

Our Ref: 400360/11/05/DB/db/02

14 June 2012

Your Ref: ECm1/LN2/M/10-88

**DEPARTMENT OF ECONOMIC DEVELOPMENT, ENVIRONMENTAL AFFAIRS AND
TOURISM: CACADU REGION**

Private Bag X 5001

GREENACRES

6057

ATT: MS. NICOLE GERBER

**RE: PROPOSED CONSTRUCTION OF REDHOUSE CHELSEA ARTERIAL AND
EXTENSION OF WALKER DRIVE, PORT ELIZABETH, WITHIN THE NELSON
MANDELA BAY MUNICIPAL AREA: DESKTOP ASSESSMENT AND ROUTE
DETERMINATION FROM WALKER DRIVE TO KRAGGA KAMMA ROAD**

With reference to your correspondence dated 10 February 2012, and the discussions between the Nelson Mandela Bay Municipality (NMBM) and the Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) at the Bilateral Meeting between the two institutions on 25 May 2012. This document has been prepared as a response to the above-mentioned correspondence and is therefore submitted as an addendum to the final Environmental Impact Report that was submitted to DEDEAT (on 18 May 2012). The purpose of this report is to consider the route determination of the subsequent phases. Input has been provided by Terratest, NMBM and BKS Engineers.

We, as Terratest (Pty) Ltd, acknowledged the comments that were made by DEDEAT, in which they require the route determination of subsequent phases to be considered in the current EIR. This is owing to the fact that future decisions taken on EIAs for the subsequent phases could be deemed to be incremental decision making. We, however, have stated that our appointment and Scope of Works from the Client (NMBM) was only limited to undertake EIA studies for the Redhouse Chelsea Arterial and Walker Drive extension (as detailed in the final EIR dated May 2012). The comments received then from DEDEAT were submitted to our Client and BKS Engineers, who are project engineers, and then had to wait for a decision from the NMBM regarding the way forward.

The NMBM has deliberated this within its internal Directorates and they requested that Terratest submit a response letter on their behalf. This letter was submitted to DEDEAT on the 15 May 2012. This was deemed not to be adequate information in the afore-mentioned Bilateral meeting between the NMBM and DEDEAT, and therefore the following report is submitted for DEDEAT approval.

1. REDHOUSE CHELSEA ARTERIAL LONG TERM PLANS

Road planning in the greater Port Elizabeth included for many years a north/south arterial (generally referred to as the Redhouse Chelsea Arterial) in the western part of the city from Stanford Road in Bethelsdorp, southwards through Hunters Retreat and past Sherwood to link with Kragga Kamma Road and eventually an extended Montmedy Road to the southwest of Lorraine. The NMBM Comprehensive Integrated Transport Plan (CITP) includes the Redhouse Chelsea Arterial and parts of the road have been constructed at this stage, e.g. the section known as Bishops Way in the Hunters Retreat area. Allowance was made in the town planning scheme for the road reserve required for various sections of this road, also where it crosses the N2, and recent planning shows a revised alignment in the vicinity of the N2.

The provision of the Redhouse Chelsea Arterial in the CITP allows for the linking with an extended Walker Drive, which will be extended westwards to link with an existing road overpass on the N2 freeway.

Both the current NMBM's CITP and Transportation study for the Western Suburbs' Local Spatial Development Framework (LSDF) of March 2009 made provision for the construction of Redhouse Chelsea Arterial (linking Cape Road with Kragga Kamma Road and the future Fairview Arterial (Montmedy Road) and Walker Drive Extension (linking Walker Drive across the N2 with Mission Road just north of the Kuyga residential area). See attached **Appendix A**

Based on the abovementioned 2009 transportation study, it was resolved that a phased implementation of the Redhouse Chelsea Arterial be carried out as follows:

- a)** Phase 1: Section from Cape Road to Walker Drive. This road is to be implemented immediately.
- b)** Phase 2: Section Walker Drive to Kragga Kamma Road. This section will only be possibly implemented after 2020. At that time a new traffic study will be conducted to review the traffic situation and future projections for the area and inter alia determine the necessity for implementing this section of the road.

