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Dear Katherine

VEGETATION ASSESSMENT FOR PROPOSED RESERVOIR INFRASTRUCTURE AT WEST RIDING

1. Introduction

I have been asked to investigate vegetation along the route of a proposed pipeline in the area of West Riding, inland of Durban. This will involve laying of approximately four km of a 500 mm diameter steel pipe alongside roads to an inlet point at a reservoir. A map showing the proposed layout of the infrastructure is attached to this report as Appendix 1. Terms of reference provided for the investigation and report are as follows:

- Map the broad vegetation communities/habitats affected by the proposed activity and confirm the presence and/or assess the likelihood of occurrence of protected and red data floral species within these communities/habitats.
- Provide a description on the composition and integrity of the vegetation communities/habitats identified.
- Determine the conservation importance of the mapped vegetation communities/habitats in terms of the maintenance of local and municipal floral biodiversity.
- Identify and describe the potential impacts to be imparted on the mapped floral habitats and noteworthy flora resulting from the proposed activity.
- Provide mitigation measures to avoid, minimise, repair and/or offset the severity/magnitude of the potential impacts on the mapped communities/habitats and noteworthy flora and fauna.

2. Vegetation classification

The national vegetation classification and map for South Africa by Mucina & Rutherford (2006) identifies the route as occurring within the KwaZulu-Natal Sandstone Sourveld, a grassland type that is assessed as Endangered. KwaZulu-Natal Sandstone Sourveld is now formally recognized as a listed Endangered ecosystem (SANBI 2009). However, the route passes through an area that for the greatest part comprises dense residential and suburban development, and although there are smaller areas of open space that are also transformed, vegetation is so altered it cannot be plausibly interpreted to be KwaZulu-Natal Sandstone

Sourveld, or in fact any other formally recognized vegetation type. As a result, it is also not possible to map the vegetation along the route to discrete vegetation types or components, except for identifying areas of transformed open space in Appendix 1.

3. Field observations

Vegetation on the route was investigated by way of a reconnaissance approach on 15 August 2014. This involved observations by vehicle and on foot, during which notes, GPS positions and photographs were taken. More detailed mapping of positions of protected plants was carried out on 19 September 2014. A map of sensitivities along the route is also included in Appendix 1 with GPS positions of these sensitivities provided in Appendix 2. This report is short, for reasons that emerge from the following observations:

- Nearly all vegetation along the route is transformed and none is in natural state. The great majority of the route passes along mown or cultivated verges along which there is contiguous suburban development. Vegetation that may be affected by construction in this area comprises only garden plantings, garden escapes, alien plants and occasional indigenous trees. The small number of scattered indigenous trees have either been planted, have established by chance distribution of seeds, or in a few cases could be remnants of the original vegetation. There is no indigenous herbaceous component in this habitat except for garden plantings or weeds of disturbance.

The scope of work did not extend to identifying and listing every garden ornamental that has been planted through the four km of suburban verges, as this could not be accomplished in the time allowed. Instead only indigenous plants and alien species are recorded. These are listed in Appendix 3.

- Amongst the plantings on verges and fence lines are a small number of species that while planted in gardens, are protected by the National Forests Act or the provincial conservation ordinance. These are discussed under this heading further below. A schedule of GPS positions at which protected species occur is attached as Appendix 2.
- Apart from road verges comprised of garden plants, escapes, aliens and some common indigenous trees, there are small areas that are not in this category. This is other open space that has not been developed. There are four of these areas, which are shown in Appendix 1. These areas are also transformed or severely degraded. They are invaded by alien plants and apart from these only common pioneer or ruderal indigenous plants occur, although one of these is protected by the provincial conservation ordinance. These areas are also discussed under a separate heading below.

4. Suburban road verges

The only sensitivities along mown road verges, in which garden plants, escapes, aliens or common indigenous trees occur are a small range of planted protected species, as follows.

4.1 National Forests Act

- At one point a homeowner has planted a single *Podocarpus henkellii* (Henkel's or Drooping-leaf Yellowwood) tree on the verge, at a second point a mixed row of small *Podocarpus henkellii* and *Podocarpus latifolius* (Real Yellowwood) have been recently planted on the verge side of a fence line, and at a third point two larger *Podocarpus henkellii* trees have been planted.
- At another point a homeowner has planted a *Barringtonia racemosa* (Powder-puff Tree) tree on a verge.

