

ARCHAEOLOGICAL SCOPING REPORT

FOR THE PROPOSED DEVELOPMENT OF THE RICHARDS BAY COMBINED CYCLE
POWER PLANT (CCPP) AND ASSOCIATED INFRASTRUCTURE ON A SITE NEAR
RICHARDS BAY, KWAZULU-NATAL PROVINCE

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EXECUTIVE SUMMARY

Site name and location: The project is referred to as the Richards Bay CCPP: 3000MW. The project is located in the Richards Bay area.

1: 50 000 Topographic Map: 2831DD.

EIA Consultant: Savannah Environmental (Pty) Ltd.

Developer: Eskom Holdings SoC Ltd

Heritage Consultant: Heritage Contracts and Archaeological Consulting CC (HCAC).

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Date of Report: 5 May 2017.

Findings of the Assessment:

The scope of work comprises a heritage scoping report for the Richards Bay CCPP 3000MW project. This report was conducted based on a desktop study of available data regarding cultural heritage resources of the area. Extensive field based heritage surveys adjacent to the areas under investigation recorded a high frequency of heritage sites (e.g., Anderson and Anderson 2008 and 2009, Anderson 2004, 2007, 2013, van Schalkwyk 2013). These studies showed that the dune systems closer to the sea is of heritage significance. The site has previously been disturbed and it is expected that identified impacts on heritage resources in this area can be mitigated. A single Stone Age find spot of low significance was previously recorded (van Schalkwyk 2013) on the western periphery of the site. According to the palaeontological sensitivity map on SAHRIS the entire site is of low palaeontological sensitivity.

From an archaeological point of view the proposed project is considered to be viable and no fatal flaws are expected. This will be confirmed through a Heritage Impact Assessment to be undertaken in the EIA Phase.

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ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BIA: Basic Impact Assessment
CRM: Cultural Resource Management
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EMP: Environmental Management Plan
ESA: Early Stone Age
GPS: Global Positioning System
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA: National Environmental Management Act
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency
SAHRIS: South African Heritage Resources Information System

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (2 million to 300 000 years ago)

Middle Stone Age (300 000 to 30 000 years ago)

Late Stone Age (30 000 years ago until recent)

Historic (approximately AD 1840 to 1950)

Historic building (over 60 years old)

Lithics: Stone Age artefacts

1. INTRODUCTION

Heritage Contracts and Archaeological Consulting CC (**HCAC**) was contracted by Savannah Environmental (Pty) Ltd to conduct a heritage scoping study for the proposed Richards Bay CCPP. The Project is located close to Richards Bay, KZN (Figure 1). The heritage scoping report forms part of the Environmental Impact Assessment (EIA) process for the project and will be followed by a Heritage Impact Assessment report as part of the EIA phase.

The aim of the scoping report is to conduct a desktop study to identify possible heritage resources within the project site. The study furthermore aims to assess the impact of the proposed project on non - renewable heritage resources and to submit appropriate recommendations with regards to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve and develop them within the framework provided by Heritage legislation.

This report outlines the approach and methodology utilised for the Scoping phase of the project. The report includes information collected from various sources and consultations. Possible impacts are identified and mitigation measures are proposed in the following report. It is important to note that no field work was conducted as part of the scoping phase but will be conducted as part of the EIA phase.

