

**ARCHAEOLOGICAL IMPACT ASSESSMENT
THE PROPOSED SANDRIFT OXIDATION PONDS
AND SEWER PIPELINE
NORTHERN CAPE**

Prepared for:

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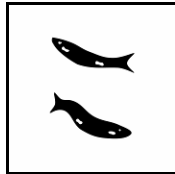
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Executive summary

The Agency for Cultural Resource Management (ACRM) was commissioned by Bvi Consulting Engineers to conduct an Archaeological Impact Assessment (AIA) for the proposed construction of oxidation ponds and a sewer pipeline at Sandrift in the Richtersveld region of the Northern Cape.

Sandrifft is a small village located on the southern bank of the Orange River, about 45 kms north east of Alexander Bay and about 125 kms from Port Nolloth on the Namaqualand coast.

The proposed 5.3 ha site for the oxidation ponds is a fairly level piece of land located on the right hand side of the road about 1.5 kms before one enters the village.

In terms of Section 38 (1) (c) of the National Heritage Resources Act 1999 (Act 25 of 1999), an Archaeological Impact Assessment (AIA) of the proposed project is required if the footprint area of the proposed development is more than 5000 m².

In addition, Section 38 (1) (a) of the Act indicates that any person constructing a powerline, pipeline or road, or similar linear development exceeding 300m in length must notify the responsible heritage resources authority (i.e. SAHRA), who will in turn advise whether an impact assessment is required before development can take place.

The aim of the archaeological study is to locate and map heritage sites or remains that may potentially be impacted by the proposed development, to assess the significance of the potential impacts and to propose measures to mitigate any impacts.

A field study took place in which the following observations were made:

Thirty stone artefacts were documented during the study of the proposed activities. Eleven tools were documented in the footprint area for the proposed oxidation dam and 19 tools were found during a walk through survey of the proposed pipeline. Each of the archaeological occurrences has been mapped with a hand held GPS unit.

The tools are dominated by Middle and Later Stone Age flakes, chunks, cores and smashed/broken cobbles. Only one Early Stone Age flake was found. The tools are all in quartzite and chalcedony and are highly patinated. Quartzite is locally available, but chalcedony must have washed down the river from higher levels upstream. No formal tools were found, but several utilized and retouched flakes were counted. No organic remains such as pottery, bone or ostrich eggshell was found. The tools are all spread very thinly and unevenly over the surrounding landscape. No activity areas or evidence of any human settlement was found.

Their small numbers and the isolated and disturbed context in which they were found mean that the remains have been rated as having low archaeological significance.

Five graves were documented in or near to the proposed sewer pipeline. Typically these 'traditional' forms of graves appear in the landscape as circular stone cairns and probably predate the colonial era. Grave 1 and Grave 5 appear to be in, or at least very close to the proposed alignment, and cognizance of their presence must be taken into account when the final pipeline layout is prepared. Graves older than 100 years are

protected under the NHRA and it is an offence to damage or remove any grave without a permit issued by SAHRA.

Overall, the study has identified no significant impacts to pre-colonial archaeological material that will need to be mitigated prior to proposed development activities.

With regard to the proposed construction of oxidation ponds and a sewerage pipeline at Sandrift, the following recommendations are therefore made:

1. The project is deemed to be viable.
2. No archaeological mitigation is required.
3. All graves must be avoided with particular attention to Grave 1 and Grave 5 which are located in or very close to the pipeline servitude. This might require a slight adjustment being made to the route.
4. Should any unmarked human remains, or features such as buried ostrich eggshell caches be exposed or uncovered during excavations and bulk earthworks these must immediately be reported to the South African Heritage Resources Agency (Ms Mariagrazia Galimberti 021 4624502). Burials must not be disturbed until inspected by the archaeologist and will have to be removed by an archaeologist under a permit issued by SAHRA.

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1. INTRODUCTION

Bvi Consulting Engineers, on behalf of the Richtersveld Municipality, commissioned the Agency for Cultural Resource Management (ACRM) to conduct an Archaeological Impact Assessment (AIA) for the proposed construction of oxidation ponds and a sewer pipeline at Sandrift in the Richtersveld region of the Northern Cape (Figures 1 & 2).

The proposed project entails the following:

- Construction of sewer oxidation and evaporation ponds.
- Construction of inlet and outlet structures to convey water from one pond to another.
- Installation of security fencing around the ponds.
- Construction of a ± 1.3 km underground sewer pipeline.
- Construction of a sewer pump station.
- Construction of a 0.6 km gravel access road.

