HERITAGE SURVEY OF THE LUSIKISIKI REGIONAL WATER SUPPLY SCHEME, EASTERN CAPE.

FOR EOH COASTAL & ENVIRONMENTAL SERVICES

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INTRODUCTION

"The Department of Water Affairs (DWA) appointed AECOM (Pty) Ltd. in 2010, to undertake a Feasibility Study for Augmentation of the Lusikisiki Regional Water Supply Scheme. This study reported that a combination of surface water (Zalu Dam) and groundwater would be the most feasible solution for the long-term water supply for the LRWSS. The Zalu Dam was found to be the most feasible surface storage option for the areas around Lusikisiki, with the south-western part of the study area requiring supplies from groundwater [Figures 1 – 3].

The DWA proposes to begin the second phase of the scheme to augment the existing water supply in the area from Lusikisiki to Port St Johns (Ingquza Hill and Port St John's Local Municipalities). This will involve two water resources:

- The construction of the Zalu Dam on the Xura River to the west of Lusikisiki, which will also involve the upgrading of the Lusikisiki water treatment works and the expansion of the potable water reticulation in the Lusikisiki area; and

- A groundwater abstraction scheme in the south, which will augment water supplies to Port St Johns and the surrounding areas.

The study area for the EIA comprises the entire region between Lusikisiki (up to about 15 km inland) and the coast, extending from the Mzimvubu River in the

south-west to the Msikaba River in the northeast. This area includes the Zalu Dam site and its catchment along the Xura River, conveyance routes between the dam and control reservoirs, as well as borehole sites that could be developed for augmentation of water supplies from groundwater and the routes of the main pipelines from the boreholes to the control reservoirs" (CES BID 2014).

LIMITATIONS IN THE STUDY

There are two limitations to the study area. They are as follows:

1. The precise location of the pipeline is to be decided and it is currently a conceptual layout. However, the pipeline might be moved closer to the existing roads, as opposed to creating new access roads.
2. There are several conceptual boreholes and extraction points. However, the locations of the pipelines from these points to the main system have not been finalised. Given the large area, these points were omitted from the study, as the pipelines has not been finalised.

The limitations can be covered by a desktop study at a later stage.

