

MEMORANDUM
PROPOSED TOWNSHIP ESTABLISHMENTS:
AMALIA EXTENSION 5
ON
A PORTION OF THE REMAINING EXTENT OF PORTION
2 AND A PORTION OF THE REMAINING EXTENT OF
PORTION 6 OF THE FARM NIEUWJAARSFONTEIN NO.
73-HO
AND
AMALIA EXTENSION 6
ON
A PORTION OF THE REMAINING EXTENT OF PORTION
6 OF THE FARM NIEUWJAARSFONTEIN NO. 73-HO

CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

Informal settlements remain eyesores across major cities in South Africa. They consist of non-conventional housing built without complying with legal building procedures. These settlements are usually built at the edge of the cities where land is cheap and neglected. However, these informal settlements are often better located than the housing developments to which the government seeks to relocate them. The urban poor usually use salvaged materials like wood, tins, corrugated iron and others to build these settlements. Broadly, these crude dwellings mostly lack proper indoor infrastructure, such as water supply, sanitation, drainage, waste disposal and proper road access. Urban households regularly live in these awful conditions which increase the spread of contagious diseases. The result of the rapid urban growth and lack of supplemented investments in services, mainly in the indigents' areas has given rise to an increase in the number of households living in informal settlements without suitable infrastructure.

There is also a bond between poor housing and environmental conditions in informal settlements which also reflect poverty. Linking basic services such as water to health is viewed as a false separation as these services are 'intimately related to housing'. It becomes a housing issue if children playing outside the house contract diarrhoea via

ingesting pathogens from fecal matter which contaminates the land on which they play. Otherwise, it is the house which provides for shelter against injury, weather and disease. Improving the surroundings of the house is to limit severe health risks existing within poor quality housing.

The awful state of informal settlements in South African is often multiplied by constraints of land costs suitable for housing the urban poor and low-income groups. Indeed, the lack of land and housing causes many urban poor including migrants to build their own houses in informal settlements, just to solve the housing problems by themselves.

Informal settlements are described as illegal and spontaneous shantytowns lacking decent services and infrastructure. These settlements are characterized by illegality and informality, environmental hazards, poverty and vulnerability, social stress and others. Informal settlements provide housing for the urban poor in South African cities and towns.

One of the South African Government's greatest challenges stems from the fact that informal settlements continue to grow faster than the rate of low-income housing delivery. The need therefore, for in-situ informal settlement upgrade is paramount. National Development Outcome 8 mandates an ambitious target of improving the quality of life of 400 000 households by 2014 by upgrading informal settlements in well-located areas. The National Upgrading Support Programme (NUSP) was created by the National Department of Human Settlements (NDHS) to provide assistance to provinces and municipalities in their efforts to upgrade informal settlements. The HDA is an important partner in providing technical support or upgrading under the coordination of the NUSP.

The Upgrading Informal Settlements Programme (UISP) and urban Settlements Development Grant (USDG) administered by the NDHS, are the primary policy and grant instruments used to meet national targets. Municipalities are required to act as developers for the UISP and the NUSP provides support, in partnership with the province and the NDHS, to help them to do so effectively.

In terms of section 9(1) of the National Housing Act (107 of 1997), every municipality must, as part of the municipality's process of integrated development planning (IDP) take all reasonable and necessary steps to ensure that the inhabitants within its area of jurisdiction have access to adequate housing on a progressive basis by setting housing delivery goals, identifying suitable land for housing development and planning, facilitating, initiating and co-coordinating housing development in its area of jurisdiction.

Housing comprises a series of complex interrelationships between people, their needs and values and resources within a political and legal environment. This complexity requires a focused approach to efforts aimed at providing housing. National Government has started to respond by putting the necessary policy and legislative environment in place.

This framework outlines the roles and responsibilities of different spheres of government in relation to housing, as well as dealing with aspects relating to the design and content of housing policy and legislation. In the context of this framework the Mamusa Local Municipality is required to take all reasonable steps to ensure the provision of adequate housing to its residents.

In terms of the Housing Sector Plan of the Mamusa Local Municipality (2013), the housing demand in the Mamusa Local Municipality area was estimated as follows:

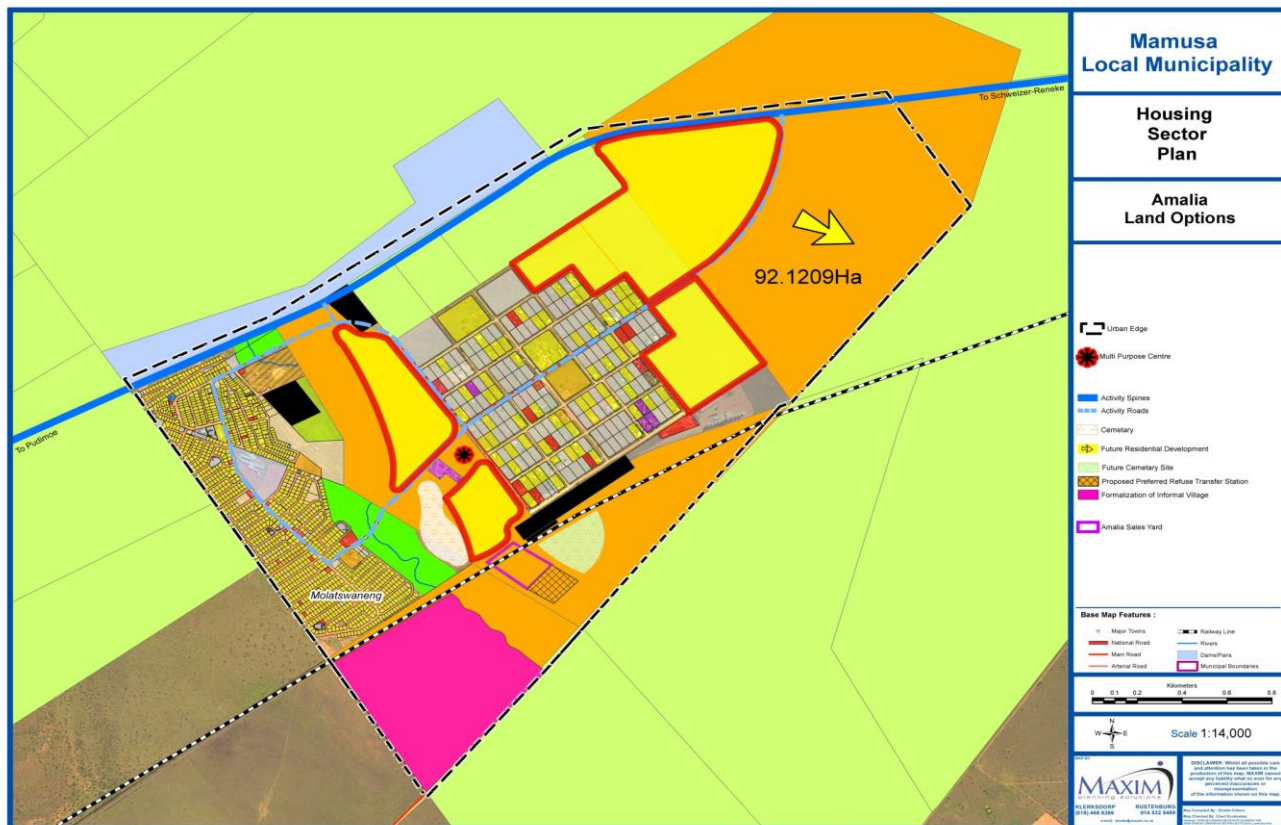
	Schweizer / Ipelegeng		Amalia / Molatswaneng		Glaudina		Migdol		Total
Needs based on land use survey and outstanding projects									
Informal Structures on stands	1844		56		192		0		2092
Informal Structures in backyards & landless	1107		800		256		358		2521
Vacant Stands	435		135		113		0		683
Land needed for landless and backyard dwellings	92.25 ha		66.66 ha		21.33 ha		29.83 ha		210.07 ha
Additional Households, Planned projects and land needs									
Expected additional households 2013 – 2017	438		58		32		36		564
Expected land needs based on 5 year growth	36.5 ha		4.8 ha		2.7 ha		3 ha		47 ha
Expected Housing Categories									
• Fully subsidized (low cost rental)	62.10%	2105	49.00%	448	68.90%	331	72.80%	287	3171
• Institutional / GAP Housing	24.90%	844	26.30%	240	25.20%	121	23.10%	91	1296
• Bonded housing	13.00%	441	24.70%	226	5.90%	28	4.10%	16	711

The Housing Sector Plan similarly investigated the locality of the then existing informal housing structures and same is reflected on the following map.

