An Archaeological Assessment
for the
proposed 132kV power-line from Auas sub-station to Rehoboth sub-station
and
proposed 220kV power-line from Auas sub-station to Khomas sub-station

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1 EXECUTIVE SUMMARY

An archaeological assessment of the Auas-Khomas and Auas-Rehoboth power-line routes confirms the pattern of archaeological site distribution based on existing knowledge and associations with key terrain features. The Auas-Khomas line is generally poor in archaeological remains and is not considered vulnerable to damage in the course of construction work. A possible exception is a previously identified historical site on the Aukeigas River. The Auas-Rehoboth line is similarly poor in archaeological remains, although the proposed alignment will traverse the vicinity of two important archaeological sites identified in a previous survey. Mitigation measures for these sites are recommended, including a slight shift in the alignment, or demarcation of the sites during construction. Further mitigation measures may be required under the National Heritage Act should the line impact on the actual sites.

2 INTRODUCTION

NamPower (Pty) Ltd, the Namibian power utility, proposes to construct two new inter-connector lines from the Auas sub-station, east of Windhoek. These power-lines will comprise a 132kV line to Rehoboth sub-station and a 220kV line to the Khomas sub-station on the western edge of the capital. Both lines will be supported by steel pylons and will require heavy equipment brought to the alignment via access tracks established during the course of construction. Where necessary, the alignment will be cleared by mechanical means. Drilling will be required to fix guy-lines at each pylon, thus affecting a footprint with a radius of approximately 50m.

The Environmental Assessment Policy approved by Cabinet Resolution 16.8.94/002 requires that developments such as the proposed power-lines from Auas sub-station to Rehoboth and Khomas sub-stations should include detailed environmental assessment and monitoring. The Draft Environment Management Act (1998) specifically recognizes the archaeological record (Paragraph 1 (c), Definitions) as a component of the physical environment. In Namibia, archaeological remains are protected in terms of the National Heritage Act (No. 27 of 2004). The Act provides, under Part V, Section 51, Paragraph 3, for the preparation of an impact assessment, and requires, under Part VI, Section 55, Paragraph 4 that developers report archaeological finds to the National Heritage Council. Due to the specialized nature of the field, it has become established practice to include archaeological surveys in environmental assessment programmes in Namibia.

Enviro Dynamics (Pty) Ltd has commissioned Quaternary Research Services to carry out an archaeological assessment of the proposed power-lines under the following Terms of Reference:

a. Review the existing information on the general area traversed by the alignment.

b. Devise an appropriate sampling strategy that would focus on the most sensitive components.

c. A field survey at 25% coverage, weighted as above.

d. Attendance of meetings with team members to discuss route evaluation and mitigation.

e. Preliminary reporting, with zoning of areas according to sensitivity, and possible mitigation measures.

f. Full reporting.

3 BACKGROUND

The general pattern of archaeological site distributions in the central highlands of Namibia has been established by a series of archaeological impact assessments and related studies carried out during the last ten years. These investigations have also helped to establish the basic archaeological sequence for the central highlands, and to indicate in broad terms, the cultural affinities of the finds. A brief overview of the archaeology of the central highlands is given below, as a justification for the approach taken in the present study. Previous archaeological assessments and investigations relevant to this study are listed at the end of the report. Further surveys, such as that reported here, improve the resolution of the pattern and allow more reliable prediction of survey results.

Most archaeological evidence from the central highlands of Namibia is in the form of surface finds, there being little possibility for preservation by natural burial. The very steep gradients of the terrain, and generally sparse vegetation cover, have resulted in acute sheet erosion over very wide areas. This phenomenon is illustrated by the general absence of surface finds pre-dating approximately 5 000 years before present, a marked contrast to lower gradient areas in other parts of Namibia, where surface lag deposits commonly include material from the entire mid-Pleistocene and Holocene period, spanning approximately one million years. Pleistocene-age archaeological remains in the central highlands are restricted to spring tufas and other localized contexts, sometimes revealed by the continuous erosion of this terrain.

The generally low density of archaeological sites in the central highlands (cf. Kinahan & Deelie 1990; Kinahan 2000) is reflected in the accompanying map (Figure 1). Archaeological records accumulated until 1981 form a baseline distribution pattern which is augmented by records from more recent archaeological assessment surveys. The lower density of the baseline distribution is informative at the regional scale, but does not provide a sufficient basis for assessment at the local scale. The archaeological assessment surveys usually reflect high densities at the local scale and these may be used as an indicator of archaeological distributions in the same general area.