The footprint area of the proposed oxidation ponds and associated infrastructure will be about 5.3 ha.

The proposed activities are to be located on Remainder of Farm Richtersveld 11, Namaqualand.

In terms of Section 38 (1) (c) of the National Heritage Resources Act 1999 (Act 25 of 1999), an AIA of the proposed development is required if the development footprint area is more than 5000 m². This is to determine if the area contains heritage sites and to take the necessary steps to ensure that they are not damaged or destroyed during development.

In addition, Section 38 (1) (a) of the Act indicates that any person constructing a powerline, pipeline or road, or linear development exceeding 300m in length is required to notify the responsible heritage resources authority, who will advise whether an impact assessment is required before development can take place.

ACRM has been instructed to undertake a baseline study in order to locate and map archaeological sites or remains that may potentially be impacted by the proposed development, to assess the significance of the potential impacts and to propose measures to mitigate any impacts.

The AIA forms part of the Environmental Basic Assessment process that is being undertaken by independent environmental consultants, Enviro-Logic cc.



Figure 1. Locality Map: Regional context

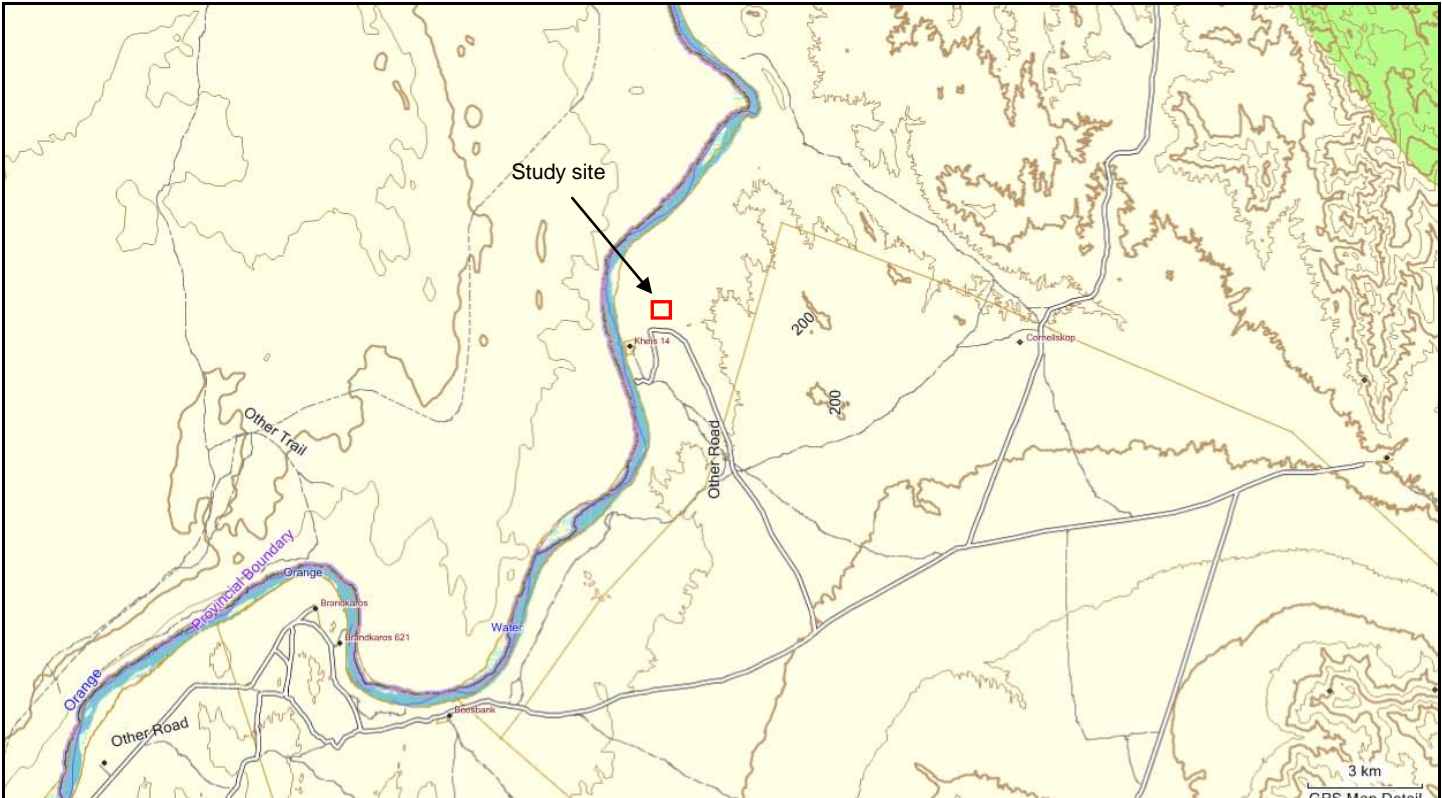


Figure 2. Locality Map: Local context

2. TERMS OF REFERENCE

The terms of reference for the archaeological study were to:

- Determine whether there are likely to be any archaeological resources that may be impacted by the proposed construction of the oxidation ponds, including associated infrastructure;
- To identify and map archaeological resources that may be impacted by the proposed development;
- To assess the sensitivity and conservation significance of archaeological resources affected by the proposed development;
- To assess the significance of any impacts resulting from the proposed development, and
- To identify measures to protect and maintain any valuable archaeological sites that may be impacted by the proposed development

3. DESCRIPTION OF THE AFFECTED ENVIRONMENT

An aerial photograph indicating the site layout for the proposed Sandrift oxidation ponds is illustrated in Figure 3.

Sandrifft is a small Nama village located on the southern bank of the Orange River, about 45 kms north east of Alexander Bay and about 125 kms from Port Nolloth on the Namaqualand coast.

The proposed site for the oxidation ponds is situated on the right hand side of the road and about 1.5 kms before the entrance to the small township (Figures 4 & 5). The site is fairly level and covered in wind blown sand, small stone and some larger rocks. There are several gravel tracks that intersect the site. A recently graded road has also been made. Drainage channels are also visible on the landscape and in the surrounding area. There are, no significant landscape on the proposed site, which is featureless and slopes slightly from south to north. The proposed site is quite degraded. Surrounding land use is vacant land (mainly used for small stock grazing) and extensive diamond mining. Much of the surrounding lands to the west of the `main' road is owned by the Trans Hex Diamond Mining Company.

