

PHASE 1 HERITAGE IMPACT ASSESSMENT OF 8 ADJOINING PLOTS IN BLOEMSPRUIT, BLOEMFONTEIN, FREE STATE PROVINCE.



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Declaration of Independence

Paleo Field Services remains financially independent, with no vested interest in project activities or outcomes except for professional fees. Its sole remuneration comes from agreed-upon services for each project. Paleo Field Services accepts client-provided information as accurate.

Yours truly,

A handwritten signature in blue ink, appearing to read "L. Rossouw", written in a cursive style.

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SUMMARY

A Phase 1 Heritage Impact Assessment was conducted on eight adjacent plots designated for residential development in Bloemspruit, Bloemfontein. The respective plots have been heavily degraded by past human activities, including construction and vegetation alteration. Remnants of several buildings less than 60 years old are present. A terrain survey found no intact fossils in the Quaternary sediments and no evidence of Stone Age artifacts or surface scatters. Additionally, there were no aboveground signs of prehistoric structures, Anglo Boer War sites, graves, or buildings older than 60 years within the study area. The site's underlying geology includes possibly fossil-bearing Karoo Supergroup strata, while surface sediments comprise non-significant residual soils. Due to the depth of overburden and low terrain, bedrock sediments are unlikely to be impacted palaeontologically. Archaeological impact at proposed sites is expected to be minimal. Proposed development will affect severely degraded terrain and palaeontologically insignificant overburden where expected impact will have negligible negative effects on palaeontological, archaeological or historically significant heritage with no further mitigation needed. The proposed footprint is assigned a rating of Generally Protected C (Low Significance) and development can go ahead if all activities stay within the marked boundaries.

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INTRODUCTION

A Phase 1 Heritage Impact Assessment was conducted on eight adjacent plots designated for residential development in Bloemspruit, Bloemfontein (**Fig. 1**). The assessment is required as a prerequisite for new development in terms of the National Heritage Resources Act (NHRA) 25 of 1999. The NHRA identifies what is defined as a heritage resource, the criteria for establishing its significance and lists specific activities for which a heritage specialist study may be required. The NHRA prescribes a system of grading of places/objects via Section 7 and makes provision for the general protection of heritage resources via Sections 34, 35, 36, and 37 (in respect of the built environment, archaeology/ palaeontology, burial grounds/graves and monuments/memorials, respectively), while Section 38 sets out guidelines under which heritage impact assessments are required when new developments may impact upon heritage resources.

In this case, the proposed development triggered Section 38(1) of the Act where proposed development is categorised *as any development or other activity which will change the*

character of a site exceeding 5 000 m² in extent or involving three or more existing erven or subdivisions thereof.

LOCALITY DATA

Map Reference: 1:50 000 topographical map 2926 AB Maselspoort and 1:250 000 scale geological map 2826 Bloemfontein.

GPS Coordinates (Fig. 2)

- A) 29° 7'43.20"S 26°17'13.36"E
- B) 29° 7'46.27"S 26°17'26.20"E
- C) 29° 7'52.24"S 26°17'23.95"E
- D) 29° 7'50.89"S 26°17'17.25"E
- E) 29° 7'58.67"S 26°17'14.85"E
- F) 29° 8'2.32"S 26°17'28.02"E
- G) 29° 8'8.13"S 26°17'25.87"E
- H) 29° 8'1.41"S 26°17'0.56"E
- I) 29° 7'48.72"S 26°17'4.73"E

Adjoining Plots 186, 185, 199, 135, 176, 177, 141, 136 together covers ~30 ha respectively and are situated on Voorspoed and Garden Streets in Bloemspruit, about 14 km east-southeast of the Bloemfontein CBD (**Fig. 2**).

ASSUMPTIONS AND LIMITATIONS

The development footprint area appears to be located on previously transformed, low relief terrain with the expectation that visibility should be relatively high in terms of archaeological remains including above-ground historical structures and low in terms of palaeontological exposures.