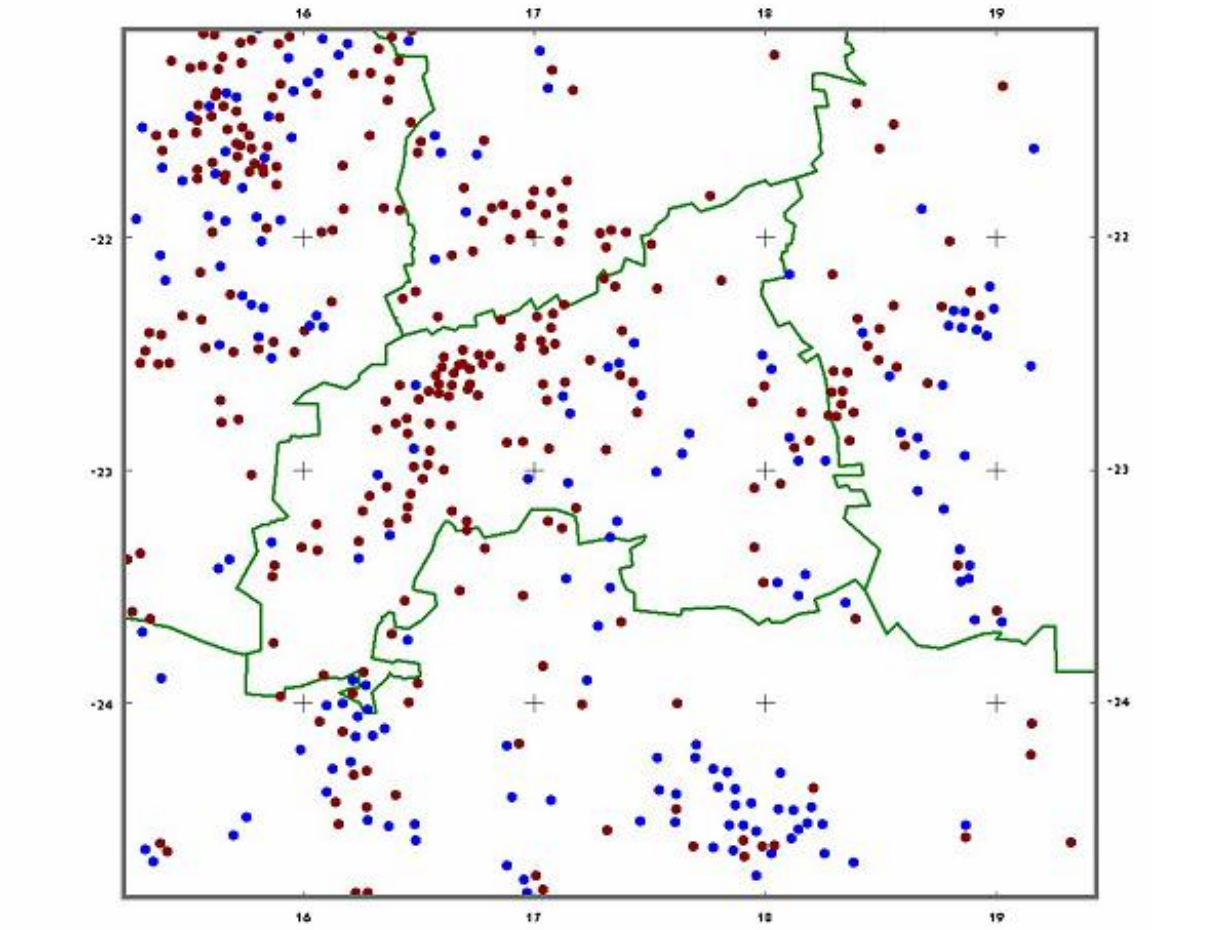

Figure 1: The general distribution of archaeological sites in the Khomas Region, Pleistocene sites (pre-dating 10 000 years before present) shown in blue; Holocene sites (post-dating 10 000 years before present) shown in dark brown.

