

A PHASE ONE CULTURAL HERITAGE IMPACT ASSESSMENT OF THE GREATER BULWER- DONNYBROOK BULK WATER SUPPLY SCHEME.



ACTIVE HERITAGE CC. **FOR: KINVIG & ASSOCIATES**

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LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|-----------------|---|
| EIA | Early Iron Age |
| ESA | Early Stone Age |
| HISTORIC PERIOD | Since the arrival of the white settlers - c. AD 1836 in this part of the country |
| IRON AGE | Early Iron Age AD 200 - AD 1000 Late Iron Age AD 1000 - AD 1830 |
| LIA | Late Iron Age |
| LSA | Late Stone Age |
| MSA | Middle Stone Age |
| NEMA | National Environmental Management Act, 1998 (Act No. 107 of 1998 and associated regulations (2006). |
| NHRA | National Heritage Resources Act, 1999 (Act No. 25 of 1999) and associated regulations (2000) |
| SAHRA | South African Heritage Resources Agency |
| STONE AGE | Early Stone Age 2 000 000 - 250 000 BP Middle Stone Age 250 000 - 25 000 BP Late Stone Age 30 000 - until c. AD 200 |

EXECUTIVE SUMMARY

A phase one cultural heritage survey of the proposed Greater Bulwer-Donnybrook Bulk Water Supply Scheme identified three heritage sites in close association with the footprint. These include an old railway bridge that spans the Mkhomazi River and two Mission Stations that dates back to 1887 and 1888. A phase two heritage impact assessment is proposed for all these historical period sites should it not be possible to maintain a buffer of at least 50m around them. There is no archaeological reason why the proposed Water Supply Scheme development may not proceed on the remainder of the footprint as planned. However, attention is drawn to the South African National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and the KwaZulu-Natal Heritage Act (Act No. 4 of 2008) which requires that operations that expose archaeological or historical remains should cease immediately, pending evaluation by the provincial heritage agency.

1 BACKGROUND INFORMATION ON THE PROJECT

The consultant was approached by Kinvig & Associates Environmental Consulting to conduct a heritage impact assessment (HIA) of the proposed Greater Bulwer-Donnybrook Bulk Water Supply Scheme near Bulwer, Donnybrook, Ixopo and Creighton in KwaZulu-Natal.

According to the National Heritage Resources Act, 1999 (NHRA) (Act No. 25 of 1999), the heritage resources of South Africa include:

- 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 natural features of cultural significance;
- e. geological sites of scientific or cultural importance;
- f. archaeological and palaeontological sites;
- g. graves and burial grounds, including-
 - i. ancestral graves;
 - ii. royal graves and graves of traditional leaders;
 - iii. graves of victims of conflict;
 - iv. graves of individuals designated by the Minister by notice in the Gazette;
 - v. historical graves and cemeteries; and

- vi. other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- h. sites of significance relating to the history of slavery in South Africa;
- i. movable objects, including-
 - i. objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - ii. objects to which oral traditions are attached or which are associated with living heritage;
 - iii. ethnographic art and objects;
 - iv. military objects;
 - v. objects of decorative or fine art;
 - vi. objects of scientific or technological interest; and
 - vii. books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

The newly promulgated KwaZulu-Natal Heritage Act (Act No. 4 of 2008) also makes specific mention to rock art and archaeological sites.

It is furthermore stated that:

—(1) No person may destroy, damage, excavate, alter, write or draw upon, or otherwise disturb any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Council having been obtained on written application to the KwaZulu-Natal Heritage Council.

(2) Upon discovery of archaeological or palaeontological material or a meteorite by any person, all activity or operations in the general vicinity of such material or meteorite must cease forthwith and a person who made the discovery must submit a written report to the Council without delay.

(3) The Council may, after consultation with an owner or controlling authority, by way of written notice served on the owner or controlling authority, prohibit any activity considered by the Council to be inappropriate within 50 metres of a rock art site.