The proposed 1.3 km long underground sewer pipeline will connect to a proposed sewer pump station near the entrance to the town (Figures 6-7).

The existing 0.6 km long gravel access road will be upgraded. No new access roads are planned.



Figure 4. View of the site facing south east. Note the drainage channels



Figure 5. View of the site facing north



Figure 6. View of the pipeline servitude facing north and the town of Sandrift



Figure 7. View of the pipeline servitude facing north



Figure 8. View of the pipeline servitude facing north

4. STUDY APPROACH

4.1 Method of survey

A survey of the proposed development activities was undertaken on the 2nd and 3rd August, 2011 and a number of archaeological observations were made.

A desk top study was also done.

All archaeological remains documented during the study have been mapped using a hand-held Garmin Oregon 300 GPS unit set on the map datum WGS 84.

4.2 Constraints and limitations

There were no constraints or limitations associated with the study.

4.3 Identification of potential risks

There are no archaeological risks associated with proposed construction of the oxidation ponds.

There are, however, several graves that are situated within, or close to the alignment of the sewer pipeline, which may be threatened by the proposed activities.

It is unlikely, but unmarked human remains and ostrich eggshell caches may also be uncovered or exposed during excavations and bulk earthworks.

4.4 Results of the desk top study

The Richtersveld is a vast and arid region in the Northern Cape and because of its remoteness very little systematic archaeological research or work has been done in the area. Most of the work that has been done has been in, or near the floodplain of the Orange River. The floodplain area would have attracted people in the past as it offered a range of accessible terrestrial and marine resources (antelope, small game, fish and crabs), as well as water, and vegetable material for shelter and fuel.

While no archaeological work has been done at Sandrift (prior to this study), scatters of Early, Middle and Later Stone Age tools have been documented at Koeskop (just west of Sandrift), Bloeddrift, Nxodap, Jakkalsberg and Sendelingsdrift (Halkett 1999). Petroglyphs (or rock engravings) have also been recorded at Bloeddrift (Halkett 1999) and Sendelingsdrift. Some of the engravings depict aspects of colonial life while others are more enigmatic and probably date to the last 2000 years.