Archaeological sites in the central highlands tend to occur in localized clusters representing ancient nodes of settlement. These usually lie within 5km of a spring or seepage point, although there is sometimes no evidence to indicate the water point itself. Favoured locations include the foot-slopes of low ridges and alluvial terraces on large bends in stream-courses. Where outcropping bedrock forms sheltered overhangs these often have some evidence of occupation, including rock paintings, although in settlements dating to within the last 1 000 years the rock shelters are generally peripheral to the main settlement which occupied a suitable area of open ground for the construction of huts and livestock enclosures. Stone foundations of huts, stock enclosure entrances and storage cairns are among the characteristic features of these sites. The features are often associated with pottery, quern stones and stone artefact debris. Burial cairns are frequently found as isolated features in the vicinity of these sites.

On the basis of observations from previous surveys in the central highlands it is usually possible to predict the location of archaeological sites by inspecting the aerial photography and, to a lesser extent, by interpretation of the 1: 50 000 topographic maps. The possible presence of archaeological sites can also be predicted on the ground from indications of soil erosion and, for the more recent sites, an association with certain tree species such as *Boscia albitrunca*. Down-slope dispersal of artefact debris in coarse "float" may confirm these indications even before the site itself is reached.

Early colonial settlement remains form an important additional component of the historical landscape. While the major features of the historical pattern of settlement are usually well known, minor but nonetheless important features may turn up unexpectedly in the course of archaeological surveys. These features include old roadways, mineshafts, burial places and fortifications. The central highlands of Namibia formed a major nexus of early colonial settlement and recent archaeological surveys have added considerable detail to the documentation available for this period.

The proposed power-line from Auas sub-station to Khomas sub-station follows a roughly east-west alignment along the southern foot-slopes of the Auas Mountains, before turning north through the Auaspoort in the vicinity of Kempinski plots. An extension of the line from Khomas sub-station towards the Tony Rust Racetrack was added to the survey by verbal agreement with Enviro Dynamics. Little information is available on the archaeology of the southern foot-slopes of the Auas Mountains, Auaspoort, or the western edges of the Windhoek Townlands. One historical site, a German colonial military post on the Aukeigas River (QRS 19/30; -22.5849S 16.9701E), was documented in the course of a previous power-line survey.

The proposed power-line from Auas sub-station to Rehoboth sub-station follows a southerly alignment to Nauaspoort, before turning west near Worsted railway siding and then south to follow the main (B1) road to Rehoboth. The section between Auas sub-station and Nauaspoort will parallel the existing Aries-Auas 400kV power-line route. A detailed archaeological assessment of that alignment revealed a number of significant sites, including one large rock shelter (QRS 14/161; -22.9637S 17.2791E), on the farm Koppieskraal, and a group of small rock shelters with unusual engravings (QRS 14/163; -22.9283S 17.2986E), on the farm Veglus.

4 METHODS

Field assessment of linear developments such as power-line routes involves prior selection of sample areas to be traversed on foot, with parallel or intersecting transects spaced according to surface visibility. Archaeological remains are recorded using standard descriptive criteria, with the central point of the site located by hand-held GPS. Archaeological sites are recorded whether found in the pre-selected sample area or at some other point en route to or from the sample area. Site details are transferred from field notes to digital format and integrated with the archaeological GIS based on the cumulative results of similar surveys.

The 25% sample required under the ToR for the present study is weighted in favour of areas known to have archaeological remains; areas of comparable terrain conditions where the presence of archaeological remains is unconfirmed; and areas with terrain conditions unlike those of known archaeological significance and therefore requiring special consideration. In the case of the Auas-Khomas alignment the southern foot-slopes of the Auas Mountains required special consideration as this area is of unknown archaeological significance. The Auaspoort and northward extension of the alignment crosses terrain in which archaeological sites are expected to occur in specific contexts, such as wide bends in stream-courses and on the foot-slopes of hills with outcropping bedrock.

In the case of the Auas-Rehoboth alignment, the open thornbush savanna north of the Aris-Dordabis road is known to be rather poor in archaeological remains except in the near vicinity of rocky outcrops. An inspection of the aerial photography shows that the alignment avoids rocky outcrops in this area. Further south, towards Nauaspoort, the alignment traverses a mixed terrain of montane grasslands with rocky outcrops and narrow river valleys. The survey of the Aries-Auas 400kV power-line revealed significant local concentrations of archaeological sites in this area, as mentioned in the previous section. To the south and west of Nauaspoort the alignment traverses open thornbush savanna of low archaeological significance.

The selection of sample areas used in the survey also took into account the degree of prior disturbance which would affect the presence and integrity of archaeological remains. Thus, much of the Windhoek Townlands area north of the Khomas sub-station is considered to be disturbed ground and not worth close attention. The same applies to the northern parts of the Auaspoort and the area around the Kempinski plots. The area immediately north of Nauaspoort is similarly disturbed, as is the thornbush savanna area flanking the main (B1) road north of Rehoboth.

