Right areas in which there is a risk of Impact upon the Archaeological heritage.

With regard to the exact locations of the proposed boreholes; the client indicated that it would not be a useful exercise for the ACO to inspect the site of every proposed borehole as indicated in the amended EMP and PWP documents for the following reasons:

- a. For various reasons those documents indicate the location of a great many more proposed boreholes than will ever be drilled (e.g., the Quaggasfontein Project alone contains approximately 800 proposed boreholes). However, the reality is that only a small percentage of these will ever be drilled. The proposed drilling programme is designed to identify the aerial extent of any subsurface mineralisation as quickly as possible and once the margins of the mineralisation is identified further lateral drilling away from the target will be terminated. This procedure is necessitated by the tremendous uncertainty of the location, extent and orientation of any subsurface mineralization;
- b. Further to point a, is entirely possible that the early stages of drilling may suggest that the programme is not viable and, in this case almost all of the holes will not be drilled;
- c. The boreholes have been located, sight unseen, on a predefined grid. The reality is that when it comes time to site the holes in the field many of the holes will need to be re-sited slightly due to

inappropriate local topography etc. Accordingly, the site inspection would be a waste of time in these cases;

- d. An effective and comprehensive survey of the various project areas, rather than one centred on pin point locations (i.e. borehole locations), would provide a better methodology as it could identify broad areas where drilling would be undesirable or inappropriate. A pin-point approach would need months of field work, at prohibitive expense and for the most part be wasted effort;
- e. Should mining be the eventual outcome of the exploration efforts a much more comprehensive examination and report would be required for inclusion in the Environmental Management Programme in any case.

3. TERMS OF REFERENCE

Prior to the commencement of fieldwork, the following was anticipated:

- Identification of heritage sites through a desk top survey and site visit
- Rating of significance of heritage sites on the properties
- Assessment of the impact of prospecting on the heritage of the properties
- Recommendations for mitigation.



Figure 1: The location of the two drill areas on Kookers Grafs and Slingers Fontein.



Figure 2: The farms Slingers Fontein (Map sheet 3121DB) and Kooker's Grafs Vlakte (3122AC) is located between Fraserburg and Carnarvon, Northern Cape Province. The drill areas are indicated on Figures 3 & 4. (Mapping information supplied by: Chief Directorate: Surveys and Mapping (web: w3sli.wcape.gov.za).

4. LEGISLATION

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The basis for all heritage impact assessment is the National Heritage Resources Act 25 (NHRA) of 1999, which in turn prescribes the manner in which heritage is assessed and managed. The National Heritage Resources Act 25 of 1999 has defined certain kinds of heritage as being worthy of protection, by either specific or general protection mechanisms. In South Africa the law is directed towards the protection of human made heritage, although places and objects of scientific importance are covered. The National Heritage Resources Act also protects intangible heritage such as traditional activities, oral histories and places where significant events happened. Generally protected heritage which must be considered in any heritage assessment includes:

- Cultural landscapes
- Buildings and structures (greater than 60 years of age)
 - Archaeological sites (greater than 100 years of age)
 - Palaeontological sites and specimens
 - Shipwrecks and aircraft wrecks
 - Graves and grave yards.

Section 38 of the NHRA requires that Heritage Impact Assessments (HIA's) are required for certain kinds of development such as rezoning of land greater than 10 000 sq m in extent or exceeding 3 or more sub-divisions, or for any activity that will alter the character or landscape of a site greater than 5000 sq m.

5. RECEIVING ENVIRONMENT

The mountains and kopjes north of Fraserberg are comprised of horizontally bedded, fossiliferous shales and mudstones of the Beaufort Group in the KarooSupergroup. They are intersected at numerous locations by dolerite dykes and sills that are more resistant to erosion than the surrounding sedimentary rocks. While small overhangs do occur under the lintels of these siltstone caps, they are very rare. These sedimentary rocks tend to weather into angular slab like rocks which are widely distributed in the study area.

Dykes and sills have baked the surrounding shales resulting in patches of high quality hornfels. Hornfels are an attractive rock for stone tool makers because it flakes predictably and produces sharp edges (Parkington et al 2008). The majority of artefacts found in the study area are of hornfels (also known as indurated shales). The igneous rocks erode into rounded spherical boulders which are used for rock engravings.