FIG. 1 GENERAL LOCATION OF THE LUSIKISIKI SSW

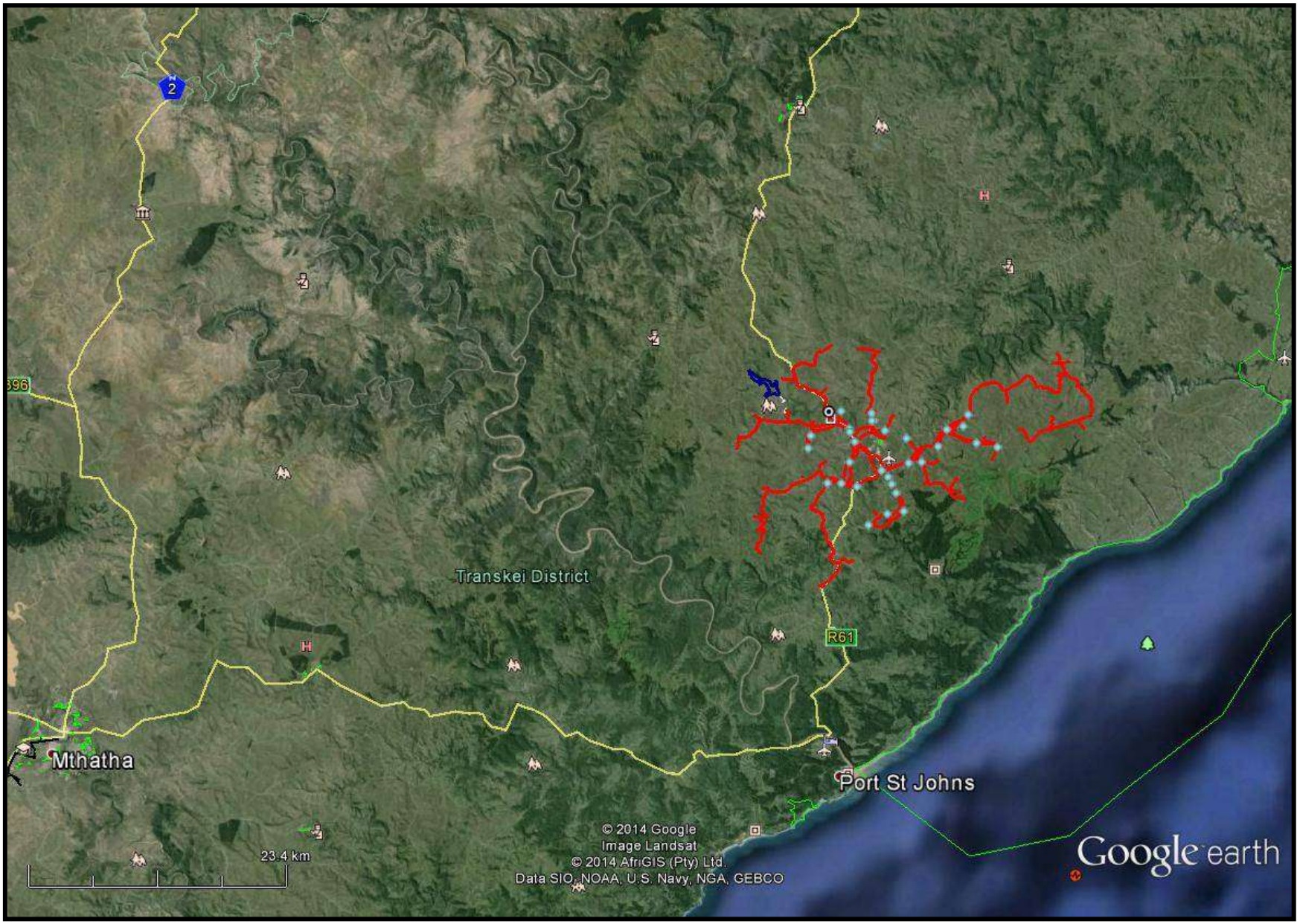


FIG. 2: AERIAL OVERVIEW OF THE LUSIKISIKI SSW

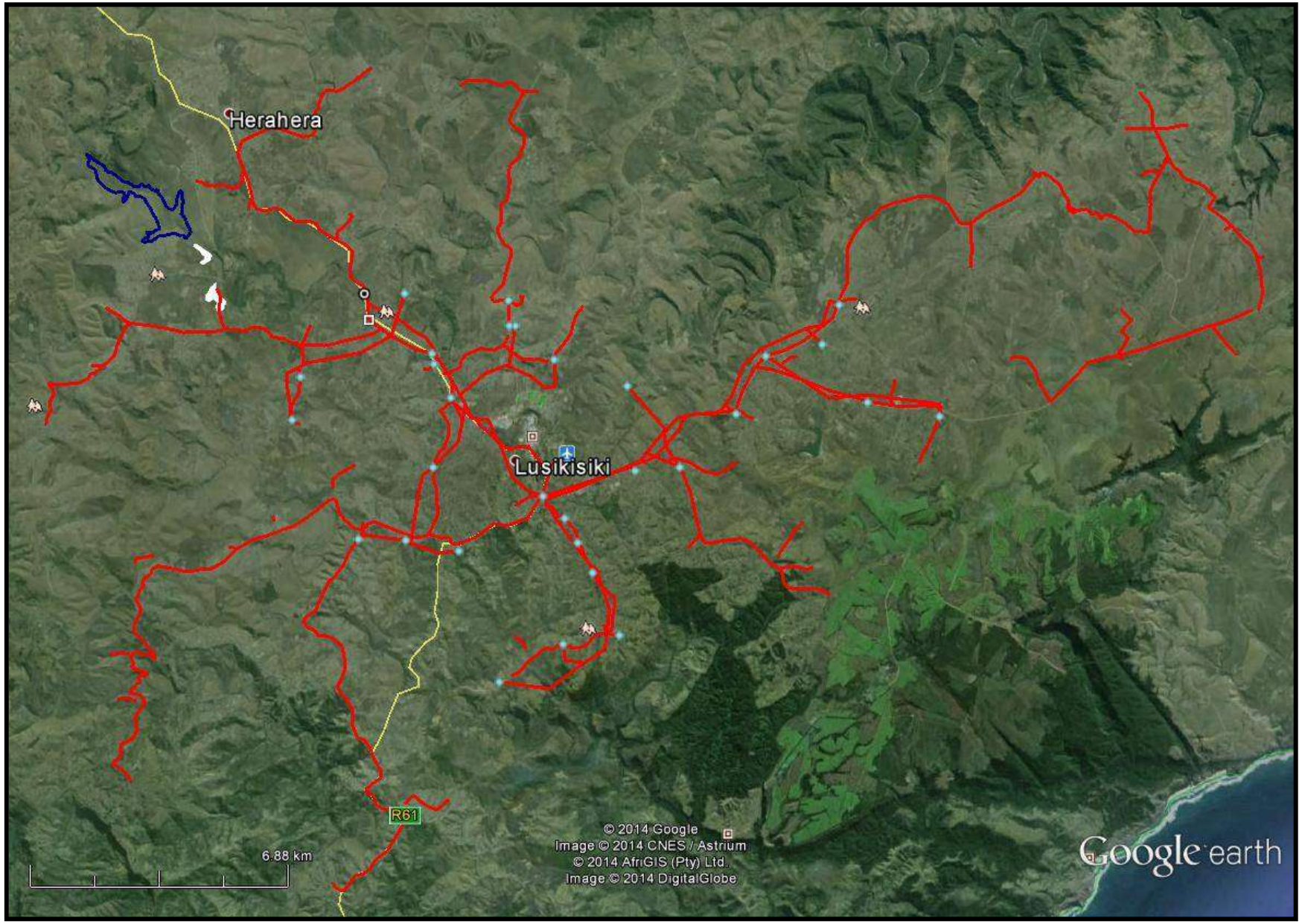


FIG. 3A: NORTHERN TOPOGRAPHICAL MAP OF THE LUSIKISIKI SSW

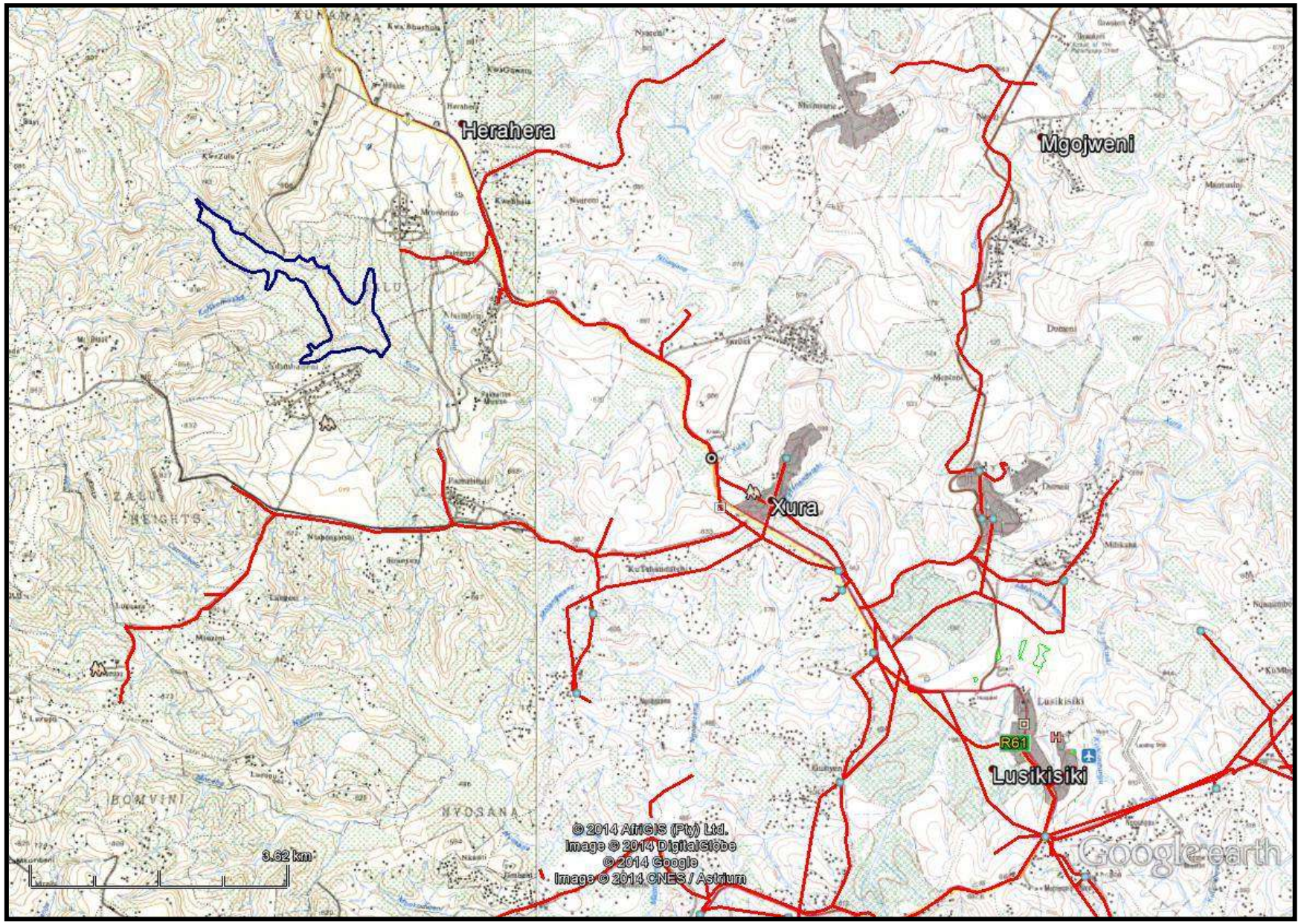


FIG. 3B: SOUTHERN TOPOGRAPHICAL MAP OF THE LUSIKISIKI SSW

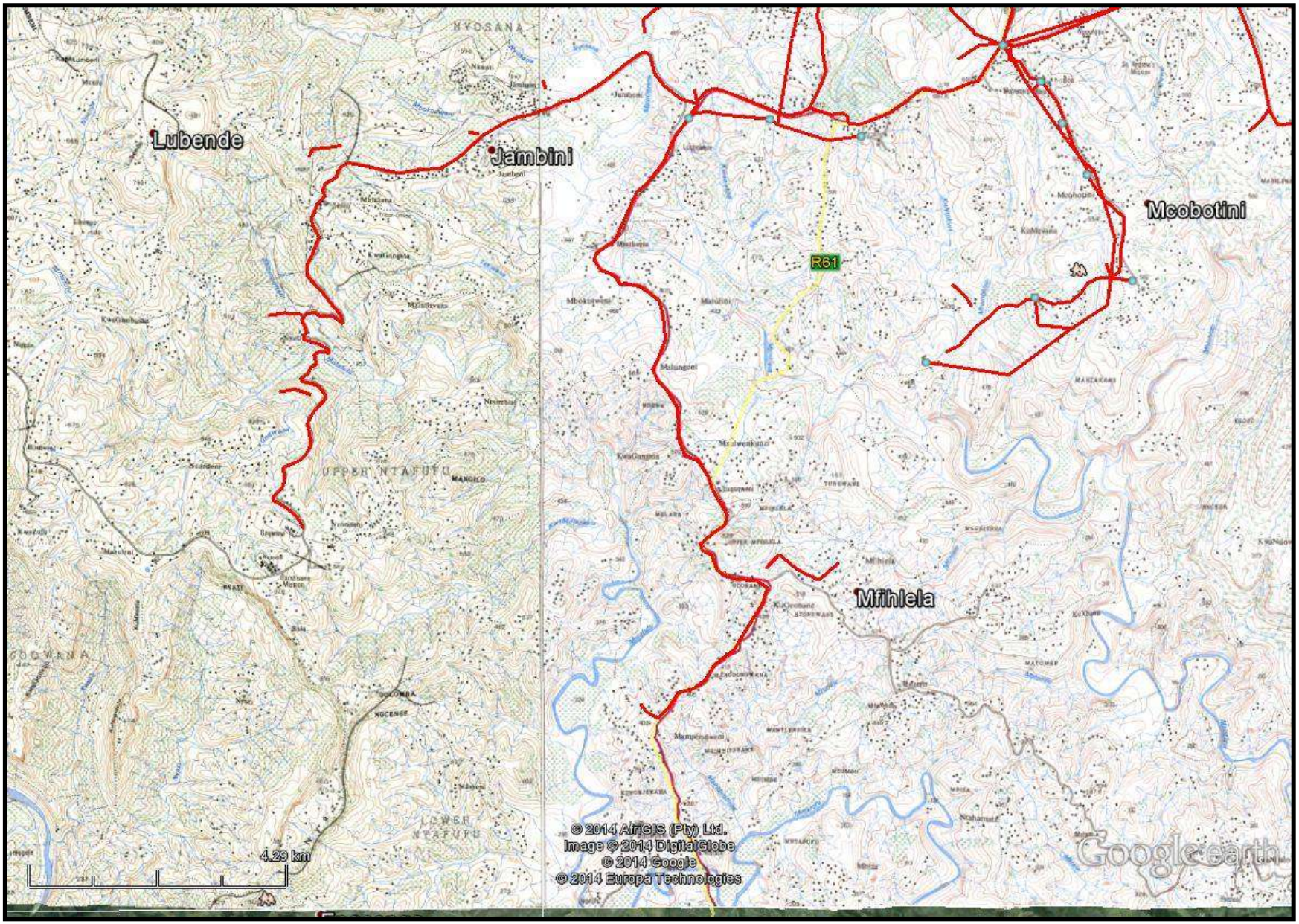
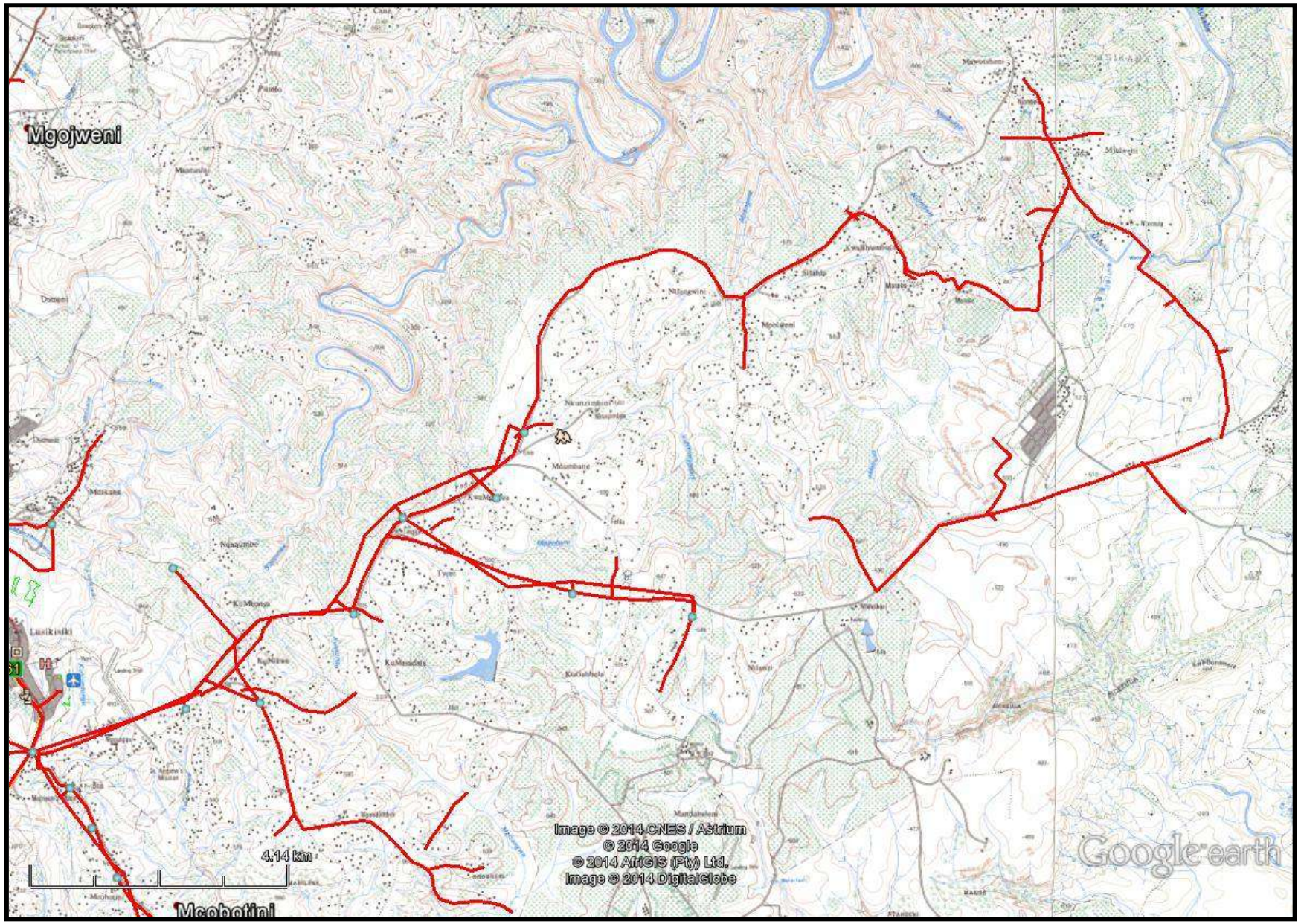


FIG. 3C: TOPOGRAPHICAL MAP OF THE LUSIKISIKI SSW



NATIONAL HERITAGE RESOURCES ACT OF 1999

The National Heritage Resources Act of 1999 (pp 12-14) protects a variety of heritage resources. This are resources are defined as follows:

1. **"**For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.
2. Without limiting the generality of subsection (1), the national estate may include—
   - 2.1. Places, buildings, structures and equipment of cultural significance;
   - 2.2. Places to which oral traditions are attached or which are associated with living heritage;
   - 2.3. Historical settlements and townscapes;
   - 2.4. Landscapes and natural features of cultural significance;
   - 2.5. Geological sites of scientific or cultural importance;
   - 2.6. Archaeological and palaeontological sites;
   - 2.7. Graves and burial grounds, including—
     - 2.7.1. Ancestral graves;
     - 2.7.2. Royal graves and graves of traditional leaders;
     - 2.7.3. Graves of victims of conflict;
     - 2.7.4. Graves of individuals designated by the Minister by notice in the Gazette;
     - 2.7.5. Historical graves and cemeteries; and
     - 2.7.6. Other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
3. Sites of significance relating to the history of slavery in South Africa;
   - 3.1. Movable objects, including—

4. Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
   4.1. Objects to which oral traditions are attached or which are associated with living heritage;
   4.2. Ethnographic art and objects;
   4.3. Military objects;
   4.4. objects of decorative or fine art;
   4.5. Objects of scientific or technological interest; and
   4.6. 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).
5. Without limiting the generality of subsections (1) and (2), a place or object is to be considered part of the national estate if it has cultural significance or other special value because of—
   5.1. Its importance in the community, or pattern of South Africa's history;
   5.2. Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
   5.3. Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
   5.4. Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
   5.5. Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
   5.6. Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
   5.7. Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
   5.8. 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

5.9. sites of significance relating to the history of slavery in South Africa"

METHOD

The method for Heritage assessment consists of several steps.