(4) No person may exhume, remove from its original position or otherwise disturb, damage, destroy, own or collect any object or material associated with any battlefield

site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Council having been obtained on written application to the Council.

(5) No person may bring any equipment which assists in the detection of metals and archaeological and palaeontological objects and material, or excavation equipment onto any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, or meteorite impact site, or use similar detection or excavation equipment for the recovery of meteorites, without the prior written approval of the Council having been obtained on written application to the Council.

(6) (a) The ownership of any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site, on discovery, vest in the Provincial Government and the Council is regarded as the custodian on behalf of the Provincial Government.

(b) The Council may establish and maintain a provincial repository or repositories for the safekeeping or display of—

- (i) archaeological objects;
- (ii) palaeontological material;
- (iii) ecofacts;
- (iv) objects related to battlefield sites;
- (v) material cultural artefacts; or
- (vi) meteorites.

(7) The Council may, subject to such conditions as the Council may determine, loan any object or material referred to in subsection (6) to a national or provincial museum or institution.

(8) No person may, without the prior written approval of the Council having been obtained on written application to the Council, trade in, export or attempt to export from the Province—

- (a) any category of archaeological object;
- (b) any palaeontological material;
- (c) any ecofact;
- (d) any object which may reasonably be regarded as having been recovered from a battlefield site;
- (e) any material cultural artefact; or
- (f) any meteorite.

(9) (a) A person or institution in possession of an object or material referred to in paragraphs (a) – (f) of subsection (8), must submit full particulars of such object or material, including such information as may be prescribed, to the Council.

(b) An object or material referred to in paragraph (a) must, subject to paragraph (c) and the directives of the Council, remain under the control of the person or institution submitting the particulars thereof.

(c) The ownership of any object or material referred to in paragraph (a) vest in the Provincial Government and the Council is regarded as the custodian on behalf of the Provincial Government.

This study aims to identify and assess the significance of any heritage and archaeological resources occurring on the site. Based on the significance, the impact of the development on the heritage resources would be determined. Then appropriate actions to reduce the impact on the heritage resources would be put forward. In terms of the NHRA, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of:

- a. its importance in the community, or pattern of South Africa's history;
- b. its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- c. its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- d. its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- e. its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- f. its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- g. its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- h. its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- i. sites of significance relating to the history of slavery in South Africa.

Table 1. Background information

| | |
|--------------|---|
| Consultants: | Active Heritage cc for Kinvig & Associates Environmental Consulting |
|--------------|---|

| | |
|---------------------------|--|
| Type of development: | Construction of ca. 100km of pipeline, a number of reservoirs and a water treatment works (Fig 1). |
| Rezoning or subdivision: | Rezoning |
| Terms of reference | To carry out a Heritage Impact Assessment |
| Legislative requirements: | The Heritage Impact Assessment was carried out in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and following the requirements of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and the KwaZulu Natal Heritage Act (Act No. 4 of 2008) |

1.1. Details of the area surveyed:

Footprint: The proposed development consists of a water pipeline in excess of 100km linking a number of reservoirs with a water treatment works (Fig 1). The greatest portion of the proposed pipeline is situated adjacent the R617 that links Bulwer with Underberg. Another section connects the R617 with the R 612 further south. This section of the pipeline then runs south along the R617 towards Donnybrook. A third section connects the small town of Creighton with the R617 further north. Another significant section serves the small village of Ncwadi. The GPS coordinates for the central area of the footprint is: S 29° 53' 27.38" E 29° 51' 19.71". The study area is characterised by commercial farms, woodlots, and communal areas (Fig 5).

2 BACKGROUND TO ARCHAEOLOGICAL HISTORY OF AREA

Bulwer is situated in the foothills of the southern Drakensberg in KwaZulu-Natal whilst Donnybrook, Ixopo and Creighton are situated in the southern Midlands Region of KwaZulu-Natal. The foothills of the Drakensberg is well endowed with cultural heritage, including various wilderness areas within and outside the formal protected area network that includes the World Heritage Site. Although most literature refers to this heritage mainly in terms of San rock art, the region also contains other categories of cultural heritage features representative of various cultures and time-periods.