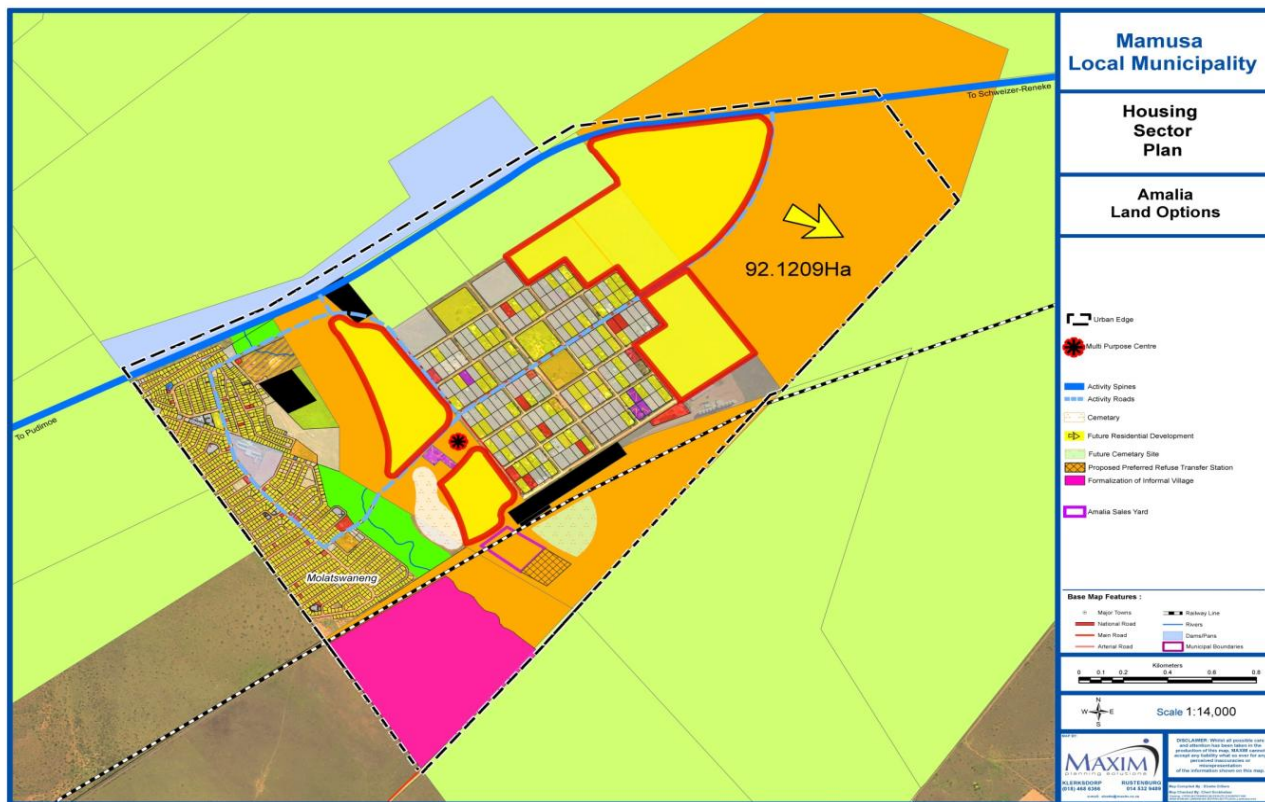


Map 1: Locality of existing informal housing structures

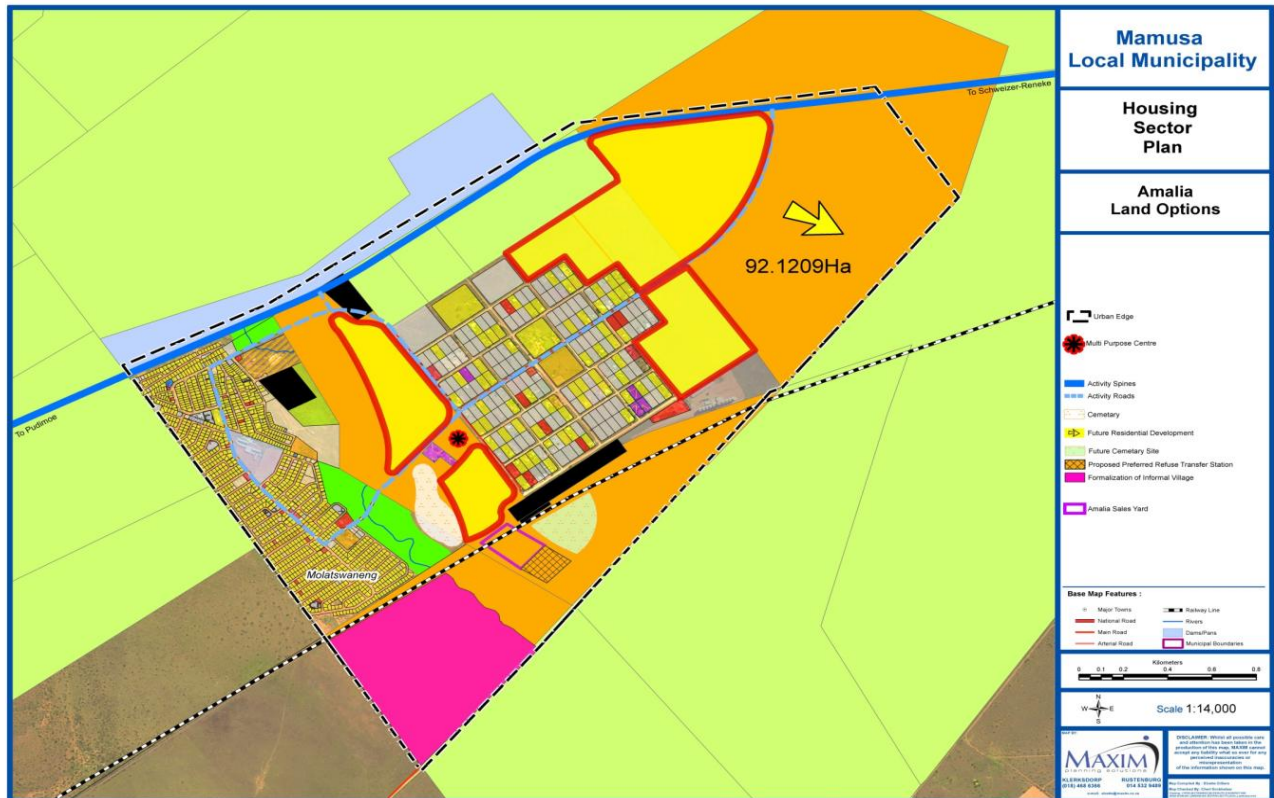
The Mamusa Local Municipality Housing Sector Plan identified four different development options for future residential development purposes:



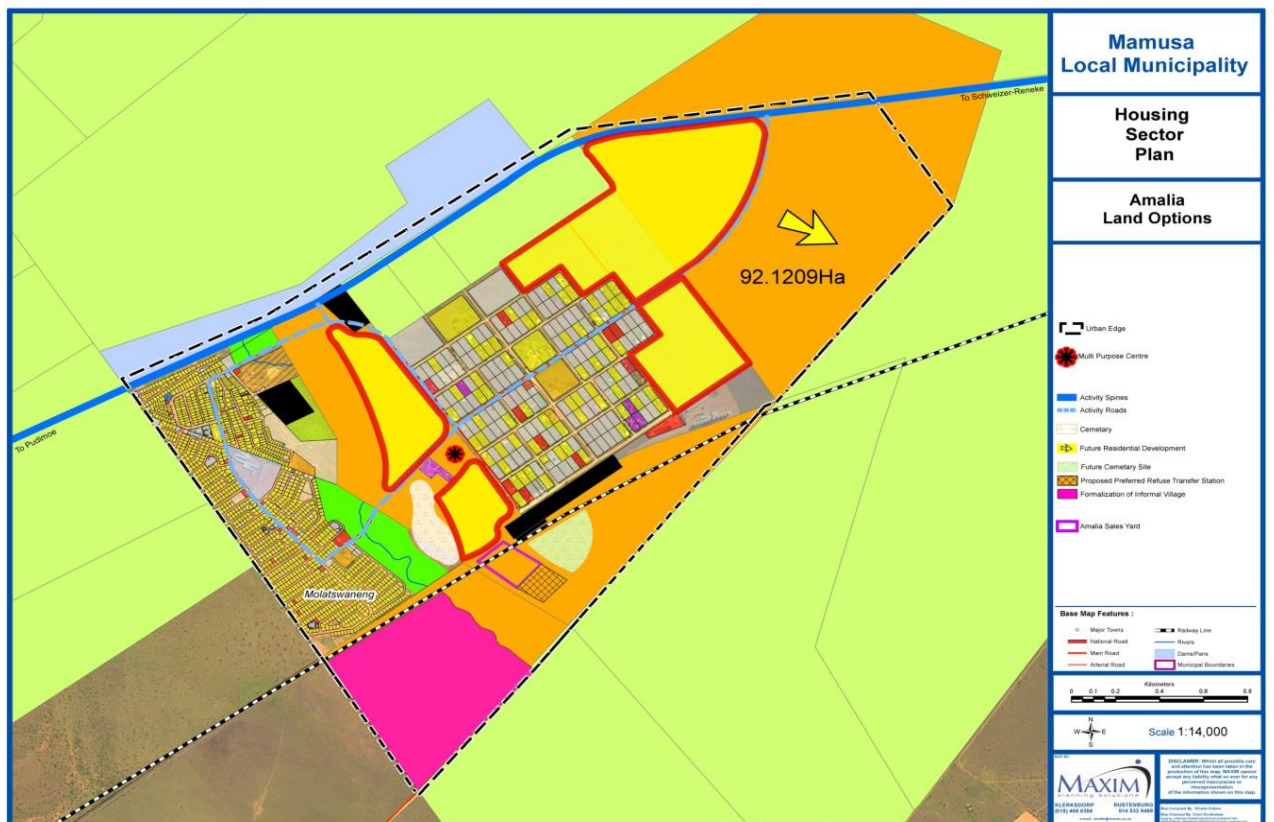
Map 2: Land Options – Amalia (Option 1)



Map 3: Land Options – Amalia (Option 2)



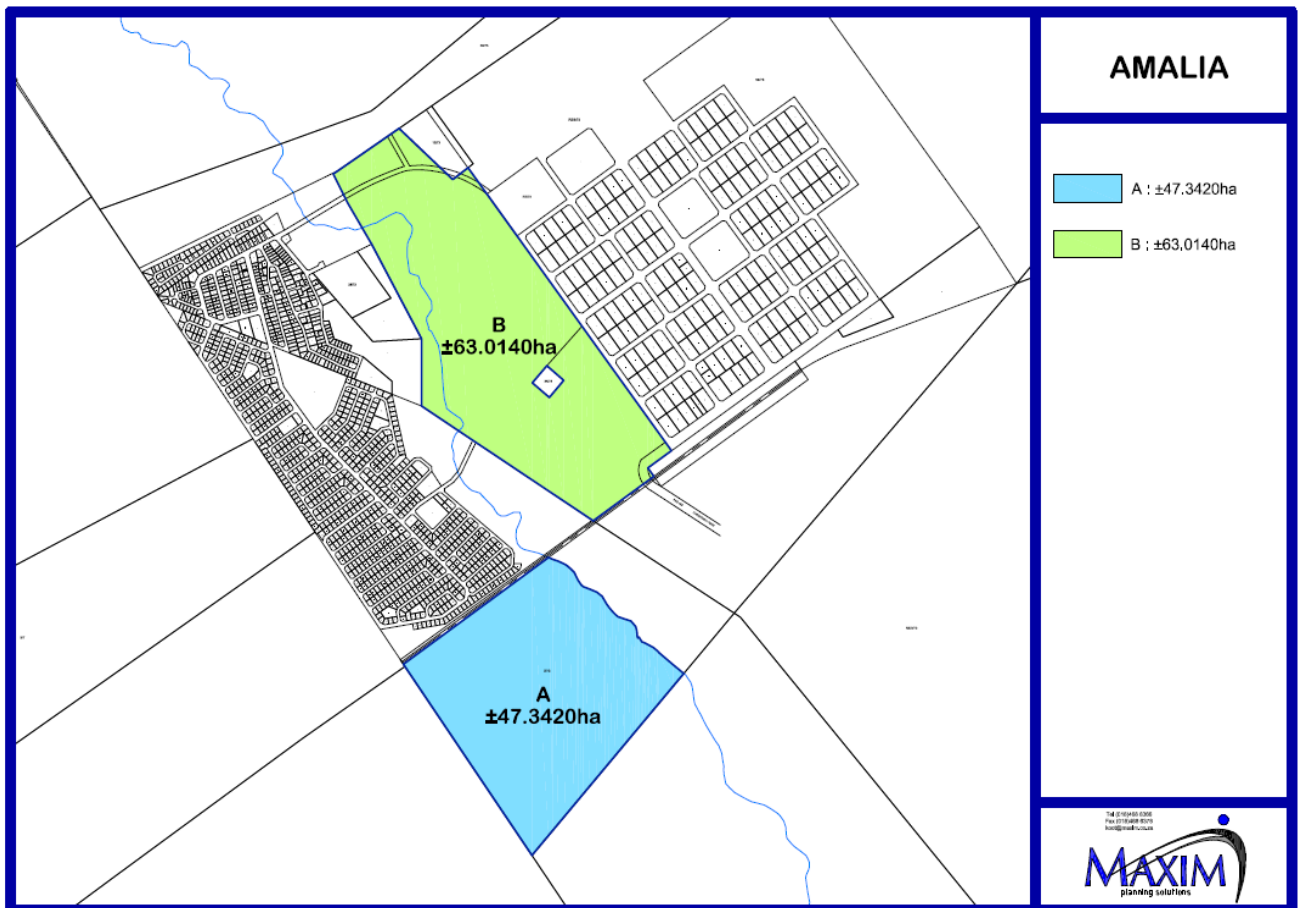
Map 4: Land Options – Amalia (Option 3)



Map 5: Land Options – Amalia (Option 4)

It is against the fore-mentioned background that the Dr. Ruth Segomotsi Mompoti District Municipality during the latter part of 2013 invited suitably qualified professional service providers to submit bids for the planning of 1000 erven in Amalia. This project was subsequently awarded to Maxim Planning Solutions (Pty) Ltd on 12 November 2013 and the project commenced with a project inception meeting that was held on 09 December 2013.

The initial appointment received from the Dr. Ruth Segomotsi Mompoti District Municipality focussed on the Remaining Extent of Portion 2 of the farm Nieuwjaarsfontein No. 73-HO (indicated as Area A on the following map). Due to the limited size of this property, which directly impacts on the development potential thereof, the commission of Maxim Planning Solutions (Pty) Ltd was extended to also include a portion of the Remaining Extent of Portion 6 of the farm Nieuwjaarsfontein No. 73-HO located between the urban areas of Amalia and Molatswaneng (indicated as Area B on the following map).



Map 6: Land development areas

In preparation of the township establishment application and as integral part of the township establishment process, Maxim Planning Solutions (Pty) Ltd commissioned the following pre-planning studies:

- Aerial survey of the development area conducted by Azur Aerial Works CC;
- Contour mapping and mapping of all physical structures and infrastructure conducted by Azur Aerial Works CC;
- 1:100 year floodline determination conducted by Moedi Consulting Engineers (Pty) Ltd;
- Phase 1 Geotechnical Investigation conducted by Geoset CC;
- Phase 1 Heritage Impact Assessment conducted by A Pelsers Archaeological Consulting CC;
- Engineering Services Investigation conducted by Moedi Consulting Engineers (Pty) Ltd; and
- Environmental Impact Assessment conducted by AB Enviro-Consult

The results of the studies referred to above will be addressed in the respective sections of this Memorandum.

Maxim Planning Solutions (Pty) Ltd subsequently attended to the compilation of an integrated layout plan for the entire development area and same was presented to the Project Steering Committee on 03 June 2014 at which time the layout plan of the proposed township area was approved.

This chapter will provide a concise background to the project as well as a project outline.

1.2 APPLICATION

Maxim Planning Solutions (Pty) Ltd is hereby applying on behalf of the Mamusa Local Municipality for the establishment of the following proposed townships:

- Amalia Extension 5 on a portion of the Remaining Extent of Portion 2 and a portion of the Remaining Extent of Portion 6 of the farm Nieuwjaarsfontein No. 73-HO; and
- Amalia Extension 6 on a portion of the Remaining Extent of Portion 6 of the farm Nieuwjaarsfontein No 73-HO

in terms of the provisions of Chapter IV of the Town Planning and Townships Ordinance, 1986 (Ordinance 15 of 1986).

1.3 PUBLIC PARTICIPATION

The application in respect of the establishment of the proposed townships Amalia Extensions 5 and 6 will be advertised in accordance with the provisions of Section 108(1)(a) of the Town Planning and Townships Ordinance, 1986 (Ordinance 15 of 1986) in the Stellalander on 02 and 09 July 2014 as well as in the North West Provincial Gazette on 01 and 08 July 2014. Objectors will be afforded a period of 28 days from 02 July 2014 to submit objections or comments in respect of the proposed township areas to the Municipal Manager of the Mamusa Local Municipality.