The first step forms part of the desktop assessment. Here we would consult the database that has been collated by Umlando. This database contains archaeological site locations and basic information from several provinces (information from Umlando surveys and some colleagues), most of the national and provincial monuments and battlefields in Southern Africa (http://www.vuvuzela.com/googleearth/monuments.html) and cemeteries in southern Africa (information supplied by the Genealogical Society of Southern Africa). We use 1st and 2nd edition 1:50 000 topographical and 1937 aerial photographs where available, to assist in general location and dating of buildings and/or graves. The database is in Google Earth format and thus used as a quick reference when undertaking desktop studies. Where required we would consult with a local data recording centre, however these tend to be fragmented between different institutions and areas and thus difficult to access at times. We also consult with an historical architect, palaeontologist, and an historian where necessary.

The survey results will define the significance of each recorded site, as well as a management plan.

All sites are grouped according to low, medium, and high significance for the purpose of this report. Sites of low significance have no diagnostic artefacts or features. Sites of medium significance have diagnostic artefacts or features and these sites tend to be sampled. Sampling includes the collection of artefacts for future analysis. All diagnostic pottery, such as rims, lips, and decorated sherds are sampled, while bone, stone, and shell are mostly noted. Sampling usually

occurs on most sites. Sites of high significance are excavated and/or extensively sampled. Those sites that are extensively sampled have high research potential, yet poor preservation of features.

Defining significance

Heritage sites vary according to significance and several different criteria relate to each type of site. However, there are several criteria that allow for a general significance rating of archaeological sites.

These criteria are:

1. State of preservation of:

1.1. Organic remains:

1.1.1. Faunal

1.1.2. Botanical

1.2. Rock art

1.3. Walling

1.4. Presence of a cultural deposit

1.5. Features:

1.5.1. Ash Features

1.5.2. Graves

1.5.3. Middens

1.5.4. Cattle byres

1.5.5. Bedding and ash complexes

2. Spatial arrangements:

2.1. Internal housing arrangements

2.2. Intra-site settlement patterns

2.3. Inter-site settlement patterns

3. Features of the site:

3.1. Are there any unusual, unique or rare artefacts or images at the site?

3.2. Is it a type site?

3.3. Does the site have a very good example of a specific time period, feature, or artefact?

4. Research:

4.1. Providing information on current research projects

4.2. Salvaging information for potential future research projects

5. Inter- and intra-site variability

5.1. Can this particular site yield information regarding intra-site variability, i.e. spatial relationships between various features and artefacts?

5.2. Can this particular site yield information about a community's social relationships within itself, or between other communities?

6. Archaeological Experience:

6.1. The personal experience and expertise of the CRM practitioner should not be ignored. Experience can indicate sites that have potentially significant aspects, but need to be tested prior to any conclusions.

7. Educational:

7.1. Does the site have the potential to be used as an educational instrument?

7.2. Does the site have the potential to become a tourist attraction?

7.3. The educational value of a site can only be fully determined after initial test-pit excavations and/or full excavations.

8. Other Heritage Significance:

8.1. Palaeontological sites

8.2. Historical buildings

8.3. Battlefields and general Anglo-Zulu and Anglo-Boer sites

8.4. Graves and/or community cemeteries

8.5. Living Heritage Sites

8.6. Cultural Landscapes, that includes old trees, hills, mountains, rivers, etc related to cultural or historical experiences.

The more a site can fulfill the above criteria, the more significant it becomes. Test-pit excavations are used to test the full potential of an archaeological deposit. This occurs in Phase 2. These test-pit excavations may require further excavations if the site is of significance (Phase 3). Sites may also be mapped and/or have artefacts sampled as a form of mitigation. Sampling normally occurs when the artefacts may be good examples of their type, but are not in a primary archaeological context. Mapping records the spatial relationship between features and artefacts.

TABLE 1: SAHRA GRADINGS FOR HERITAGE SITES

SITE SIGNIFICANCE	FIELD RATING	GRADE	RECOMMENDED MITIGATION
High Significance	National Significance	Grade 1	Site conservation / Site development
High Significance	Provincial Significance	Grade 2	Site conservation / Site development
High Significance	Local Significance	Grade 3A / 3B	
High / Medium Significance	Generally Protected A		Site conservation or mitigation prior to development / destruction
Medium Significance	Generally Protected B		Site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction
Low Significance	Generally Protected C		On-site sampling monitoring or no archaeological mitigation required prior to or during development / destruction