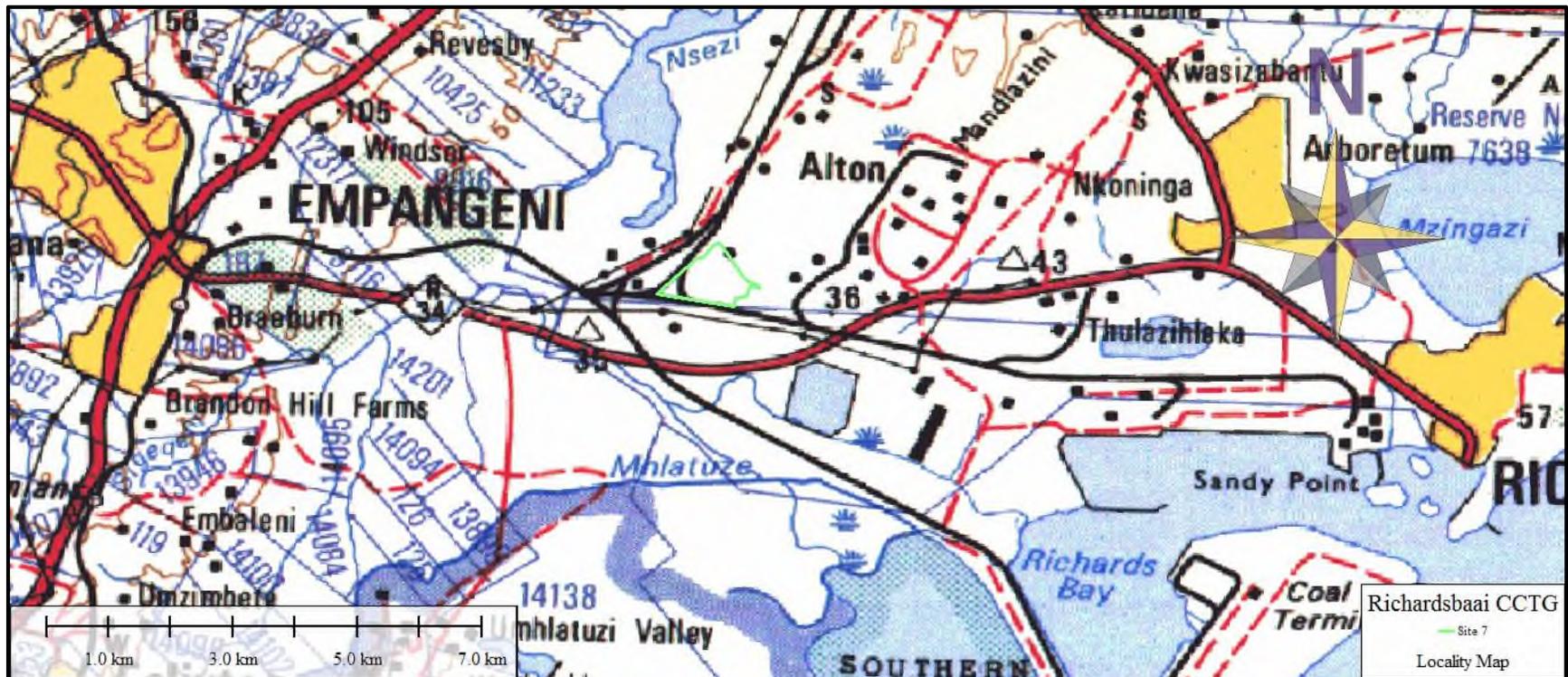


Figure 1. Locality map of the site under investigation indicated in green.

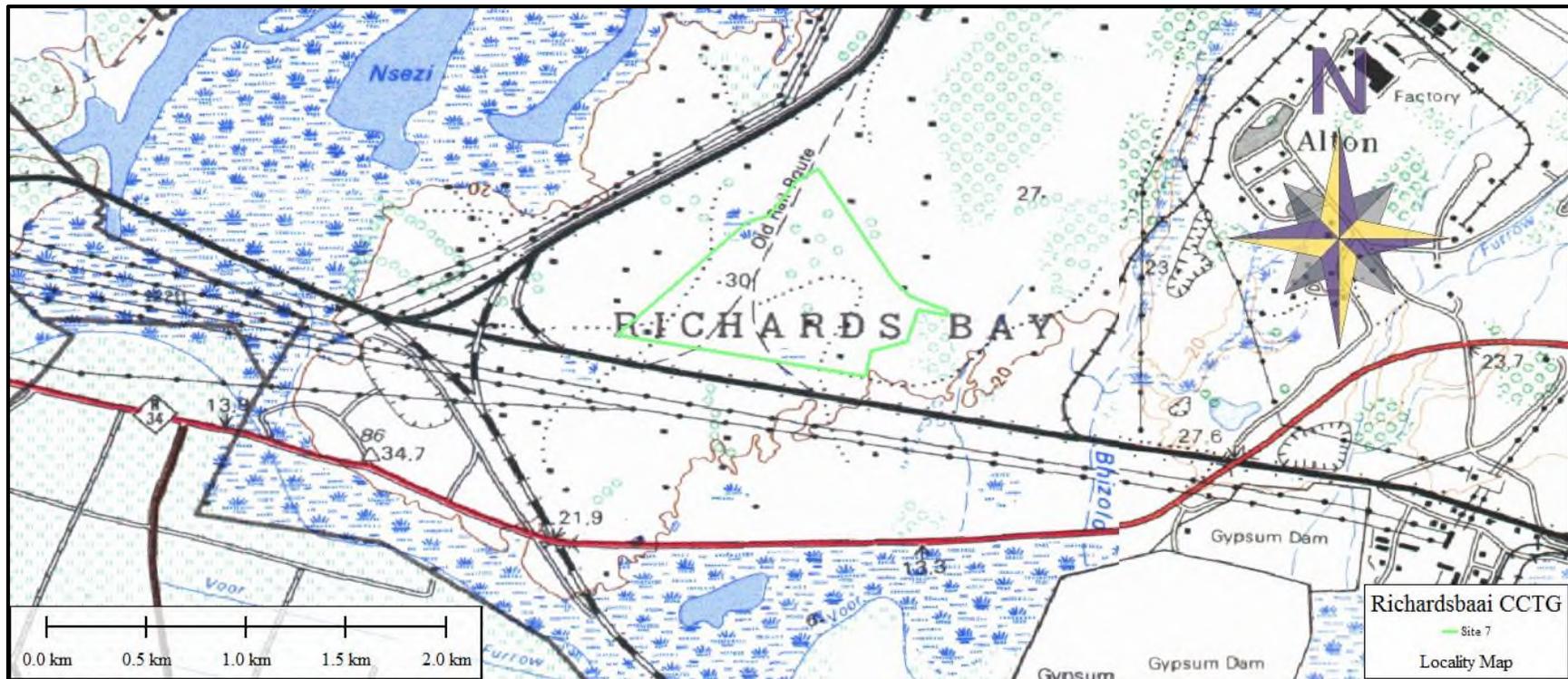


Figure 2. 1:50 000 Topographical map indicating the site in green.

1.1 Terms of Reference

The main aim of this scoping report is to determine if any known heritage resources occur within the project site. The objectives of the scoping report were to:

- » Conduct a desktop study:
 - * Review available literature, previous heritage studies and other relevant information sources to obtain a thorough understanding of the archaeological and cultural heritage conditions of the area;
 - * Identify known and recorded archaeological and cultural sites; and
 - * Determine whether the area is renowned for any cultural and heritage resources, such as Stone Age sites, Iron Age sites, informal graveyards or historical homesteads.
- » Compile a specialist Heritage Scoping Report in line with the requirements of the EIA Regulations, 2014, as amended on 07 April 2017.