The application will also, in accordance with the prescriptions of Section 108(1)(b) of the Town Planning and Townships Ordinance, 1986 (Ordinance 15 of 1986) be referred to the following external organizations / departments for comments or objections:

- ✧ Department of Public Works, Roads and Transport
- ✧ Telkom SA Limited
- ✧ Eskom
- ✧ Dr. Ruth Segomotsi Mompati District Municipality
- ✧ Department of Minerals and Energy
- ✧ Department of Agriculture
- ✧ Department of Water Affairs and Forestry
- ✧ Department of Local Government and Traditional Affairs
- ✧ Department of Education
- ✧ Department of Health
- ✧ South African Post Office
- ✧ Spornet
- ✧ South African Heritage Resources Agency
- ✧ South African National Roads Agency Limited

The fore-mentioned organizations / departments will be afforded a period of 60 days to comment in this matter in accordance with the prescriptions of Section 108(1) of the Town Planning and Townships Ordinance, 1986 (Ordinance 15 of 1986).

1.4 STUDY AREA DELINEATION

The proposed development areas comprise a portion of the Remaining Extent of Portion 2 of the farm Nieuwjaarsfontein No. 73-HO and a portion of the Remaining Extent of Portion 6 of the farm Nieuwjaarsfontein NO. 73-HO as will be described in detail in section 2.1.

1.5 REPORT OUTLINE

The remainder of the report is structured in terms of the following main headings:

- Chapter 2: Particulars of the development area
- Chapter 3: Physical aspects
- Chapter 4: Proposed development
- Chapter 5: Provision of Engineering Services
- Chapter 6: Conclusion

CHAPTER 2: PARTICULARS OF THE DEVELOPMENT AREAS

2.1 LOCALITY

The proposed township areas of Amalia Extensions 5 and 6 are located on the following properties:

Proposed township area	Property description
Amalia Extension 5	Portion of the Remaining Extent of Portion 2 and a portion of the Remaining Extent of Portion 6 of the farm Nieuwjaarsfontein No. 73-HO
Amalia Extension 6	Portion of the Remaining Extent of Portion 6 of the farm Nieuwjaarsfontein No. 73-HO

The proposed township area of Amalia Extension 5 comprises two (2) separate development areas of which the northern development area is located directly adjacent and to the south-west of the existing township area of Amalia and is bordered to the south-west by the existing township area of Molatswaneng. The southern portion of the township area is located adjacent and to the south of the Amalia-Pudimoe railway line and is bordered to the south by the Amalia-Hartbeestpan district road (Road 2013).

The proposed township area of Amalia Extension 6 is located directly adjacent and to the west of the existing township area of Amalia and is bordered to the west by the existing township area of Amalia Extension 4. The proposed township area is bordered to the south by the Amalia-Pudimoe railway line and will be located directly south of the northern portion of the proposed township area of Amalia Extension 5.

The proposed township areas are located within the central portion of the urban area of Amalia as indicated on the following Google image depicting the urban area of Amalia.



Map 7: Google image depicting locality of proposed township area

The proposed township area detailed above is located within the area of jurisdiction of the Mamusa Local Municipality which in turn falls within the area of jurisdiction of the Dr. Ruth Segomotsi Mompati District Municipality.

2.2 SG DIAGRAMS

The Remaining Extent of Portion 2 of the farm Nieuwjaarsfontein No. 73-HO is reflected on subdivision diagram SG No. A959/1910. The Remaining Extent of Portion 6 of the farm Nieuwjaarsfontein No. 73-HO is reflected on subdivision diagram SG No. A12/1928 (attached as **Annexure D** to the application for township establishment).

2.3 OWNER

The farm portions, on which the proposed township areas are to be established, are currently registered as follows:

Property description	Registered owner	Deed of Transfer
Remaining Extent of Portion 2 of the farm Nieuwjaarsfontein No. 73-HO	Schweizer Reneke Local Municipality (now Mamusa Local Municipality)	T35160/1990
Remaining Extent of Portion 6 of the farm Nieuwjaarsfontein No. 73-HO	Schweizer Reneke Local Municipality (now Mamusa Local Municipality)	G60/1940

The proclamation of the proposed township areas will include the amendment of the details of the registered property owner to reflect the name change of the Schweizer Reneke Local Municipality to the Mamusa Local Municipality (refer **Annexure F** to the application for township establishment for Aktex Deed Office Enquiries) (Deed of Transfer T35160/1995 and Crown Grant No. 60/1940 attached as **Annexure G** to the application for township establishment).

2.4 AREA

The Remaining Extent of Portion 2 of the farm Nieuwjaarsfontein No. 73-HO comprises a total area of 62,1238 hectares.

The Remaining Extent of Portion 6 of the farm Nieuwjaarsfontein No. 73-HO comprises total area of 330,5138 hectares.

The respective proposed township areas will comprise the following areas:

- Amalia Extension 5 : 80,7799 hectares
- Amalia Extension 6 : 19,4859 hectares

2.5 EXISTING LAND USE AND ZONING

The northern portion of the proposed township area of Amalia Extension 5 is predominantly vacant with the exclusion of infrastructure of Eskom (powerlines) and Telkom (telephone lines) that traverse the development area.



Plate 1: View of Eskom powerlines on the northern portion of Amalia Extension 5



Plate 2: View of Telkom telephone lines locate along the eastern boundary of the northern portion of Amalia Extension 5

The southern portion of the proposed township area of Amalia Extension 5 is currently occupied by an informal settlement comprising various informal housing structures. The locality of the informal structures is reflected on the aerial survey below conducted by Azur Aerial Works CC during January 2014.



Map 8: Results of aerial survey of development areas



Plate 3: View of informal dwelling units located on the southern portion of the proposed township Amalia Extension 5



Plate 4: View of informal settlement from Road 2013

The proposed township area of Amalia Extension 6 is currently also predominantly vacant with the exception of infrastructure of Eskom (powerlines), two (2) cemeteries and a solid waste site. These facilities have all been incorporated in the layout plan of the proposed township area.



Plate 5: View of Eskom powerlines traversing Amalia Extension 6



Plate 6: View of Amalia solid waste site



Plate 7: View of cemetery



Plate 8: View of cemetery

The cemeteries detailed above will also be addressed in the section 3.9 below. The cemetery reflected in Plate 5 is located in the southern portion of the proposed township area of Amalia Extension 6 whereas the cemetery reflected in Plate 6 is located adjacent to the access road between Amalia township and Molatswaneng.



Map 9: Locality of existing facilities

In considering the surrounding land uses, cognisance should be taken of the fact that both the northern portion of the proposed township area of Amalia Extension 5 and the proposed township Amalia Extension 6 are bordered to the east by the existing township area of Amalia and to the west by the existing township areas of Molatswaneng and Amalia Extension 4 respectively.

The proposed township area of Amalia Extension 6 is located directly adjacent to the Amalia Community Safety Centre.



Plate 9: View of Amalia Community Safety Centre

The southern portion of the proposed township area of Amalia Extension 5 is bordered to the north by the Amalia-Pudimoe railway line. This same railway line also comprises the southern boundary of the township area of Amalia Extension 6.



Plate 10 & 11: View of Amalia-Pudimoe railway line (direction east & west)

2.6 MINERAL RIGHTS

According to Deed of Transfer T35160/1995, the rights to minerals in respect of the Remaining Extent of Portion 2 of the farm Nieuwjaarsfontein No. 73-HO have not been separated from the property rights.

In terms of Crown Grant No. 60/1940, the rights to minerals in respect of the Remaining Extent of Portion 6 of the farm Nieuwjaarsfontein No. 73-HO were similarly not separated from the property rights.

The rights to minerals in respect of both properties are however subject to the provisions of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) that came into force on 01 May 2004. The application for township establishment will subsequently also be referred to the Department of Minerals and Energy for its consent in respect of the establishment of the proposed townships.

2.7 RESTRICTIVE TITLE CONDITIONS

According to Deed of Transfer T35160/1995, the Remaining Extent of Portion 2 of the farm Nieuwjaarsfontein No. 73-HO is not subject to any restrictive title conditions.

The Remaining Extent of Portion 6 of the farm Nieuwjaarsfontein No. 73-HO, as held by Crown Grant No. 60/1940, is similarly not subject to any restrictive title conditions.

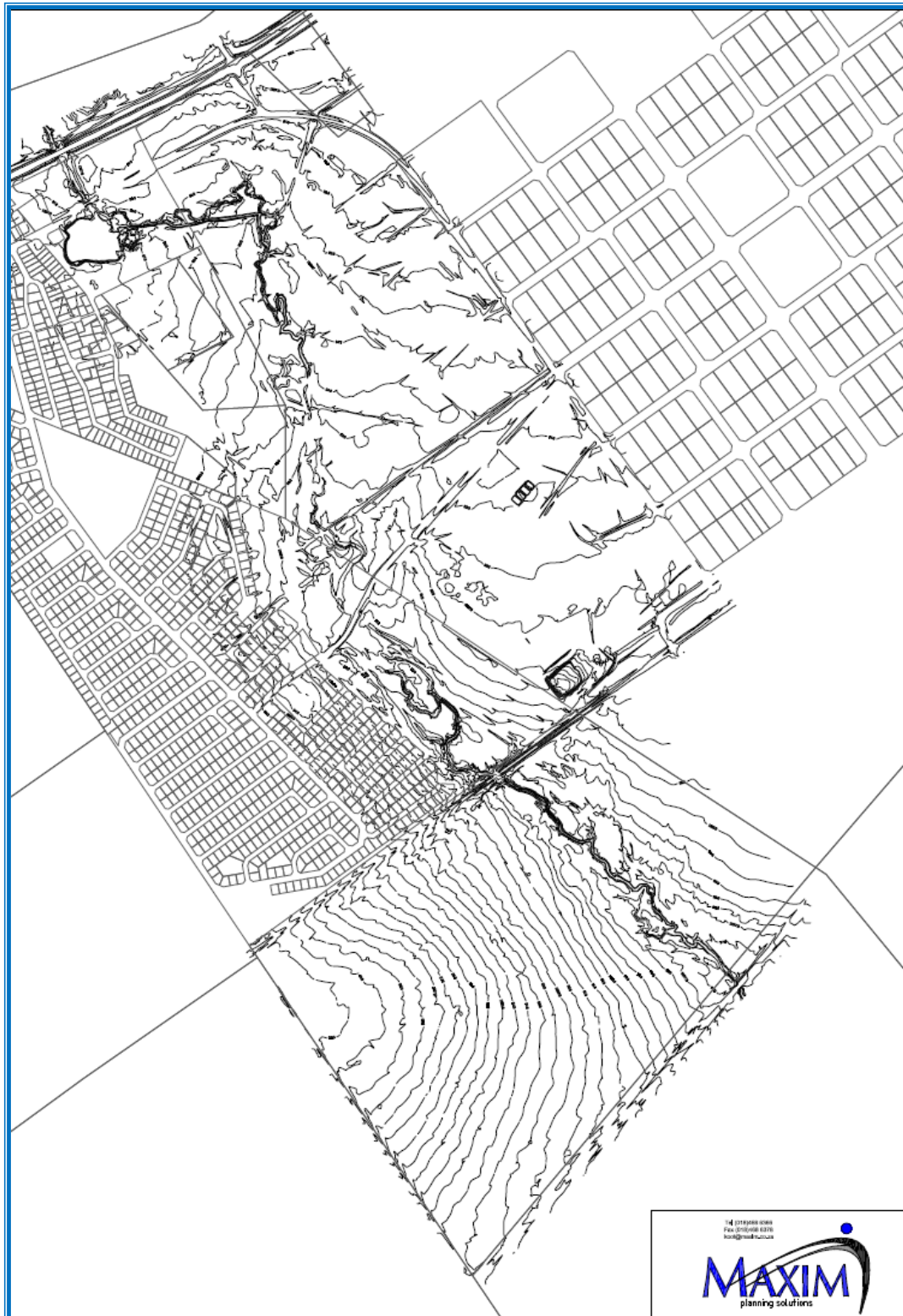
Cognisance should be taken of the fact that the Remaining Extent of Portion 6 of the farm Nieuwjaarsfontein No. 73-Ho is subject to an unregistered road servitude (15,0m wide) as reflected on servitude diagram SG No. 5484/1999 (refer SG diagram attached to the application for township establishment as **Annexure E**). This servitude was established during the establishment of the Amalia Community Safety Centre and provides for access from Road 462 to Portion 35 of the farm Nieuwjaarsfontein No. 73-HO. This servitude is reflected on the layout plan of the proposed township area of Amalia Extension 5 and will be accommodated in the road reserve of the road linking the township area of Amalia and Molatswaneng passing the Amalia Community Safety Centre.