5 OBSERVATIONS

Field observations made during the survey are summarized in accompanying map (Figure 2). The map illustrates both the Auas-Khomas and the Auas-Rehoboth alignments, indicated in red. Sample areas on the lines are indicated in green. The background distribution of archaeological sites is indicated by solid purple circles. These are augmented by the results of two previous surveys: the Windhoek-Walvis Bay (Us Pass) power-line (QRS Job 19; sites indicated as solid blue squares), and the Aries-Auas power-line (QRS Job 12; sites indicated as solid blue circles). The latter line is most relevant to the present study. As the map shows, there is a fairly high density of archaeological sites on the Aries-Auas line. However, all but two of the sites are of either low significance or low vulnerability, according to the survey results.

5.1 Auas to Rehoboth

Due to the proximity of the Auas-Rehoboth and Aries-Auas alignments, sampling was limited to four targets: the section traversing Tews Farm; the Koppieskraal-Veglus section; the section immediately north of Nauaspoort; and the section to the south-east of Nauaspoort where the new alignment deviates toward the B1 road. Archaeological sites documented in the course of the survey on this alignment area as follows:

QRS 69/5 -23.1413S 17.16669E

Ruins of late 19th to early 20th century lime kiln works, about 400m east of Wortel railway siding, on the farm Kanichab Oos. The kiln is of local unfired mud brick, now largely decomposed except for the inner surface of the kiln which is vitrified. Two steel doors and their frames protrude from the rubble. These appear to have been fabricated from boiler plate and other scrap iron. Flanking the kiln on the north side is a pile of broken limestone, and adjacent to that is an area covered by burnt limestone and cinder. About 50m to the south are the remains of two buildings, including the concrete floor of a corrugated iron shed, and the walls of a local brick and mortar dwelling. The presence of some refractory bricks from Vereeniging (RSA) suggests that the site was in use until at least 50 years ago.

QRS 69/6 -22.96325S 17.27958E

Gatepost on farm Koppieskraal, used as reference point for suggested buffer zone around site QRS 14/161 (-22.9637S 17.2791E). This point is separated from the existing 400kV inter-connector line (nearest pylon QRS 69/7 -22.96223S 17.27844E), by a deep erosion gully approximately 50m wide. The position of the sites QRS 14/161 and 14/163 in relation to the existing lines and the proposed line is shown in the map (Figure 3) accompanying map the next section.

5.2 Auas to Khomas

Sampling targets on the Auas-Khomas alignment were limited to five areas: the section of Paulinenhof where the existing Auas-Oamites line coincides with the proposed alignment; on Waldeck and Aris, following the proposed alignment; and in the Auaspoort section as far as the satellite receiving station. The extension of the proposed alignment from the Khomas sub-station to the vicinity of the Tony Rust racetrack was sampled in the most promising

area, namely the eastern foothills of the Kaiser Wilhelmberg. Archaeological sites located in the course of the survey are as follows:

QRS 69/1 -22.70488S 17.15695E

Surface find of fractured quartzite quern-stone on the farm Aris. The site is an erosion surface on a low ridge, with patchy thickets of *Acacia mellifera* and occasional specimens of *Boscia albitrunca,* indicator characteristics of pre-colonial cattle-posts. No other archaeological remains were noted.

QRS 69/2 -22.71063S 17.18137E

Large concentration of broken ostrich eggshell eroding from narrow crevice beneath a prominent outcrop of porphyritic granite, on the farm Aris. The eggshell fragments probably represent a cache of either eggs or shell fragments for manufacturing ornaments. No other archaeological remains were noted.

QRS 69/3 -22.67404S 17.24625E

Three quartzite quern-stones and one quartzite pestle stone, on the farm Waldeck. The site is on the west-facing slope of a low ridge, with single very old specimens of *Acacia erioloba* and *Zizyphus mucronata,* indicator characteristics of pre-colonial cattle-posts. No other archaeological remains were noted.

QRS 69/4 -22.67208S 17.22579E

A single quartzite boulder quern-stone, on the farm Waldeck. The site is on the east-facing slope of a low ridge with single very old specimens of *A. erioloba* and *Z. mucronata.* No other archaeological remains were noted.