See attached **Appendix B** - Layout Plan (Figure 5A Revision 00)

There were initially three phases to the Arterial. The portion that links up with Bloemendal was identified as impacting on extremely environmentally sensitive areas and therefore this phase has subsequently been abandoned as per the Environmental Management Framework (EMF) recommendations.

The Redhouse Chelsea Arterial will in the long term be extended southwards from Walker Drive to Kragga Kamma and eventually to Montmedy Road, but only when there is a need for its implementation in terms of traffic demand as explained above. As stated above, a section from Walker Drive Extension to Kragga Kamma Road (and beyond) is not part of the detailed engineering and environmental studies currently being carried out by NMBM. The NMBM has not budgeted for this phase of the road and hence our appointment, as well that of BKS, was only limited to immediate phase of development. Therefore this will have to be subjected to a future separate environmental assessment. However it is important to mention that the necessity of providing the section of road is not a certainty, this will only be determined post 2020.

The purpose of this report is to highlight the significant biophysical impacts, both positive and negative, and also cumulative impacts that may result from the proposed development of the future route to Kragga Kamma Road only. This Desktop Report is submitted as a response and an addendum in support of an Application for Authorisation and Environmental Impact Report, submitted to the Department of Economic Development and Environmental Affairs in terms of National Environmental Management Act (Act no. 107 of 1998), and as requested by the DEDEAT in a letter dated 10 February 2012.

2. SCOPING AND ROUTE DETERMINATION

A site visit was undertaken on the 05th of June 2012 in order to assess the route determination of the future phases as requested by DEDEAT. Representatives that undertook the site visit are as follows:

- Dumisani Bokveldt (Terratest – EAP)
- Jill Miller (NMBM – Environmental Management)
- Abigail Kamineth (NMBM – Environmental Management)
- Wesley Berrington (NMBM – NMBM Environmental Management)
- Luvuyo Ntshebe (NMBM – Roads, Stormwater and Transportation)
- Florence Nakamya (NMBM – Roads, Stormwater and Transportation)
- Retha Esterhuizen (BKS – Project Engineers)

2.1 SITE DESCRIPTION

2.1.1 Vegetation

The road traverses an area identified and described in the Nelson Mandela Bay Metropolitan Open Space System (NM MOSS) as the Rowallan Park and Colleen Glen Grassy Fynbos. On a fine scale inspection, the vegetation on site is described as Lorraine Transitional Grassy Fynbos. This fine scale vegetation type is a mosaic and merging of other described vegetation types. The landscape is made up of calcareous sandstone / sand with poor drainage. Quartzitic conglomerate soils with sandstone “rocky outcrops” form low elevations extruding the sandy soils.

The first portion of the roadway (ahead of Walker Drive) that we inspected was made up of sandy aeolianite soils covered in grassy vegetation with low species diversity. Poor drainage has created these conditions. The vegetation has been invaded with alien plant species such as *Acacia saligna* and *A. mearnsii*. It is my opinion that the natural vegetation would persist if sensitive construction were to pass through it.

After passing over the sandy soils, the stable quartzitic soil type with emerging rock outcrops was encountered. Few alien plants were present on these soils and a true grassy fynbos vegetation was encountered. This area of merging soil / vegetation types with these emerging rocky outcrops is the last remaining habitat for two Critically Endangered (CE) plant species. They are *Agathosma gonaquensis* and *Corpuscularia lehmanii*. A population of +- 100 *Agathosma* and a small group of *Corpuscularia* were seen. (As seen in **Appendix C** – site photographs)

The suggested road development would dissect this stable area and create two distinct islands of this vegetation on either side of the road. The road has been revised not to divide this area but to pass by on the northern side of it. This may affect the pollination ecology necessary to maintain the CE plants. Sensitive forward planning will have to be done so as to maintain a sensitive ecological system. It would be least destructive to create a road through the sandy / grass dominated area which can be easily recognized by the alien vegetation domination on the site.

NM MOSS

The main biodiversity features that stand out is the fact that it forms part of a Critical Biodiversity Area (CBA) and crosses a drainage line of the Baakens, which is the Klein Kabega. The vegetation types on site are described as Vulnerable Rowallan Park Grassy Fynbos and Critically Endangered Colleen Glen Grassy Fynbos.