Ridges and lines of rocky hills strewn with these boulders are a characteristic feature of the Karoo. In addition, the dykes have the effect of damming up small streams resulting in small springs which often generate pans (or leegtes) of

seasonal water – another feature of the landscape (Parkington et al 2008). Vegetation cover is typical Karoo veld of low, semi-desert scrub, with varying amounts of seasonal grasses that disappear in the dry winter months. Taller shrubs and trees may occur near springs and dry river beds. Stock farming, predominantly sheep farming, is widespread. Some farms also keep small numbers of springbuck. The annual average rainfall is around 350mm per annum and falls mainly in the summer. Snow is not uncommon on the high lying grounds. Subzero temperatures occur between April and October and may drop down to -6C. High winds during the daytime are a characteristic of the Karoo.

The drill area on **Kooker's Grafs Vlakte** is located to the west of the farm road, on a slight elevation. The property slopes down south to a dry river bed (but does not include the river bed) as well as to the east and west. The northern section is slightly rocky.

Plate 1: Kooker's Grafs Vlakte - view of drill area looking from rocky area on east towards the west.

The drill area on **Slingers Fontein** comprises a long elevated dolerite ridge running along the eastern portion of the site. It is unlikely that prospecting will take place along the upper reaches of this ridge due to the difficulty of taking the rig up the steep slopes. The western portion of the drill area is completely flat and extends southward toward a large pan, which is not included in the drill area.

Plate 2: Slingers Fontein - the dolerite ridge along the eastern edge of the drill area.

Plate 3: View of the drill area on Slingers Fontein below the ridge, looking west. The stone structure is visible on the extreme left.

5.1 Archaeological Background

There has been no systematic archaeological work undertaken in this immediate vicinity and this discussion is based on projects from other areas, some more than 200 km away. Because of the scarcity of caves and shelters, more than 90% of Karoo archaeological sites are open sites of stone artefacts, ostrich eggshell fragments and occasionally, pottery. Bone remains are rarely preserved. Artefacts of both the Early and Middle Stone Age are widespread. More intensive occupation of the Karoo started around 13 000 years ago during the Later Stone Age. Distinctive stone tool assemblages, referred to as the Lockshoek have been identified. Characteristic of this period is large knife like tools with natural

backing. Large scrapers are also common. This industry disappears abruptly around 9000 years ago. The Karoo seems to have been largely unoccupied until 4500 BP, presumably as a result of drier conditions.

The most detailed and comprehensive investigation of the Karoo was undertaken in the Upper Seacow River by Sampson (1988). He recorded some six thousand archaeological sites which he ascribed to Bushmen hunter-gatherers and Khoekhoen pastoralists. The archaeological remains relating to the Bushmen have been historically described as the "Smithfield Industry", and are found from the western Free State to the northern part of the Northern Cape. The Smithfield typically contains flaked lithics (on un-patinated blue-black hornfels), grinding equipment, bored stones, and potsherds (typically relating to bowl-shaped pots with stamp impressed decoration). Formal stone tools include endscrapers. Sampson also recognized a Khoekhoen ceramic tradition and he speculates on the chronological ordering of the settlement in the valley (1988). He notes that many of the Smithfield sites occur in dense clusters, and that they are concentrated on the flat sandy patches on the foot slopes and crests of dolerite hills and ridges. usually within a half-hour walk (1km radius) of a fountain. Many of these sites are protected from the winds by low ridges and boulders, in other words shelter especially in the winter months is of paramount importance. Rock engravings do occur to the south and east of Beaufort West on dolerite boulders and these were examined closely during this survey.

Dreyer (2007a & b) has undertaken a number of surveys of borrow pits along regional roads in the Williston and Carnarvon areas further to the north. In addition to historic structures and graves, he recorded a background "noise" of MSA and LSA stone tool scatters. He regarded these to be of low significance.

5.2 Historical Background

The survey diagram for Slingers Fontein dates to 1976, suggesting that the original farm formed part of a later consolidation. The farm contains a number of large dams and there is reference to a "trek pad".

The farm Kooker's Grafs Vlakte was surveyed by the Government Surveyor "according to beacons pointed out to me by T.J. Mostert, September 1885". This diagram shows no buildings on the property. The name Kooker's Grafs Vlakte suggests the presence of graves on the farm, but we did not find any in the drill area and we did not have the opportunity to interview the farm owner.

6. METHODS

The boundaries of the site were loaded onto handheld GPS receivers (set to the WGS84 datum) to facilitate the identification of the search area during field work. Fieldwork was undertaken by Lita Webley and Tim Hart from the 13 May 2010.

Walk paths and site locations were recorded with GPS (Figures 3 & 4) and finds were photographed and described.

6.1 Limitations

The size of the two drill areas meant that we were unable to conduct a detailed foot survey and we had to target specific areas which we considered more likely to contain archaeological sites. This included ridges, pans and river valleys. We are confident that we covered the most sensitive areas and that a detailed AIA is unlikely to produce significantly more sites.