The reporting of the scoping component is based on the results and findings of a desktop study, wherein potential issues associated with the proposed project will be identified, and those issues requiring further investigation through the IA Phase highlighted. Reporting will aim to identify the anticipated impacts, as well as cumulative impacts, of the operational units of the proposed project activity on the identified heritage resources for all 3 development stages of the project, i.e. construction, operation and decommissioning. Reporting will also consider alternatives should any significant sites be impacted on by the proposed project. This is done to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve and develop them within the framework provided by Heritage Legislation.

During the EIA phase, the following terms apply:

Field study

Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development

Reporting

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all

studies and results comply with the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

1.2 Nature of the development

The primary components of the project include the following:

- » A gas turbine using gas (diesel or natural gas) to generate electricity.
- » A heat recovery steam generator (HRSG) which will capture heat from the high temperature exhaust gases to produce high temperature and high pressure dry steam, which is then supplied to a steam turbine.
- » A steam turbine will use the dry steam to drive its turbine to generate additional electrical power.
- » A condenser which converts exhaust steam from the steam turbine back into water through a cooling process.
- » A bypass stack for the CCPP, anticipated to be approximately 40 to 60 meters in height, will be associated with each HRSG. It is anticipated that there will be a bypass stack for each gas turbine.
- » Water treatment plant for the treatment of potable water and production of demineralised water (for steam generation).
- » Dry-cooled technology consisting of a system of air-cooled condenser fans situated in fan banks approximately between 25 m - 30 m above ground.
- » A water pipeline – supply of potable from a potential water source to the power station.
- » A water tank – the exact size, still need to be determined depending on the sizing of the steam turbine.
- » A gas pipeline – the supply of natural gas from the gas supply take-off point at the harbour and the power station.
- » A water dam - temporary retention, flushing and treatment of waste water produced on the site
- » A gas supply conditioning – a process facility to condition and meter the gas prior to being supplied to the gas turbine
- » Diesel off-loading and storage – diesel will be used as a back-up fuel supply if and when natural gas is not available for power generation. A diesel truck off-loading facility is to be built and stored in tanks which will hold a capacity for 8 hour operation. The size of the tanks is still to be determined.

- » Closed Fin-fan coolers – these are heat exchangers used to cool the lube oil for the gas turbine and steam turbines.
- » Exhaust stack – after the HRSG, the combustion gases is discharged into the atmosphere via the exhaust stack. The stack is estimated to be between 40 and 60 meters in height.
- » Once-through-cooling – Once-through-cooling is another option for the cooling technology but it is dependent on the technical feasibility of its application

Water will be required for the CCPP power generation process. High quality water is required for use within the CCPP power generation process. Membranes/ion exchange systems would be required for water treatment on site. A waste treatment plant for the effluent from this water treatment system will be required. All solid waste generated from this process would be disposed of off-site at a suitably licensed waste disposal facility.

The power station is to be operated as a zero-liquid effluent discharge (ZLED) system, i.e. water within the power station will be recycled for re-use in the power station process. No liquid waste from the power station will therefore be discharged to the environment.

A high voltage (HV) yard, power lines for the evacuation of power to the grid/network and ancillary Facilities will be required.

In addition, the Project will include the following facilities/components:

- » Access road to site;
- » 132 kV and 400 kV switchyard;
- » Control and electrical building;
- » Central control room, warehouse and administrative buildings;
- » Firefighting systems;
- » Fuel/gas/diesel storage facilities;
- » Emergency backup generators (diesel or LPG); and
- » Chemical storage facilities (Water treatment chemicals, and demineralizing resins, lubricants, grease and turbine cleaning detergents, fire extinguishing foams).

1.3 The receiving environment

The project is located in the Richards Bay area in KwaZulu-Natal (Figure 1). The site is located at 28° 46' 09.4114" S, 31° 59' 06.6212" E. The site measures approximately 71ha and is located approximately 10 km from the sea. The site is covered in short grass and previously impacted on by an old railway line (Figure 9).

2. APPROACH AND METHODOLOGY

The assessment is to be undertaken in two phases, a desktop study as part of the Scoping phase and an Archaeological Impact Assessment as part of the EIA phase. This report concerns the scoping phase. The aim of the scoping phase is to cover available data regarding archaeological and cultural heritage to compile a background history of the study area in order to identify possible heritage issues or fatal flaws that could possibly be associated with the project and should be avoided during development.

This was accomplished by means of the following phases (the results are represented in section 4 of this report):

2.1 Literature review

A review was conducted utilising data for information gathering from a range of sources on the archaeology and history of the area. The aim of this is to extract data and information on the area in question, looking at archaeological sites, historical sites and graves of the area.

2.2 Information collection

Data from the Pietermaritzburg museum data base and the South African Heritage Resources Information System (SAHRIS) was consulted to collect data from Cultural Resource Management (CRM) practitioners who undertook work in the area to provide the most comprehensive account of known sites where possible.

2.3 Public consultation

No public consultation was conducted during this phase by the author.

2.4 Google Earth and mapping survey

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological sites might be located.

2.5 Genealogical Society of South Africa

The database of the genealogical society was consulted to collect data on any known graves in the area.

2.6. Restrictions

This study did not assess the impact on intangible resources or the palaeontological component of the project. Based on available data and resources as outlined in the report additional information that becomes available at a later stage might change the outcome of assessment.

3. LEGISLATION

For this project, the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and the KwaZulu-Natal Heritage Act, No. 4 of 2008 is of importance and the following sites and features are protected:

- a. Archaeological artefacts, structures and sites older than 100 years;
- b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography;
- c. Objects of decorative and visual arts;
- d. Military objects, structures and sites older than 75 years;
- e. Historical objects, structures and sites older than 60 years;
- f. Proclaimed heritage sites;
- g. Grave yards and graves older than 60 years;
- h. Meteorites and fossils; and
- i. Objects, structures and sites of scientific or technological value.