CHAPTER 3: PHYSICAL ASPECTS

3.1 TOPOGRAPHY AND DRAINAGE

To allow for the proper planning of the proposed residential township areas and due to the occupation of the area south of the Amalia-Pudimoe railway line by an informal

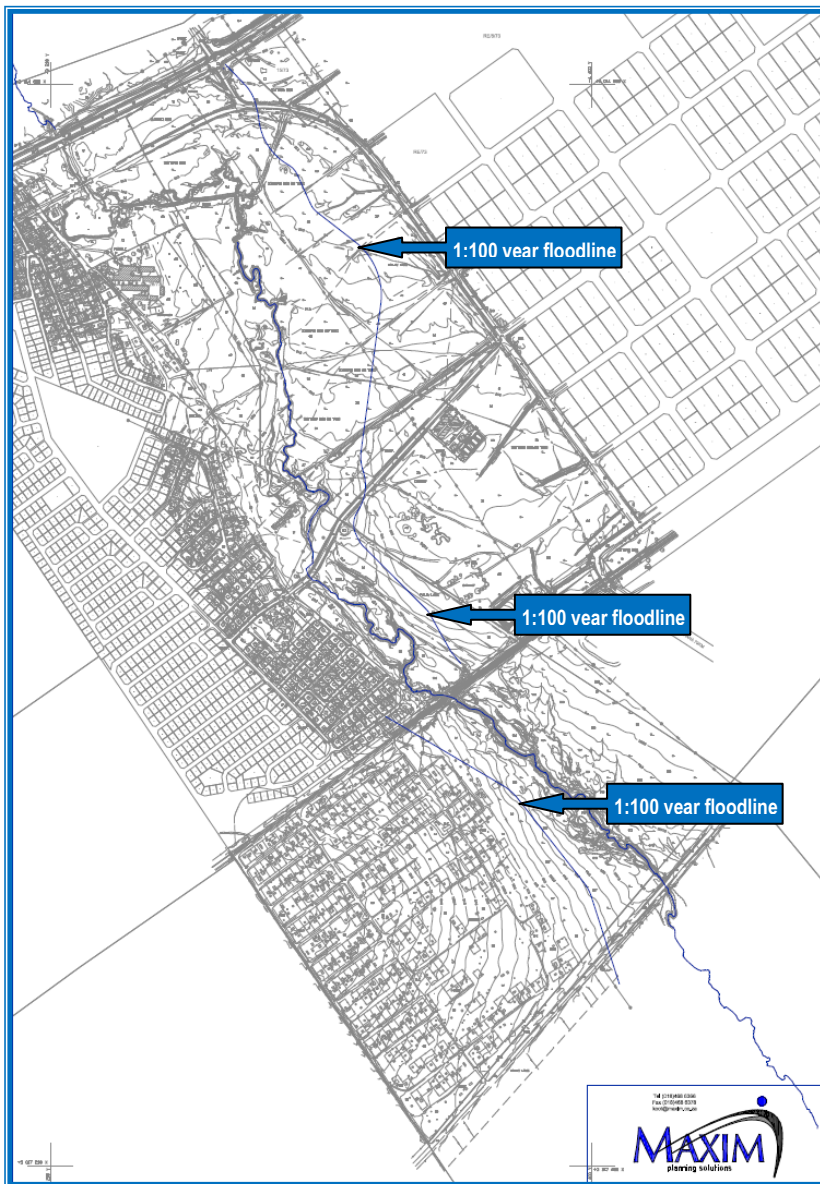
settlement, Maxim Planning Solutions (Pty) Ltd commissioned Azur Aerial Works CC to conduct an aerial survey of the proposed development area. The results of the aerial survey were employed to generate contour data in respect of the development areas as well as to verify the locality of informal housing structures. The contour map of the development area is reflected on the following map:



Map 10: Results of contour survey

proposed township areas of Amalia Extensions 5 and 6 are located Extension 16 is located at between 1307 and 1297.5 metres above mean sea level. The northern portion of the proposed township area of Amalia Extension 5 drains in a westerly direction towards the Nieuwjaarspruit. This is also the case with the proposed township Amalia Extension 6. The southern portion of the proposed township area of Amalia Extension 5 drains in a north-easterly direction towards the Nieuwjaarspruit.

Topographic features of note that should be taken into consideration are the various storm water drainage features evident on the northern portion of the development area emanating from the township area of Amalia. Where possible these drainage features were accommodated in the open space system of the proposed township areas but these features will eventually have to be accommodated in the storm water drainage system of the proposed township areas.



Due to the locality of the proposed township areas adjacent to the Nieuwjaarspruit, both township areas are affected by the 1:100 year floodline applicable along this spruit. For this purpose, Maxim Planning Solutions (Pty) Ltd appointed Moedi Consulting Engineers (Pty) Ltd for the determination of the 1:100 year floodline. The results of the floodline determination are reflected on the following map:

Map 11: Results of contour survey

3.2 CLIMATE

The region is characterized by summer rainfall with thunderstorms, with annual low rainfall figures of 455mm at Armoedsvlakte near Vryburg, recorded at the closest weather station to the site. Winters are dry with frost common. The warmest months are normally December and January and the coldest months are June and July.

An analysis of the data confirms a Weinert's N-Value in the order of 5.0 for Amalia. The mechanical disintegration of rocks will therefore be dominant over chemical decomposition, and shallow soil horizons will be expected in areas of poor drainage, underlain by igneous rocks.

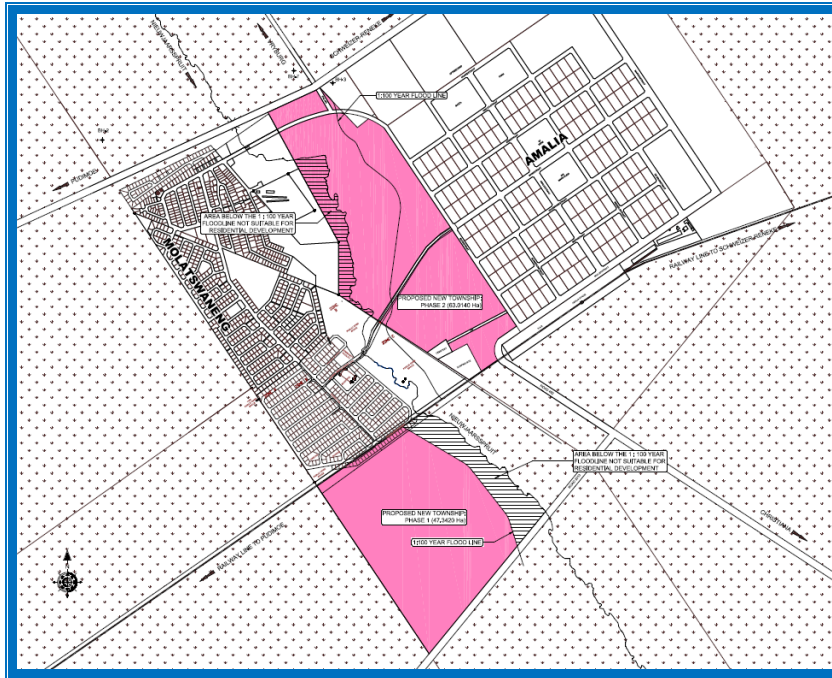
Storm water drainage and road pavement design must incorporate the climatic extremes above.

3.3 FRESHWATER SYSTEM

- ❖ The proposed development area is located within the Middle Vaal Water Management Area.
- ❖ Plate flow is the dominant drainage pattern on site, and no drainage channel intersects the two sites, but they are both bordered by the same perennial water stream. Drainage occurs in a south-easterly direction towards the Harts River.

3.4 WETLANDS AND PANS

The township areas of Amalia Extensions 5 and 6 are both located adjacent to the Nieuwjaarsspruit and are both subject to the 1:100 year floodline applicable along this drainage feature. The 1:100 year floodline was accommodated in the layout plans of both proposed township areas.



Map 12: 1:100 year floodline determination conducted by Moedi Consulting Engineers

3.5 VEGETATION

The area is typically characterized by Kalahari thornveld *veld type* of the Tropical Bush and Savanna Type (Acocks, 1988).

The site itself is covered by sparse grasslands of which some was used as agriculture land, and only a few indigenous thorn trees are present on site.

3.6 GROUNDWATER

The permanent or perched water table on site is deeper than 1,5m below ground surface.

Seepage and the presence of perennial fluctuations of ground water were encountered on site, proving that a seasonal perched water table may exist. A ferruginised profile or calcrete indicates that some perennial water level fluctuations may occur.

Ground water in the form of seepage was not intersected in any test pit during the investigation, but normal water tightening techniques such as damp course on foundation levels are required.

The expected high permeability of the silty sand may lead to leachate from sanitation systems to reach the ground water, and a closed water borne sewage system is recommended. The depth of excavation also restricts the use of open pit latrines on the two sites.

Special care must be taken to ensure adequate surface drainage to prevent the accumulation of water next to structures.

Storm water diversion measures such as ponding pools are recommended to control peak flows during thunderstorms.

All embankments must be adequately compacted and planted with grass to stop any excessive erosion and scouring of the landscape.

3.7 GEOLOGY (Extract from Geotechnical Report compiled by Geoset CC attached as **Annexure J** to the application for township establishment)

The area is underlain by quartz & feldspar porphyry or rhyolite of the Makwassie Formation, or tholeitic & calc-alkaline basalt & andesite of the Allanridge Formation, Platberg Group, Ventersdorp Supergroup. Surficial deposits on site include quaternary aeolian sand, calcrete and colluvium, covering the lithology.

No dolomite occurs in the area and no stability investigation is required.

3.7.1 SITE EVALUATION

- The presence of ferricrete or calcrete indicates that perennial fluctuations of ground water will be encountered on site, proving that a seasonal perched water table may exist.
- Special care must be taken to ensure adequate surface drainage to prevent the accumulation of water next to structures.
- The site contains medium compressible or collapsible soil, with medium expansive soil, and foundations will need special treatment to withstand movement associated with the variable moisture content of the soil.
- Some problems regarding excavatability can be expected across the site reflected in the R classification of the site due to the presence of calcrete, shallow rock and some core stones of lava and shale.
- Retaining walls as well as slope stabilization measures are recommended on all constructed embankments exceeding 1,5m.
- No mining activities on site or history of mining or contaminated land in the area were found. The site is located a distance from any active mining operations and in an inactive area regarding seismic activity.

- Storm water diversion measures such as ponding pools are recommended to control peak flows during thunderstorms. Drainage provision along the already provided gutters from the existing roads from town should be incorporated.
- All embankments must be adequately compacted and planted with grass to stop any excessive erosion and scouring of the landscape.

3.7.2 SITE ZONATION

In terms of the results of the geotechnical investigation, the development area was divided into the following geotechnical zones:

Special Development:

Site Class C1/H1/R

This zone consists of aeolian sand and is underlain by calcrete and lava or shale and comprises medium compressible and collapsible soil, with low to medium expansive properties, with an estimated total settlement or heave of up to 15mm measured at surface. Foundations will therefore require special foundation techniques such as proper compaction techniques and lightly reinforced strip footings with articulation joints at all internal and external doors and openings with light reinforcement (brickforce) in masonry, or soil replacement by an engineered fill soil raft. Foundation excavations should be inspected and loose material well compacted. If loose patches are present in situ material below foundations should be removed to a depth and width of 1,5 times the foundation width or to a competent horizon and replaced with material compacted to 93% MOD AASHTO density at -1% to +2% of optimum moisture content. Special construction techniques can also include the use of deep strip foundations, stiffened strip footings, stiffened or cellular rafts or even piled foundations. Site drainage and plumbing and service precautions must be used. The site is at shallow depth underlain by shallow rock lava with some core stones or calcrete, and hard to very hard excavation is expected for service installation excavations. It is classified as C1/H1/R according to the NHBRC and SAIEG guidelines.

Land not Suitable for development

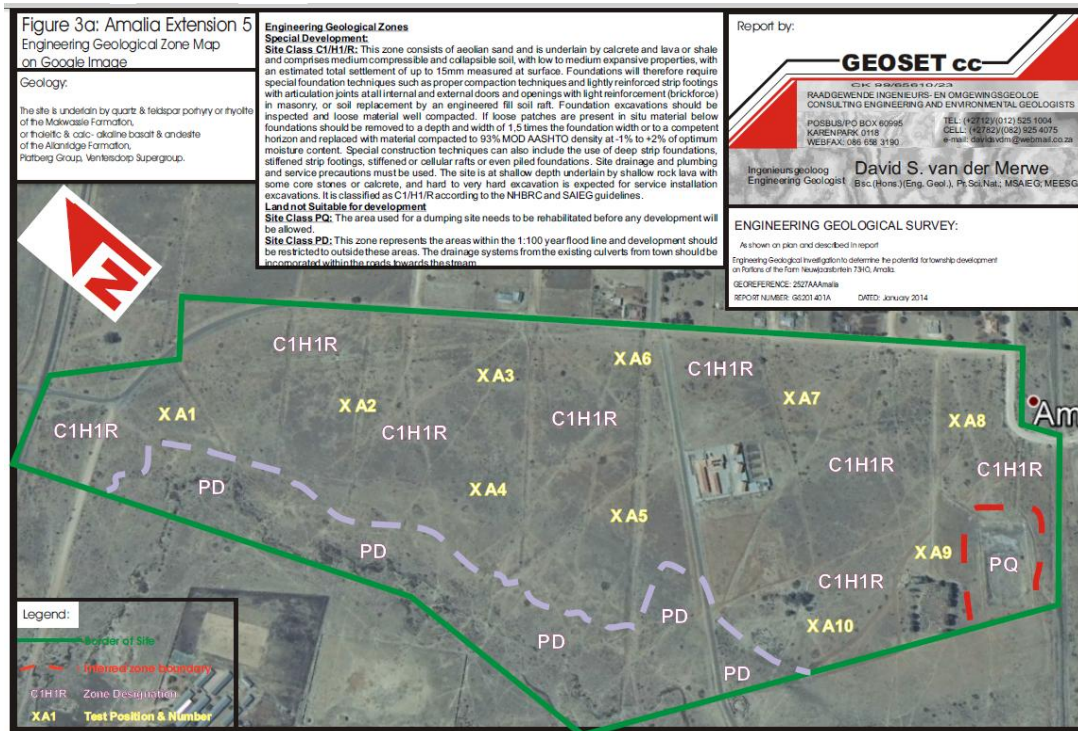
Site Class PQ

This area used for a dumping site needs to be rehabilitated before any development should be allowed.