QRS 69/8-19 (co-ordinates listed below)

A series of drystone buttressing structures supporting the old Windhoek to Aris road through the Auaspoort. Some of these structures would date to the late 19th century, although the road would have been under continual maintenance and repair until it was replaced by the present road in the early 1960's. Some of the buttressing has evidently been rebuilt over reinforced concrete culverts of the type that were first constructed in Namibia at the end of the 1940's. The reinforced concrete bridge at the northern end of the poort (Mile 7) is of the same type and was constructed in 1940 (Bridge No. 8; old number TR 1/5). Co-ordinates for north and south points of each section of buttressing are as follows:

QRS 69/8 (-22.67605S 17.06836E) to QRS 69/9 (-22.67624S 17.06847E)
QRS 69/10 (-22.67857S 17.06889E) to QRS 69/11 (-22.67924S 17.06874E)
QRS 69/12 (-22.68112S 17.06849E) to QRS 69/13 (-22.68184S 17.06871E)
QRS 69/14 (-22.68218S 17.06887E) to QRS 69/15 (-22.68259S 17.06914E)
QRS 69/16 (-22.68268S 17.06917E) to QRS 69/17 (-22.68288S 17.06928E)
QRS 69/18 (-22.68291S 17.0693E) to QRS 69/19 (-22.68305S 17.06937E)

QRS 69/20 -22.60972S 17.04321E

Three collapsed and dispersed stone features on Windhoek Townlands. The site is on a low saddle between rocky hills, with dense thickets of *A. hereroensis* and *Dichrostachys cinerea.* No other archaeological remains were noted.

QRS 69/21 -22.61051S 17.03319E

A low, south-facing rock shelter on outscropping Khomas schist on the eastern footslopes of the Kaiser Wilhelmberg. The shelter has a level floor of ashy sand with fragments of charcoal and flaked quartz indicating archaeological occupation. A fragment of a 19th century green glass bottle base was also present. On the wall of the shelter, approximately 2.2m above floor level is a faintly visible painted "swastika". This graffiti is similar to other World War II-era examples found elsewhere in the Windhoek Townlands.

6 ASSESSMENT

Of the archaeological sites listed for the Auas-Rehoboth alignment only two are considered vulnerable, viz QRS 14/161 and 14/164. The former is a rock shelter site with two stratified archaeological deposits and a dense surface scatter of artefact debris. The site has several rock paintings, including monochrome sheep and cattle. There is also an engraved game board in one of the shelters. The site is worthy of special consideration because it represents an unusually well-preserved deposit, in an environment where very few stratified deposits exist. Excavation of the site would provide material for dating of the local sequence, as well as other evidence that would contribute to an improved understanding of the archaeology of the central highlands. The rock art at the site has already been vandalized and construction work in the near vicinity would endanger the site further as the rocks provide the only shade in the area.

The latter site, QRS 14/164, is a series of small rock shelters with unusual rock engravings comprising a number of meandering trails which link the shelters together. Non-representative rock art is common in the central highlands but these examples are unique in their integration with the surface features of the terrain. Engravings such as these are easily damaged, especially as rock shelters provide attractive shade when construction work is underway. According to the proposed alignment, the historical lime kiln at QRS 69/5 will not be vulnerable to damage.

None of the sites recorded on the Auas-Khomas (plus extension) alignment are considered vulnerable to the present alignment. Furthermore, the terrain on the southern flanks of the Auas Mountains is rather poor in archaeological remains and should not be sensitive to changes in the proposed alignment. If possible, the remains of the old Windhoek-Aris road in the Auaspoort should be quite stable enough for use by heavy machinery during the construction of the line. At the northern end of the extension to the Auas-Khomas line, the site QRS 19/30 should be considered highly vulnerable. The site comprises the remains of a German colonial military control post overlooking the Aukeigas River. The remains of the control post are associated with a German colonial military encampment and the remains of a small settlement dating from the relocation of indigenous people to the Aukeigas Reserve. The settlement remains are of some historical interest and worthy of preservation. The precise alignment of the power-line at this point is not clear.

7 MITIGATION

With regard to the Auas-Rehoboth alignment, the following mitigation is recommended:

1. The new line should be positioned to avoid the two sites QRS 14/161 and 14/163 indicated on the accompanying map (Figure 3). The preferred alignment as far as these sites are concerned would be to the east of the Aries-Auas 400kV line, and between that and the parallel line running approximately 4km to the east.

2. If it is necessary to position the new line closer to the two archaeological sites indicated construction work (including improvement of access tracks) should be avoided within a radius of 200m from the sites.