All these three species are protected by the National Forests Act and may not be damaged or destroyed without permit authorization from the national Department of Agriculture, Forestry and Fisheries (DAFF). Except for *Podocarpus latifolius*, these species do not occur naturally on the Durban escarpment. *Podocarpus henkellii* is a species of Southern Mistbelt Forest (Mucina & Rutherford 2006) of the midlands and upland parts of KwaZulu-Natal and the contiguous Eastern Cape province, while *Barringtonia racemosa* is a species confined to freshwater parts of coastal estuaries, sometimes extending along watercourses or occurring in Swamp Forest, but then only a few kilometres inland. *Podocarpus henkellii* and *Podocarpus latifolius* are fairly common garden subjects, while *Barringtonia racemosa* is more occasionally seen in coastal and semi-coastal gardens. Neither of these trees, in spite of their protected status, is rare or Red Listed (Raimondo et al 2009).

The following plants have been planted in many places on road verges along the route and are protected by the provincial conservation ordinance.

- Aloes are popular garden subjects and various aloe species have been planted in gardens and along road verges by homeowners. The species involved on road verges are as follows: *Aloe arborescens* (Krantz Aloe, most common), *Aloe barberae* (Tree Aloe, next most common), *Aloe ferox* (Bitter Aloe, uncommon), and *Aloe* cf. *tenuior* (at one locality, plants not in flower). *Aloe rupestris* and *Aloe vanbalenii* possibly occur in small numbers (although a few plants have the forms of these species, flowering needed to confirm as hybrids are fairly often seen in horticulture). These species are not rare or threatened, although *Aloe barberae* is uncommonly encountered in the wild. However, all these species are common garden or landscaping subjects. These plants are protected because all aloes are protected by the provincial conservation ordinance. Even though this seems unnecessary in the case of a genus that is commonly encountered in the wild, this was presumably done on a blanket basis because some species are rare and the genus is targeted by collectors or stripped out of the wild by landscapers, and some species cannot be readily distinguished from other by non-specialist conservation or law enforcement officers.
- *Dietes grandiflora*. This member of the Iridaceae or iris family is a very popular garden subject, and a staple in gardens and landscaped settings in South Africa and even beyond. It is typically planted *en masse* in beds, being utilized even by those who have no interest in indigenous plants. It is a common species in forest and wooded habitats in eastern South Africa. It is not threatened or Red Listed. However, the provincial conservation records that all Iridaceae are protected even though only *Dierama* is specifically mentioned. The dates taxonomy in the

ordinance means consultation with Ezemvelo KwaZulu-Natal Wildlife is needed to confirm whether *Dietes* is also considered protected.

- 3 *Kniphofia* plants have been planted in two places on fence lines/property entrances. These are possibly hybrids as plants available in horticulture are often of mixed origin.
- A single *Scadoxus puniceus* plant was seen in one of the rows of *Dietes grandiflora* plants planted on a fence line. It could not be ascertained if this had been planted or had grown up naturally.

Families, genera and species protected by the provincial conservation ordinance may not be damaged or destroyed without permit authorization from the provincial conservation authority, Ezemvelo KwaZulu-Natal Wildlife. However, given that common species are involved that have been planted in garden or near-garden situations, a permit may be waived in this case. Consultation will be needed with Ezemvelo KwaZulu-Natal Wildlife to determine if this will be so.

As noted, approximate GPS positions for protected species on the route are provided in Appendix 2. However, not enough resolution has been provided as to which side of the road the route will proceed and the exact position and size of the construction footprint. It may be then that most or all of these occurrences are avoided by construction and permits are unnecessary. Many and even most of these plants are planted close to the verge side of fence lines and do not extend far into the verge.

DAFF will probably require a permit irrespective of whether or not trees are planted, are common or are in garden or near-garden situations. If permits are required species protected by the provincial conservation ordinance can be relocated or new examples of the same species can be obtained from horticulture to replace those as necessary. Except for one locality at which smaller trees have been more recently planted, relocation of the trees would be difficult and apart from the effort and expense involved carries high risk of mortality or enduring ill health. A more feasible solution in the opinion of the author is obtaining good sized specimens in bags from horticulture to be used as replacements.