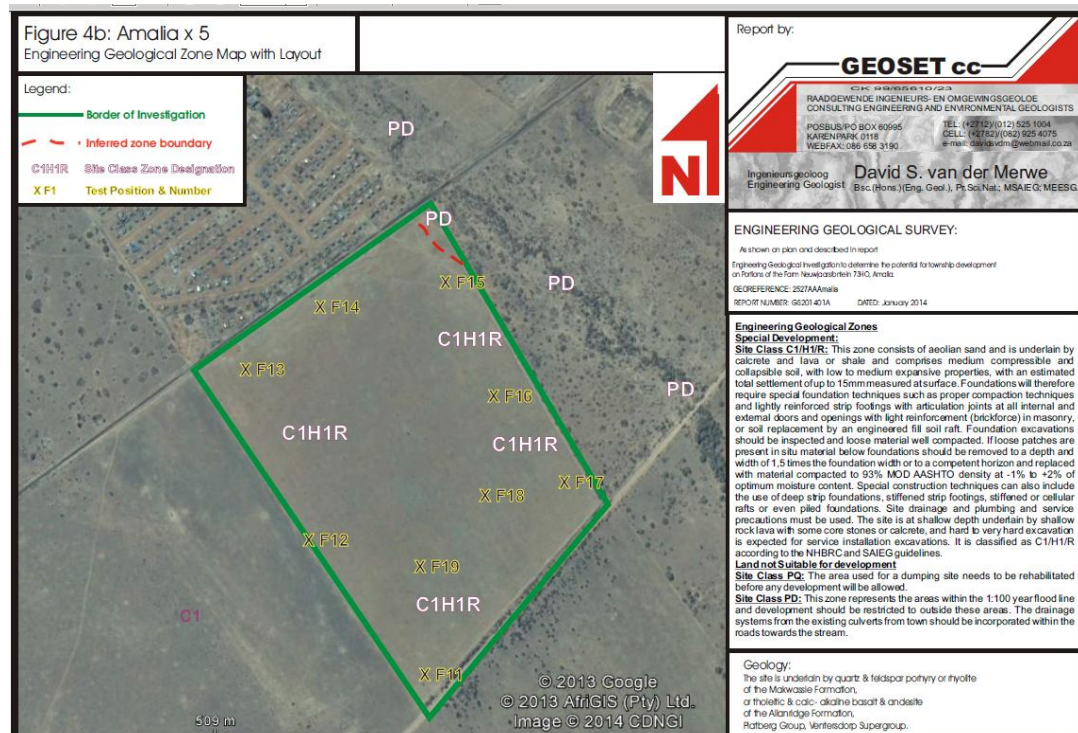
Site Class PD:

This zone represents the areas within the 1:100 year flood line and development should be restricted to outside these areas. The drainage systems from the existing culverts from town should be incorporated within the roads towards the stream.

The comprehensive Geotechnical Report is attached as **Annexure J** to the application for township establishment and the geotechnical zones are reflected on the following diagram as it applies to the proposed township areas:

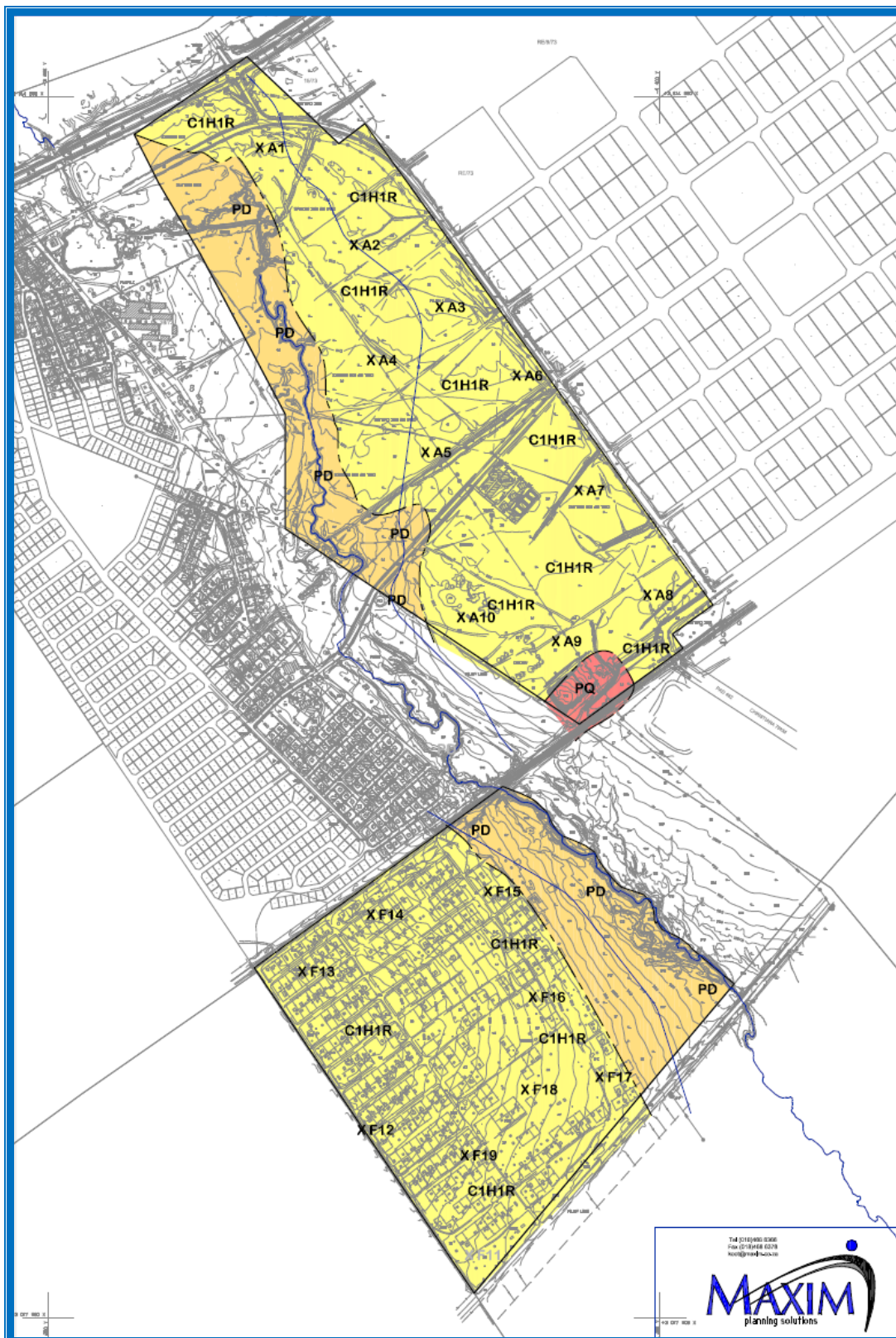


Map 13: Geotechnical site zonation as compiled by Geoset CC (northern portion of development area)



Map 14: Geotechnical site zonation as compiled by Geoset CC (southern portion of development area)

The results of the geotechnical investigation are also reflected on the following map depicting the entire development area.



Map 15: Geotechnical site zonation as compiled by Geoset CC (Amalia Extensions 5 and 6)

3.7.3 FOUNDATION SOLUTIONS

- ***Consolidation or collapse settlement***

Site Class C (Estimated total Settlement of less than 5mm):

Normal Construction:

Minor collapse settlement requires normal construction (strip footing and slab on the ground) with compaction in foundation trenches and good site drainage.

Site Class C1 (Estimated total Settlement of between 5 and 10mm):

Modified normal construction:

Reinforced strip footing and slab on the ground.

Articulation joints at some internal and all external doors and openings.

Light reinforcement in masonry.

Site drainage and service/plumbing precautions recommended.

Foundation pressure not to exceed 50 kPa (single storey buildings).

Compaction of in situ soils below individual footings:

Remove in situ material below foundations to a depth and width of 1,5 times the foundation width or to a competent horizon and replace with material compacted to 93% MOD AASHTO density at -1% to +2% of optimum moisture content.

Normal construction with light reinforcement in strip foundation and masonry.

Deep strip foundations

Normal construction with drainage precaution.

Founding on a competent horizon below problem horizon.

Soil Raft

Remove in situ material to 1,0m beyond perimeter of building to a depth and width of 1,5 times the widest foundation or to a competent horizon and replace with material compacted to 93% MOD AASHTO density at -1% to +2% of optimum moisture content.

Normal construction with lightly reinforced strip footings and masonry.

- ***Expansive soil***

Site Class H (Estimated total heave of less than 7.5mm):

Soil tested as medium expansive with a clay layer thickness of up to 0,3m from surface

Normal construction:

Minor heave requires normal construction (strip footing and slab on the ground) with site drainage and service/plumbing precautions recommended.

Site Class H1 (Estimated total heave of between 7.5 and 15mm):

Tested as medium expansive with a clay layer thickness of between 0,45 to 0,85m from surface,

or a highly expansive clay layer of between 0,3 and 0,4m in thickness from surface

or a clay layer with a very high expansive potential of up to 0.3m.

Modified normal:

Lightly reinforced strip footings.

Articulation joints at all internal/external doors and openings

Light reinforcement in masonry.

Site drainage and plumbing/service precautions.

Or soil raft:

Remove all or part of expansive horizon to 1,0m beyond the perimeter of the construction and replace with inert backfill compacted to 93% MOD AASHTO density at -1% to 2% of optimum moisture content.

Normal construction with lightly reinforced strip footings and masonry.

Site drainage and plumbing/service precautions

3.7.4 CONCLUSION

- The area is underlain by quartz & feldspar porphyry or rhyolite of the Makwassie Formation, or tholeitic & calc- alkaline basalt & andesite of the Allanridge Formation, Platberg Group, Ventersdorp Supergroup. Surficial deposits include quaternary calcrete and colluvium, covering the lithology on site.
- Some problems are foreseen regarding the excavatability to 1,5m depth on site.
- Zoning of the site revealed zones with constraints regarding the **compressibility and collapse potential, as well as the expansive properties** of the soil, and **shallow rock and core stones** may hamper the placement of services.

- **Special construction** techniques must be used to enable proper development including the use of **compaction techniques with steel reinforcement** or **soil rafts** as described.
- **This investigation was done to reveal the geotechnical properties on site with the techniques as described to form our opinion. Although every possible factor during the investigation was dealt with, it is possible to encounter variable local conditions. This will require the inspection of foundations by a competent person to verify expected problems.**

3.8 ENVIRONMENTAL IMPACT ASSESSMENT

AB Enviro-Consult was appointed to conduct an Environmental Impact Assessment in terms of sections 24 and 24(D) of the National Environmental Management Act, 1998 (Act 107 of 1998). This activity is listed as Listing Notice 2, Activity number 15 (Government Notice No. R545) and came into effect on 18 June 2010. The fore-mentioned activity is described as follows:

“(15) Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more;”

The project was registered with the Department of Economic Development, Environment, Conservation and Tourism and the Environmental Impact Assessment Report is currently in process of finalisation following the finalisation of the public participation process and the Environmental Impact Assessment will in due course be submitted to the Department of Economic Development, Environment, Conservation and Tourism for consideration.

3.9 CULTURAL HERITAGE AREAS

A Pelsers Archaeological Consulting CC was commissioned by Maxim Planning Solutions (Pty) Ltd to conduct a Heritage Impact Assessment in respect of the proposed township areas. The fore-mentioned assessment contained the following results:

No archaeological (Stone Age or Iron Age) sites, features or artifacts were identified during the assessment. Dense grass cover in certain sections made visibility difficult and it is possible that individual objects might be present. Furthermore large sections of both Areas A and B had been disturbed through agricultural activities (ploughing) and as a

result if any archaeological sites did exist here in the past it would have been extensively disturbed or destroyed to a large degree.