The main vegetation type affected by Phase 2 of Redhouse Chelsea Arterial is Rowallan Park Grassy Fynbos. Only a small portion of Colleen Glen Grassy Fynbos will be affected. (See attached MOSS layout – **Appendix D**). The MOSS highlights a broader overview of ecological features, of which the field investigation identifies fine scale features.

2.1.2 Rock Refugia

Rocky Refugia (rocky outcrops) tend to form distinct habitat islands in a matrix of the more widespread Grassy Fynbos vegetation where underlying bedrock is exposed at the surface, more prevalent on the higher lying areas running as bands across the site, but also exposed throughout the area where they are near the surface. *Metalsia aurea*, a typical Grassy Fynbos species, is a good indicator and tends to be abundant surrounding the outcrops.

Rocky outcrops tend to provide refugia for species not commonly found in the surrounding vegetation mosaic and they tend to be adapted to habitats where soils are shallow and fire tends to be excluded. Whereas fire is an important ecological factor in typical fynbos vegetation, rocky outcrops tend to have a shallow soil, which excludes many of the more combustible fynbos shrubs and grasses and succulent species are favoured.

2.1.3 Fauna

The fauna found in the area possibly includes domestic livestock as well as small indigenous wildlife. The proximity to human settlements has unfortunately done nothing to encourage natural fauna. Indigenous wildlife found in the study area is therefore limited and probably restricted to reptiles and rodents.

2.1.4 Natural and Cultural Heritage

The study area was not found to contain any areas of natural and cultural significance; however the South African Heritage Resources Association (SAHRA) has to be registered as an Interested and Affected Party in this regard, when an EIA is being undertaken. No gravesites and sites of heritage importance were found or seen in the vicinity of the proposed routes.

2.1.5 Water Courses

The Klein Kabega drainage system is a tributary to the Baakens River and is a long stable wetland / filter / sponge, dominated by *Phragmites* reeds. The road development is planned to traverse this wetland. An inspection of this wetland revealed a stable healthy ecosystem with the edges being invaded by alien trees.

2.2 POSSIBLE ALTERNATIVE ROUTES

All the alternatives were evaluated in terms of site layout and location and compared in terms of all potential biophysical impacts, both positive and negative as well as effectiveness of mitigation measures. The principles of sustainability in terms of NEMA were also considered during route selection. Three (3) route alternatives and a 'no-go' option will have to be or are likely to be considered. Consideration is also to be given to the technical feasibility as well as minimising potential impacts to the environment and local communities.

The three possible alternatives that were identified on site for the Redhouse Chelsea Arterial extending from the Walker Drive intersection and ending at an intersection with Kragga Kamma Road are as shown in the attached Layout (**Appendix E – Fig 5A Revision 2**).

- The 1st alternative would be the original route alignment as indicated by the LSDF (from Point C at the extended Walker Drive southwards to Kragga Kamma Road).
- The 2nd alternative option is to align the route between Walker Drive and the Klein Kabega water course more to the north and closer to the alien vegetation. This alignment will then tie in with the LSDF alignment just after the crossing of the Klein Kabega water course.
- The 3rd alternative option is to upgrade Walker Drive between Point C and B to form part of this major arterial route, and then continue the alignment from Point B southwards along the original road reserve that has been allocated for this route. This option then also ties in with the LSDF alignment just after crossing the Klein Kabega water course.

NO-GO ALTERNATIVE	ALTERNATIVE 1 (LSDF Alignment)	ALTERNATIVE 2	ALTERNATIVE 3
Advantages			
<ul style="list-style-type: none"> No environmental impacts. 	<ul style="list-style-type: none"> Access to the N2 and Cape Rd provided to the area. Major job creation opportunities during the construction phase. Best geometric alignment for a major arterial road. 	<ul style="list-style-type: none"> Access to the N2 and Cape Rd provided to the area. Major job creation opportunities during the construction phase. Crossing the Klein Kabega water course at the optimum position. No impact on rocky outcrops which is situated to the area south west of this alignment. Very good geometrical alignment for a major arterial road without compromising the safety of the road user. 	<ul style="list-style-type: none"> Access to the N2 and Cape Rd provided to the area. Major job creation opportunities during the construction phase. Location of the proposed road is within the originally allocated road reserve provided for the facility. Crossing the Klein Kabega water course at the optimum position. No impact on rocky outcrops which is situated to the area south west of this alignment.
Disadvantages			
<ul style="list-style-type: none"> Does not allow this new road network for developments in the area to have interchange at this location which will enable linking of Kragga Kamma with Walker Drive, Cape Road and the N2. Lack of job creation opportunities for the local labour. 	<ul style="list-style-type: none"> Large impact on rocky outcrops visible along the entire alignment. Crossing the Klein Kabega water course not at the optimum position. 	<ul style="list-style-type: none"> Impact on small area of Fynbos vegetation 	<ul style="list-style-type: none"> Portion of Walker Drive must be upgraded to a major arterial road. Alignment of the road within ecological and riparian process areas The encounter of two major intersections where the route will have a 90 degree change in direction will have a negative impact on the traffic flow and level of service of the road.