2.1.1 The Early Stone Age

The occurrence of Early Stone Age tools such as hand axes in areas below the 1 800 m contour suggests that the first inhabitants of the area predated modern humans by at least 800 000 years. Sites belonging to this period in the Drakensberg are mostly characterised by a few surface scatters and individual stone tools – usually in the close

vicinity of water. They were most probably manufactured by *Homo erectus* or *Homo ergaster*, who were predecessors of modern humans. These most probably dates back to between 40 000 and 200 000 years ago. Based on typological criteria they most probably date back to between 300 000 and 1.7 million years ago (Mitchell 2002)

2.1.2 The Middle Stone Age

Anatomically modern people (*Homo sapiens sapiens*) with a very different economic strategy and more sophisticated stone tool kits moved into the area about 200 000 years ago. Archaeological assemblages left behind by these people have been termed Middle Stone Age. Not only were these societies more effective hunters than their predecessors but Middle Stone Age sites elsewhere in southern Africa also provide convincing evidence for some of the earliest symbolic behaviour in the world. It was Middle Stone Age people from southern and eastern Africa who left the continent roughly between 80 000 – 60 000 years ago to populate the rest of the world. Sites occur as surface scatters as well as deep cave deposits. The presence of the first anatomically modern people (i.e. *Homo sapiens sapiens*) in the area is indicated by the presence of a few Middle Stone Age blades and flakes (Mitchell 2002). One Middle Stone Age site is listed on the existing data bases as occurring in the greater project area. However, many more have been recorded in the areas to the immediate west and east of the footprint.

2.1.3. The Later Stone Age

The stone tool assemblages belonging to the immediate ancestors of the San or Bushmen have been termed Later Stone Age. Later Stone Age tools are generally much smaller but also more diversified than the earlier tool kits. It was during this period that the bow and arrow was used extensively, and societies exploited their environments distinctly more intensively and effectively. Literally hundreds of Later Stone Age sites prevail in the foothills of the Drakensberg including the greater Bulwer area. In addition, most of the rock art in the region was created by the San. Evidence from Good Hope shelter 1 near the bottom of Sani Pass suggests that the earliest archaeological evidence for San people in the southern Drakensberg region dates back to approximately 8 000 years ago (Mitchell 2002). Most of the proposed water works, however, are situated below the 1400m contour and below the sandstone formations that harbour the majority of rock shelters in this area.

Whereas most parts of the Maloti Drakensberg were only seasonally occupied by San hunter gatherers for the larger part of the last 20 000 years, the situation started to change during the later part of the Holocene around 5 000 years ago. This was compounded by the arrival of immigrant black farmers in the region soon after 1600 AD and European colonialism around 1834 AD (Wright & Mazel 2007). During the historical period, the Maloti Drakensberg and adjacent mountainous areas became the last stronghold for various southern San groups such as the Baroa, //Xegwi, !Ga!ne, //Kx'au, and //Ku//ke. There is also some archaeological evidence to suggest that San groups would have transversed the project area in search of migratory large game herds in the past (Mitchell 2002). However, most areas occupied are situated to the immediate west and east of the project area. Their Later Stone Age way of life finally came to an end during the late 19th century. San descendants still live in the area but for all practical purposes have assimilated with their more powerful neighbours. A small assimilated community is situated at Ncwadi within the footprint.