METHODOLOGY

A site assessment was conducted in accordance with the NHRA (No 25 of 1999) and SAHRA Minimum Standards for Archaeological and Palaeontological components of Impact Assessment Reports. The site was rated using existing field data, database information and published literature. This was followed by personal observation via foot surveys with access by motor vehicle. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes.

Terms of Reference

- Conduct site assessment to identify and map heritage sites and occurrences in the affected area(s) and provide an assessment of their significance.
- Conduct site assessment to determine and assess impacts of the proposed development on heritage resources relative to the sustainable social and economic benefits to be derived from the development if planned impacts will result in the loss of any resources.
- Provide a system of grading of places and objects which form part of the national estate, and which distinguishes between at least the categories as prescribed under Section 7 of the NHRA — (a) Grade I: Heritage resources with qualities so exceptional that they are of special national significance; (b) Grade II: Heritage resources which can be considered to have special qualities which make them significant within the context of a province or a region; and (c) Grade III: Other heritage resources worthy of conservation (**see Table 2**).
- Recommend mitigation measures to minimize potential impacts associated with the proposed development, if any.

BACKGROUND

Palaeontology

The study area, as shown on the 1:250 000 scale geological map 2924 Bloemfontein, is within the Beaufort Group's Adelaide Subgroup (Karoo Supergroup), featuring late Permian sedimentary rocks of alternating sandstone and mudstone layers (Pa) from stream and floodplain deposits. Extensive Jurassic dolerite sills and dykes (Jd) are also present. Quaternary residual deposits cover these rocks. The sedimentary rocks belong to the late Permian Dicynodon Assemblage Zone, noted for therapsids Dicynodon and Theriognathus, various vertebrates, invertebrate and vertebrate trace fossils, and Glossopteris plants (**Fig. 3**).

Archaeology

Archaeological evidence from the Stone Age in the Bloemfontein region dates to the Middle Stone Age. Numerous prehistoric artifacts, including Middle and Later Stone Age items, have

been documented eroding from the overbank sediments along the Modder River and its tributaries. These artifacts are often found in conjunction with large mammal fossil remains. The study area is situated outside the southwestern boundary of Late Iron Age stone-walled settlements in the Free State (**Fig. 4**).

FIELD ASSESSMENT

Bedrock sediments at the site are mostly covered by well-developed, superficial sediments, making outcrop visibility poor (**Fig. 5**). The respective plots have been heavily degraded by past human activities, including construction and vegetation alteration (**Fig. 6 – 11**). Remnants of several buildings less than 60 years old are present. A terrain survey found no intact fossils in the Quaternary sediments and no evidence of Stone Age artifacts or surface scatters. Additionally, there were no aboveground signs of prehistoric structures, Anglo Boer War sites, graves, or buildings older than 60 years within the study area.

IMPACT STATEMENT AND RECOMMENDATIONS

The site's underlying geology includes possibly fossil-bearing Karoo Supergroup strata, while surface sediments comprise non-significant residual soils. Due to the depth of overburden and low terrain, bedrock sediments are unlikely to be impacted palaeontologically. The development area has been previously altered by residential, industrial, and commercial activities. Archaeological impact at proposed sites is expected to be minimal. Proposed development will affect severely degraded terrain and palaeontologically insignificant overburden where expected impact will have negligible negative effects on palaeontological, archaeological or historically significant heritage with no further mitigation needed (**Table 1**). The proposed footprint is assigned a rating of Generally Protected C (Low Significance) (**Table 2**) and development can go ahead if all activities stay within the marked boundaries.

REFERENCES

Churchill, S.E., Brink, J.S., Berger, L.R. Hutchison, R.A., Rossouw L., *et. al.* 2000. Erfkroon: a new Florisian fossil locality from fluvial contexts in the western Free State, South Africa. *South.African Journal of Science* 96: 161 – 163.

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TABLES & FIGURES

Table 1. Site impact rating table summarizing potential palaeontological and archaeological impacts on a scale of 1 to 4. Calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude = 6-28 (Low), 29-50 (Moderate), 51-73 (High) and 74-96 (Very High).

Points	Impact significance rating	Description
6 to 28	Low impact	The anticipated impact will have negligible negative effects and will require no mitigation.
29 to 50	Moderate impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
51 to 73	High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of extenuation.
74 to 96	Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".