The national estate includes the following:

- a. Places, buildings, structures and equipment of cultural significance;
- b. Places to which oral traditions are attached or which are associated with living heritage;
- c. Historical settlements and townscapes;
- d. Landscapes and features of cultural significance;
- e. Geological sites of scientific or cultural importance;
- f. Archaeological and palaeontological importance;
- g. Graves and burial grounds;
- h. Sites of significance relating to the history of slavery; and
- i. Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.).

Section 34 (1) of the Act deals with structures that are older than 60 years. Section 35(4) of this Act deals with archaeology, palaeontology and meteorites. Section 36(3) of the Act, deals with human remains older than 60 years. Unidentified/unknown graves are also handled as older than 60 years until proven otherwise.

The KwaZulu-Natal Heritage Act, Act No. 4 of 2008 states that no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

3.1 Heritage Site Significance and Mitigation Measures

The presence and distribution of heritage resources define a Heritage Landscape. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. National and Provincial Monuments are recognised for conservation purposes. The following interrelated criteria were used to establish site significance:

- » The unique nature of a site;
- » The integrity of the archaeological/cultural heritage deposit;
- » The wider historic, archaeological and geographic context of the site;
- » The location of the site in relation to other similar sites or features;
- » The depth of the archaeological deposit (when it can be determined or is known);
- » The preservation condition of the site; and
- » Potential to answer present research questions.

The criteria above will be used to place identified sites within the South African Heritage Resources Agency's (SAHRA's) (2006) system of grading of places and objects that form part of the national estate. This system is approved by the Association of South African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region. The recommendations for each site should be read in conjunction with Section 10 of this report.

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED 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 (GP.A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

4. REGIONAL OVERVIEW

4.1 General Information

4.1.1. Database search

Several previous heritage studies were conducted in the general study area (SAHRIS) including:

- » Anderson, G. 2007. The archaeological survey of the Hillendale Mine. Numerous surveys were conducted for the Hillendale mine, in 2004 and 2007, finds included Stone Age artefacts as well as Iron Age sites.
- » Anderson, G. & Anderson, L. 2008. Archaeological Survey of the Inhlansi project for Nozelela Minerals Sands (Pty) Ltd. Numerous sites were recorded including burial, archaeological and oral history sites.
- » Anderson, G. & Anderson, L. 2008. Archaeological Survey Of The Proposed Alton Sewer Pipe Upgrade - No sites were recorded during the course of the survey along the pipeline deviation.
- » Anderson, G. & Anderson, L. 2009. Heritage Survey of the Proposed Expansion to the Transnet National Ports Authority, Richards Bay - A total of nine sites was recorded during the course of the survey. These sites date from the Cretaceous to the Late Iron Age.
- » Anderson, G. & Anderson, L. 2010. Heritage Survey of the Proposed Richards Bay Central Industrial Area for Coastal & Environmental Services. The survey did not locate any heritage sites.
- » Anderson, G. 2013. The Archaeological Surveys and Excavations of the Zulti North Mining Lease for Richards Bay Minerals. 494 Heritage Sites have been identified and mitigated including Iron Age sites and historical sites.
- » Van Schalkwyk, J. 2013. Cultural Heritage Resources Impact Assessment For The Proposed Swaziland Rail Link, Southern Section, Kwazulu-Natal Region. This study recorded numerous Stone Age find spots as well as a number of concrete arch and metal truss bridges across different rivers. Though the Stone Age features were indicated as of low significance the historical components are protected and should be documented prior to applying for a destruction permit.
- » Van Schalkwyk, L. & Wahl, E. 2014. Application for Exemption from a Phase 1 Heritage Impact Assessment of Proposed Decommissioning of the Legacy Landfills at The Bayside Aluminium Smelter, Richards Bay, KwaZulu-Natal, South Africa.

4.1 2. Public consultation

No public consultation was conducted by the heritage consultant during the scoping phase.

4.1.3. Google Earth and mapping survey

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological sites might be located.

4.1.4. Genealogical Society of South Africa

No grave sites are on record for the study area.

5. ARCHAEOLOGICAL AND HISTORICAL INFORMATION AVAILABLE ON THE STUDY AREA

The archaeology of KwaZulu-Natal can be divided in three main periods namely the Stone Age, Iron Age and Historical period.

Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resources Management (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases.

Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable (Lombard 2011). The three main phases can be divided as follows;

- » Later Stone Age; associated with Khoi and San societies and their immediate predecessors. - Recently to ~30 thousand years ago.
- » Middle Stone Age; associated with Homo sapiens and archaic modern human - . 30-300 thousand years ago.
- » Earlier Stone Age; associated with early Homo groups such as Homo habilis and Homo erectus. - 400 000-> 2 million years ago.

The LSA is well represented in KwaZulu-Natal with an abundance of rock art, like the rock paintings at Giants Castle and Kamberg in the Drakensburg Mountains (Vinnicombe, 1976). Rock art sites have been also been documented in the areas around Estcourt, Mooi River and Dundee. Several caves in KZN contain significant archaeological deposits like the well-known MSA site of Sibudu Cave on the coast of KwaZulu-Natal, which shows evidence for early forms of cognitive human behavioural patterns (Wadley, 2005). Another well-known cave called Border Cave is situated some 40 kilometres to the north east of the study area at the Ingodini Border Cave Museum Complex. The site was first investigated by Raymond Dart in 1934; here excavations exposed a thick deposit of archaeological material dating from the Iron Age overlaying MSA artefacts. Later excavations, by Beaumont in the early 1970's, revealed a complete MSA sequence succeeded by Early and Later Iron Age deposits (Klein 1977). For the study area, a single Stone Age site is on record (van Schalkwyk 2013). This site has a field rating of 3B as per the Pietermaritzburg Museum database.