2.1.4. Iron Age Sites

Around 2 000 years ago the southern African demographic landscape was transformed with the arrival of the first Bantu-speaking agriculturists in the sub-region. These subsistence farmers lived for the most part in the lower altitude, wooded areas of the eastern seaboard. Around 1250 AD certain agriculturists started occupying the higher altitude, grassland areas. Sites belonging to this period in KwaZulu-Natal are referred to as Moor Park settlements and they typically occupy hill tops with a low stone walling effect. By the early 1700s various Nguni-speaking groups moved into the area and established chieftaincies in those areas below the 1 800 m contour. Impressive Iron Age sites, with stone walling and belonging to this period, have been recorded in the Mkhomazi River Valley to the immediate north of the project area. The expansion of the Zulu kingdom around 1818 had a major impact on Iron Age settlement in the region. Various chieftaincies were attacked, and their routed remnants typically traversed the project area in search of better settlement elsewhere. Bandits often hid out in the mountains, and a number allegedly practised cannibalism. Some well preserved Later Iron Age and historical era Nguni sites occur near Lotheni and Mpendhle about 20km from the footprint. It is known from oral history that the project area was occupied by the Nhangwini, amaWushe, amaHlubi, amaBhaca, amaZizi, amaNqolo, amaCunu and various other Zulu-speaking and Xhosa-speaking refugees in the 19th century (Bryant 1965; Jackson 1975). There are also some Mpondo and Sotho groupings in the area. Interestingly, descendants of the San still live in the area

and have adopted the Zulu clan name of Muthwa. Interestingly, after the Anglo-Zulu war of 1879 and the Bambatha Rebellion of 1911 some of the African people in the study area adopted a Zulu ethnic identity.

2.1.5. The Historical period

One of the earliest European explorers in the Bulwer/Underberg area was Captain Allen Gardener. Gardener skirted the southern KwaZulu-Natal Drakensberg in 1835 seeking a route from Natal to the Cape Colony. Some Voortrekker farmers settled in the area, albeit briefly, around 1840 but it was only after 1850 when Natal became a British colony that more European, especially English-speaking, settlers arrived in the area. They were preceded and followed by French and German missionaries. The Trappist mission of Rheicenau, in the near vicinity of the footprint, became a prominent landmark in the Bulwer/Underberg District. Various other Trappist Mission stations were erected in the greater project area. These include the recently restored Centacow Mission near Creighton and the Kevenlaer Mission at Donnybrook. Kevelaer Mission specifically was founded in 1888 by Abbot Francis Pfanner of Mariannhil Mission Station near Durban. He called this place after a town in Northern Germany Kevelaer, which had been a well-known place of Pilgrimage since 1642. A benefactor from Kevelaer in Germany wished the new station to be called this. Two historical churches built at Ixopo during the 1880s are still in use. These include the St John the Baptist Anglican Church in High Street, and the former Methodist Church - now in use as the church hall. The Mariathal Mission, which was founded in 1887, served as the first seminary for priests who had studied overseas. This Mission station is situated between Ixopo and Richmond. The Bulwer Yellow Wood Church, is another historical landmark site within the greater project area. This historic church was built in 1885 from hand-sawn yellowwood timber. It was built adjacent to the then old wagon road, which was the main transport route between Pietermaritzburg and Himeville. The church was renovated in 1989 and still attracts historians and visitors from around the country. This establishment is one of the last of its kind still in use today and while the church is isolated, it is never locked, therefore allowing visitors to enter at will. It has been declared a provincial heritage site (Derwent 2006) and is protected by heritage legislation. Apart from these mission stations and church buildings there are also various farmsteads and associated graveyards, dating from approximately 1860, occur at various localities in the greater project area. Residential and public buildings older

than 60 years old also occur in the tows of Bulwer, Donnybrooke and Creighton (Derwent 2006; McKenzie 1946).

3 BACKGROUND INFORMATION OF THE SURVEY

3.1 Methodology

A desktop study was conducted of the SAHRA inventory of heritage sites. Unfortunately this database is incomplete and of only limited use. The SAHRIS website is more informative although most reports and sites cover the areas outside of KwaZulu-Natal. In addition the archaeological database of the KwaZulu-Natal Museum was consulted. This data base indicated more than 300 heritage sites in the larger Bulwer/Underberg districts. However, very few heritage sites are located in the greater project area below the 1400m contour.