Context	Rating Palaeontology	Rating Archaeology / Cultural
Geographical Extent	Site (1) The impact will only affect the site.	Site (1) The impact will only affect the site.
Probability of Occurrence	Unlikely (1) The chance of the impact occurring is extremely low	Unlikely (1) The chance of the impact occurring is extremely low

	(Less than a 25% chance of occurrence).	(Less than a 25% chance of occurrence).
Duration	Permanent (4) Mitigation either by man or natural process will not occur in such a way or such a time span prompting an impact that can be considered indefinite.	Permanent (4) Mitigation either by man or natural process will not occur in such a way or such a time span prompting an impact that can be considered indefinite.
Magnitude	Low (1) Impact affects the quality and integrity of the resource in a way that is barely perceptible.	Low (1) Impact affects the quality and integrity of the resource in a way that is barely perceptible.
Reversibility	Completely reversible (1) Impact on resource is neutral	Completely reversible (1) Impact on resource is neutral
Irreplaceable loss of resources	No loss (1) The impact will not result in the loss of any resources.	No loss (1) The impact will not result in the loss of any resources.
Cumulative Impacts	Negligible (1) (The impact would result in negligible to no cumulative effects on resource.	Negligible (1) The impact would result in negligible to no cumulative effects on resource.
Significance	Low (9) The expected impact will have negligible negative effects on the resource and will require no mitigation.	Low (9) The expected impact will have negligible negative effects on the resource and will require no mitigation.

Table 2. Description of Field Rating categories as prescribed in Section 7(1) of the NHRA where SAHRA, in consultation with the Minister and the MEC of every province, must by regulation establish a system of grading of places and objects which form part of the national estate, and which distinguishes between at least the categories— (a) Grade I: Heritage resources with qualities so exceptional that they are of special national significance; (b) Grade II: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and (c) Grade III: Other heritage resources worthy of conservation.

Field Rating	Grade (NHRA No. 25 of 1999, Section 7)	Significance	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	-	High/medium significance	Mitigation before destruction
Generally Protected B	-	Medium significance	Recording before destruction
Generally Protected C	-	Low significance	Destruction

HIA - Adjoining Plots x 8 Bloemspruit



Figure 2. Aerial view of the eight adjoining plots in Bloemspruit.