Iron Age and historical period

Bantu-speaking people moved into Eastern and Southern Africa about 2,000 years ago (Mitchell, 2002). These people cultivated sorghum and millets, herded cattle and small stock and manufactured iron tools and copper ornaments. Because metalworking represents a new technology, archaeologists call this period the Iron Age. Characteristic ceramic styles help archaeologists to separate the sites into different groups and time periods. The Iron Age as a whole represents the spread of Bantu speaking people and includes both the Pre-Historic and Historic periods. It can be divided into three distinct periods:

- » The Early Iron Age: Most of the first millennium AD.
- » The Middle Iron Age: 10th to 13th centuries AD.
- » The Late Iron Age: 14th century to colonial period.

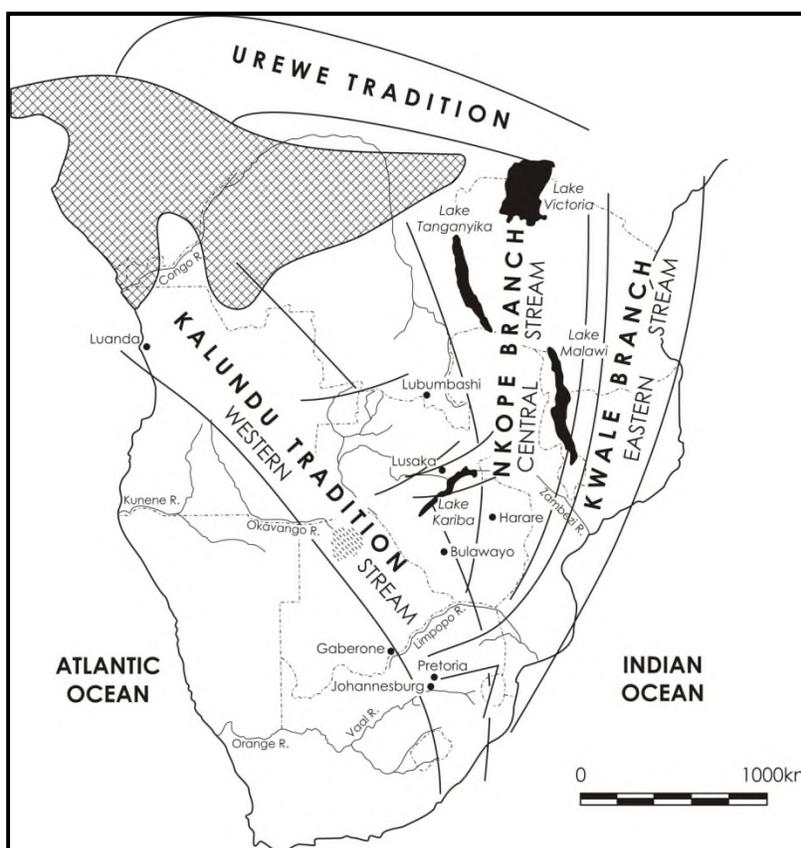


Figure 3: Movement of Bantu speaking farmers (Huffman 2007).

The first 1,000 years is called the Early Iron Age. Early Iron Age people made a living by mixed farming. They had the technology to work metals like iron. Existing evidence dates the Iron Age in southern Africa to the first millennium AD (Huffman, 2007). The site of Mzonjani, 15 km from Durban, is the oldest known Iron Age site in KwaZulu-Natal, dating to the 3rd Millennium AD (Huffman, 2007).

The area that was occupied by the Nguni speaking group of the Eastern Bantu language stream is characterised by settlement patterns defined as the Central Cattle Pattern (CCP) (Huffman, 2007). The Nguni ceramic sequence consists of the *Blackburn* (AD 1050-1500), *Moor Park* (AD 1350-1700) and, *Nqabeni* (AD 1700-1850), although excavated pottery is seldom decorated and therefore complicates archaeological interpretation (Huffman 2007: 441, 443).

Blackburn pottery is on record along the north and south coasts of KwaZulu-Natal, often in shell middens (Huffman 2007: 443). The available radiocarbon dates place *Blackburn* between about AD 1100 and perhaps 1500.

The earliest known type of stonewalling that characterises this settlement pattern (CCP) in the region is the Moor Park site, which dates from the 14th to 16th Centuries AD (Huffman, 2007). This type of stonewalling can be found in defensive positions on hilltops in the Midlands of KZN (Huffman, 2007). Archaeologists have concluded that the function of these structures was to serve mainly as defensive purposes (Huffman, 2007). Archaeologically, the Natal area was occupied by the Zulu people by AD 1050 (Huffman, 2007).

In the late 1400's, a Nguni group under the leadership of Dlamini settled in the Delagoa Bay area. By the late 1700's, the Dlamini clan moved into land settling on the banks of the Pongola River where it cuts through the Lebombo Mountains. An attempt was also made to occupy the area between the Pongola River and Magudu Hills (at that stage the area was under Ndwandwe rule), but they had to retreat back across the Pongola River (Bonner 2002; Fourie 2013).

Serious rivalry between the Ndwandwe under Zwide and the Ngwane (Swazi) under Sobhuza created a period of unrest and confrontation in the early 1800's. An attempt from Zwide to annex the grain fields on the south side of the Pongola River almost destroyed the Ngwane. These successive Ndwandwe attacks lead to the fleeing of the Ngwane to the far north (Bonner, 2002).