There were no significant limitations to the fieldwork on Kooker's Grafs Vlakte. It was possible to access most areas of the site from the farm road which runs through the centre of the drill area (Figure 3). There were more limitations on Slingers Fontein. This is because of the hilly nature of the eastern portion of the drill area. This made access difficult to certain areas and they could not be accessed without spending considerable time on site (Figure 4).

Figure 3: The drill area on Kooker's Grafs Vlakte and the trackways reflecting' the archaeological survey.

Figure 4: The drill area on Slingers Fontein and the tracks of the archaeological survey.

7. RESULTS OF FIELD SURVEY

Kooker's Grafs Vlakte

Apart from the usual ephemeral scatter of weathered MSA artefacts and the unpatinated LSA artefacts (both on hornfels), we did discover three clusters of fairly dense stone tools (Table 1). In addition, we recovered a single large stone scraper which is possibly of Lockshoek origin (Plate 4). It occurs in isolation and is not associated with any other stone artefacts.

In addition, we had been informed of the presence of a stone ruin on the edge of the drill area and this was investigated by Tim Hart. He reports that the building is a collapsed, dry-stone wall structure, some $5m \times 5m$ in size with a single entrance (Plate 5). He is of the opinion that it represents a kraal. There was some associated 20^{th} century ceramics and glass. Nearby is a small collapsed stone structure which he thought resembled an outside oven – frequently encountered in the more arid parts of South Africa. He noted that these structures were close to a river system and may have been a good focus for settlement in the past.

Plate 4: The "Lockshoek" scraper; Plate 5: The stone structure, probably a kraal.

Slingers Fontein

The Slingers Fontein site incorporates the western margins of a dolerite ridge (Plate 2). This was the only dolerite area found in any drill area during our surveys. We examined the round dolerite boulders closely to make sure that they did not have any rock engravings. None were observed.

Despite the topography, no significant archaeological sites were discovered. We found a single Early Stone Age implement (Site 37) close to the little stone structure on the edge of the ridge (Site 38). The stone structure comprised a circle with an entrance looking out over the plains. There was a semicircle of stones built around the entrance, forming a sort of "skerm" or shelter. Some green and brown bottle glass suggested a 20th century date. This was probably to protect the occupant from the wind while making a fire. It is likely that the stone structure represents a shepherd's hut.

Plate 6: The shepherd's shelter (Site 38) and; Plate 7: an ESA stone artefact.

We found a single scatter of weathered MSA artefacts against the side of the ridge, in the lee of the wind (Site 39). Despite the size of the terrain very few scatters of stone tools were observed. We plotted a pan (just outside the drill area) with a very dense scatter of MSA artefacts around the margins (Site 4). The reason for recording this site is to point out that this area is not completely devoid of archaeological sites, but that the inhabitants probably had very specific environmental constraints which dictated settlement.

Plate 8: Site 39 on the dolerite ridge on Slingers Fontein; **Plate 9:** The pan outside the drill area with the dense scatter of MSA material in the foreground.

8. SITE SIGNIFICANCE, IMPACT OF DEVELOPMENT AND MITIGATION

8.1 Loss of Pre-colonial Sites

The aridity of the area suggests that pre-colonial occupation would have been situated in areas where water would have been available, even if only for limited periods of good rainfall. There are two dry river beds on either side of the drill area in Kookers Grafs Vlakte. It is possible that the stone kraal and "oven" may have been constructed near one of the perennial stream to make use of the water. There are two windpumps in the drill area on Slingers Fontein and we investigated around them as we assumed that they may have been placed on permanent fountains. No archaeological sites were found nearby. There are no dry stream beds on the drill area. We found the densest accumulation of stone artefacts around a pan, but this was outside the drill area (Site 40).

Significance: Section 35 of the NHRA prohibits any person, without a permit, from destroying, damaging, excavating, altering, defacing or disturbing any archaeological sites and material, palaeontological sites and

meteorites. No significant Stone Age archaeological remains were discovered in the drill area which would prevent prospecting. The "Lockshoek" scraper is an interesting find, but occurs in isolation and it unlikely to provide any additional information on this time period.

Mitigation: It is recommended that prospecting should be allowed to proceed without mitigation.

8.2 Loss of Colonial Sites

We found a few dry-wall stone structures on Kooker's Grafs Vlakte and Slingers Fontein (Kraal, Oven and Site 38). They appear to be related to sheep herding activities and probably date to the 20th century.