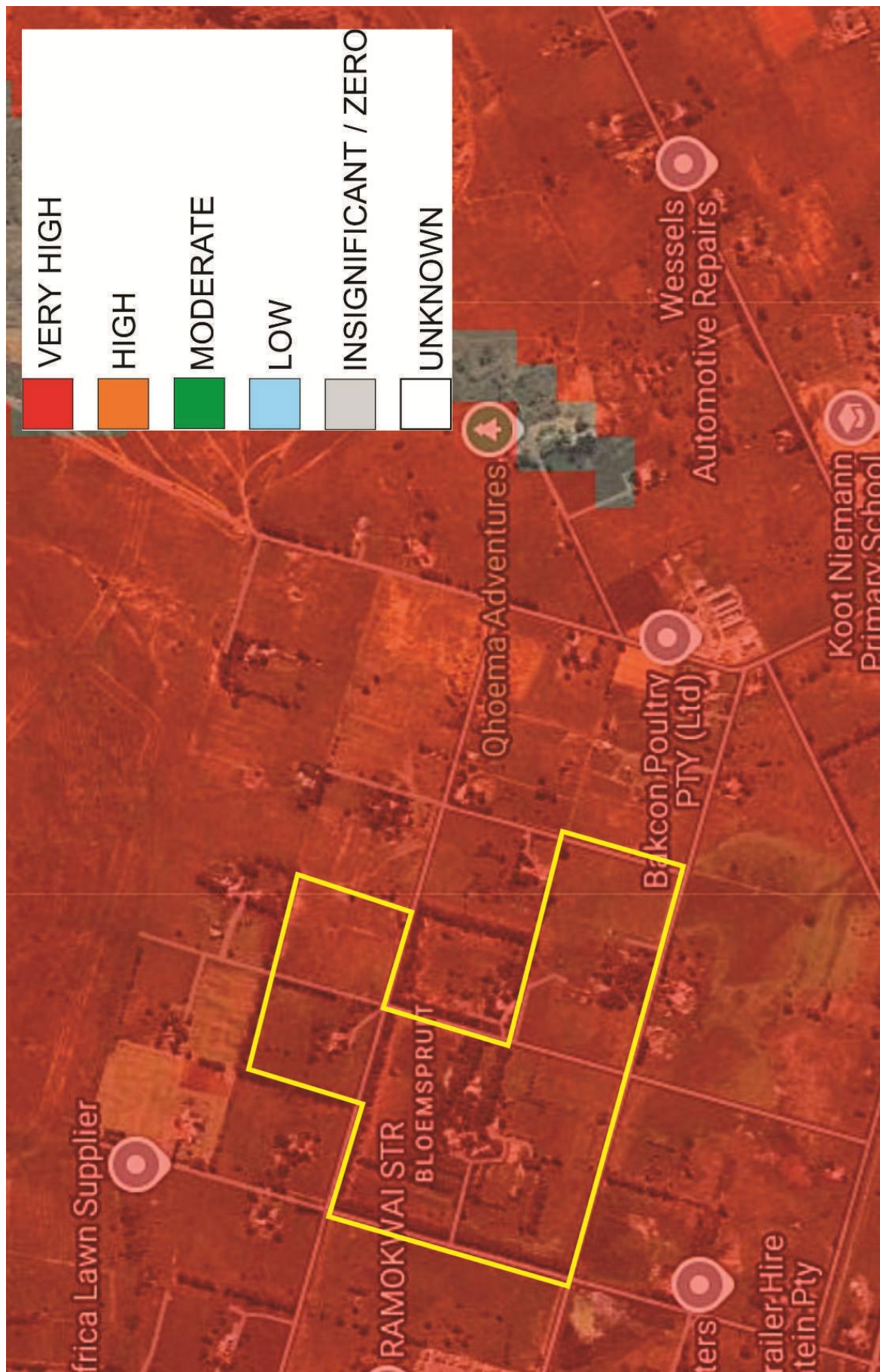


Figure 3. Study area marked on SAHRIS palaeosensitivity map based on 1:250 000 scale geological map 2926 Bloemfontein.



Figure 4. Map of previously recorded heritage sites/features (yellow icons) located within 2 km radius of the study area.



Figure 5. The study area is covered by well-developed, superficial sediments. Due to the depth of the overburden and low terrain, bedrock sediments are unlikely to be impacted palaeontologically.



Figure 6. General view of Plot 136 (above left & right) and Plot 141 (below left & right)