The only sites and remains identified during the assessment dates to the recent historical period and consists of two cemeteries and some remains (cement dams) related to earlier farming activities. All these were located on Area B. Both cemeteries date to very recent times and are currently still in use. The exact number of graves on both sites was not determined during this Phase 1 HIA, but probably number in the hundreds in total.

Cemetery 1

Cultural Significance: **Graves always carry a High Significance**

Heritage Significance: **Grade III - Other heritage resources of local importance and therefore worthy of conservation.**

Field Rating: **General protection A (IV A): site should be mitigated before destruction (high/medium significance).**

Mitigation Proposed: **If the site is to be impacted on by the development the graves could be exhumed and relocated after detailed social consultation has been undertaken and all due legal processes followed. The best should be to leave the site in situ and to Manage.**

Cemetery 2 & Cement dams

Cultural Significance: **Graves High. Cement dams low.**

Heritage Significance: **Grade III - Other heritage resources of local importance and therefore worthy of conservation (Graves). None for cement dams.**

Field Rating: **General protection A (IV A): site should be mitigated before destruction (high/medium significance)[Graves]. General protection C (IV C): phase 1 is seen as sufficient recording and it may be demolished (low significance)[for cement dams].**

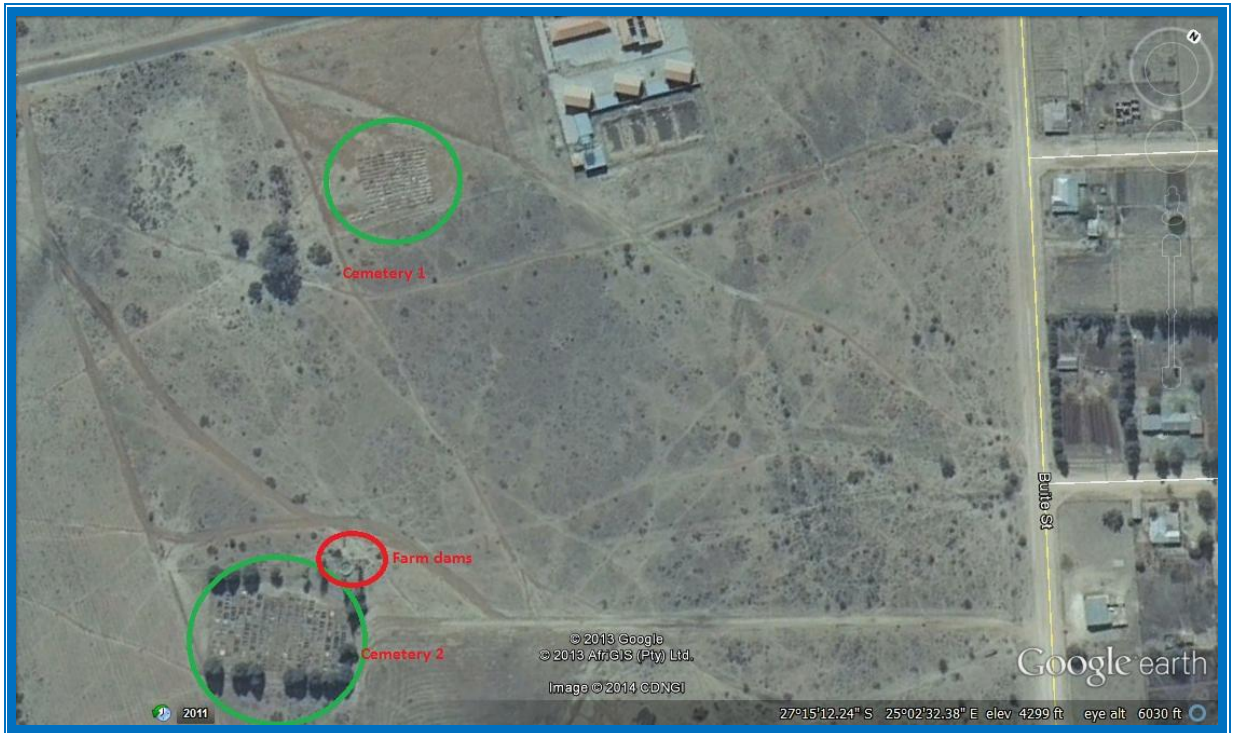
Mitigation Proposed: **If the site is to be impacted on by the development the graves could be exhumed and relocated after detailed social consultation has been undertaken and all due legal processes followed. The best should be to leave the site in situ and to Manage. No mitigation required for cement dams.**



Map 16: Closer view of Area A. Note the old ploughed fields covering most of the area (Google Earth 2014).



Map 17: Closer view of Area B. Most of the area has been disturbed through ploughing as well.



Map 18: View of Area B showing cemeteries and farm dam locations (Google Earth 2014).



Plate 12: View of Cemetery 1.



Plate 13: View of a section of Cemetery 2.



Plate 14: Cement dams close to Cemetery 1.

The Phase 1 HIA concluded that it is possible to say that the Phase 1 HIA for the proposed Amalia Extension 5 Township, located on various portions of the farm Nieuwjaarsfontein 73HO has been conducted successfully. Two areas (Areas A & B) comprising around 110ha in total, had to be studied. Both areas have been largely disturbed in the recent past through agricultural activities and some other developments and if any archaeological sites did occur here in the past it would have been extensively disturbed or destroyed as a result. None were identified during the assessment.

Two fairly large and recent cemeteries were recorded in Area A. Both are currently being used and the exact number of graves on these two sites is not known. Should these sites be impacted by the development it is recommended that they are exhumed and relocated after all due processes (including social consultation, detailed documentation and the obtaining of relevant permits) have been followed. However, the first prize would be the in-situ preservation and Management of these cemeteries. The cement dam remains are of low significance and most likely less than 60 years of age. These features are not unique and therefore do not have any real significance. It is recommended that they can be demolished.

From a Heritage point of view the development should however be allowed to continue, taking cognizance of the above recommendations and the proposed mitigation measures provided in the Discussion section of this document.

Furthermore, the subterranean presence of archaeological or historical sites, features or objects is always a possibility. This could include unknown and unmarked burial pits. Should any be uncovered during the development process a heritage specialist should be called in to investigate and recommend on the best way forward.

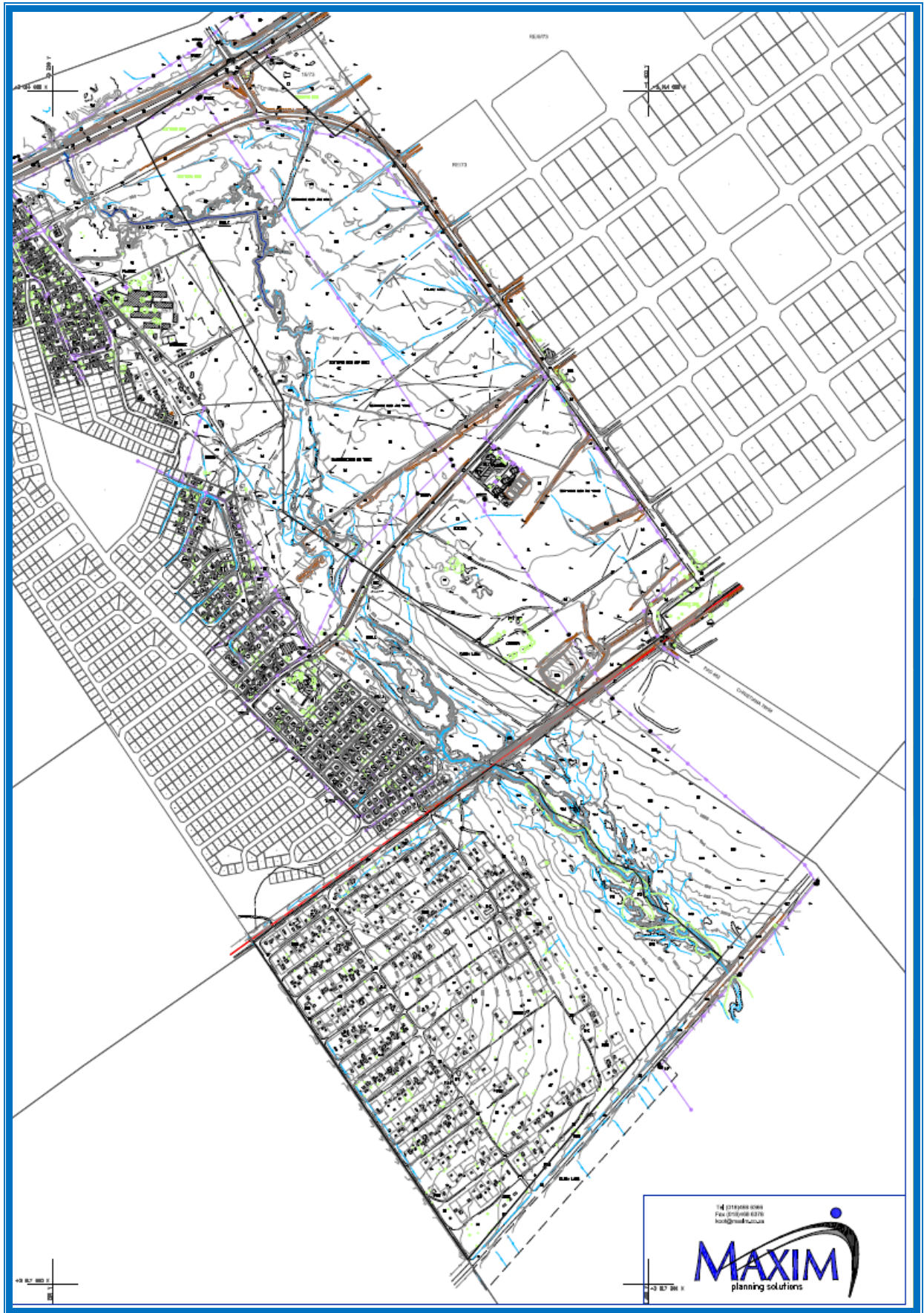
The comprehensive Heritage Impact Assessment conducted by A Pelsers Archaeological Consulting is attached as **Annexure K** to the application for township establishment.

CHAPTER 4: PROPOSED DEVELOPMENT

4.1 LAND USES

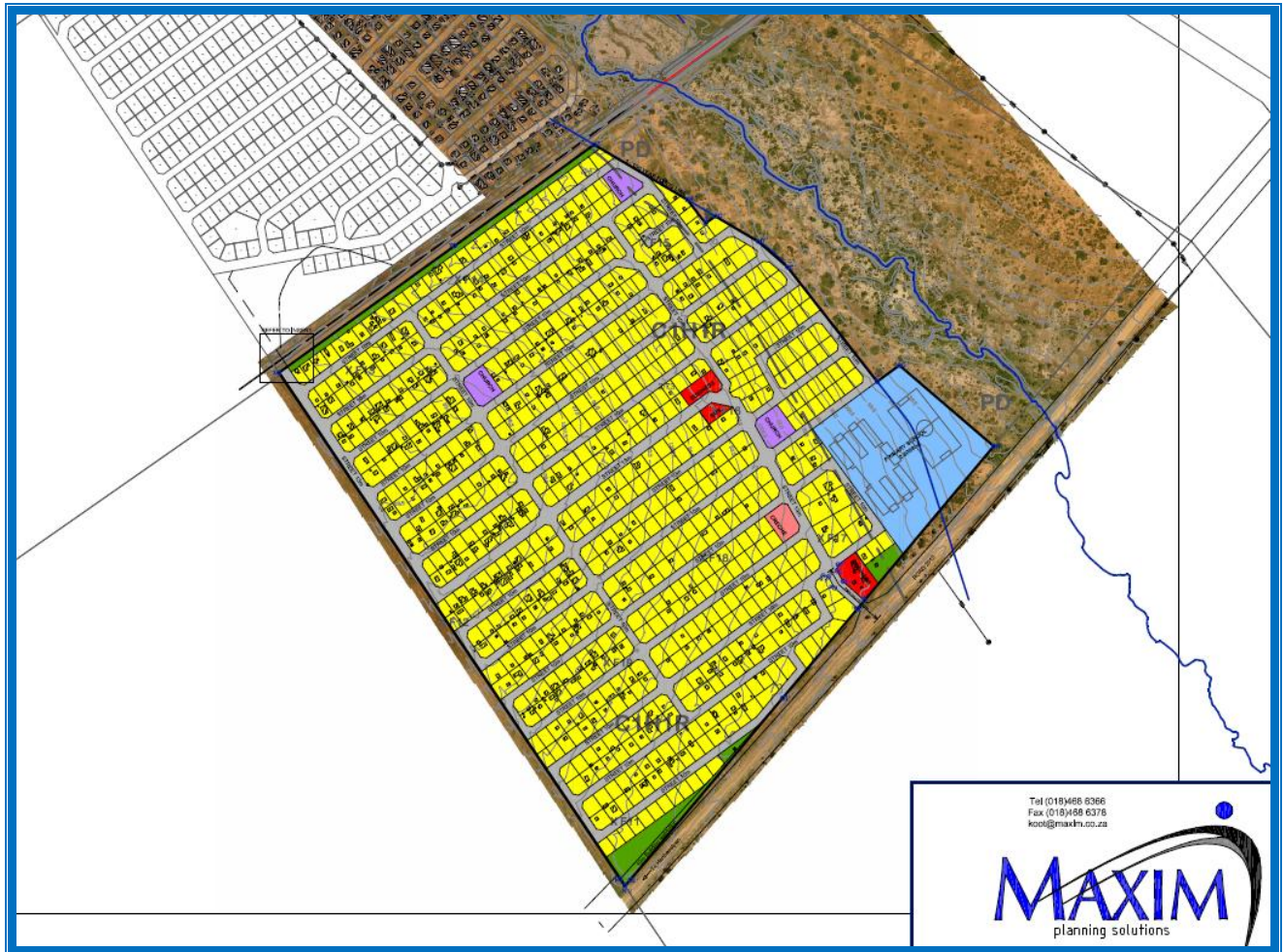
The intention of the applicant i.e. the Mamusa Local Municipality is to utilize the concerned properties for the establishment of the proposed township areas of Amalia Extension 5 and Amalia Extension 6. The primary aim of the township areas is to address the urgent need experience by the Mamusa Local Municipality in the Amalia/Molatswaneng urban complex for vacant residential erven. This need has given rise to illegal occupation of the development area taking place. To allow for organised settlement to take place within the proposed township areas, the Mamusa Local Municipality resolved to consider in-situ planning of the area south of the Amalia-Pudimoe railway line where informal occupation of the land has already taken place.