The Late Iron Age economy was based on agriculture and livestock. Both components were inextricably linked to cultural practices and even contributed to the evolution of other institutions. In the Nguni groups, economic activities were divided along gender lines; men were closely associated with cattle and women with farming. It is believed that maize was introduced to northern KwaZulu-Natal via the Delagoa Bay trade network and the crop soon became widely cultivated. According to oral tradition, the Mthethwa first produced maize in the late 18th century (Huffman 2007: 453, 457).

Along with cattle and trade beads, (both used as currency for bride wealth); metal objects also became markers of wealth, status and power. Iron and copper ornaments (bangles,

neck-and earrings) were worn to indicate social position and were also used in trade (Wylie 2006: 58, 59). Other metal artefacts which may appear in the archaeological record are iron spear points and hoes used for agriculture (very few have been found in context). It is interesting that the deliberate burial of numerous metal objects (mostly spearheads and hoes) seems to have been a common practice in Late Iron Age KwaZulu-Natal (Maggs 1991). This phenomenon is probably connected to the period of instability leading up to the Mfecane.

The Difaqane (Sotho), or Mfekane/Imfecane (“the crushing” in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820’s until the late 1830’s (Berg 1999: 109-115). It came about in response to heightened competition for land and trade, and caused population groups like gun-carrying Griquas and Shaka’s Zulus to attack other tribes (Berg 1999: 14; 116-119). In KwaZulu-Natal, this commenced in the early 1800’s when the amaZulu were still under Senzangakona (Omer-Cooper, 1993).

The Mthethwa confederacy also arose in the 18th century as a consolidation of clans that formed part of the greater northern Nguni-speaking cultural group in southern Africa. Their ruling lineage (the Nyambose) originally settled between the Mfolozi and Mhlatuse rivers (Wylie 2006: 49).

Indian Ocean trade contributed to changes in the socio-political structures of many groups, including that of the Mthethwa: imported beads became part of bride-wealth/lobola currency, increased demand for meat and grain from east coast ships necessitated more control of agricultural labour, cattle-raids etc., and even influenced the evolution of the amabutho (age-set regiments) system. Ivory, hides, slaves, grain, and metal hoes were exchanged for incoming commodities such as beads and cloth (Mitchell & Whitelaw 2005: 228; Huffman 2007: 77-80). It was amid the ensuing power struggles between politically complex chiefdoms that the Mthethwa, Ndwandwe in the north and the Qwabe in the south emerged as prominent role-players.

6. PROBABILITY OF OCCURRENCE OF SITES

Based on the above information, it is possible to determine the probability of finding archaeological and cultural heritage sites within the study area to a certain degree. For the purposes of this section of the report the following terms are used – low, medium and high probability. Low probability indicates that no known occurrences of sites have been found previously in the general study area. Medium probability indicates some known occurrences in the general study area are documented and can therefore be expected in the study area. A high probability indicates that occurrences have been documented close to or in the study area and that the environment of the study area has a high degree of probability for the occurrence of sites.

» Archaeological and Cultural Heritage Landscape

NOTE: *Archaeology is the study of human material and remains (by definition) and is not restricted in any formal way as being below the ground surface.*

Archaeological remains dating to the following periods can be expected within the study areas:

» Stone Age finds

ESA: *Low Probability*

MSA: *Medium Probability*

LSA: *Medium Probability*

LSA –Herder: *Low Probability*

Shell Middens: *Low Probability*

» Iron Age finds

EIA: *Low to Medium Probability*

MIA: *Low Probability*

LIA: *Low to Medium Probability*

» Historical finds

Historical period: *Low-Medium Probability*

Historical dumps: *Low-Medium Probability*

Structural remains: *Low-Medium Probability*

» Living Heritage

For example, rainmaking sites: *Low Probability*

» Burial/Cemeteries

Burials over 100 years: *Low to Medium Probability*

Burials younger than 60 years: *Low Probability*

Subsurface excavations including ground levelling, landscaping, and foundation preparation can expose any number of these resources.

7. ASSUMPTIONS AND LIMITATIONS

The study area was not subjected to a field survey at this stage in the environmental process, this will be done during the EIA phase. It is assumed that information obtained for the wider area is applicable to the study area. Additional information could become available in future that could change the results of this report. It is assumed that the EAP has provided AMAFA with an NID and will upload all relevant documents to the SAHRIS.

8. FINDINGS

The site measures approximately 71ha and is located approximately 10 km from the sea. The site is covered in short grass and previously impacted on by an old railway line (Figure 9). An unknown portion of the study area was previously covered by a Cultural Heritage survey for the Swaziland Railway Link Ermelo to Richards Bay (van Schalkwyk 2013). This study recorded a Stone Age find spot located on the western periphery of the site. (Figure 8). This site has a field rating of 3B as per the Pietermaritzburg Museum database. According to the palaeontological sensitivity map on SAHRIS the entire site is of low palaeontological sensitivity. Apart from the disused railway line no other structures or features are visible on satellite images for the area.