A ground survey of the proposed developments following standard and accepted archaeological procedures was conducted.

3.2 Restrictions encountered during the survey

3.2.1 Visibility

Visibility during the site visit was good.

3.2.2 Disturbance.

No disturbance of any potential archaeological stratigraphy or heritage features has been noted.

3.3 Details of equipment used in the survey

GPS: Garmin Etrek

Digital cameras: Canon Powershot A460

All readings were taken using the GPS. Accuracy was to a level of 5 m.

4 DESCRIPTION OF SITES AND MATERIAL OBSERVED

4.1 Locational data

Province: KwaZulu-Natal

Towns: Bulwer, Creighton, Donnybrook, Ixopo.

4.2 Description of Heritage Sites

Only three heritage sites occur on the footprint that is within 50m from the proposed waterworks. These include:

- a) A Railway Bridge that spans the Mkhomazi River in the near vicinity of Deepdale Station, Ncwadi.
- b) The Kevelaer Mission Station at Donnybrook.
- c) The Mariathal Mission near Ixopo.

No prehistoric archaeological sites or graves were observed. The area is also not part of any known cultural landscape.

4.2.1 The Old Railway Bridge near Deepdale Station, Ncwadi.

This old bridge is situated on the outskirts of the small village of Ncwadi near Deepdale Station (Fig 2). It spans the Mkhomazi River and is approximately 35m long and 2.5m broad (Figs 6 & 7). The bridge carries the local railway line and is still in use. The bridge has a metal framework on the sides as do other railway bridges in the Province. The GPS coordinates for this structure is: S 29° 46' 58.99" E 20° 57' 27.98". The bridge is older than 60 years and is therefore protected by heritage legislation.

The bridge is situated directly in the trajectory of the proposed water pipeline (Fig 3). As it is a heritage feature it will be damaged and/or altered by the proposed development. It is therefore suggested that the developers alter the pipeline trajectory in the immediate vicinity of the bridge and allows for a buffer between the bridge and the proposed pipeline (see below). The site is rated as Local Grade 111A (Tables 2 & 3) and it must therefore be retained as a heritage site.

4.2.2 The Mariathal Mission Station

The Mariathal Mission Station is situated directly adjacent to the R56 near Ixopo (Fig 3). It consists of a complex of about 13 structures including the church building (Fig

10). The complete mission complex covers an area of approximately 110m x 320m. The GPS coordinates for the Mission Station are: S 30° 06' 59.66" E 30° 05' 34.49". The oldest buildings at the Mission Station, including the church building, was constructed in 1887. It is therefore older than 60 years and is protected by National and Provincial Heritage Legislation. Given the history of the Mission Station in terms of the broader Trappist Missionary activities in southern KwaZulu-Natal the Site is rated as Provincial (Grade 11) (Tables 2 & 3). It is therefore regarded as having provincial significance and should not be damaged or altered under any circumstances. A buffer of at least 50m must be maintained around this important heritage site.

The Mariathal Mission Station is situated within 30m from the proposed water pipeline which runs roughly parallel to the R56. In order to maintain a buffer of 50m around this site it is suggested that the proposed pipeline trajectory shifts approximately 30m north from its present position.

4.2.3 The Kevelaer Mission Station

The Kevelaer Mission Station is situated directly adjacent to the R612 adjacent to Donnybrook (Fig 4). It consists of a complex of about 20 structures including the church building (Figs 8 & 9). The complete mission complex covers an area of approximately 190m x 220m. The GPS coordinates for the Mission Station are: S 29° 54' 37.48" E 29° 51' 59.77". The oldest buildings at the Mission Station, including the church building, was constructed in 1888. It is therefore older than 60 years and is protected by National and Provincial Heritage Legislation. Given the history of the Mission Station in terms of the broader Trappist Missionary activities in southern KwaZulu-Natal the Site is rated as Provincial (Grade 11) (Tables 2 & 3). It is therefore regarded as having provincial significance and should not be damaged or altered under any circumstances. A buffer of at least 50m must be maintained around this important heritage site.