3. In the event that the final co-ordinates determined by the line surveyor impinge on this buffer, the EMP should require that the sites are demarcated with danger tape during the construction phase. The EMP must stipulate that all such marking material is removed immediately construction is completed.

4. If the final alignment impacts on the sites within a radius of 100m, this final positioning will require notification of the National Heritage Council, for possible consideration of further impact assessment and mitigation in terms of the National Heritage Act (27 of 2004).

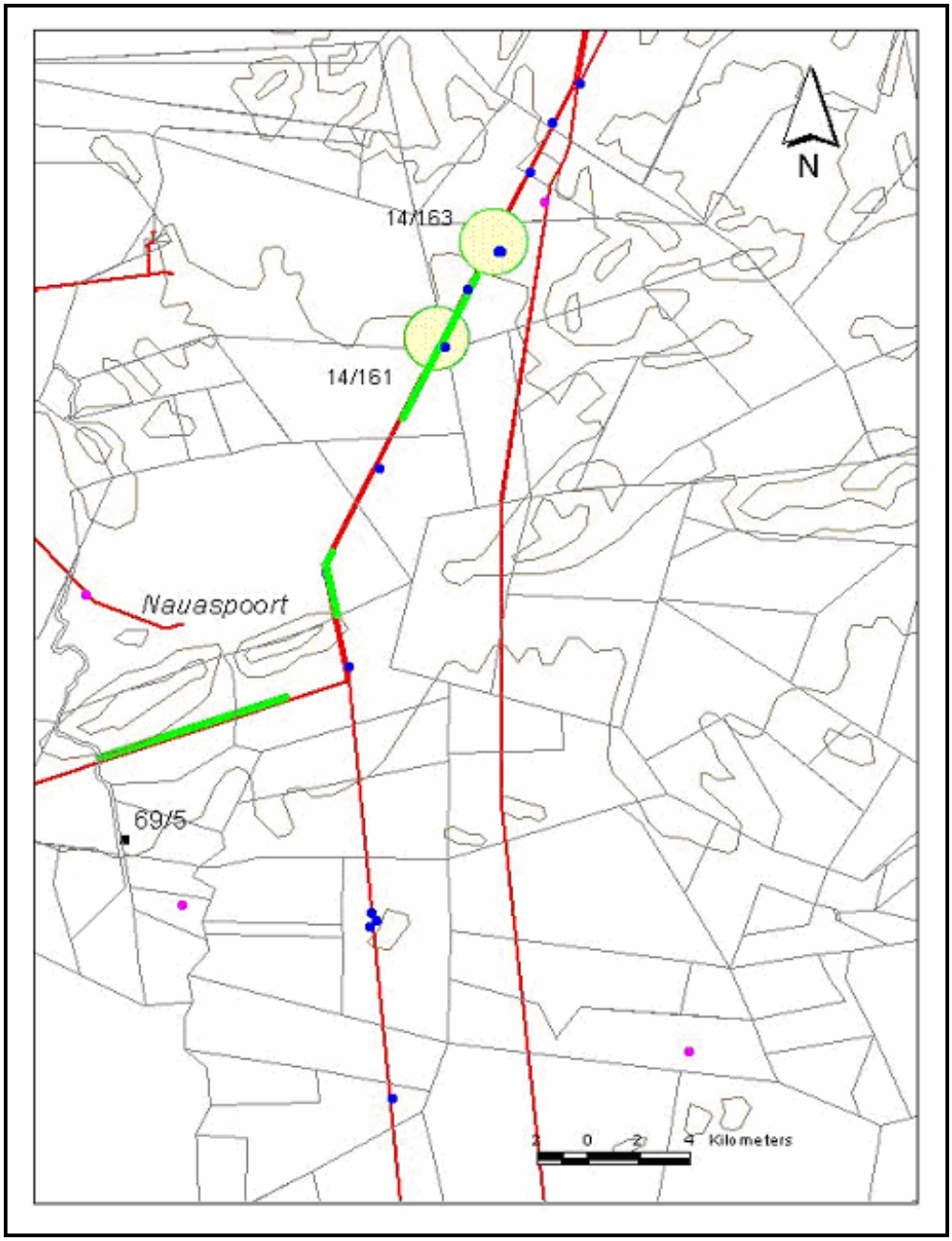

Figure 2: Field observations made during the survey

Figure 3: Mitigation recommended indicated on the map

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Previous archaeological surveys:
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