5. Open space areas

The four open space areas along the route that do not comprise gardened or lawn-like road verges are shown from east to west, as polygons P1 to P4 in Appendix 1.

P1

This area comprises an open space area bisected by a drainage line. It cannot fairly be described as grassland although it probably once was. It has now been converted into a lawn-like expanse probably as a result of years of close and regular mowing, and had been mown when seen during this survey. As a result, except for a few weeds of disturbance, herbs are absent. The drainage line is incised and an existing pipeline passes across it close to the road. It appears as if in addition to mowing of the more level areas, the drainage line is also regularly brush-cut. As a result very little plant diversity persists within it. Two trees occur next to the pipeline, namely a small *Ficis sur* (Broom Cluster Fig) and a large *Syzygium*

cordatum (Umdoni). Although neither is rare or protected, due to ecological value these trees should be avoided if at all possible, although probably away from the path of construction.

P2

P3 is an area of open space that was probably once grassland, but which has now become extensively invaded by alien species (including some lesser known species and garden escapes) together with some woody pioneers such as *Maesa lanceolata* (False Assegai). Close to the road verge there is a dense infestation of *Rubus* (Bramble), not in flower and not identified to species. However, amongst the *Rubus* infestation are large numbers of *Aristea ecklonii* plants and a smaller number of *Aristea* plants amongst grass in the verge. As this species is a member of the Iridaceae, if plants are to be damaged or destroyed consultation is needed with Ezemvelo KwaZulu-Natal Wildlife to establish if a permit will be required. However, *Aristea ecklonii* is in the experience of the author a common and widespread species in KwaZulu-Natal. It is something of a ruderal, with a preference for disturbed or scrubby grassland and grassland-woody vegetation ecotones. As a result plants are not conservation significant. *Aristea ecklonii* plants could also be relocated into other suitable proximate habitat, although if there is to be good survival, this would need to be done with due care in the summer months by a horticulturally qualified person, with maintenance (watering) for 6 weeks subsequently.

P3

This is a corridor comprising open space on either side of a railway line. On the west is Old Main Road and on the east a contiguous line of gardens and suburban properties. The railway and road reserve also appears to be regularly brush-cut and the grassy vegetation is entirely secondary and devoid of plant diversity except for ruderals (species that flourish in disturbed situations), other weeds of disturbance and alien species. Nearly all trees are either alien species, garden ornamentals or garden escapes. The only conservation significant plants seen along this part of the route are two *Cussonia spicata* trees, the position of which is provided in Appendix 1 and Appendix 2. These are probably relics from a time before the vegetation became so transformed. These should be avoided if at all possible.

P4

This westernmost open space area comprises an extensive, nearly pure stand of *Eucalyptus grandis* trees, with lesser presence of smaller alien species and common indigenous pioneer trees scattered beneath, particularly *Trema orientalis* (Pigeonwood). For this reason it also has little conservation worth.

6. Rare and Red Listed species

No species that are Red Listed (Raimondo et al 2009) or which I consider rare were seen along the route.

7. Mitigations

The proposed development can be well mitigated as follows:

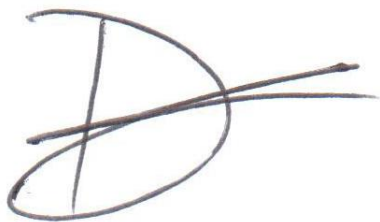
- Avoid protected species if possible;
- Relocate or replace protected species if they cannot be avoided (note that aloes relocate well);
- If trees are destroyed, whether indigenous or alien, these can be replaced with an indigenous tree on a one-to-one basis. Those species that are suitable for the according to the criteria of probably once naturally occurring in the area, hardiness, availability in horticulture and which are also productive for wildlife (birds, bats and insects) are Appendix 5.
- If new plantings are necessary, ensure that this occurs in the summer / near-summer months (i.e. the time of year when rains occur) and if this is necessary the planting exercise should be delayed until then. This should also occur under direction of a horticulturist. Maintenance should be provided by way of thorough watering once a week for a six week period after planting, or longer if the horticulturist deems conditions make this necessary.
- Monitor the route for a one year period afterwards, at six month intervals, and destroy any alien species that establish within the construction footprint. Best practice will involve herbicide treatment or herbicide treatment following cutting of stumps or frilling of non-herbaceous alien plants, not cutting alone.
- Where construction encroaches into open space areas, destroy all alien species within 30 metres of the footprint during or by the end of construction and allow follow up annually for two years. However, due to the difficulty and hazard (including to members of the public) in dealing with the very tall *Eucalyptus grandis* trees in open space area 5, cutting down or frilling and herbiciding of the trees can be omitted.