Archaeological excavations have also been done on a 300 year old Herder (or pastoralist) campsite near Bloeddrift about 20 kms further to the north east (from Sandrift) (Smith *et al* 2001). Spatially discreet hearths were excavated generating large numbers of quartz and other stone pieces, bone chips, pottery, ostrich eggshell fragments and beads. Similar spatial features and cultural debris were documented further north at Jakkalsberg near Sendelingsdrift, although earlier LSA hunter/gatherer, as well as late Herder, and historical elements were also documented (Wadley 1997).

Jakkalsberg N and Jakkalsberg L (at Sendelingsdrift) are two LSA sites with large assemblages of lithics and bead manufacturing debris, including engraved ostrich eggshells and flask mouth fragments that have been dated to about 3500 years ago (Orton & Halkett 2010). The assemblages at Jakkalsberg are interesting in that they include types of tools uncommon in South Africa, but are more frequently found through much of central and southern Africa, such as triangles, trapezia and denticulates.

5. RESULTS OF THE SURVEY

A Google aerial photograph indicating the waypoints of archaeological occurrences documented during the study is illustrated in Figures 17 and 18 in the Appendix.

A spreadsheet of the waypoints and description of the archaeological finds is presented in Table 1 in the Appendix.

5.1 The proposed oxidation ponds

Eleven stone implements (116-126) were documented in the footprint area for the proposed oxidation ponds. There is no spatial distribution or integrity to the finds and they all occur randomly and unevenly over the surrounding landscape. No organic remains such as pottery, ostrich eggshell or bone were found. The tools are in highly patinated quartzite and chalcedony. Quartzite is locally available, but fine grained chalcedony would have washed down the river from higher upstream and were prized by the early inhabitants of the area for the production of stone artefacts. Most of the tools are utilized, modified and retouched flakes, chunks and smashed cobbles. Only one round core (120) was found among the small collection. One ESA flake (116) was also counted, while the remainder of the tools is assigned to the MSA and LSA.

Most of the tools documented during the study are illustrated in Figures 9 & 10



Figure 9. Artefacts from the proposed oxidation ponds. Scale is in cm



Figure 10. Artefacts from the proposed oxidation ponds. Scale is in cm

5.1.1 Significance of the archaeological remains

The small numbers and the isolated and disturbed context in which they were found mean that the remains have been rated as having low archaeological significance.

5.2 The proposed sewer pipeline

Sixteen archaeological occurrences (212-231) numbering 19 stone tools were documented within the area identified as the proposed sewer pipeline.

The tools are not unlike those found in the footprint area of the proposed oxidation ponds and comprise two cores (214 & 231), one small bifacial flake (213), a retouched pointed flake (214), flakes, chunks and smashed and broken cobbles. The material used is quartzite and chalcedony and all the tools are highly patinated. The remains are spread very thinly and unevenly over the surrounding landscape. No activity areas or evidence of any human settlement were recognized. No organic remains such as pottery, bone or ostrich eggshell was found.

A collection of some of the tools documented in the proposed pipeline is illustrated in Figures 11 and 12.



Figure 11. Collection of tools from the proposed sewer pipeline. Scale is in cm



Figure 12. Collection of tools from the proposed sewer pipeline. Scale is in cm.

5.2.1 Significance of the archaeological remains

The small numbers isolated and disturbed context in which they were found means that the remains have been rated as having low archaeological significance.

5.3. Graves

Five graves were documented in, or close to the alignment of the proposed sewer pipeline (Figures 13-16 and refer to Figures 17 & 18 in the Appendix). None of the graves show Christian influences (such as rectangular mounds of stone, headstones or footstones), and are more traditional in form with circular stone cairns covering them. These types of graves are common in the Richtersveld landscape (Halkett 1999), and are often encountered alongside the roads.

Grave 1 (S28 24.789 E16 46.849) and Grave 5 (S28 24.741 E16 46.944) may be in the actual alignment of the pipeline servitude. The graves are very visible in an otherwise featureless landscape. Grave 1 is less visible, as the cairn appears to have collapsed. While no grave goods (such as glass bottles, jars, or even marine shellfish) were found, a plastic jar was found alongside Grave 5.

Graves older than 100 years are protected under the NHRA and it is an offence to damage or remove any grave without a permit issued by SAHRA.