FIG. 4: KNOWN HERITAGE SITES IN THE GENERAL AREA

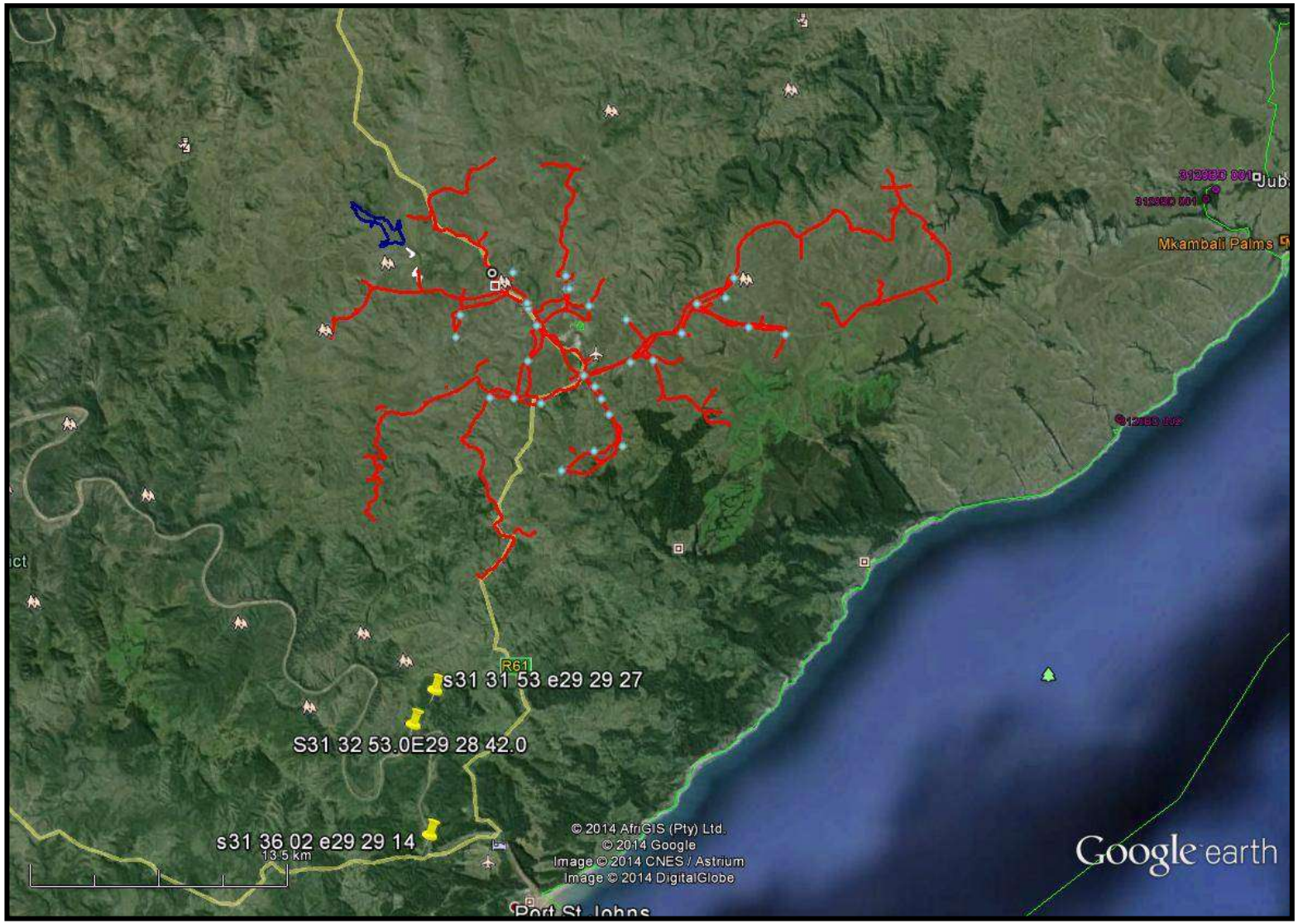


FIG. 5: SETTLEMENT LOCATIONS IN THE STUDY AREA IN 1954

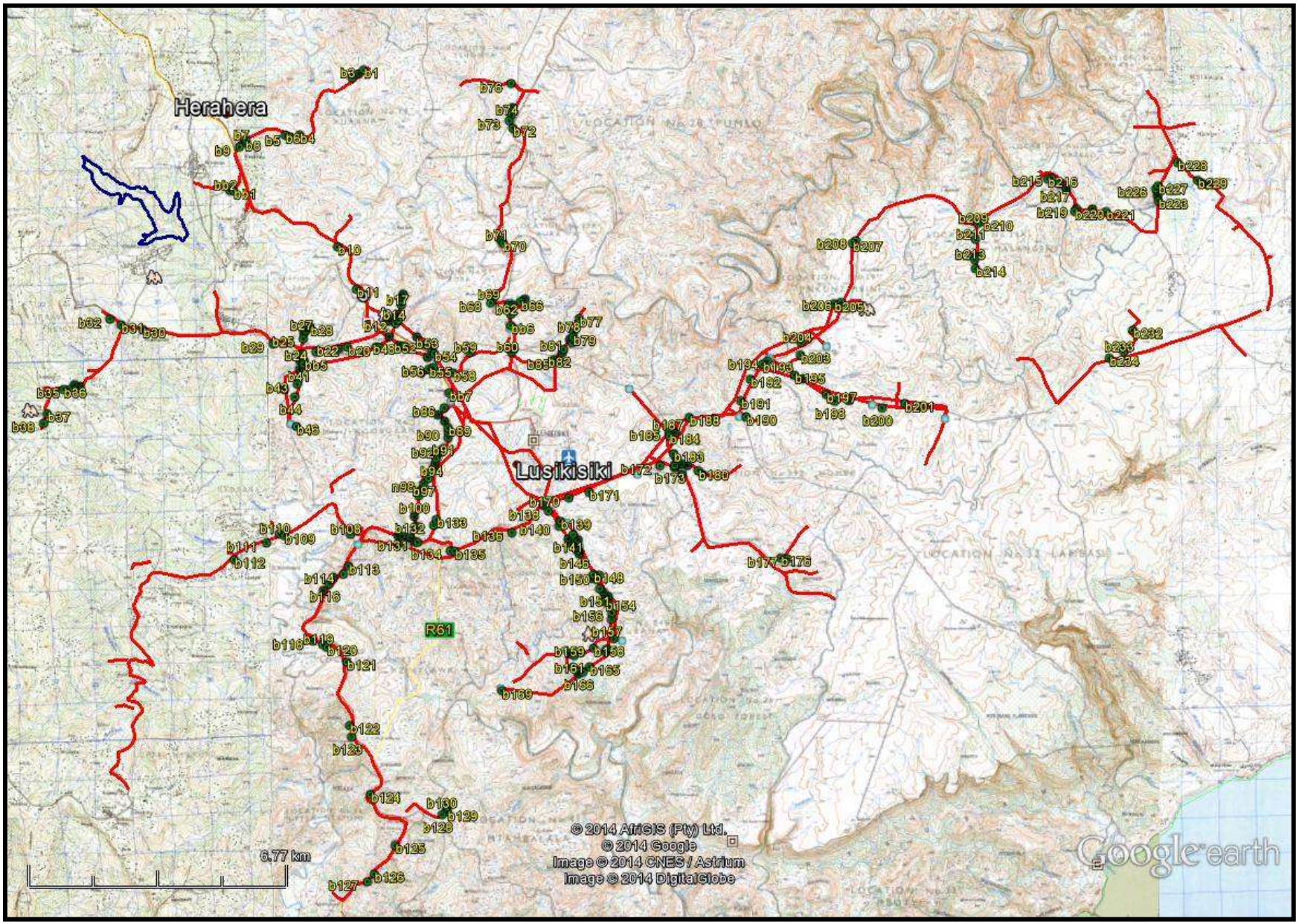


TABLE 2: LOCATION OF SETTLEMENTS IN 1954

Name	Latitude	Longitude
b1	31.274723501	29.526968686
b2	31.275599705	29.525546673
b3	31.276541457	29.523723861
b4	31.290240954	29.509361304
b5	31.290662992	29.506567494
b6	31.290236177	29.505384387
b7	31.291456572	29.494572245
b8	31.292072792	29.494346379
b9	31.293074727	29.492757496
bb1	31.303355841	29.491005943
bb2	31.303231472	29.489956793
b10	31.316537611	29.519466704
b11	31.326560220	29.524599644
b12	31.334745116	29.535558998
b13	31.334232427	29.533582427
b14	31.333962458	29.536336411
b15	31.333751474	29.535136947
b16	31.332638894	29.536161230
b17	31.330368434	29.537185898
b18	31.328636085	29.537363234
b19	31.327801511	29.537609230
bb3	31.337896214	29.533781041
b20	31.340465294	29.531093711
b21	31.340344901	29.530148963
b22	31.340353657	29.522305853
b23	31.340774919	29.519880900
b24	31.341466876	29.513555286
b25	31.338359268	29.510081167
b26	31.337025010	29.510214819
b27	31.336399274	29.510764727
b28	31.335711484	29.511974073
b29	31.339472629	29.501590645
b30	31.336047398	29.465618449
b31	31.334937378	29.459703442
b32	31.333553732	29.456757283
bb4	31.348975627	29.446601583
b33	31.349390510	29.448153618
b34	31.349683676	29.447567595
b35	31.350209182	29.445042863
b36	31.350148022	29.443661939
b37	31.355870120	29.439113423
b38	31.358118344	29.438143733
b39	31.341958057	29.509735344
b40	31.343457717	29.509025400
b41	31.344265415	29.509998418
bb5	31.343579799	29.510221265
b42	31.345525466	29.508895587
b43	31.349041360	29.508201980
b44	31.352050043	29.507450003
b45	31.350306138	29.504608474
b46	31.359059755	29.507802223
b47	31.340066777	29.536631610
b48	31.340146002	29.538013412
b49	31.342838551	29.544411532
b50	31.337968874	29.541444580
b52	31.339786046	29.543812543
b53	31.340790093	29.545569694
b54	31.341930373	29.546293419
b55	31.345634110	29.544834053
b56	31.345295249	29.546002010
b57	31.346521335	29.542657430
b58	31.346540763	29.551491721
b59	31.341750283	29.556123332
b60	31.341667589	29.567700155
b61	31.340850215	29.568420464
bb6	31.335340723	29.567561773
b62	31.332719104	29.567516743
b63	31.331658506	29.566677557
b64	31.330435295	29.566725444
b65	31.330401621	29.568110681
b66	31.329599582	29.570234666
b67	31.329042746	29.571450485
b68	31.329901362	29.561856984
b69	31.329089035	29.562515335
b70	31.315670917	29.565379531
b71	31.314949059	29.564777055
b72	31.288683942	29.568289964
b73	31.286914596	29.567297750
b74	31.285578320	29.567901972
b75	31.283784671	29.568303821
b76	31.278171979	29.567886553
b77	31.333666109	29.586449453
b78	31.336882468	29.584889657
b79	31.338153378	29.584706524
b80	31.338619619	29.583796711
b81	31.339396786	29.584432696
b82	31.341022413	29.582102527
b83	31.341872566	29.581680688
b84	31.343385870	29.579543347
b85	31.343825423	29.580749159
bb7	31.351271016	29.550377376
b86	31.354822451	29.548972693
b87	31.356441239	29.547198887
b88	31.357952313	29.549095246
b89	31.359578303	29.550056456
b90	31.360553808	29.550113466
b91	31.361829103	29.550067787

Name	Latitude	Longitude
b92	31.364541345	29.548596421
b93	31.365268945	29.548034515
b94	31.366795911	29.546696479
b95	31.367980061	29.546404423
b96	31.369253491	29.545764607
b97	31.371541192	29.544548529
n98	31.372718876	29.543183851
b99	31.374233501	29.542409182
b100	31.375538710	29.541846716
b102	31.380486864	29.540528906
b103	31.382798129	29.540919878
b104	31.385486299	29.539367804
b105	31.385188103	29.537081163
b106	31.385003468	29.535913996
b107	31.386970672	29.535926683
b108	31.384677862	29.522649515
b109	31.384977856	29.504245351
b110	31.384542258	29.502779836
b111	31.386680758	29.499196508
b112	31.390639864	29.490191343
b113	31.392258647	29.522140035
b114	31.394154227	29.520649083
b115	31.394876106	29.517821650
b116	31.396481154	29.516581256
b117	31.398054439	29.514928320
b118	31.410038909	29.511711326
b119	31.410906882	29.514605418
b120	31.411601392	29.515790105
b121	31.415098551	29.521331627
b122	31.430218836	29.522085198
b123	31.432928051	29.522610713
b124	31.446645873	29.527822691
b125	31.458992039	29.534489128
b126	31.466012443	29.528444644
b127	31.467901236	29.526491332
b128	31.451738904	29.547613926
b129	31.451027663	29.549090239
b130	31.450224435	29.548799064
b130	31.386449937	29.540590117
b131	31.386634229	29.541410482
b132	31.382623300	29.545932155
b133	31.381234259	29.546745309
b134	31.388693285	29.550586748
b135	31.388728138	29.551769739
b136	31.384382157	29.567740715
b137	31.377910285	29.576425191
b138	31.379307565	29.577858999
b139	31.381738663	29.581133315
b140	31.382846916	29.580772952
b141	31.384900865	29.584629810
b142	31.386159934	29.586040216

Name	Latitude	Longitude
b143	31.385947249	29.583275757
b144	31.387261251	29.584330088
b145	31.387902330	29.585309722
b146	31.388713205	29.586174124
b147	31.389480070	29.586340220
b148	31.394445934	29.590251157
b149	31.395328217	29.590081659
b150	31.394542227	29.591842229
b151	31.397736201	29.591952043
b152	31.398556532	29.593010816
b153	31.399576883	29.594382645
b154	31.400766249	29.593529862
b155	31.401243101	29.594462408
b156	31.403508878	29.595294986
b157	31.404972354	29.595183790
b158	31.409648051	29.595776167
b159	31.411942145	29.590208381
b160	31.412968401	29.586638075
b161	31.413687263	29.584775380
b162	31.413249738	29.583387125
b163	31.412065035	29.593917366
b164	31.412781346	29.593565007
b165	31.416365493	29.589067289
b166	31.417648943	29.587204897
b167	31.418150889	29.585817534
b168	31.416473402	29.584423629
b169	31.422150339	29.564556888
b170	31.376208090	29.583488507
b171	31.374866245	29.589135287
b172	31.368638513	29.608801465
b173	31.368587071	29.612861379
b174	31.369159124	29.612895113
b175	31.370704755	29.614904178
b176	31.390635205	29.642305907
b177	31.390842017	29.644092565
b178	31.368250051	29.614772980
b179	31.368629990	29.616452979
b180	31.369853196	29.619411769
b181	31.370753379	29.620637384
b182	31.366832652	29.613324619
b183	31.365823045	29.612555644
b184	31.361604110	29.611401205
b185	31.360763403	29.611365330
b186	31.360815464	29.613021893
b187	31.360234823	29.612240052
b188	31.357224837	29.616946758
b189	31.357530661	29.623911334
b190	31.357127722	29.632746004
b191	31.353299034	29.631269448
b192	31.348165050	29.633955584
b193	31.344611957	29.637369279

Name	Latitude	Longitude
b194	31.343916279	29.638731509
b195	31.347304254	29.646225848
b196	31.348077197	29.648518101
b197	31.351882096	29.655013875
b198	31.353452787	29.657294741
b199	31.353312555	29.661237231
b200	31.355077831	29.670532388
b201	31.354044105	29.676864464
b202	31.354684126	29.681776114
b203	31.342519045	29.647850051
b204	31.339542388	29.648078116
b205	31.330373764	29.657203275
b206	31.330056628	29.659081583
b207	31.316028032	29.662399970
b208	31.315444007	29.663281487
b209	31.311340131	29.697253302
b210	31.310865380	29.698699719
b211	31.315068791	29.696687405
b212	31.319080194	29.696586670
b213	31.319869507	29.696461295
b214	31.322000696	29.696691791
b215	31.300583746	29.717708050
b216	31.300816017	29.716633076
b217	31.302016064	29.719920138
b218	31.303130864	29.721857016
b219	31.307855680	29.724673480
b220	31.308491354	29.724204911
b222	31.307951204	29.729186678
b221	31.308573647	29.733008237
b223	31.305853131	29.747842439
b224	31.304698014	29.747615727
b225	31.303771168	29.747705621
b226	31.303057003	29.747130755
b227	31.302315035	29.747791574
b228	31.296847944	29.753059132
b229	31.300959650	29.758871105

Name	Latitude	Longitude
b230	31.301493410	29.759887793
b231	31.301906770	29.761576859
b232	31.336653722	29.740490319
b233	31.341753587	29.737984389
b234	31.343297114	29.733983861