The Mariathal Mission Station is situated within 60m from the proposed water pipeline which runs roughly parallel to the R612. In order to maintain a buffer of 50m around this site it is suggested that the proposed pipeline trajectory shifts approximately 20m west from its present position.

4.3 Dating the findings

- The Railway Bridge at Ncwadi was constructed before 1960 (actual date of construction is uncertain).
- The Mariathal Mission Station was constructed in 1887
- The Kevelaer Mission Station was constructed in 1888

5 STATEMENT OF SIGNIFICANCE (HERITAGE VALUE)

5.1 Field Rating

- The Railway Bridge at Ncwadi is rated as Local Grade 111A (Table 2).
- The Mariathal Mission Station is rated as Provincial (Grade 11) (Table 2).
- The Kevelaer Mission Station is rated as Provincial (Grade 11) (Table 2).

Table 2. Field rating and recommended grading of sites (SAHRA 2005)

| Level | Details | Action |
|-----------------------|--|--|
| National (Grade I) | The site is considered to be of National Significance | Nominated to be declared by SAHRA |
| Provincial (Grade II) | This site is considered to be of Provincial significance | Nominated to be declared by Provincial Heritage Authority |
| Local Grade IIIA | This site is considered to be of HIGH significance locally | The site should be retained as a heritage site |
| Local Grade IIIB | This site is considered to be of HIGH significance locally | The site should be mitigated, and part retained as a heritage site |
| Generally Protected A | High to medium significance | Mitigation necessary before destruction |
| Generally Protected B | Medium significance | The site needs to be recorded before destruction |
| Generally Protected C | Low significance | No further recording is required before destruction |
| | | |

Table 3. Evaluation and statement of significance for historical period heritage sites identified on the footprint.

| Significance criteria in terms of Section 3(3) of the NHRA | | |
|--|--|------------------|
| | Significance | Rating (Table 2) |
| 1. | Historic and political significance - The importance of the cultural heritage in the community or pattern of South Africa's history. | High. |
| 2. | Scientific significance – Possession of uncommon, rare or endangered aspects of South Africa's cultural heritage. | None. |
| 3. | Research/scientific significance – Potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage. | High |
| 4. | Scientific significance – Importance in demonstrating the principal characteristics of a particular class of South Africa's cultural places/objects. | High. |
| 5. | Aesthetic significance – Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group. | High |
| 6. | Scientific significance – Importance in demonstrating a high degree of creative or technical achievement at a particular period. | Average |
| 7. | Social significance – Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons. | High |
| 8. | Historic significance – Strong or special association with the life and work of a person, group or organization of importance in the history of South Africa. | High |
| 9. | The significance of the site relating to the history of slavery in South Africa. | None. |

6 RECOMMENDATIONS

The Greater Bulwer-Donnybrook Bulk Water Supply Scheme may proceed from a heritage perspective. However, buffer zones of 50m must be strictly maintained around the Mariathal Mission Station and the Kevelaer Mission Station.

With regards to the Old Railway Bridge it, it is advisable that the existing road act as a buffer between the pipeline and heritage site, as it will then be possible to keep the pipeline within the existing road reserve. It could then be a 50m metre buffer or can be closer if the existing road is between the developments to act as the buffer. Additionally, the potential impact will be less within the already impacted reserve due to less chance of graves or other potential heritage features been exposed during the construction phase.

Should it not be possible to maintain these buffer zones then a Second Phase Heritage Impact Assessment may be called for. This Second Phase Heritage Assessment should be conducted by a built heritage specialist. Mitigation measures and the possible alteration of heritage features will then be considered.

The developer has indicated that a possible option would be to consider strapping the proposed pipeline to the Old Railway Bridge rather than initiate excavations in the Mkhomazi River bed. As this action would entail the alteration of the heritage structure a Phase Two Heritage Impact Assessment must first be conducted in order to consider mitigation measures. A list of accredited built heritage specialists, who would be able to conduct this phase of the study, will be provided by the provincial heritage agency Amafa.