Figure 13. Grave 1



Figure 15. Grave 3



Figure 14. Grave 2



Figure 16. Grave 5

5.4 The proposed access road

No archaeological remains were found in the proposed 0.6 km access road to the site. The road is an existing gravel road, which will be upgraded. No new access roads are planned.

6. PREDICTED IMPACTS

The impact of the proposed construction of oxidation ponds and a sewer pipeline on important archaeological remains is rated as being low.

Five pre-colonial graves were also documented in the study, and care must be taken to avoid impacting on these sensitive sites.

7. CONCLUSION

The Phase 1 Archaeological Impact Assessment has identified no significant impacts to pre-colonial archaeological material that will need to be mitigated prior to proposed development activities.

The route for the proposed sewerage pipeline might need to be adjusted to take cognizance of Grave 1 and Grave 5 which are in, or very close to the proposed servitude.

8. RECOMMENDATIONS

With regard to the proposed construction of oxidation ponds and associated infrastructure in Sandrift in the Northern Cape, the following recommendations are made:

1. The project is deemed to be viable.
2. No archaeological mitigation is required.
3. All graves must be avoided with particular attention to Grave 1 and Grave 5 which are located in or very close to the pipeline servitude. This might require a slight adjustment being made to the route.
4. Should any unmarked human remains, or features such as buried ostrich eggshell caches be exposed or uncovered during excavations and bulk earthworks these must immediately be reported to the South African Heritage Resources Agency (Ms Mariagrazia Galimberti 021 4624502). Burials must not be removed until inspected by the archaeologist and will have to be removed by an archaeologist under a permit issued by SAHRA.

9. REFERENCES

Halkett, D. 1999. A Phase 1 Archaeological Impact Assessment of heritage resources in the Trans Hex Diamond Concession, Richtersveld. Report prepared for Trans Hex Group Ltd. Archaeology Contracts Office, University of Cape Town.

Kaplan, J. 2011. Archaeological Impact Assessment of a proposed waste refuse site in Sandrift, Northern Cape. Report prepared for Bvi Consulting Engineers. ACRM.

Orton, J. & Halkett, D. 2010. Stone tools, beads and a river: Two Holocene Microlithic sites at Jakkalsberg in the northwestern Richtersveld, Northern Cape, South Africa. *South African Archaeological Bulletin* 65:13-25.

Smith, A.B., Halkett, D., Hart, T. & Mutti, B. 2001. Spatial patterning, cultural identity and site integrity on open sites: evidence from Bloeddrift 23, a pre-colonial herder camp in the Richtersveld, Northern Cape Province, South Africa. *South African Archaeological Bulletin* 56:23-33

Webley, L. 1997. Jakkalsberg A and B: the cultural material from two pastoralist sites in the Richtersveld, Northern Cape. *South African Field Archaeology* 6:3-19.

Appendix

Name of Site	Erf/Farm Name	Lat/Long	Finds
	Remainder of Farm Richtersveld 11, Namaqualand		
116		S28 24.747 E16 47.164	Burnished ESA quartzite flake
117		S28 24.737 E16 47.156	Broken quartzite utilized flake
118		S28 24.738 E16 47.107	Burnished quartzite cobble flake
119		S28 24.743 E16 47.095	Chalcedony chunk
120		S28 24.745 E16 47.092	Broken chalcedony core
121		S28 24.745 E16 47.081	Large broken retouched quartzite flake
122		S28 24.734 E16 47.078	Large bifacial retouched quartzite flake
123		S28 24.736 E16 47.162	Flaked quartzite chunk
124		S28 24.726 E16 47.111	Large burnished quartzite flaked cobble
125		S28 24.697 E16 47.058	Chalcedony flaked cobble
126		S28 24.690 E16 47.110	Burnished MSA quartzite flake
212		S28 24.739 E16 46.980	Flaked chunk
213		S28 24.746 E16 46.963	Small bifacial flake
214		S28 24.750 E16 46.950	Round core , large pointed flake, small flake
215		S28 24.756 E16 46.939	Flaked chunk quartzite
216		S28 24.774 E16 46.905	Quartzite chunk
217		S28 24.776 E16 46.901	Chalcedony chunk
218		S28 24.777 E16 46.898	Large quartzite flake
220		S28 24.795 E16 46.820	X 2 quartzite chunks
221		S28 24.809 E16 46.747	Flat chalcedony flake
222		S28 24.836 E16 46.650	Quartzite chunk
223		S28 24.836 E16 46.660	MSA quartzite flake
224		S28 24.844 E16 46.740	MSA quartzite flake
225		S28 24.849 E16 46.764	MSA quartzite flake
229		S28 24.834 E16 46.805	Quartzite flaked chunk
230		S28 24.781 E16 46.875	Quartzite pointed cortex flake/chunk
231		S28 24.747 E16 46.931	Round burnished quartzite core
Grave 1		S28 24.789 E16 46.849	Possible grave, small pile of stone
Grave 2		S28 24.842 E16 46.781	Grave ,raised pile of stone
Grave 3		S28 24.849 E16 46.784	Same as above
Grave 4		S28 24.881 E16 46.764	Same as above
Grave 5		S28 24.741 E16 46.944	Same as above; plus small plastic jar