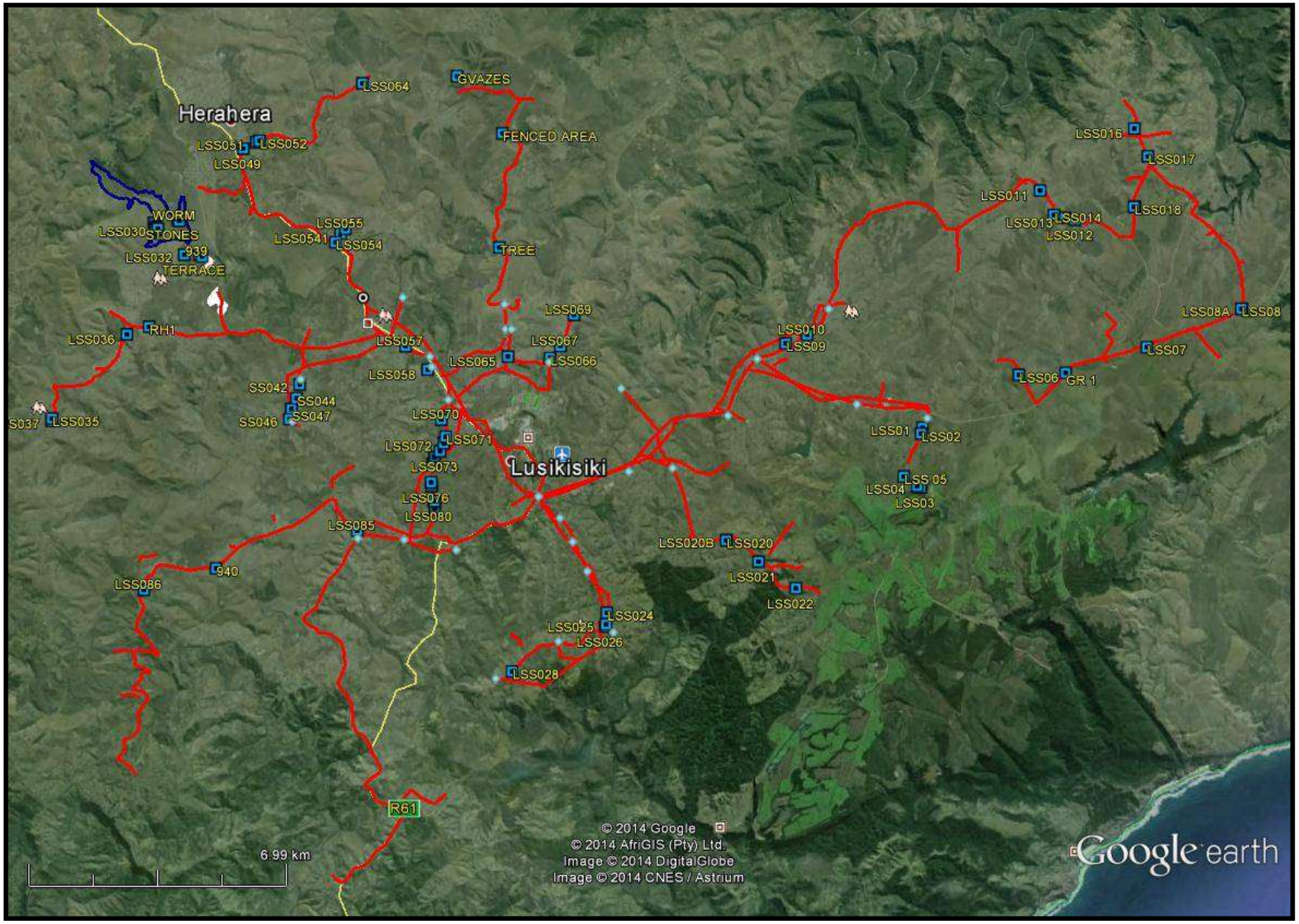
FIELD SURVEY

Eighty-seven heritage sites were noted during the survey. Their locations are shown in Figure 6 and Table 3. Most of the sites consist of human graves in a fenced of and/or demarcated area. However, these tend to be close to the road and/or pipeline. Only those graves within 50m of the new pipelines were recorded. Full mitigation for graves is explained in 'Management Plan'.

TABLE 3: LOCATION OF RECORDED HERITAGE SITES

Name	Latitude	Longitude	Description
LSS 005	-31.371822964	29.681340031	
LSS001	-31.359942975	29.686807981	
LSS002	-31.361459568	29.686532674	
LSS003	-31.374574006	29.686366003	
LSS004	-31.374267982	29.685335029	
LSS006	-31.346953036	29.714606982	
LSS007	-31.339033626	29.750965885	
LSS008	-31.330701029	29.778458979	
LSS008A	-31.330715027	29.778637011	
LSS009	-31.339401025	29.647517977	
LSS010	-31.337295994	29.653602988	
LSS011	-31.302133240	29.720237342	
LSS012	-31.308725388	29.730775314	
LSS013	-31.308385003	29.727541964	
LSS014	-31.307990398	29.724135878	
LSS015	-31.305782812	29.724294873	
LSS016	-31.286696742	29.747681277	
LSS017	-31.293461274	29.751366012	
LSS018	-31.305726981	29.747654982	
LSS018A	-31.305764029	29.747912977	GR
LSS019	-31.302130960	29.761767006	
LSS020	-31.387511976	29.630495002	
LSS020B	-31.387420027	29.630531967	
LSS021	-31.392676081	29.639870389	
LSS022	-31.399118025	29.650515690	
LSS023	-31.387268826	29.586185269	
LSS024	-31.405188745	29.596255394	
LSS025	-31.408055793	29.595632865	
LSS026	-31.408452023	29.595541597	
LSS027	-31.413271404	29.584402146	
LSS028	-31.419517553	29.568873468	
LSS029	-31.309983982	29.467077982	
LSS030	-31.311446037	29.468199983	
LSS030B	-31.311303042	29.467769992	
LSS030C	-31.311248979	29.467600007	
LSS031	-31.311720042	29.467530018	
LSS032	-31.317775967	29.475692986	
LSS033	-31.326851194	29.484090309	
LSS034	-31.330071115	29.487021106	
LSS035	-31.337174959	29.459262025	
LSS036	-31.357692648	29.437919367	
LSS037	-31.358263231	29.437816085	
LSS038	-31.359614416	29.437434846	
LSS039	-31.341579552	29.457135493	
LSS040	-31.336304869	29.464402199	
LSS042	-31.349443680	29.508278854	
LSS044	-31.352760019	29.507515971	
LSS046	-31.357864011	29.505430972	
LSS047	-31.355356984	29.506004965	
LSS049	-31.292088032	29.492800031	
LSS051	-31.290573576	29.496522841	
LSS052	-31.290269983	29.497422238	
LSS053	-31.314650544	29.518614303	
LSS054	-31.312448550	29.520172739	
LSS055	-31.311341390	29.521507022	
LSS056	-31.310296477	29.523266204	
LSS057	-31.340693985	29.540962543	
LSS058	-31.345844995	29.545203072	
LSS059	-31.341634253	29.557918004	
LSS060	-31.341838816	29.561769751	
LSS061a	-31.317742020	29.479968008	
LSS061b	-31.318177041	29.480776023	
LSS062	-31.284863733	29.568231594	
LSS063	-31.287694444	29.566388889	
LSS064	-31.275951881	29.526530099	
LSS065	-31.342532163	29.568110176	
LSS066	-31.342972078	29.580105357	
LSS067	-31.339903854	29.582838959	
LSS068	-31.336535383	29.567863494	
LSS069	-31.332465187	29.587072860	
LSS070	-31.358128369	29.548908612	
LSS071	-31.362130489	29.550090836	
LSS072	-31.363831424	29.549838908	
LSS073	-31.365872424	29.548683650	
LSS074	-31.367165013	29.546919152	
LSS075	-31.368798958	29.546603970	
LSS076	-31.373313238	29.546355269	
LSS077	-31.374349450	29.546060745	
LSS078	-31.374756406	29.546252596	
LSS079	-31.376637823	29.546525019	
LSS080	-31.377927490	29.546883804	
LSS081	-31.379683797	29.547413993	
LSS082	-31.379676091	29.547063669	
LSS084	-31.384499540	29.545379725	
LSS085	-31.385136964	29.524794007	
LSS086	-31.399990547	29.463600177	
LSS087	-31.304295364	29.746854430	

FIG. 6: LOCATIONS OF RECORDED SITES



LSS01

The site consists of a recent cemetery in the fenced yard of a house (fig. 7). The cemetery is 21m from the pipeline and 60m from the road. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The graves occur 10m from the pipe centre point and require mitigation in the form of demarcation, moving the line further away from the grave, and restricting the footprint width for 20m around the grave.

SAHRA Rating: 3A

FIG. 7: CEMETERY AT LSS01

LSS02

The site consists of a recent grave in the fenced yard of a house (fig. 8). The grave is 11m from the pipeline centre. The pipeline footprint will affect the graves.

Significance: The site is of high significance

Mitigation: The graves occur 10m from the pipe centre point and require mitigation in the form of demarcation, moving the line further away from the grave, and restricting the footprint width for 20m around the grave.

SAHRA Rating: 3A

FIG. 8: GRAVE AT LSS02

LSS03

The site consists of a recent cemetery in an open space (fig. 9). The cemetery is near a proposed extraction point and/or bore hole. The pipeline footprint may affect the graves.

Significance: The site is of high significance

Mitigation: The location of the pipeline for the boreholes still needs to be determined. General mitigation applies to the site.

SAHRA Rating: 3A

FIG. 9: CEMETERY AT LSS03

LSS04

The site consists of a recent cemetery in an open space demarcated by large poles (fig. 10). The grave is near a proposed extraction point and/or bore hole. The pipeline footprint may affect the graves.

Significance: The site is of high significance

Mitigation: The graves occur 10m from the pipe centre point and require mitigation in the form of demarcation, moving the line further away from the grave, and restricting the footprint width for 20m around the grave.

SAHRA Rating: 3A

FIG. 10: GRAVE AT LSS04

LSS05

The site consists of a recent cemetery of eight graves in the fenced yard of a house (fig. 11). The cemetery is near the end of the line (by 300m), but will be affected if the line is extended. The current pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The graves occur 10m from the pipe centre point and require mitigation in the form of demarcation, moving the line further away from the grave, and restricting the footprint width for 20m around the grave.

SAHRA Rating: 3A

FIG. 11: CEMETERY AT LSS05

LSS06

The site consists of an area of religious activity, possibly linked to the ZCC that is still in use by the community. There is an outer circle of stones painted white and two central large boulders, of which one has writing on it (fig. 12). The circle is 49m from the pipeline and 12m from the road. The pipeline footprint will not affect the site.

Significance: The site is of high significance

Mitigation: The site occurs 10m from the access road and requires mitigation in the form of demarcation and moving the line further away from the area.

SAHRA Rating: 3A

FIG. 12: RELIGIOUS AREA AT LSS06

LSS07

The site consists of a cemetery with a demarcated boundary (fig. 13). The cemetery is 50m from the road, and the pipeline occurs between the two. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline should be moved closer to the road.

SAHRA Rating: 3A

FIG. 13: CEMETERY AT LSS07

LSS08

The site consists of a cemetery on the outskirts of a village (fig. 14). The pipeline currently occurs 5m to the east of the main cemetery and 5m west of an isolated grave. This suggests that more graves could occur in the pipeline footprint. The current pipeline footprint will affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline will need to be moved further north. There is an access road ~280m north that can be used.

SAHRA Rating: 3A

FIG. 14: CEMETERY AT LSS08

LSS09 (a.k.a. LUS01)

The site consists of a single grave that was recorded by Umlando (2011). The report states" *"LUS01 is located ~370m northeast of the proposed substation on the top of a hill (Fig. 8). The site is probably the same as H44, however since the area has been systematically ploughed, there are no foundations. The only feature is a grave with a headstone. The grave appears to have been made from mud, and then painted white. There is no date or name on the grave.*

The line will not go over the grave; however, the substation may occur within 50m of the grave.

Significance: The grave is of high significance.

Mitigation: the grave should be fenced off if the substation is built nearby. The norm is that any grave within 20m requires to be fenced off; however, since this is a construction area, I would suggest the grave is fenced of regardless of distance."

SAHRA Rating: 3A

Fig. 15 shows the grave without demarcation or fencing during the above construction phase. The pipeline will not affect the grave.

FIG. 15: GRAVE AT LSS09

LSS010

The site consists of the foundations of a settlement. Only one house floor is currently visible (fig. 16). More foundations should occur in the general area, and thus so should human remains. The current pipeline occurs 11m from the one foundation.

Significance: The site is of currently of low significance, unless human remains occur, then it will be of high significance.

Mitigation: The pipeline should be moved towards the road in case human remains are uncovered.

SAHRA Rating: 3C, if no graves.

FIG. 16: HOUSE FOUNDATION AT LSS010

LSS011

The site consists of two modern graves ~20m from the road (fig. 17). The current pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: No mitigation is currently required.

SAHRA Rating: 3A

FIG. 17: GRAVES AT LSS011

LSS012

The site consists of a settlement with two graves below the houses (fig. 18). The graves are ~40m from the pipeline and 70m from the road. The pipeline footprint will not affect the graves. The pipeline footprint may affect the house foundations.

Significance: The graves are of high significance

Mitigation: The graves occur 40m from the pipe centre point and require mitigation in the form of demarcation and restricting the footprint width for 20m around the grave.

SAHRA Rating: 3A

FIG. 18: AT LSS012

LSS013

The site consists of a recently abandoned settlement that may have human graves (fig. 19). If graves do occur at the site, and are subsurface and unmarked, then the current position of the pipeline will directly affect the graves.