2.3 IMPACT ASSESSMENT

This section investigates the likely biophysical and impacts and benefits, which may arise from the proposed construction of Redhouse Chelsea Arterial from the extended Walker Drive to Kragga Kamma Road. The impact of the construction of road and associated infrastructure is assessed according to a number of criteria to arrive at an overall significance rating. The criteria used are as follows:

Intensity

- Low** – Ecological functions may continue undisturbed, No rare or endangered species affected, No objection from IAPs
- Medium** – Ecological functioning temporary affected, No rare or endangered species affected, some concern from IAPs.
- High** – Ecological functioning permanently altered. Rare or endangered species impacted. Major concern from IAPs

Duration

- Short term** – Less than the duration of the activity
- Medium Term** – Impact persists until activity ceases
- Permanent** – Impact is permanent

Spatial Scale

- Site** – Immediate area of impact
- Local** – Area within 20km of proposed site
- Regional** – Entire Nelson Mandela Bay Metro

Probability

- Low** – Unlikely
- Medium** – Possible
- High** – Likely
- D** – Definite

A summary of the potential impacts related to the proposed activity is provided in the table overleaf. These impacts will have to be further investigated as part of an Environmental Assessment that would be undertaken for the proposed route.

Table 1. Summary of Impacts

Ref Below	Environment	Description of potential environmental impact	Criteria					Significance	
			Intensity	Spatial	Scale	Duration	Probability	With mitigation	Without mitigation
2.3.1	Soils	The exposure of soils to the threat of erosion through the removal of vegetation cover	M	S	P	H	M	H	
2.3.2	Water Courses	The impact of construction on water quality of rivers and streams, through erosion and subsequent siltation.	H	L	P	H	M	H	
2.3.3	Geology	The impact of construction on geology.	L	S	ST	L	L	L	
2.3.4	Air Quality	The impact of construction on air quality including dust generation	L	S	ST	M	L	M	
2.3.5	Indigenous vegetation and endangered plant species	The impact on indigenous vegetation and/or rare or protected plant species.	H	S	P	H	M	H	
2.3.6	Alien Vegetation	The impact of construction on the spread of alien and invasive vegetation.	M	S	ST	H	L	M	
2.3.7	Fauna	The impact on animal habitat and therefore species diversity and density	H	S	MT	H	L	L	
2.3.8	Natural Heritage	The impact on natural heritage resources such as old buildings, graves and other sites of significance.	L	L	P	M	L	L	
2.3.9	Aesthetics/ Visual impact.	The impact of the new road developments on the aesthetics of the area	M	L	P	D	M	M	
2.3.10	Land-use and capability	The impact on current land use and future land capability.	L	L	P	M	M	M	
2.3.11	Socio-economic structure	The impact of road network provision for the locals on the socio-economic structure of the region.	L	L	P	H	M	H	

2.4 SUMMARY OF IMPACTS AND MITIGATIONS MEASURES

2.4.1 Soils

Soils will be affected by the activities involved in a project of this nature as major earthworks are expected during the construction phase of the project. Threats to the soil environment also include compaction, contamination and exposure to wind and water erosion. The impact on soils, only on the footprint of the road structures, is however considered minimal (low) if the following mitigation measures are implemented.