Table 1. Spreadsheet of waypoints and description of archaeological finds

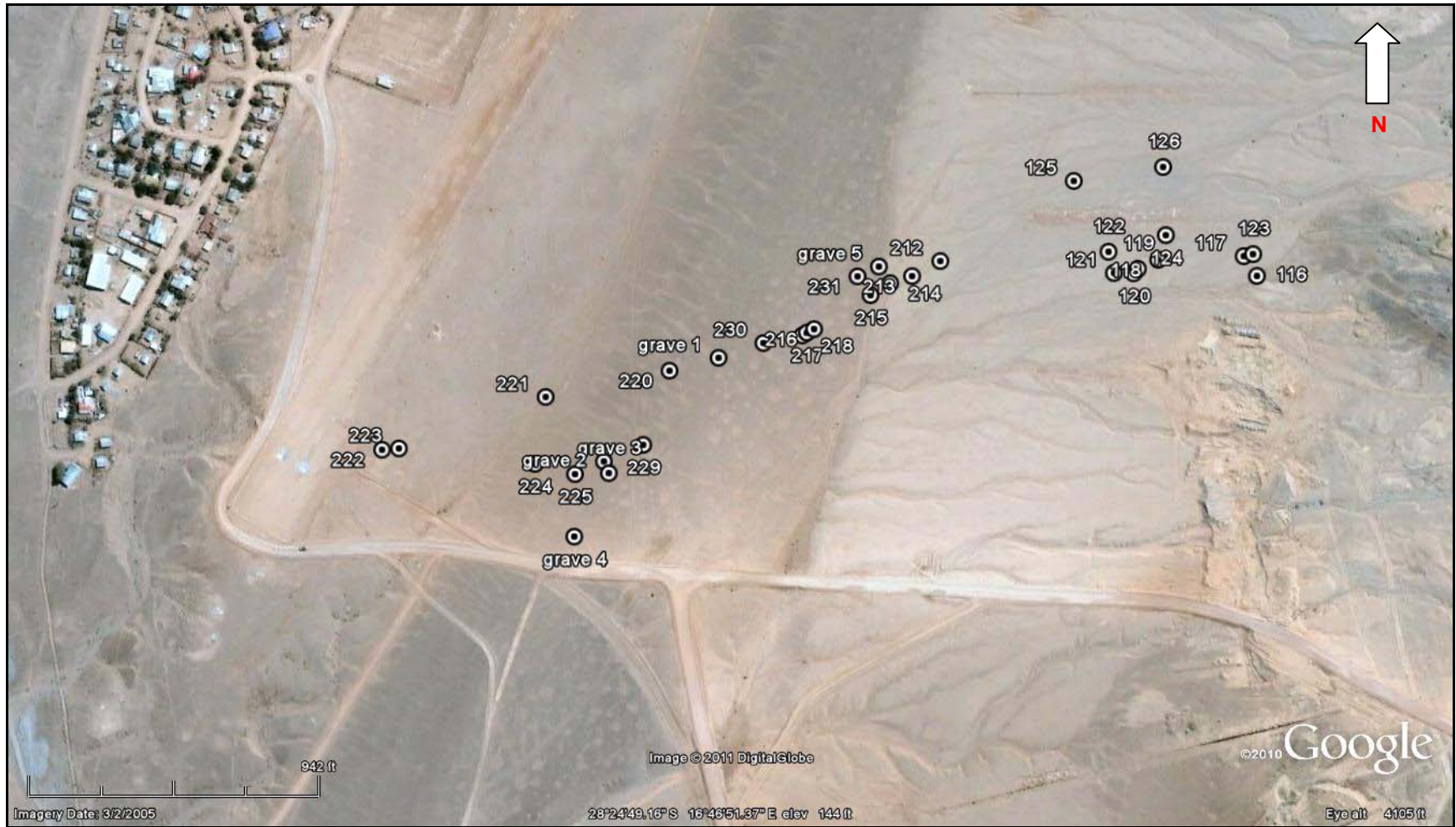