Significance: The site is possibly of high significance

Mitigation: The pipeline should be moved closer to the road and uphill of the settlement.

SAHRA Rating: 3C, unless graves are found.

FIG. 19: RECENTLY ABANDONED SETTLEMENT AT LSS013

LSS014

The site consists of the foundations of a settlement that is probably related to site ‘b220’ from the desktop study. Three – four house floors are currently visible (fig. 20). More foundations should occur in the general area, and thus so should human remains. The current pipeline goes through the site.

Significance: The site is of currently of low significance

Mitigation: The pipeline should be moved towards the road in case human remains are uncovered.

SAHRA Rating: 3C, if no graves.

FIG. 20: HOUSE FLOOR REMAINS AT LSS014

LSS015

The site consists of a two grave cemetery (fig. 21). The graves are ~30m from pipeline and 50m from the road. The 20m buffer for the graves will fall into the pipeline buffer.

Significance: The site is of high significance

Mitigation: The graves occur 30m from the pipe centre point and require mitigation in the form of demarcation and moving the line further away from the graves.

SAHRA Rating: 3A

FIG. 21: AT LSS015

LSS016

The site consists of a four graves on the top of the hill (fig. 22). The current pipeline footprint will directly affect these graves.

Significance: The site is of high significance

Mitigation: The graves occur in the footprint and require mitigation in the form of demarcation, moving the line further away from the grave, and restricting the footprint width for 20m around the grave.

SAHRA Rating: 3A

FIG. 22: GAVES AT LSS016

LSS017

The site consists of a single grave ~7m from the road (fig. 23). The grave is in a fenced of area of a yard

Significance: The site is of high significance

Mitigation: The grave occurs within 7m of the road edge. Given the limited available space, the pipeline should not need to be rerouted provided it remains on the opposite side of the road

SAHRA Rating: 3A

FIG. 23: GRAVE AT LSS017

LSS018

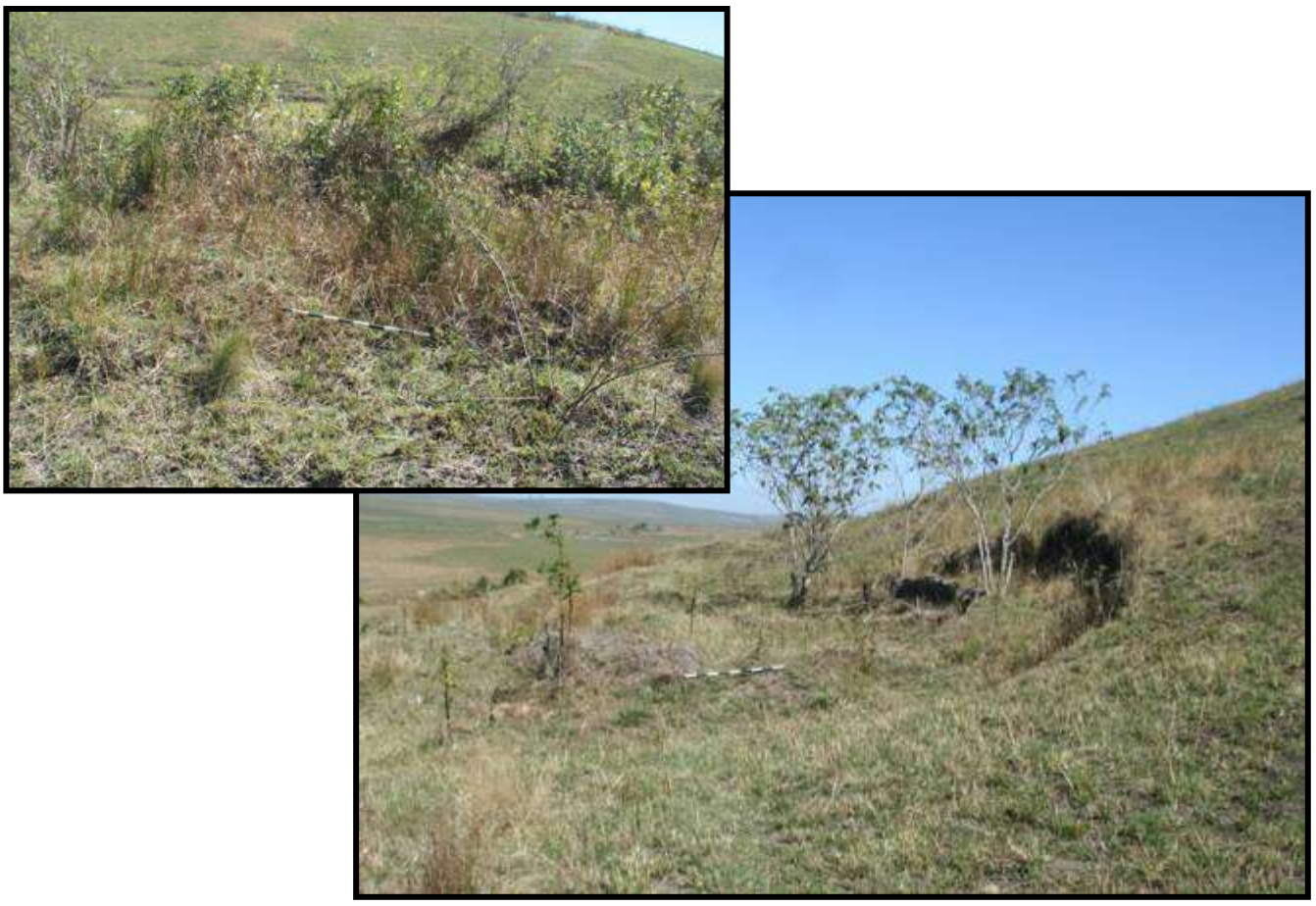
The site is located at the base of a hill just above the flood plains of a river. The site consists of a ~5 house foundations and two graves (fig. 24). This site is probably related to 'b223' from the desktop study. The pipeline footprint might affect the graves.

Significance: The site is of high significance

Mitigation: The graves occur 30m from the pipe centre point and require mitigation in the form of demarcation, moving the line further away from the grave, and restricting the footprint width for 20m around the grave.

SAHRA Rating: 3A

FIG. 24: SETTLEMENT AND GRAVES AT LSS018



LSS019

The site consists of two recent graves ~15m to the south of the road (fig. 25). The site probably relates to 'b231' from the desktop study. The cemetery is 21m from the pipeline and 60m from the road. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The graves occur on the opposite side of the pipeline footprint. Provided the pipeline remains on the northern side of the road, then no mitigation will be required.

SAHRA Rating: 3A

FIG. 25: GRAVES AT LSS019

LSS020

The site consists of a cemetery ~6m – 20m from the road (fig. 26). The current pipeline is 12m from the cemetery. The pipeline footprint might affect the graves.

Significance: The site is of high significance

Mitigation: The graves occur 10m from the pipe centre point and require mitigation in the form of demarcation, moving the line further away from the grave, and restricting the footprint width for 20m around the grave. The pipeline should move to the opposite side of the road.

SAHRA Rating: 3A

FIG. 26: CEMETERY AT LSS020

LSS021

The site consists of a single grave demarcated with a wooden fence (fig. 27). The grave is situated next to an existing pipeline and 10m from the road. The pipeline footprint might affect the graves.

Significance: The site is of high significance

Mitigation: The grave occurs within the current pipeline footprint. The grave requires mitigation in the form of demarcation, moving the line further away from the grave, and restricting the footprint width for 20m around the grave.

SAHRA Rating: 3A

FIG. 27: GRAVE AT LSS021

LSS022

The site consists of two graves, near the house and in a demarcated yard (fig. 28). The grave is situated in the pipeline footprint and will be affected by the construction activity.

Significance: The site is of high significance

Mitigation: The grave occurs within the current pipeline footprint. The grave requires mitigation in the form of demarcation, moving the line further away from the grave, and restricting the footprint width for 20m around the grave.

SAHRA Rating: 3A

FIG. 28: GRAVES AT LSS022

LSS023

The site consists of a single grave in the fenced yard of a house (fig. 29). The grave is ~20m from the road. The current pipeline footprint that occurs on the opposite side of the road will not affect the graves.

Significance: The site is of high significance

Mitigation: No mitigation is currently required provided the pipeline remains on the opposite side of the road.

SAHRA Rating: 3A

FIG. 29: AT LSS023

LSS024

The site consists of a three graves cemetery in the fenced yard of a house (fig. 30). The graves occur in the pipeline footprint and are 7m from the road. The current pipeline footprint will affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline will need to be moved to the opposite, or eastern, side of the road.

SAHRA Rating: 3A

FIG. 30: GRAVES AT LSS024

LSS025

The site consists of a single grave demarcated with wooden poles (fig. 31). The grave is ~30m from the road and 20m from the pipeline. The pipeline footprint might affect the grave.

Significance: The site is of high significance

Mitigation: The graves occur within the current pipeline footprint. Mitigation will be in the form of demarcation, moving the line further away from the grave, and restricting the footprint width for 20m around the grave.

SAHRA Rating: 3A

FIG. 31: GRAVE AT LSS025

LSS026

The site consists of a three recent graves in the fenced yard of a house (fig. 32). The cemetery is 40m from the road and falls within the pipeline footprint... The pipeline footprint might affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline should move closer to the road. The graves require mitigation in the form of demarcation, moving the line further away from the grave, and restricting the footprint width for 20m around the grave.

SAHRA Rating: 3A

FIG. 32: GRAVES AT LSS026

LSS027

The site consists of three graves in the fenced yard of a house (fig. 33). The graves occur within the current pipeline footprint and 8m from the road. The pipeline footprint will affect the graves.

Significance: The site is of high significance

Mitigation: The graves occur 8m from the pipe centre point and require mitigation in the form of demarcation, moving the line further away from the grave, and restricting the footprint width for 20m around the grave. The pipeline should be placed on the opposite side of the road.

SAHRA Rating: 3A

FIG. 33: GRAVES AT LSS027

LSS028

The site consists of a recently abandoned settlement (fig. 34). No graves were observed at the settlement; however, the grass was dense resulting in poor visibility. If this site follows the pattern of sites similar in age, then graves would occur in front of the tree. The tree is 20m from road, with pipeline located between the two. The pipeline footprint will affect the site.

Significance: The site is of high significance

Mitigation: The pipeline must be moved as close to the road as uphill, and thus uphill form the settlement.

SAHRA Rating: 3C, if no graves occur.

FIG. 34: SETTLEMENT AT LSS028

LSS029

The site consists of a single recent grave (fig. 35). The grave is made out of a brick wall and a headstone. The high water mark for the Zalu Dam occurs ~65m below the grave. The dam wall occurs ~1km to the southeast. The Zalu Dam will not affect the graves if the high water mark does not come closer than 25m.