For this purpose, Maxim Planning Solutions (Pty) Ltd commissioned the services of Azur Aerial Works CC to conduct an aerial survey of the development area to capture the locality of all existing informal housing structures and infrastructure. The results of the aerial survey and mapping are reflected on the following map.



Map 19: Results of aerial survey and line mapping depicting informal structures

On instruction from the Mamusa Local Municipality, the layout plan of the southern portion of the proposed township area of Amalia Extension 5 was based on the location of existing informal housing structures. The results of the planning of the southern portion of the proposed township area of Amalia Extension 5, where the locality of existing informal housing structures were taken into consideration, are reflected on the following extract from the concerned layout plan (refer Map 20 below).



Map 20: Extract form the layout plan of Amalia Extension 5 depicting locality of informal dwelling units

The layout plans of the respective township areas make provision for the following land uses:

Amalia Extension 5

Use Zone	Proposed Land Use	Number of erven	Area in hectares	% of area
Residential	Dwelling house (average stand size 338m ²)	1000	33,7694	41.80%
Business	Shops, community facilities	6	1,7544	2,17%

Community facility	Primary School	1	2,6089	3.23%
	Crèche	2	0,2539	0,31%
	Church	1	0,6344	0,79%
Public open spaces	Parks and recreational facilities	7	28,1091	34,80%
Streets	Streets		13,6498	16,90%
Total		1021	80,7799	100%

Amalia Extension 6

Use Zone	Proposed Land Use	Number of erven	Area in hectares	% of area
Residential	Dwelling house (average stand size 322m ²)	284	9,1519	46,97%
Community facility	Church	1	0,1077	0,55%
Municipal	Municipal purposes	4	5,2836	27,11%
Public open spaces	Parks and recreational facilities	5	0,7007	3,60%
Streets	Streets		4,2420	21,77%
Total		294	19,4859	100%

4.2 FACTORS INFLUENCING THE LAYOUT PLANS

The layout plans of the proposed township areas of Amalia Extension 5 and Amalia Extension 6 were influenced by the following factors:

★ Amalia Extension 5 (northern portion of the proposed township area):

- Accommodating the road reserve of Provincial Road P23-3 (Amalia-Pudimoe road). In this regard provision was made for a road reserve of 53,5 metres in accordance with the relevant road proclamation notice (Administrators Notice 532 dated 21 June 1967) (Attached as **Annexure M** to the application for township establishment);
- Accommodating the existing two access roads to Molatswaneng township from Amalia traversing the proposed township area;
- Accommodating the road reserve of Road 462 comprising the eastern boundary of the proposed township area. In this regard provision was made for a road reserve of 25 metres in accordance with the relevant road proclamation notice (Administrators Notice 321 dated 10 March 1976) (Attached as **Annexure M** to the application for township establishment);
- Alignment of the accesses to the proposed township area with the existing street network in the adjacent township area of Amalia;
- Addressing the 1:100 year floodline applicable along the Nieuwjaarsspruit;

- Accommodating the existing Mimosa Rural / Amalia 1 22kV feeder traversing the northern portion of the proposed township area from north to south. The power line is currently not protected by a servitude and same will be protected by a servitude that will be registered as integral part of the township establishment process. The registration of a servitude to protect the fore-mentioned power line will be applicable to all erven traversed by the power line;
 - A Telkom telephone line is located along the eastern boundary of the proposed township area. This telephone line was accommodated in the layout plan within the building restriction area provided along Road 462;
 - The layout plan accommodates a 10m building restriction area along Road 462 and a 16m building restriction area along Provincial Road 23/3. As the normal building line along a numbered road usually comprises a width of 16m, the application for township establishment includes an application to the Department of Transport, Roads and Public Works for permission in respect of the relaxation of the building line from 16m to 10m due to the fact that Road 462 currently provides access to the existing township area of Amalia with housing structures already erected along the northern boundary of the fore-mentioned road on erven in the concerned township area;
 - A line of no access was introduced along the boundary of the township area bordering onto Provincial Road P23-3 and Road 462;
 - Two large business erven were provided directly opposite the existing Amalia Community Safety Centre with the intention that this area be developed as a service node for the entire urban area of Amalia/Molatswaneng;
 - During establishment of the Amalia Community Safety Centre, located on Portion 35 of the farm Nieuwjaarsfontein No. 73-HO, provision was made for a road servitude 15m wide across the Remaining Extent of Portion 6 of the farm Nieuwjaarsfontein No. 73-HO to allow access to the concerned facility from the street network of the township area of Amalia. The alignment of this servitude was taken into consideration during the compilation of the layout plan and coincides with a street in the proposed township area (refer street in the proposed township area located along the southern boundary thereof);
 - The layout plan also took cognisance (where possible) of the existing topographical features of the development area. These features mainly relate to storm water drainage features that transport water emanating from Amalia township to the Nieuwjaarsspruit;
 - Ensuring adequate surface storm water drainage; and
 - The layout plan makes provision for residential erven of minimum 300m² and an average of 338m².
- ★ **Amalia Extension 5 (southern portion of the proposed township area):**
- Accommodating the road reserve of Road 2013 comprising the southern boundary of the proposed township area. In this regard provision was made for

a road reserve of 25 metres in accordance with the relevant road proclamation notice (Administrators Notice 1465 dated 30 August 1972) (Attached as **Annexure M** to the application for township establishment);

- Addressing the 1:100 year floodline applicable along the Nieuwjaarspruit;
- The layout plan accommodates a 10m building restriction area along Road 2013. As the normal building line along a numbered road usually comprises a width of 16m, the application for township establishment includes an application to the Department of Transport, Roads and Public Works for permission in respect of the relaxation of the building line from 16m to 10m due to the low order of Road 2013;
- Access to the proposed township area from Road 2013 will be restricted to a single access point as reflected on the layout plan;
- Due to the fact that the proposed township area is divorced from the existing urban area of Molatswaneng by the Amalia-Pudimoe railway line, provision was made for a primary school within the proposed township area to limit the movement of people across the railway line;
- As mentioned previously, the layout plan of the township area took into consideration the locality of existing informal housing structures already erected within the development area;
- Provision was also made for a variety of non-residential erven to address the social and economic needs of the concerned community and to ensure that the proposed township area is a truly integrated human settlement;
- The layout plan incorporates a 84,5 m line of no access applicable along the intersection of the street in the proposed township area linking onto Road 2013 (as indicated on the layout plan);
- Due to the locality of the proposed township area adjacent to the Amalia-Pudimoe railway line as well as the fact that the existing railway reserve has not been surveyed and subdivided from the Remaining Extent of Portion 2 of the farm Nieuwjaarsfontein No. 73-HO, the layout plan used the same assumptions employed during the establishment of the adjacent township area of Amalia Extension 4. These assumptions make provision for a railway reserve of 11,8 metres (measured from the centre line of the railway line) with an added 8 metres building restriction area imposed along the fore-mentioned railway reserve, as depicted on the following diagram.

- The layout plan also makes provision for access to the existing urban area of Molatswaneng to be provided through a proposed new level crossing located within the north-western corner of the proposed township area. This access point will be



discussed in greater detail in section 4.3 below;

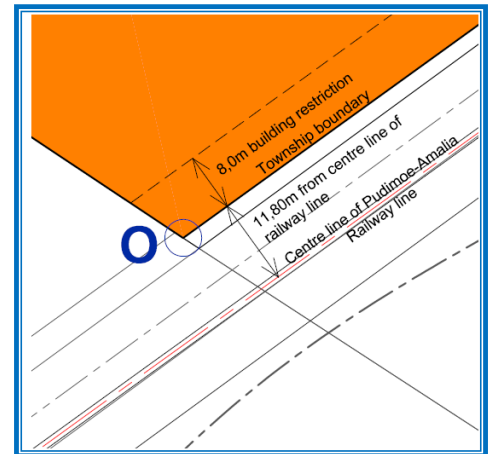
- Ensuring adequate surface storm water drainage; and
- The layout plan makes provision for residential erven of minimum 300m² and an average of 338m².

★ **Amalia Extension 6:**

- The layout plan of the proposed township area was aligned with the street network provided in the adjacent proposed township area of Amalia Extension 5 (specifically where it relates to the existing main access road between Amalia and Molatswaneng township areas);
- Accommodating the road reserve of Road 462 comprising the eastern boundary of the proposed township area. In this regard provision was made for a road reserve of 25 metres in accordance with the relevant road proclamation notice (Administrators Notice 321 dated 10 March 1976) (Attached as **Annexure M** to the application for township establishment);
- Addressing the 1:100 year floodline applicable along the Nieuwjaarspruit;
- Accommodating the existing Mimosa Rural / Amalia 1 22kV feeder traversing the northern portion of the proposed township area from north to south. The power line is currently not protected by a servitude and same will be protected by a servitude that will be registered as integral part of the township establishment process. The registration of a servitude to protect the fore-mentioned power line will be applicable to all erven traversed by the power line;
- A Telkom telephone line is located along the eastern boundary of the proposed township area. This telephone line was accommodated in the layout plan within the building restriction area provided along Road 462;
- The layout plan accommodates a 10m building restriction area along Road 462. As the normal building line along a numbered road usually comprises a width of 16m, the application for township establishment includes an application to the Department of Transport, Roads and Public Works for permission in respect of the relaxation of the building line from 16m to 10m due to the fact that Road 462 currently provides access to the existing township area of Amalia with housing structures already erected along the northern boundary of the fore-mentioned road on erven in the concerned township area;
- A line of no access was introduced along the boundary of the township area bordering onto Road 462;
- The layout plan also accommodates the existing Amalia Community Safety Centre that is located on the adjacent Portion 35 of the farm Nieuwjaarsfontein No. 73-HO and even provides additional space for the future expansion of this facility;
- Due to the presence of two (2) existing cemeteries on the development area, same was accommodated on two (2) proposed "Municipal" erven in the

township area. The size of these erven will also allow for the future expansion of the existing cemeteries;

- The proposed development area is also affected by the existing solid waste site of Amalia. This facility was accommodated on the layout plan and will be located within a proposed “Municipal” erf;
- The layout plan also took cognisance (where possible) of the existing topographical features of the development area. These features mainly relate to storm water drainage features that transport water emanating from Amalia township to the Nieuwjaarspruit;
- Ensuring adequate surface storm water drainage; and
- Due to the locality of the proposed township area adjacent to the Amalia-Pudimoe railway line as well as the fact that the existing railway reserve has not been surveyed and subdivided from the Remaining Extent of Portion 2 of the farm Nieuwjaarsfontein No. 73-HO, the layout plan used the same assumptions employed during the establishment of the adjacent township area of Amalia Extension 4. These assumptions make provision for a railway reserve of 11,8 metres (measured from the centre line of the railway line) with an added 8 metres building restriction area imposed along the fore-mentioned railway reserve, as depicted on the following diagram.



- The layout plan makes provision for residential erven of minimum 300m² and an average of 322m².

4.3 ACCESS

Access to the northern portion of the proposed township area of Amalia Extension 5 will be obtained from Road 462 as well as from the existing two (2) main access roads between Amalia township and Molatswaneng township areas. Road 462 is located along the eastern boundary of the proposed township area and comprises a road reserve width of 25 metres. Access from Road 462 to the proposed township area will be restricted to two (2) proposed new access points, as depicted on the layout plan.