Figure 17. Waypoints of archaeological finds

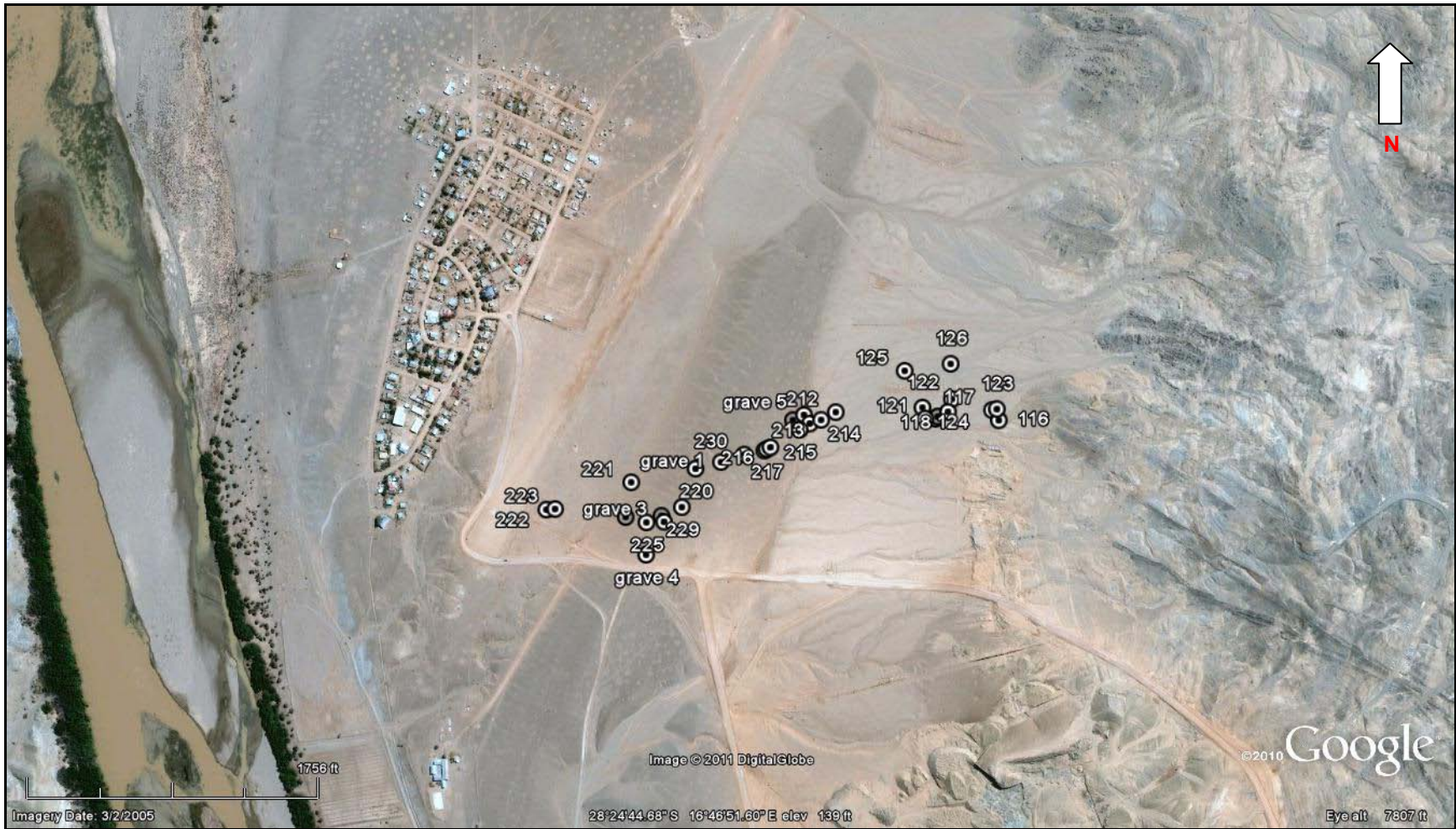


Figure 18. Waypoints of archaeological finds