Mitigation Measures

- Contractors are to keep within the proposed route at all times and to use all existing access roads where possible;
- In the event of material removed during construction, whether being excessive after backfilling or being unsuitable or as overburden, the excess material must be removed from the construction site to a suitable site agreed upon by the Local Authority (Nelson Mandela Bay Municipality);
- Should the construction area show signs of no rehabilitation, additional plant material (preferably grass) must be planted along the disturbed areas;
- The site should be monitored during the regular maintenance program to ensure that no erosion occurs and that no alien vegetation is allowed to spread into the area;
- The previously stockpiled topsoil must be spread over the backfilled trenched areas and the indigenous pioneer species must be allowed to establish themselves;
- Any embankments must be suitably sloped and compacted to promote runoff, as per measures outlined in SABS 1200. Embankments must be hydroseeded with an appropriate seed mix, to be provided by the developer, and monitored after a complete cycle of the rainy season to ensure that the vegetation is well established;
- Stockpiles must not exceed 1,5m in height.

2.4.2 Water Courses

As mentioned in this report, the road will cross over the Baakens River tributary, namely Klein Kabega. Crossings over water courses and streams must be carefully designed so as not to impede water flow or pollute drainage areas during construction. Wherever possible, structures for bridges are to be located on high ground to avoid the potential flood impacts and erosion of stream banks. The impact of the proposed construction of the road on water courses is thus considered to be high.

The crossing point of the Klein Kabega water course is at a point where the flow is identified by low velocity sheet flow over a wide area. The area occurs to be a permanent natural wetland. The structure crossing the water course will have to provide a wide area for water to flow through but not necessarily a very high structure as the flow velocity that will occur is not very high. An example of the type of structure that can be constructed over this water course can be seen further downstream, approximately 540m eastwards where Devon Road crosses the Klein Kabega water course. The causeway development should prevent any habitat loss or negative impacts to the Endangered Red Fin Minnow (*Barbus affer*). It is not likely to be in that section of river, but any downstream effects should be avoided. This fish is a sensitive indicator of water quality.

The potential of ground water pollution via contamination surface water infiltration is a possible impact of the proposed development. Surface water contaminants can end up in the groundwater zone via infiltration. Therefore, surface water management (particularly stormwater) is concurrent with the prevention of groundwater pollution. Ground and surface water protection should be made a management concern for the total development. Mitigation measures will reduce the significance of the impact during construction to medium.

Mitigation Measures

- Minimise vegetation cover removal in construction areas;
- Initiate immediate re-planting after construction is completed to minimise any excess runoff;
- Ensure all construction equipment is free of leaks from oil and fuels. Refuelling of vehicles must only occur within the confines of the site camp;
- Adequate storm water control mechanisms must be in place;

2.4.3 Geology

Excavations will be required for the erection of the support structures in the bridge/culvert structure over the Klein Kabega. The impact of the road network on the surrounding geology is therefore considered to be insignificant.

2.4.4 Air Quality

During the construction phase of the activity, air quality will be affected through dust generation associated with the construction works. Air quality will also be affected by exhaust emissions from vehicles and equipment. However, with mitigation measures in place, the impact of the construction of the roads is considered negligible.

Mitigation Measures

- All construction vehicles and plant must be fitted with silencer and exhaust systems;
- Hours of operation must be confined to the normal daily operational hours;
- Regular spraying of stockpiles and exposed soil with water will significantly reduce the dust problem on the site.

2.4.5 Indigenous Vegetation and the Impact on Rare and Endangered Species

The clearing requirements of the roads will be limited by the choice in route of the proposed new road. This might ensure substantially less damage to the existing vegetation through clearing requirements. It will also mean that less soil will be exposed. Critically Endangered plant species (*i.e. Agathosma gonaquensis* and *Corpuscularia lehmanii*) were encountered during the site investigation along the proposed route, and these will require protection and/or relocation during construction.

Mitigation Measures:

- No clearing of indigenous permitted species to occur without the necessary permits.
- Fencing of “no-go” areas to protect the Critically Endangered plant species
- Plant search and rescue to be undertaken prior to construction.

2.4.6 Alien Invasive Vegetation

Alien invasive vegetation infestation will want to increase after removal of indigenous vegetation. Disturbance and exposure of soil facilitates the establishment of alien invasive plants, which often become difficult to control once established without competition. Alien invasive plant management must occur for a minimum of two years after the completion of the construction phase, in order to facilitate the re-establishment of indigenous vegetation.