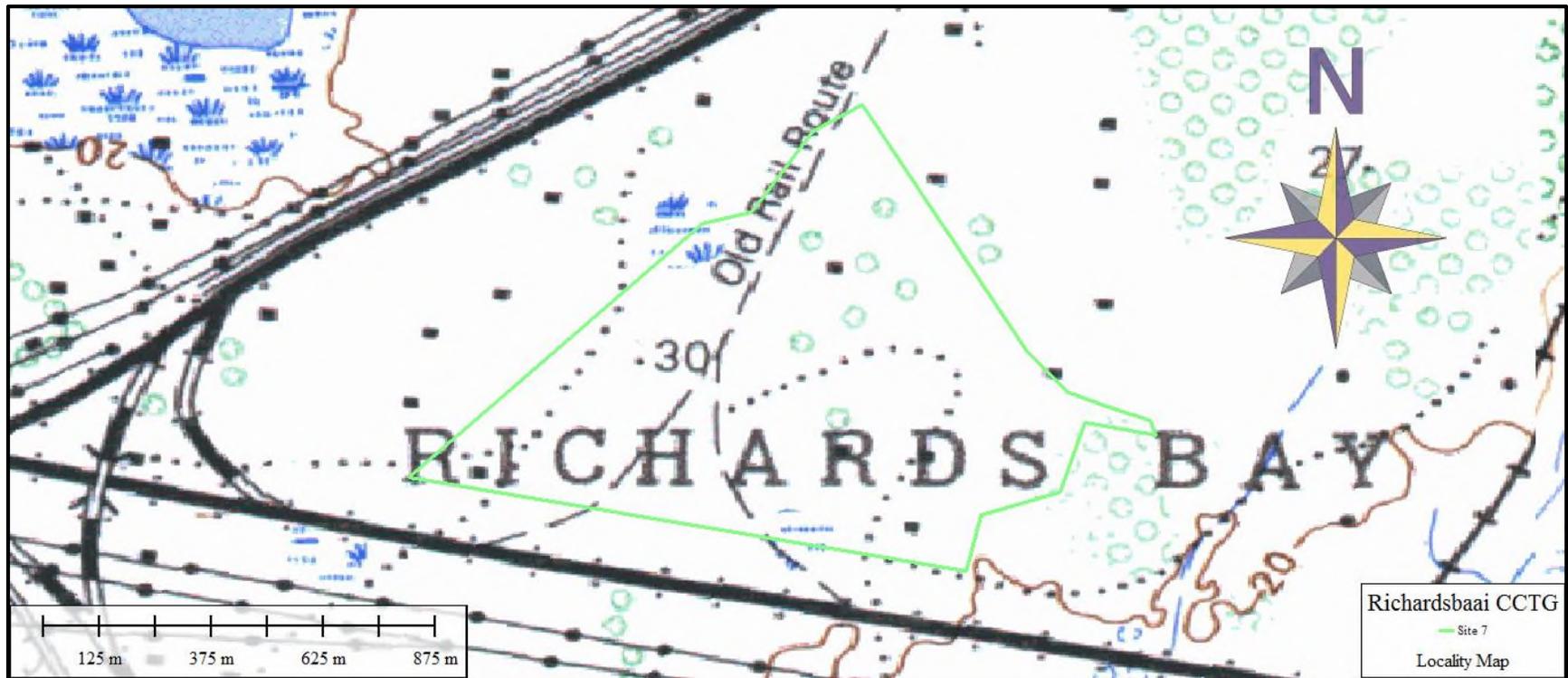


Figure 4: Extract of the 1: 50 000 map indicating the site in green. Note the old rail route.



Figure 5: Known sites in relation to the site indicated with yellow pin.

8.1. Archaeology

8.1.1 Archaeological finds

Extensive field based heritage surveys adjacent to the areas under investigation recorded a high frequency of heritage sites (e.g., Anderson and Anderson 2008 and 2009, Anderson 2004, 2007, 2013). These studies showed that the area is of heritage significance especially the dune systems close to the sea. The site has previously been disturbed and it is expected that identified heritage resources in this area can be mitigated. A single site has been recorded within the project site (van Schalkwyk 2013). According to the author the site is classified as a find spot (does not constitute a habitation site) and is of low significance. He recommended no further mitigation measures if the site is impacted on. From the report, it is not clear if the find spot dates to the Early or Middle Stone Age. Impacts to heritage resources will occur primarily during the construction phase and no impacts are expected during the decommissioning phase.

8.1.2 Nature of Impact

The construction phase of the project could directly impact on surface and subsurface archaeological sites.

8.1.3 Extent of impact

The project could have a low impact on a local scale.

8.2. Historical period

8.2.1 Historical finds:

Historical finds include middens, structural remains and cultural landscape. No standing structures or buildings occur in the study area. The remains of the old railway that is visible on topographical maps and satellite imagery will have to be investigated further during the IA phase.

8.2.2 Nature of Impact

The construction of the project can directly impact on both the visual context and sense of place of historical sites.

8.2.3 Extent of impact

The construction of the project could have a low to medium impact on a local scale.

8.3. Burials and Cemeteries

8.3.1 Burials and Cemeteries

Graves and informal cemeteries can be expected anywhere on the landscape.

8.3.2 Nature of Impact

The construction and operation of the proposed project could directly impact on marked and unmarked graves.

8.3.3 Extent of impact

The project could have a low to medium impact on a local scale.

Impact on Heritage resources			
The construction of the proposed project could directly impact on graves, archaeological sites and historical sites.			
Issue	Nature of Impact	Extent of Impact	No-Go Areas
Disturbance and destruction of archaeological sites, historical sites and graves.	Construction activities could cause irreversible damage or destroy heritage resources and depletion of the archaeological record of the area.	Low to Medium on a local scale.	TBC after field work
Description of expected significance of impact			
Significance of sites, mitigation and significance of possible impact can only be determined after the field work has been conducted, but based on previous work in the area Stone Age find spots can be expected. A section of the site was previously surveyed (van Schalkwyk 2013) and no heritage constraints or further mitigation was recommended.			
Gaps in knowledge & recommendations for further study			
The entire study area has not been subjected to a heritage resource survey and it is assumed that information obtained for the wider region is applicable to the study area. To address these gaps, it is recommended that a field study should be conducted to confirm the presence of heritage resources after which mitigation measures will be recommended (if needed).			