7 MAPS AND FIGURES

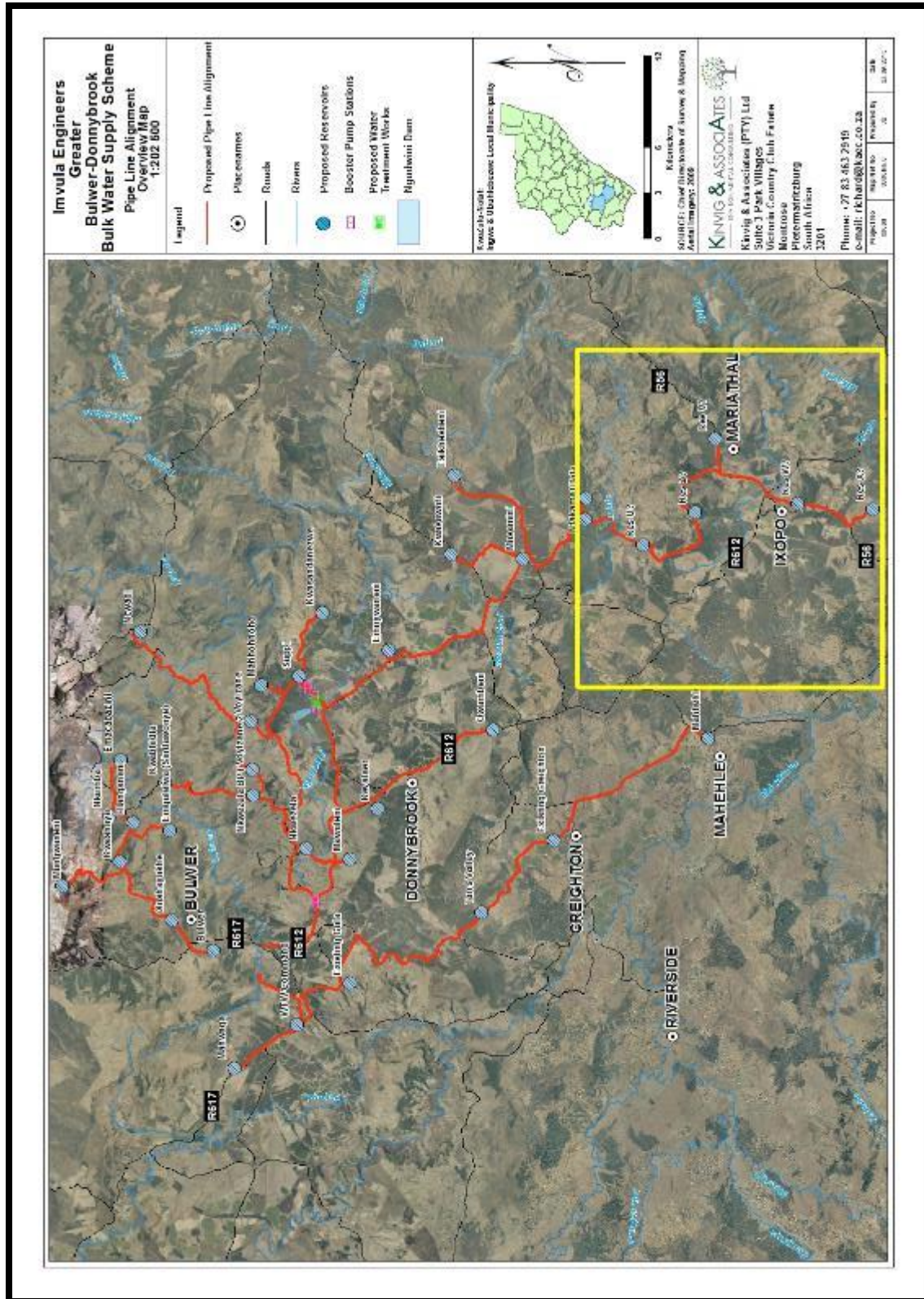


Figure 1. Map showing the location of the Greater Bulwer-Donnybrook Bulk Water Supply Scheme the yellow box indicate the recent extension of the project (Source: Kinvig & Associates)



Figure 2. Google Earth Image showing the location of the old bridge situated on the outskirts of Ncwadi. The orange line indicate the proposed trajectory of a water pipeline.