Significance: The site is of high significance

Mitigation: No mitigation is required

SAHRA Rating: 3A

FIG. 35: GRAVE 2AT LSS029

LSS030

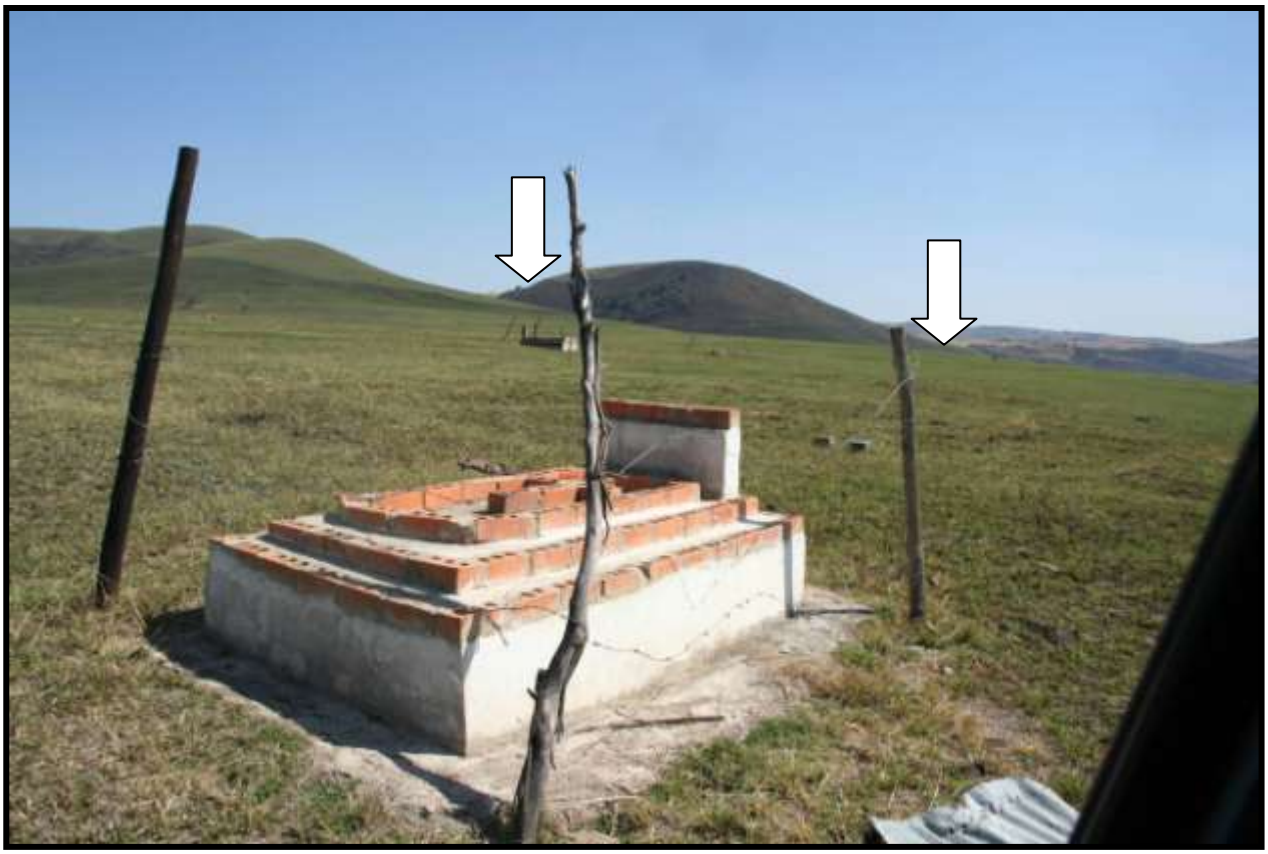
The site consists of a three recent graves each that has wooden poles around them (fig. 36). The high water mark for the Zalu Dam occurs ~35m below the grave. The dam wall occurs ~800m to the southeast. The Zalu Dam will not affect the graves if the high water mark does not come closer than 25m.

Significance: The site is of high significance

Mitigation: The graves occur 10m from the pipe centre point and require mitigation in the form of demarcation, moving the line further away from the grave, and restricting the footprint width for 20m around the grave.

SAHRA Rating: 3A

FIG. 36: GRAVES AT LSS030



LSS031

The site consists of a sunken stone cairn that may be a grave (fig. 37). There are remnants of house foundations; however, the field has been ploughed. The cairn is 110m from the Zalu Dam high water mark. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: No mitigation is required.

SAHRA Rating: 3A if a grave

FIG. 37: STONE CAIRN AT LSS031

LSS032

The site consists of a sunken stone cairn that may be a grave (fig. 38). There are remnants of house foundations; however, the field has been ploughed. The cairn is 110m from the Zalu Dam high water mark. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: No mitigation is required.

SAHRA Rating: 3A if a grave

FIG. 38: POSSIBLE GRAVE AT LSS032

LSS033

The site consists of a church that post-dates 1980 (fig. 39, and see fig. 4). The church is located in the area designated for Borrow Pit 1.

Significance: The building is of low significance; however, it is attached to a place of spiritual activity and thus may be of high local significance.

Mitigation: The buildings are not directly protected by the NHRA, as they are not older than 60 years. Community consultation would be required if the building was to be damaged. I suggest that Borrow Pit 1 excludes this area.

SAHRA Rating: 3C

FIG. 39: CHURCH AT LSS039

LSS034

The site consists of a large cemetery near the church at LS033 and the village of Pamalitoli. Borrow Pit 1 has included the cemetery in the study area.

Significance: The site is of high significance

Mitigation: The borrow pit will need to move its location or pay for the exhumation of the human remains if community consent was given. I suggest the former option is more viable.

SAHRA Rating: 3A

FIG. 40: CEMETERY AT LSS034

LSS035

The site consists of four graves 2m to the east of the road (fig. 41). The pipeline and footprint occurs on the graves. The pipeline footprint will affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to be moved to the opposite side of the road. The graves need to be demarcated before construction begins.

SAHRA Rating: 3A

FIG. 41: GRAVES AT LSS035

LSS036

The site consists of two recent graves in the fenced yard of a house (fig. 42). The graves are 5m from the road in the pipeline footprint. The pipeline footprint will affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to move to the opposite side of the road.

SAHRA Rating: 3A

FIG. 42: GRAVES AT LSS036

LSS037

The site consists of two recent graves in the fenced yard of a house (fig. 43). The graves are 5m from the road in the pipeline footprint. The pipeline footprint will affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to move to the opposite side of the road.

SAHRA Rating: 3A

FIG. 43: GRAVES AT LSS037

LSS038

The site consists of a single grave in the fenced yard of a house (fig. 44). The grave is 5m from the road and in the pipeline footprint; however the pipeline is on the opposite side of the road. The pipeline footprint might affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 44: GRAVE AT LSS038

LSS039

The site consists of a single grave in the fenced yard of a house (fig. 45). The grave is 15m from the road and in the pipeline footprint. The pipeline footprint might affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 45: GRAVE AT LSS039

LSS040

The site consists of a recent cemetery on the outer fencing of a school (fig. 46). The cemetery is unfenced and ~45m from the road. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The graves should be demarcated before construction occurs.

SAHRA Rating: 3A

FIG. 46: CEMETERY AT LSS040

LSS041

The site consists of a single grave in the fenced yard of a house (fig. 47). The cemetery is 15m from the road and 10m from an existing pipeline... The pipeline footprint will not directly affect the graves. It appears as if the pipeline will extend to the west from this point.

Significance: The site is of high significance

Mitigation: The pipeline should keep the 20m buffer, however this is unlikely as it links into the existing system. The pipeline should remain in the area between the two dirt roads, and thus would not affect the grave.

SAHRA Rating: 3A

FIG. 47: GRAVE AT LSS041

LSS042

The site consists of a two graves in the fenced yard of a house (fig. 48). The graves are ~13m from the road. The graves will occur in the pipeline footprint.

Significance: The site is of high significance

Mitigation: The pipeline needs to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 48: GRAVES AT LSS042

LSS043

The site consists of a single recent grave in the fenced yard of a house (fig. 49). The grave is ~21m from the road. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 49 GRAVE AT LSS043

LSS044

The site consists of three graves next to the road (fig. 50). The graves are not demarcated and ~1m - 5m from the road. The pipeline will not affect the graves if it remains on the opposite side of the road...

Significance: The site is of high significance

Mitigation: The pipeline needs to remain on the opposite side of the road. The graves need to be demarcated before construction beings.

SAHRA Rating: 3A

FIG. 50: GRAVES AT LSS044

LSS045

The site consists of two recent graves in the fenced yard of a house (fig. 51). The graves are ~3m – 5m from the road. The pipeline footprint will not affect the graves as it occurs on the opposite side of the road...

Significance: The site is of high significance

Mitigation: The pipeline needs to remain on the opposite side of the road. SAHRA Rating: 3A

FIG.51: GRAVES AT LSS045

LSS046

The site consists of four recent graves in the fenced yard of a house (fig. 52). The graves are ~20m from the road. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: No mitigation is required provided that the pipeline does not occur within the yard.

SAHRA Rating: 3A

FIG. 52: GRAVES AT LSS046

LSS047

The site consists of a single recent grave in the fenced yard of a house (fig. 53). The grave is 22m from the road. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 53: GRAVE AT LSS047

LSS048

The site consists of a single recent grave in the fenced yard of a house (fig. 54). The grave is ~10m from the road. The current pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 54: GRAVE AT LSS048

LSS049

The site consists of a single recent grave in the fenced yard of a house (fig. 55). The grave is ~10m from the road. The current pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 55: GRAVES AT LSS049

LSS050

The site consists of a recent grave in the fenced yard of a house (fig. 56). The grave is ~7m from the road. The current pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 56: GRAVE AT LSS050

LSS051

The site consists of two recent graves in the fenced yard of a house (fig. 57). The cemetery is 2m from the road. The pipeline footprint might affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 57: GRAVES AT LSS051

LSS052

The site consists of two recent graves in the fenced yard of a house (fig. 58). The cemetery is ~8m from the road. The pipeline footprint might affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 58: GRAVES AT LSS052

LSS053

The site consists of a single recent grave in the fenced yard of a house (fig. 59). The grave is 8m from the road. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 59: GRAVE AT LSS053

LSS054

The site consists of a single recent grave in the fenced yard of a house (fig. 60). The cemetery is 9m from the road. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 60: GRAVE AT LSS054

LSS055

The site consists of a single recent grave in the fenced yard of a house (fig. 61). The cemetery is 7m from the road. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 61: GRAVE AT LSS055

LSS056

The site consists of a single grave that has been fenced off (fig. 62). The cemetery is 21m from the pipeline and 60m from the road. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: No mitigation is required

SAHRA Rating: 3A

FIG. 62: GRAVE AT LSS056

LSS057

The site consists of a recent cemetery in the fenced yard of a house (fig. 63). The cemetery is 20m from the R68. The pipeline footprint might affect the graves.

Significance: The site is of high significance

Mitigation: The graves require mitigation in the form of demarcation, moving the line further away from the grave, and restricting the footprint width for 20m around the grave.

SAHRA Rating: 3A

FIG. 63: CEMETERY AT LSS057

LSS058

The site consists of two recent graves in the fenced yard of a house (fig. 64). The cemetery is ~3m from the road. The pipeline footprint might affect the graves.

Significance: The site is of high significance

Mitigation: The graves occur 10m from the pipe centre point and require mitigation in the form of demarcation, moving the line further away from the grave, and restricting the footprint width for 20m around the grave. The pipeline should move to the opposite side of the road.

SAHRA Rating: 3A

FIG. 64: GRAVES AT LSS058

LSS059

The site consists of a single recent grave in the fenced yard of a house (fig. 65). The cemetery is 21m from the road. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: No mitigation is required provided that the pipeline footprint remains 20m from the grave. The pipeline should remain on the opposite side of the road. SAHRA Rating: 3A

FIG. 65: GRAVE AT LSS059

LSS060

The site consists of two recent graves in the fenced yard of a house (fig. 66). The cemetery is 21m from the pipeline and 60m from the road. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline should be placed on the opposite side of the road.

SAHRA Rating: 3A

FIG. 66: GRAVES AT LSS060

LSS061

The site is located in the proposed Borrow Pit 2. .The site consists of an area of terracing with scattered artefacts. These artefacts include Middle Stone Age flakes, a lower grinding stone and pottery sherds (fig. 67). The artefacts are all in a secondary context. The terracing is for houses, and thus human graves may occur in the borrow pit

Significance: The site is of high significance

Mitigation: No mitigation is required but the Borrow Pit 2 should be noted as being sensitive for human remains.