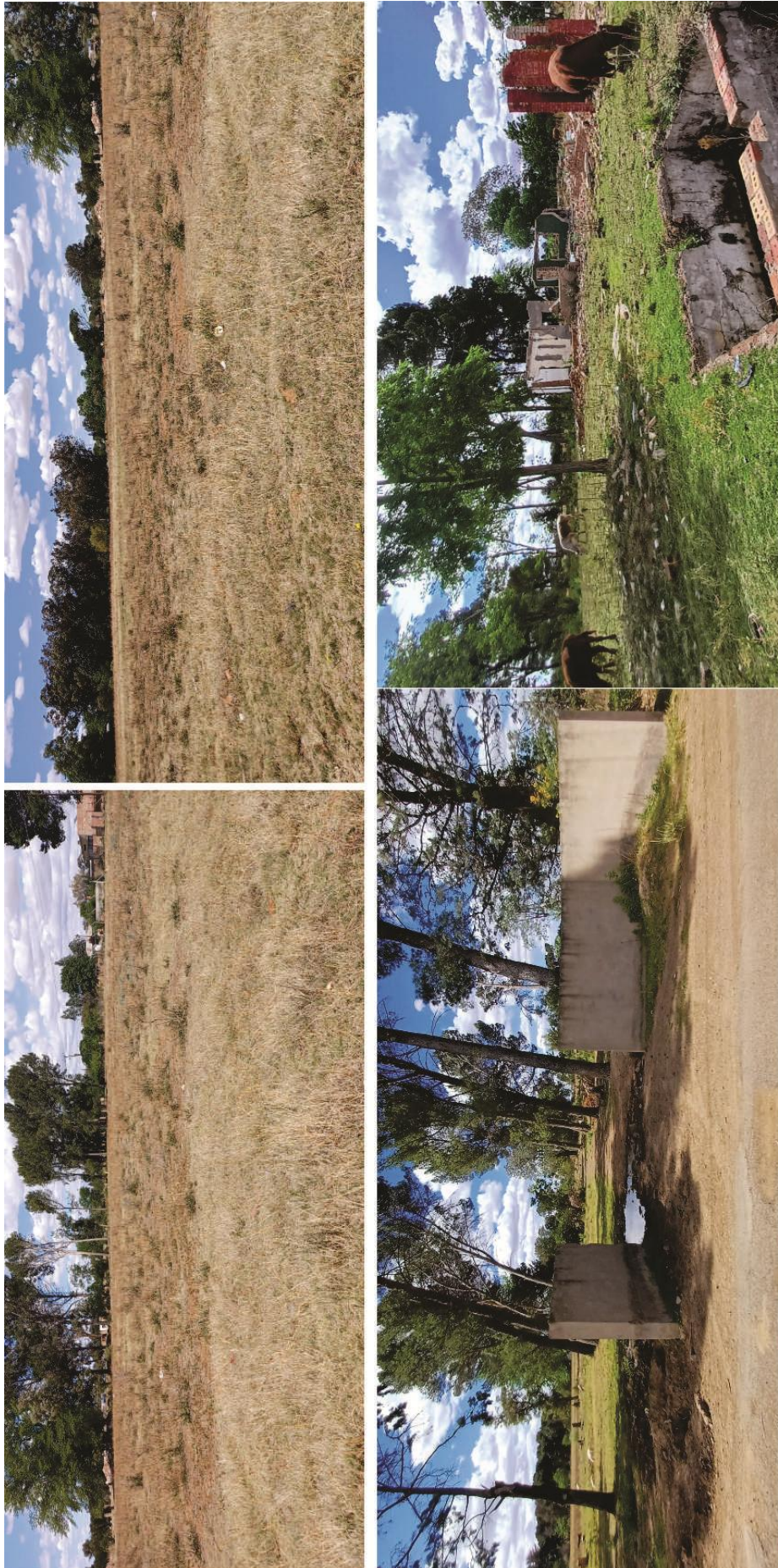


Figure 7. General view of Plot 135 (above left & right) and Plot 199 (below left & right)



Figure 8. General view of Plot 176.



Figure 9. General view of Plot 177.



Figure 10. General view of Plot 185.

APPENDIX 2 – SURVEY TRACK LOG



Index	Position	Index	Position
1	S29 08.078 E26 17.221	16	S29 07.925 E26 17.124
2	S29 08.004 E26 17.249	17	S29 07.864 E26 17.097
3	S29 08.023 E26 17.153	18	S29 07.932 E26 17.042
4	S29 08.007 E26 17.045	19	S29 07.971 E26 17.222
5	S29 07.961 E26 17.030	20	S29 07.903 E26 17.280
6	S29 07.994 E26 17.144	21	S29 07.858 E26 17.211
7	S29 08.051 E26 17.175	22	S29 07.825 E26 17.080
8	S29 08.022 E26 17.309	23	S29 07.798 E26 17.083
9	S29 08.089 E26 17.337	24	S29 07.821 E26 17.173
10	S29 08.119 E26 17.415	25	S29 07.841 E26 17.229
11	S29 08.005 E26 17.350	26	S29 07.803 E26 17.250
12	S29 07.971 E26 17.232	27	S29 07.772 E26 17.217
13	S29 07.921 E26 17.254	28	S29 07.806 E26 17.306
14	S29 07.905 E26 17.190	29	S29 07.784 E26 17.351
15	S29 07.948 E26 17.180	30	S29 07.829 E26 17.356