The following impacts can be expected to heritage resources in the area:

- » Direct impacts to heritage resources including damage and destruction of sites.
- » Indirect impacts including impacts on the cultural landscape and sense of place of the area.
- » Cumulative impacts including the permanent destruction of heritage resources throughout the wider region due to various developments in the area.
- » Residual risks for the proposed project include depletion of the archaeological record of the wider region.

9. POTENTIAL SIGNIFICANCE OF HERITAGE RESOURCES

Based on the current information obtained for the area at a desktop level it is anticipated that any sites that occur within the proposed development area will have a Generally Protected B (GP.B) or lower field rating and all sites should be mitigatable. No red flags have been identified.

10. CONCLUSIONS AND RECOMMENDATIONS

Extensive field based heritage surveys adjacent to the area under investigation recorded a high frequency of heritage sites (e.g., Anderson and Anderson 2008 and 2009, Anderson 2004, 2007, 2013, Van Schalkwyk 2013). The studies showed that the larger area is of heritage significance especially the dune systems close to the sea. The site has previously been disturbed and it is expected that identified heritage resources in this area can be mitigated. A single Stone Age find spot is on record within the site.

Every site is relevant to the Heritage Landscape, but it is anticipated that few sites in the study area could have conservation value. It is recommended that impacts to heritage sites should be mitigated by micro adjustments to the layout to preserve the sites *in situ* as far as possible. If this is not possible, the following conclusions are applicable to the heritage sites:

» Archaeological sites

A previous study of an unknown portion of the study area recorded a Stone Age find spot of low significance (van Schalkwyk 2013). This assessment should be verified during the Impact Assessment phase of the project. However, if any sites of significance are found these sites could be mitigated either in the form of conservation of the sites within the development or by a Phase 2 study where the sites will be recorded and sampled before the client can apply for a destruction permit for these sites prior to development.

» Historical finds and Cultural landscape

No standing buildings occur in the study area. The remains of an old railway line can be seen from topographical maps and satellite imagery. A field and archival study is required to confirm the condition of this feature and should be done during the Impact Assessment phase.

» Burials and cemeteries

Formal and informal cemeteries as well as pre-colonial graves occur widely across Southern Africa. It is generally recommended that these sites are preserved *in situ* and within a development. These sites can however be relocated if conservation is not possible, but this option must be seen as a last resort and is not advisable. The presence of any grave sites must be confirmed during the field survey and the public consultation process.

» General

From an archaeological viewpoint, the proposed project is considered to be viable. This will however be confirmed through the Heritage Impact Assessment to be undertaken in the EIA Phase.

11. PLAN OF STUDY

The development triggers the NHRA in the following areas and therefore a Phase 1 Archaeological Impact Assessment (AIA) is recommended:

Action Trigger	Yes/No	Description
Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300 m in length.	Yes	Internal access roads
Construction of a bridge or similar structure exceeding 50 m in length.	No	
Development exceeding 5000 m ²	Yes	Footprint of impact area exceeds 5000m ²
Development involving more than 3 erven or sub divisions	No	
Development involving more than 3 erven or sub divisions that have been consolidated in the past 5 years	No	
Re-zoning of site exceeding 10 000 m ²	Yes	Unknown
Any other development category, public open space, squares, parks or recreational grounds	No	

With cognisance of the recorded archaeological sites in the wider area and in order to comply with the National Heritage Resources Act (Act 25 of 1999) it is recommended that a Phase 1 AIA must be undertaken. During this study sites of archaeological, historical or places of cultural interest must be located, identified, recorded, photographed and described. During this study, the levels of significance of recorded heritage resources must be determined and mitigation proposed should any significant sites be impacted upon, ensuring that all the requirements of the SAHRA are met.

11.1 Reasoned Opinion

If the above recommendations are adhered to and based on approval from SAHRA, HCAC is of the opinion that the impact of the development on heritage resources can be mitigated. This will be confirmed through the Heritage Impact Assessment to be undertaken in the EIA Phase.

If during the pre-construction phase or during construction, any archaeological finds are made (e.g. graves, stone tools, and skeletal material), the operations must be stopped, and the archaeologist must be contacted for an assessment of the finds. Due to the subsurface nature of archaeological material and graves the possibility of the occurrence of unmarked or informal graves and subsurface finds cannot be excluded.

12. LIST OF PREPARERS

Jaco van der Walt (Archaeologist and project manager).

13. STATEMENT OF COMPETENCY

The author of the report is a member of the Association of Southern African Professional Archaeologists and is also accredited in the following fields of the Cultural Resource Management (CRM) Section, member number 159: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation. Jaco is also an accredited CRM Archaeologist with SAHRA and AMAFA.

Jaco has been involved in research and contract work in South Africa, Botswana, Mozambique, Zimbabwe, Tanzania and the DRC and conducted well over 300 AIAs since he started his career in CRM in 2000. This involved several mining operations, Eskom transmission and distribution projects and infrastructure developments. The results of several of these projects were presented at international and local conferences.

14. STATEMENT OF INDEPENDENCE

I, Jaco van der Walt as duly authorised representative of Heritage Contracts and Archaeological Consulting CC, hereby confirm my independence as a specialist and declare that neither I nor the Heritage Contracts and Archaeological Consulting CC have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which the client was appointed as Environmental Assessment practitioner, other than fair remuneration for work performed on this project.



SIGNATURE:

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