Figure 3. Google Earth Imagery showing the location of the Mariathal Mission Station situated adjacent to the R56 near Ixopo. The orange line indicates the proposed trajectory of a water pipeline.



Figure 4. Google Earth Imagery showing the locality of the Kevelaer Mission near Donnybrook. The Orange line indicate the proposed trajectory of a water pipeline.



Figure 5. Most of the proposed Water Works runs along the existing road network of the project area. The existing road network runs past plantations, woodlots, rural villages and small towns. This photograph is the R612 section, between Donnybrook and Ixopo, of the project area



Figure 6. The Railway Bridge spanning the Mkhomazi River near Deepdale Station.



Figure 7. The Railway Bridge near Deepdale Station showing the metal framework on the sides of the bridge.



Figure 8. The Kevelaer Mission Station

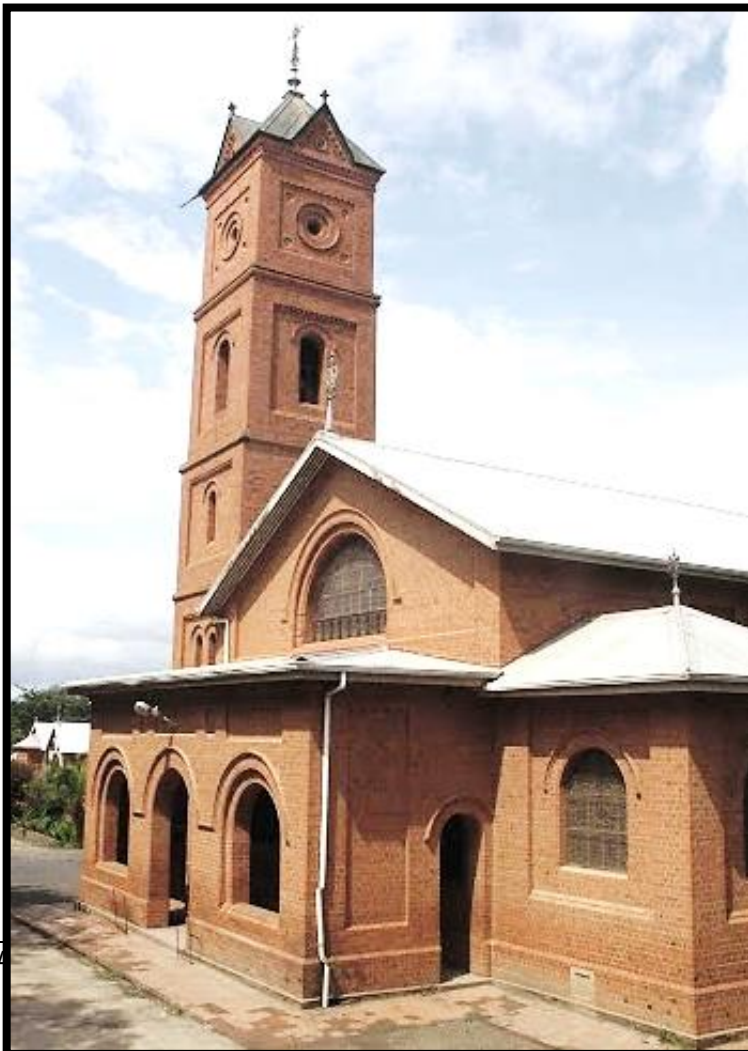


Figure 9. The church building at Kevelaer Mission

Figure 10. The church building at Mariathal near Ixopo

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