Mitigation Measures

An ongoing maintenance of the site must include alien plant management.

2.4.7 Fauna

Habitat destruction will be limited to the road servitude only. Any threatened or endangered fauna located during construction must be unharmed and removed to an undisturbed section within the area, or the environmental consultants alerted. During field investigation there were no endangered fauna identified on site.

2.4.8 Natural and Cultural Heritage

By visual assessment, the study area was not found to contain any areas of cultural significance. No gravesites or sites of heritage importance were found in the vicinity of the proposed works, however SAHRA must be registered as an Interested and Affected Party in this regard and any assessment done on site must be made available for them to review and comment on. Where bush clearing takes place however, the contractors must pay particular attention to the extracted soil and soil profiles, informing the environmental consultants immediately if any historical or cultural artefacts are unearthed. Archaeological consultants will then be contacted by the environmental consultants or project manager.

2.4.9 Aesthetics

By virtue of their size and height, arterial roads are known to have a large impact on aesthetics of an area. Areas where the roads will have the most visual impact will be where there are bridge structures and slope infill. The road network will be visible along the N2 road and the surrounding residential areas. This situation will be exacerbated due to the removal of the occurring alien invasive plants exposing the roads and the structures.

During the construction phase, the exposure of soil and earth-moving machinery will have a noticeable visual impact. The nature of the new roads will also have a permanent impact on the aesthetic of the site. Upon construction completion, however, a re-vegetation initiative will serve to somewhat improve upon the general loss of aesthetics.

Mitigation Measures

- Areas affected by construction works must be covered with topsoil as soon as possible.
- All construction debris must be cleared as soon as works are complete.
- Re-vegetation by hydro seeding must be implemented and monitored.

2.4.10 Socio-Economic Structure

The road would have positive impacts on the social and economic profile of the area. The socio-economic benefits of having safe and reliable road network for the area might outweigh the environmental impacts that the development may impose, subject to an EIA conducted on site. From an employment perspective, the proposed works will employ a number of people from the local communities during the construction phase. The construction phase of the activity might be a labour intensive process, and it is an objective would be to develop the skills of the workers/residents within and around the study area and thus their employment potential will increase.

2.4.11 Land-use and Capability

By upgrading and improving the road network and access to the N2 and Cape Road, the proposed roads will have a positive impact on residents of the area.

2.4.12 Waste Management

Waste will be generated during the construction phase of the development. During the operational phase, waste management will pertain to proper disposal of waste collected along the road and in litter traps in the storm water system.

Mitigation

- No dumping to be allowed during the construction phase, care must be taken of removing all rubble on completion of the construction phase;
- Ensure availability of bins during the construction phase;
- If any soil is contaminated by cement or fuel for example, it must be disposed of in a registered waste facility;
- All construction waste that cannot be re-used must be deposited at a registered waste facility.

2.5 CONCLUSION

This document is submitted as a response to a DEDEAT query, dated 10 February 2012, on the route determination of the subsequent phases of the Redhouse Chelsea Arterial, and therefore it is an addendum to the Final Environmental Impact Assessment submitted to DEDEA in May 2012. This report is an assessment of the future route from Walker Drive to Kragga Kamma, as identified in the NMBM CITP. Fatal flaws that have been identified as a result of the route “walk-over” can be described as follows:

- The location of rocky outcrops within the original LSDF alignment
- Impact on Critically Endangered Plant Species as occurring in the Fynbos vegetation
- Impact on Klein Kageba wetland and river system

The route determination though would need to be subjected to an Environmental Impact Assessment that would have a thorough investigation of issues identified in this report. Possible options (alternatives) and mitigation measures have been suggested in this report, in dealing with the identified fatal flaws. The EIA will possibly be undertaken when the NMBM is ready to implement this section of road.

I trust that the above is in order.

Yours Faithfully

DUMISANI BOKVELDT Pr Sci Nat

for: **TERRATEST (Pty) Ltd**

APPENDIX A

NMBM LONG TERM ROAD NETWORK

APPENDIX B

LSDF ALIGNMENT

APPENDIX C

PHOTOGRAPHS

APPENDIX D

NM MOSS LAYOUT

APPENDIX E

ROUTE ALTERNATIVES