SAHRA Rating: 3A

FIG. 67: ARTEFACTS AT LSS061[1]

[1] GPS is 12cm in length

LSS062

The site consists of a single recent grave in the fenced yard of a house (fig. 68). The grave is in the pipeline footprint and 130m from the road. The pipeline footprint will affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to move closer to the road.

SAHRA Rating: 3A

FIG. 68: GRAVE AT LSS062

LSS063

The site consists of three recent graves in the fenced yard of a house (fig. 69). The graves are in the pipeline footprint and 140m from the road. The pipeline footprint might affect the graves. 60m to the southeast is a fenced off area that may be older graves.

Significance: The site is of high significance

Mitigation: The pipeline needs to move closer to the road.

SAHRA Rating: 3A

FIG. 69: GRAVES AT LSS063

LSS064

The site consists of a recent cemetery on the side of the road (fig. 70). The cemetery is 6m from the road while the pipeline is ~20m from the cemetery, on the opposite side of the road. The pipeline footprint should not affect the graves.

Significance: The site is of high significance

Mitigation: The cemetery should be demarcated before construction begins and the pipeline must be placed on the opposite side of the road.

SAHRA Rating: 3A

FIG. 70: CEMETERY AT LSS064

LSS065

The site consists of several buildings and an entry wall (fig. 75). The walls for the gate are 16m from the road. The buildings occur on the 1982, but not 1954, topographical maps: they are thus not older than 60 years. The buildings are part of a general store.

Significance: The site is of low significance

Mitigation: While the buildings are not protected, the pipeline should not affect the walls.

SAHRA Rating: 3C

FIG.71: BUILDING AT LSS065

LSS066

The site consists of three recent graves in the fenced yard of a house (fig. 72). The graves are ~10m from the road. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline should remain on the opposite side of the road. SAHRA Rating: 3A

FIG. 72: GRAVES AT LSS066

LSS067

The site consists of a single recent grave in the fenced yard of a house (fig. 73). The grave is ~17m from the road. The current pipeline footprint will affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline should be moved to the opposite side of the road. SAHRA Rating: 3A

FIG. 73: AT LSS067

LSS068

The site consists of three recent graves in the fenced yard of a house (fig. 74). The graves are 10m from the road. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 74: GRAVES AT LSS068

LSS069

The site consists of a single recent grave in the fenced yard of a house (fig. 75). The grave is ~20m from the road. The pipeline footprint will not affect the grave.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 75: GRAVE AT LSS069

LSS070

The site consists of a single recent grave in the fenced yard of a house (fig. 76). The grave is ~20m from the road. The pipeline footprint will not affect the grave.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road.

SAHRA Rating: 3A

FIG. 76: GRAVE AT LSS070

LSS071

The site consists of a single recent grave in the fenced yard of a house (fig. 76). The grave is ~20m from the road. The current pipeline footprint will affect the grave.

Significance: The site is of high significance

Mitigation: The pipeline will need to be moved to the opposite side of the road.

SAHRA Rating: 3A

FIG. 77: GRAVE AT LSS071

LSS072

The site consists of two recent graves in the fenced yard of a house (fig. 78). The graves are 10m from the road. The pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road, or between the existing fence and road.

SAHRA Rating: 3A

FIG. 78: GRAVES AT LSS072

LSS073

The site consists of a single recent grave in the fenced yard of a house (fig. 76). The grave is ~20m from the road. The current pipeline footprint will affect the grave.

Significance: The site is of high significance

Mitigation: The pipeline will need to be moved to the opposite side of the road.

SAHRA Rating: 3A

FIG. 79: GRAVE AT LSS073

LSS074

The site consists of two recent graves in the fenced yard of a house (fig. 78). The graves are 10m from the road. The current pipeline footprint will affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road, or between the existing fence and road.

SAHRA Rating: 3A

FIG. 80: GRAVES AT LSS074

LSS075

The site consists of a recent grave in the fenced yard of a house (fig. 81). The graves are 10m from the road. The pipeline footprint will not affect the grave.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road, or between the existing fence and road.

SAHRA Rating: 3A

FIG. 81: GRAVE AT LSS075

LSS076

The site consists of a recent grave in the fenced yard of a house (fig. 82). The graves are 10m from the road. The pipeline footprint will not affect the grave.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road, or between the existing fence and road.

SAHRA Rating: 3A

FIG.82: GRAVE AT LSS076

LSS077

The site consists of two recent graves in the fenced yard of a house (fig. 83). The graves are 10m from the road. The current pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road, or between the existing fence and road.

SAHRA Rating: 3A

FIG. 83: GRAVES AT LSS077

LSS078

The site consists of two recent graves in the fenced yard of a house (fig. 84). The graves are ~3m from the road. The current pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road, or between the existing fence and road.

SAHRA Rating: 3A

FIG. 84: GRAVES AT LSS078

LSS079

The site consists of two recent graves in the fenced yard of a house (fig. 85). The graves are ~20 from the road. The current pipeline footprint will not affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road, or between the existing fence and road.

SAHRA Rating: 3A

FIG. 85: GRAVES AT LSS079

LSS080

The site consists of two recent graves in the fenced yard of a house (fig. 86). The graves are ~6 from the road. The current pipeline footprint might affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road, or between the existing fence and road.

SAHRA Rating: 3A

FIG. 86: GRAVES AT LSS080

LSS081

The site consists of a recent grave in the fenced yard of a house (fig. 87). The graves are 10m from the road. The pipeline footprint will not affect the grave.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road, or between the existing fence and road.

SAHRA Rating: 3A

FIG. 87: GRAVE AT LSS081

LSS082

The site consists of a recent grave in the fenced yard of a house (fig. 88). The graves are ~5m from the road. The pipeline footprint might affect the grave.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road, or between the existing fence and road.

SAHRA Rating: 3A

FIG. 88: GRAVE AT LSS082

LSS083

The site consists of a recent grave in the fenced yard of a house (fig. 89). The graves are ~10m from the road. The pipeline footprint might affect the grave.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road, or between the existing fence and road.

SAHRA Rating: 3A

FIG. 89: GRAVE AT LSS083

LSS084

The site consists of a recent grave in the fenced yard of a house (fig. 90). The graves are ~3m from the road. The pipeline footprint might affect the grave.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road, or between the existing fence and road.

SAHRA Rating: 3A

FIG. 90: GRAVE AT LSS084

LSS085

The site consists of two recent graves in the fenced yard of a house (fig. 91). The graves are ~5 from the road. The current pipeline footprint might affect the graves.

Significance: The site is of high significance

Mitigation: The pipeline will need to remain on the opposite side of the road, or between the existing fence and road.

SAHRA Rating: 3A

FIG. 91: GRAVES AT LSS085

LSS086

The site consists of a General Dealer building dating to 1924 (fig. 92). The pipeline footprint will not affect the building.

Significance: To be assessed if affected.

Mitigation: The pipeline should remain on the opposite side of the road to avoid potential historical middens related to the original building.

SAHRA Rating: N/A

FIG. 92: GENERAL DEALER AT LSS086

LSS087

The site consists of Early Stone Age and Historical Period artefacts (fig. 93). The artefacts were observed on the top of a hill in an agricultural field. They include a hand-axe, cleaver, general core, and a mortar.

Significance: The site is of low significance as the artefacts are in a secondary context.

Mitigation: No mitigation is required.

SAHRA Rating: 3A

FIG. 93: ARTEFACTS AT LSS087

MANAGEMENT PLAN

The normal practice for all human burials is that each cemetery, or grave, is protected if it falls within 50m – 100m of a development. All grave(s) and/or cemeteries are required to be clearly demarcated prior to the commencement of construction. There should be a 5m buffer between the edge of the grave/cemetery and the fence. The fence needs to be clearly demarcated as well. In most circumstances, a 20m buffer is required between the edge of the grave, and the edge of the footprint. However, in many instances the pipeline is restricted by space in the villages. In these instances, the pipeline can be moved to the opposite side of the road. Those graves that are already in demarcated, and fenced off, yards would not require further mitigation. In the case of human graves outside of the villages, the 20m buffer rule should apply.

The historical sites noted from the desktop study may yield human remains. The nature of the older human graves in this area is that they are subsurface, and unmarked. That is, it will not be possible to note their exact locations, and only those areas where they might occur. Each settlement noted in Table 2 should have a 50m sensitivity radius placed around it, for potential human remains.

Several steps need to be followed if graves are uncovered during the course of the project. If human graves are uncovered during the course of earthmoving activity, then both the police and ECPHRA need to be contacted immediately. All construction activity in the area needs to stop.

In terms of the National Heritage Resources Act (No. 25 of 1999), all graves not in a municipal graveyard are protected. Only a registered undertaker should handle human remains younger than 60 years or an institution declared under the Human Tissues Act. Anyone who wishes to develop an area where there are graves older than 60 years is required to follow the process described in the

legislation (section 36 and associated regulations). The specialist will require a permit from the heritage resources authority:

- Determine/ confirm the presence of the graves on the property. Normally the quickest way to proceed is to obtain the service of a professional archaeologist accredited to undertake burial relocations. The archaeologist will provide an estimate of the age of the graves. There may be a need for archival research and possibly test excavations (permit required).
- The preferred decision is to move the development so that the graves may remain undisturbed. If this is done, the developer must satisfy SAHRA/KZN Heritage that adequate arrangements have been made to protect the graves on site from the impact of the development. This usually involves fencing the grave (yard) and setting up a small site management plan indicating who will be responsible for maintaining the graves and how this is legally tied into the development. It is recommended that a distance of 10-20 m is left undisturbed between the grave and the fence around the graves.
- If the developer wishes to relocate or disturb the graves:
  - A 60-day public participation (social consultation) process as required by section 36 (and regulations - see attachment), must be undertaken to identify any direct descendants of those buried on the property. This allows for a period of consultation with any family members or community to ascertain what their wishes are for the burials. It involves notices to the public on site and through representative media. The archaeologist, who can explain the process, may do this but for large or sensitive sites, a social consultant should be employed. Archaeologists often work with undertakers, who rebury the human remains.
  - If as a result of the public participation, the family (where descendants are identified) or the community agree to the relocation process then the graves may be relocated.

- The archaeologist must submit a permit application to SAHRA/KZN Heritage for the disinterment of the burials. This must include written approval of the descendants or, if there has not been success in identifying direct descendants, written documentation of the social consultation process, which must indicate to SAHRA's satisfaction, the efforts that have been made to locate them. It must also include details of the exhumation process and the place to which the burials are to be relocated. (There are regulations regarding creating new cemeteries and so this usually means that relocation must be to an established communal rural or formal municipal cemetery.)
- Permission must be obtained before exhumation takes place from the landowner where the graves are located, and from the owners/managers of the graveyard to which the remains will be relocated.
- Other relevant legislation must be complied with, including the Human Tissues Act (National Department of Health) and any ordinances of the Provincial Department of Health). The archaeologist can usually advise about this.

The archaeological artefacts affected by the development do not require permits. They are isolated instances of artefacts, and do not constitute a site *per se*.

CONCLUSION

A heritage survey was undertaken for the Lusikisiki Regional Water Supply Scheme. The LRWSS covers a large area and includes a new dam, new pipelines; two borrow pits, and possible upgrades to existing pipelines. New boreholes and extraction points may be added at a later stage.

The heritage survey recorded 87 heritage sites that may be affected by the project. Most of the sites are human graves dating to the last 50 years. Many of these graves occur within existing fenced yards and thus should not be affected by any servitudes and footprints. In most occurrences the pipeline can be moved to the opposite side of the road.

The archaeological sites that were noted are of low significance and do not require further mitigation. They tend to be scatters of artefacts, as opposed to proper sites, and thus should not require a permit.