Plate 15: View of Road 462 (south)



Plate 16: View of Road 462 (north)

The layout plan of the proposed township area of Amalia Extension 5 also incorporates the existing two (2) access roads between the township area of Molatswaneng and Amalia.



Plate 17: View of Molatswaneng access road. Plate 18: Amalia access road past Amalia Community Safety Centre

Access to the southern portion of the proposed township area of Amalia Extension 5 will be obtained directly from Road 2013 by means of a single access point onto said road.



Plate 19: View of Road 2013 (south-west). Plate 20: View of Road 2013 (north-east)

Due to the fact that occupation of the southern portion of the proposed township area of Amalia Extension 5 has already taken place, access to this informal settlement from the existing township areas of Amalia/Molatswaneng is obtained by means of an informal level crossing across Erf 917 in the adjacent township area of Amalia Extension 4.



Plate 21: View of existing level crossing across Erf 917, Amalia Extension 4

Due to the fact that this property is currently already privately owned, the application for township establishment proposes a new level crossing within the far western corner of the proposed township area. The establishment of a proper level crossing is of paramount importance to create a linkage between the two township areas and to avoid indiscriminate crossing of the railway line. The position for the new level crossing is

proposed between beacons 188.1 and 188.6 and will be provided across Park Erf 1197 in the adjacent township area of Amalia Extension 4. This erf was initially reserved as a public open space due to the fact that the erf is affected by an existing quarry. Due to the layout of the existing township area of Amalia Extension 4, no other alternative position exists for the possible relocation of the level crossing except the position as mentioned above.



Plate 22: View of quarry area on Erf 1197. Plate 23: View of proposed level crossing

The layout plan of the proposed township Amalia Extension 4 makes provision for the residential access collector road to link with the proposed level crossing from where it will link onto the existing street network in the existing township area of Amalia Extension 4. The provision of a road across Erf 1197, Amalia Extension 4 will require rehabilitation of a portion of the quarry. The proposed linkage of the two (2) township areas across Erf 1197, Amalia Extension 4 is also indicated on the layout plan

Access to the proposed township area of Amalia Extension 6 will be obtained from Road 462 as well as from the existing main access road between Amalia township and Molatswaneng township areas that passes the Amalia Community Safety Centre. Road 462 is located along the eastern boundary of the proposed township area and comprises a road reserve width of 25 metres. Access from Road 462 to the proposed township area will be restricted to two (2) proposed new access points, as depicted on the layout plan.

CHAPTER 5: PROVISION OF ENGINEERING SERVICES

5.1 INTRODUCTION

Moedi Consulting Engineers (Pty) Ltd was appointed to investigate and report on the provision of civil services to the proposed township areas.

The provision of services to the proposed development areas will be addressed as follows:

- Section 5.2: Bulk Services (Civil Engineering Services)
- Section 5.3: Internal Services (Civil Engineering Services)

5.2 BULK SERVICES (CIVIL ENGINEERING SERVICES)

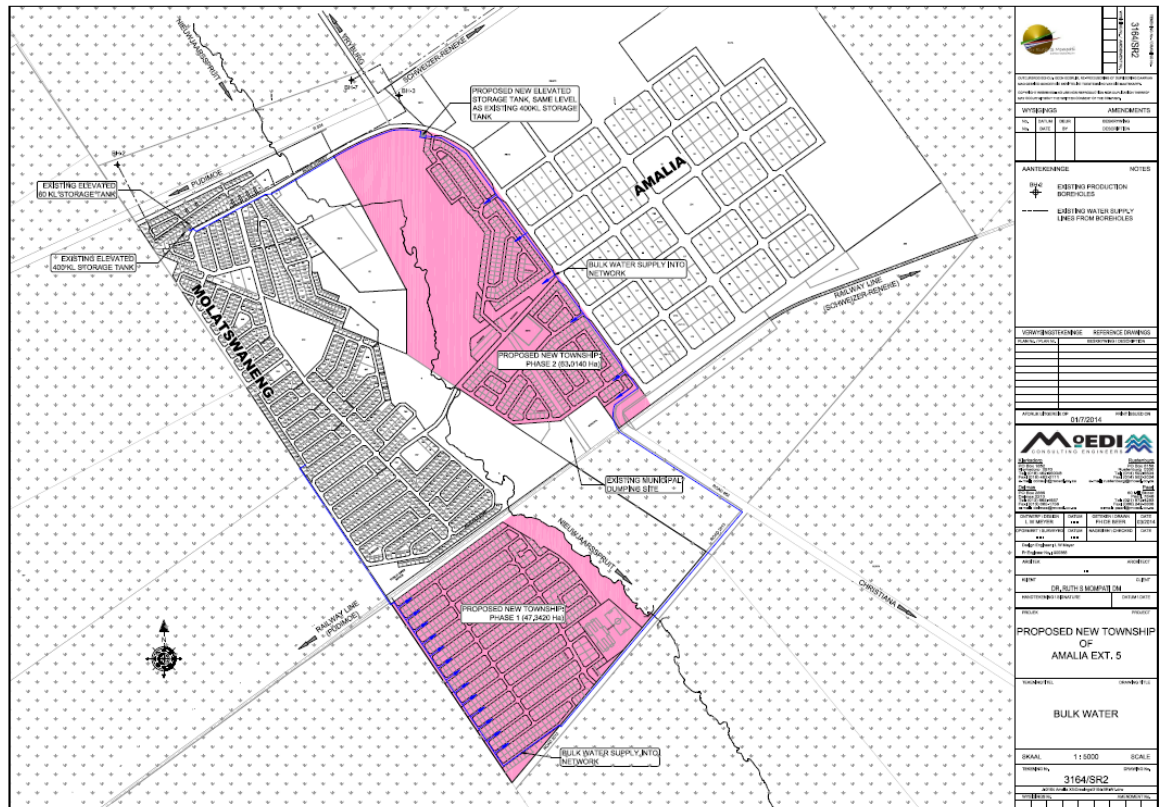
5.2.1 WATER

Potable water for the township of Molatswaneng is obtained from four existing boreholes located on the northern outskirts of Amalia connected to existing 400kℓ and 60kℓ elevated storage tanks on 20m and 15m high stands respectively located in the northern part of Molatswaneng. These boreholes have a reliable yield of approximately 3ℓ/s each. Although there are various other boreholes in and around Molatswaneng, the reliable yield of the boreholes are less than 0,5 ℓ/s each. It is therefore not economically viable to develop these boreholes for the purpose of providing sustainable potable water for human consumption.

Potable water for Amalia town is obtained from various smaller boreholes mostly located on private properties. Water is abstracted either by means of electric pumps or wind mills on each stand. The average yield of the smaller boreholes is 0.5 ℓ/s.

Due to the low yield of the secondary boreholes, it is not economically viable to incorporate such boreholes in a scheme to supply bulk water to the proposed new development. It is therefore proposed that further exploration work be conducted to establish and develop viable boreholes for ground water abstraction to supply the new development.

Such a scheme should incorporate a new elevated storage tank to be constructed on the open portion of land on the southern corner of the intersection between the R504 provincial road and Buite Street as indicated on the following map.



Map 21: Bulk Water

The elevated storage tank should have sufficient capacity to serve both phases of the township. In addition, a qualified geo-hydrologist should be appointed for the investigation, drilling and testing of additional boreholes with a combined yield as determined by the size and demand of the proposed township.

It is further proposed that the new elevated storage tank be installed on the same height and connected to the existing elevated storage tank (400kl) to enable cross supply from all the production boreholes in the area.

A ring feeder should be installed to facilitate sustainable water supply to the existing and proposed new development areas as indicated schematically on Map 22 above showing the layout of proposed bulk water services infrastructure.

5.2.2 SEWER

There is currently no formal water borne sanitation network installed in Molatswaneng. VIP toilets are currently installed on all stands. Tanks are emptied on a regular basis as required and the sewer is transported to and disposed of at oxidation ponds.

An upgrading project to increase the capacity of the oxidation ponds located to the south- east of Amalia town is currently underway. This will enable technical personnel to ensure effective removal of raw sewage from stand tanks while preventing the contamination of surface and/ or ground water resources.

It is reported that the oxidation ponds currently under construction are designed to only accommodate sewage generated by the existing township of Amalia and no provision is made for future development.

Considering the low annual rainfall of the region and related dependence on ground water as well as the natural topography of the area and the location of the proposed township, it is recommended that VIP toilets be installed on each stand to accommodate sewer. Due to the scarcity of water and absence of a formal treatment works in the area, the installation of water borne sewer would not be viable.

In addition, the capacity of the oxidation ponds should be increased to accommodate additional volumes of sewer generated.

Particularly since the community of Amalia is dependent on ground water resources, it goes without saying that comprehensive investigations are to be conducted by specialist geo-hydrological engineering consultants to determine the impact and risk of groundwater contamination before the proposed VIP sanitation system is provided.

5.2.3 ACCESS

Since Phase 1 of the proposed township is bordered to the north-west by the railway line, primary access will be provided via the existing regional road to Christiana (Road 462) located to the north-east of Phase 1. The provision of primary access to Phase 1 should incorporate the design and construction of a bridge across the Nieuwjaarsspruit to ensure the safety of pedestrians and vehicles. Direct access to Phase 1 from the existing Molatswaneng township could be provided across the railway line on the far western corner of the proposed Phase 1 development as indicated on the following map. However, formal approval for such a level crossing will have to be obtained from the rail authority.

expected growth due to additional development, the relocation of the waste disposal site should be considered to accommodate the development of Phase 2.

5.3 INTERNAL SERVICES (CIVIL ENGINEERING SERVICES)

5.3.1 WATER

A complete water network with metered yard connections will be provided to each stand in the proposed township. The network will consist of uPVC pipes of varying diameter and will also include isolating valves, bulk water meters and fire hydrants according to regulations.

5.3.2 SEWER

Refer Section 5.2.2 above

5.3.3 ROADS & STORM WATER

Depending on the availability of funds, the internal roads will initially either be graded or gravelled. Formal construction and surfacing of the primary routes through the township is dependent on the decision of the Local Municipal Council to do so if and when it is regarded as necessary and funding is available.

Storm water will be managed on the surface by means of open drains and outlets which will be incorporated in the road cross-section design. The terrain naturally drains towards the Nieuwjaarsspruit. Concentration of storm water will be avoided.

5.3.4 REFUSE REMOVAL

Refuse removal will be performed by the Local Municipality from designated locations within the township. Household refuse is removed on a weekly basis.

CHAPTER 6: CONCLUSION

From a land use and town planning point of view the proposed development areas are ideally suited for residential purposes due to the following:

- The purpose of the applications for township establishment is to provide sufficient erven within the Amalia/Molatswaneng urban complex to address the short term need for residential erven in order to address existing informal settlement of land and avoid further informal settlement from taking place whilst similarly providing vacant erven to allow for orderly future settlement.

- The proposed development areas are located directly adjacent to existing township areas and constitute the logic extension of the existing built-up urban area of Amalia. In this regard the proposed development constitutes infill development.
- The location of the proposed development areas in relation to the existing township areas of Molatswaneng and Amalia further allows for easy connection to existing services networks in order to service the erven within the proposed township areas.
- The proposed development areas are all further easily accessible due to their location adjacent to existing main access roads servicing the Amalia and Molatswaneng residential areas.
- In addition to the above-mentioned, the proposed developments also comply with the General Principles as set out in the Development Facilitation Act, namely:
 - Policy, administrative practice and laws should provide for urban and rural development and should facilitate the development of formal and informal, existing and new settlements (Principle 3(1)(a);
 - Discouraging the illegal occupation of land (Principle 3(1)(b);
 - Promoting efficient and integrated land development in rural and urban areas in support of each other (Principle 3(1)(c);
 - Promoting the availability of residential and employment opportunities in close proximity to or integrated with each other. This is specifically attained through the process of infilling whilst similarly curbing urban sprawl (Principle 3(1)(c)
 - Discouraging the phenomenon of urban sprawl (Principle 3(1)(c)
 - Contributing to the correction of historically distorted spatial patterns of settlement in the Republic and to the optimum use of existing infrastructure in excess of current demands (Principle 3(1)(c);
 - Affording members of communities affected by land development to actively participate in the process. The township establishment process as well as the Environmental Impact Assessment processes provide these opportunities (Principle 3(1)(d);
 - Principle 3(1)(h) calls for policy, administrative practice and laws to promote sustainable land development at the required scale in that they promote land development which is within the fiscal, institutional and administrative means of the Republic, promote the establishment of viable communities, promote sustainable protection of the environment, meeting the basic needs of all citizens in an affordable way and ensuring the safe utilisation of land by taking into consideration factors such as geological formations and hazardous undermined areas.
 - This process of township establishment also aims at promoting the speedy development of land (Principle 3(1)(i); and
 - The applications for township establishment similarly aim at ensuring security of tenure specifically for the landless community of Amalia.

In view of the fore-mentioned, we trust that this application will be considered favourably.

K. RAUBENHEIMER

Pr. PIn A/924/1996