Significance: Section 34 of the NHRA stipulates that no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the relevant provincial heritage resources authority. *The stone structures are not considered to be of high significance. However, it is recommended that they are retained.*

Mitigation: It is unlikely that the structures will be demolished during prospecting. However, if mining does proceed then due caution should be exercised.

8.3 Loss of Graves

No graves or packed stone cairns were discovered on these areas.

Significance: Section 36 (3) (b) of the NHRA clearly stipulates that no person may, without a permit issued by the relevant heritage authority or SAHRA destroy, damage or exhume any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority.

Mitigation: None. See general observations below.

9. CONCLUSIONS AND RECOMMENDATIONS

Prospecting on the farms will involve drilling holes some 14cm in diameter every 10000m² to 250m² in designated drill areas. The proposed drilling programme is designed to identify the aerial extent of any subsurface mineralisation as quickly as possible and once the margins of the mineralisation is identified further lateral drilling away from the target will be terminated. In all cases, the drill areas are a considerable distance from the farm house and associated farm buildings and these are not threatened in any way. A baseline archaeological survey of the

farms Kookers Grafs Vlakte and Slingers Fontein (Site 45) failed to identify any significant heritage resources which will be impacted during the drilling process.

On **Kooker's Grafs Vlakte** we identified a number of Middle and Later Stone Age artefact scatters. Of interest was the recovery of a single "Lockshoek" scraper. There was also a small stone kraal and stone "oven" suggesting that a shepherd may have lived in the area for a while, presumably during the 20th century from the associated glass and china fragments. No significant archaeological sites are threatened inside the drill area and prospecting should be allowed to continue with the proviso that if mining does take place, care should be taken to retain the stone structure.

On **Slingers Fontein** we examined the dolerite boulders on the ridge running along the eastern margins of the drill area, but found no engravings. We identified a few scatters of stone tools (Early and Middle Stone Age) on the site; however the densest accumulation of stone tools occurred outside the drill area around a large pan. We ascribe the lack of archaeological remains inside the drill area to a lack of water. We also identified a stone structure, presumably a shepherd's overnight hut, on a ridge in the study area. It is also likely to date to the 20th century from the associated bottle glass. No archaeological sites are threatened inside the drill area and prospecting should be allowed to continue, with the proviso that if mining should take place, care should be taken to retain the stone structure.

There are no significant issues which would prevent prospecting on these two properties. Finally, we advise that prospecting work should cease if any of the following are uncovered:

- Human remains/graves
- Concentrations of stone tools or faunal remains
- Stone walling or any sub-surface structures
- Fossils

If any of the above is uncovered, SAHRA should be notified so that an archaeologist/palaeontologist can investigate further.

10. REFERENCES

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Site	Lat/Lon ^o	Туре	Description
Number			
33	S31 28 31.9	LSA?	Five unpatinated stone artefacts,
	E22 01 06.1		probably LSA, from Kooker's Grafs Vlakte
34	S31 28 31.2	LSA	A single Lockshoek scraper on the
	E22 01 06.7		farm Kooker's Grafs Vlakte
Kraal?	S31 28 34.4	Colonial	A dry-wall stone structure, about 5m
	E22 00 50.5		x 5m with single entrance, possibly a
			kraal. Kooker's Grafs Vlakte
AS	S31 33 30.3	MSA	Fairly dense distribution of weathered
	E21 59 16.6		MSA artefacts on hornfels, Kooker's
	<u> </u>		Grafs_Vlakte
Oven?	S31 28 36.0	Colonial	Collapsed stone structure, possibly an
	E22 00 54.7		outside oven? Kooker's Grafs Vlakte
LSA1	S31 28 35.6	LSA	Fairly dense distribution of
	E22 00 58.2		unpatinated stone flakes, probably
			LSA. Kooker's Grafs Vlakte.
34	S31 28 18.6	MSA	Single MSA flake from Kooker's Grafs
	E22 01 08.9		Vlakte
35	S31 28 05.1	MSA	Single weathered MSA flake from
	E22 01 26.8		Kooker's Grafs vlakte
37	531 33 28.2	ESA	Single weathered MSA artefact from
	E21 59 00.6		Slingersfontein
38	S31 33 28.9	Colonial	Single semi circular stone structure on
	E21 58 58.7		the ridge at Slingersfontein
39	S31 33 23.6	MSA	Concentration of MSA artefacts from
	E21 59 05.3		the ridge on Slingersfontein

Table 1: Location of sites on Kooker's Grafs Vlakte and Slingersfontein

40	S31 35 35.0	MSA	Scatter of MSA artefacts around a pan
	E21 58 47.1		outside the drill area on
			Slingersfontein

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