7. Conclusion

Vegetation along the route is transformed and none is in natural state. The only concerns are in respect of species that have been planted as ornamentals on road verges by homeowners, but which in spite of their popularity in horticulture are protected. However, these and other impacts can be well mitigated.

Should you have any queries, please contact me through details above.

Yours sincerely



David Styles

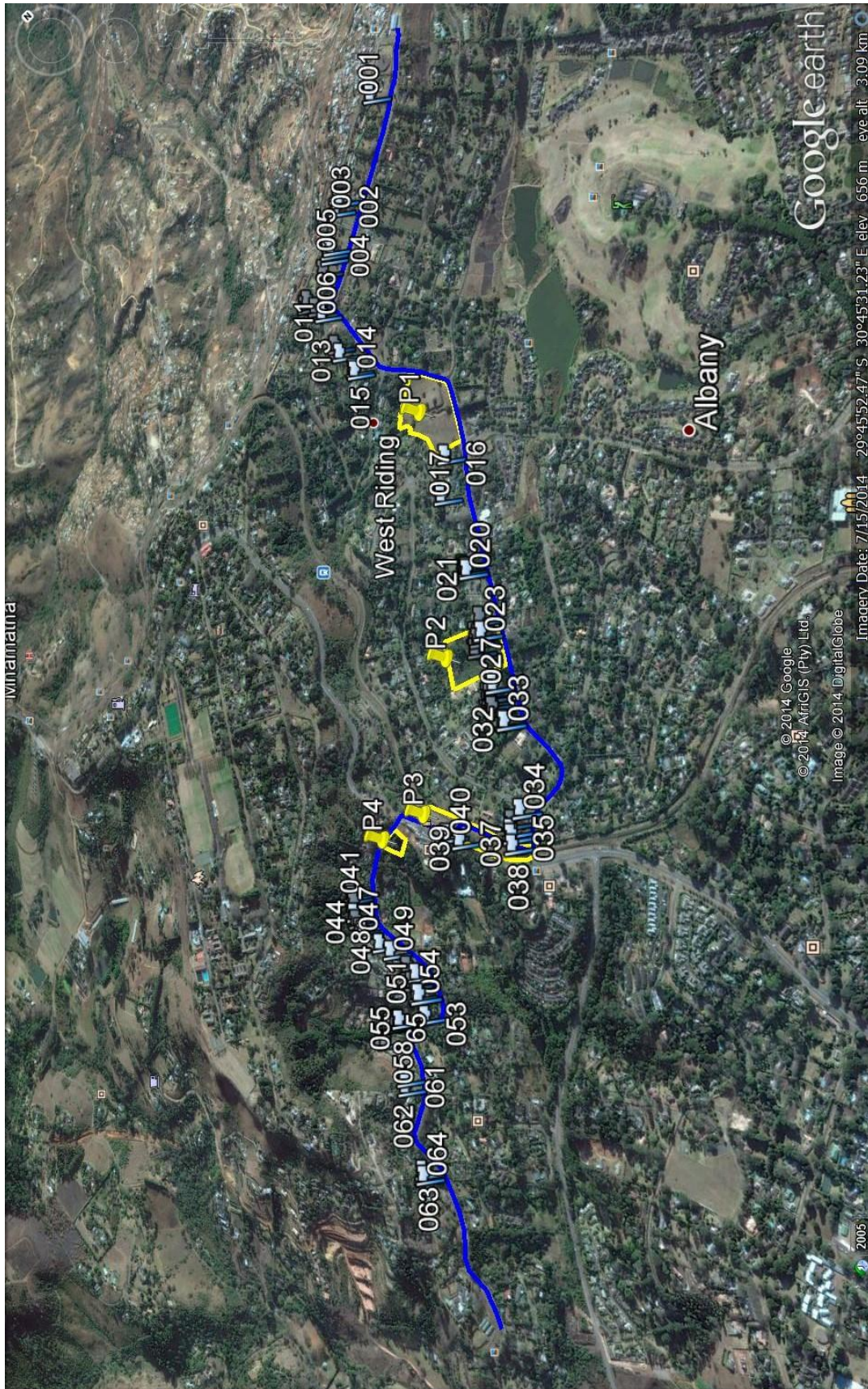
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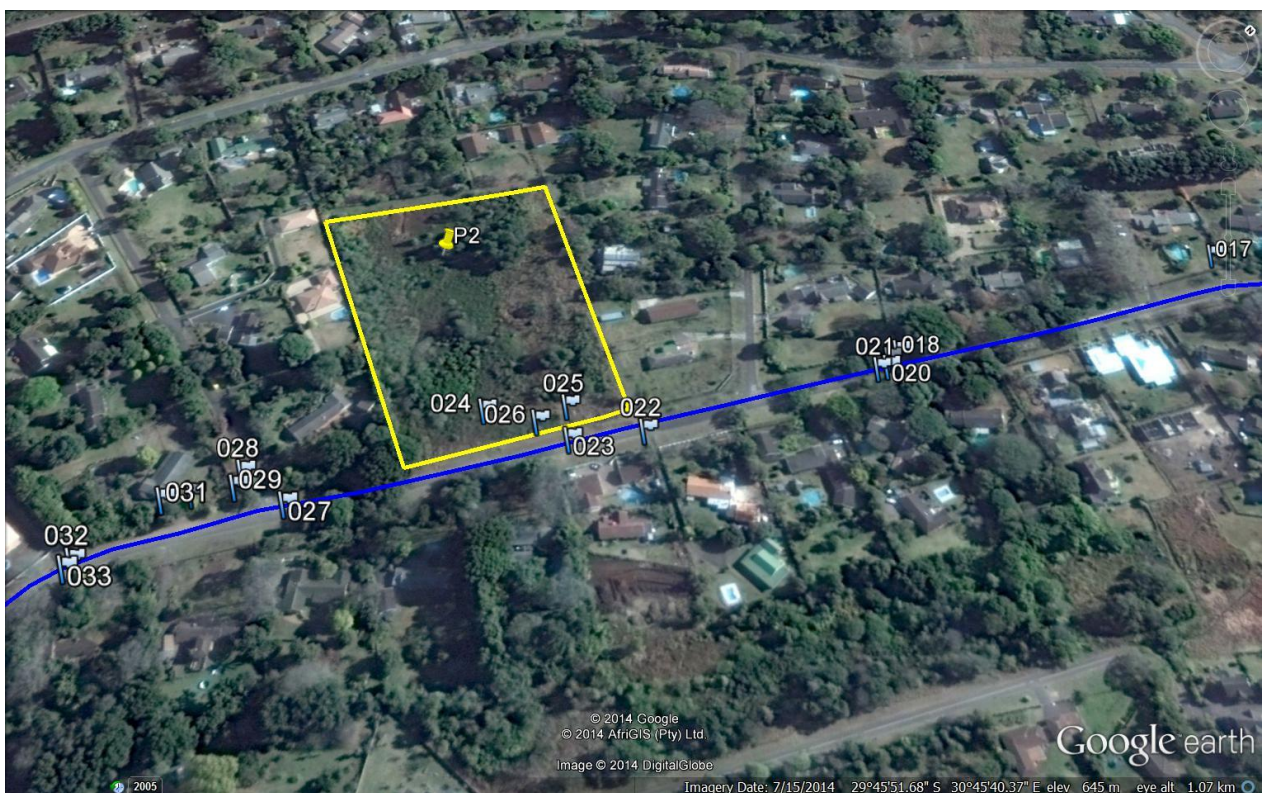
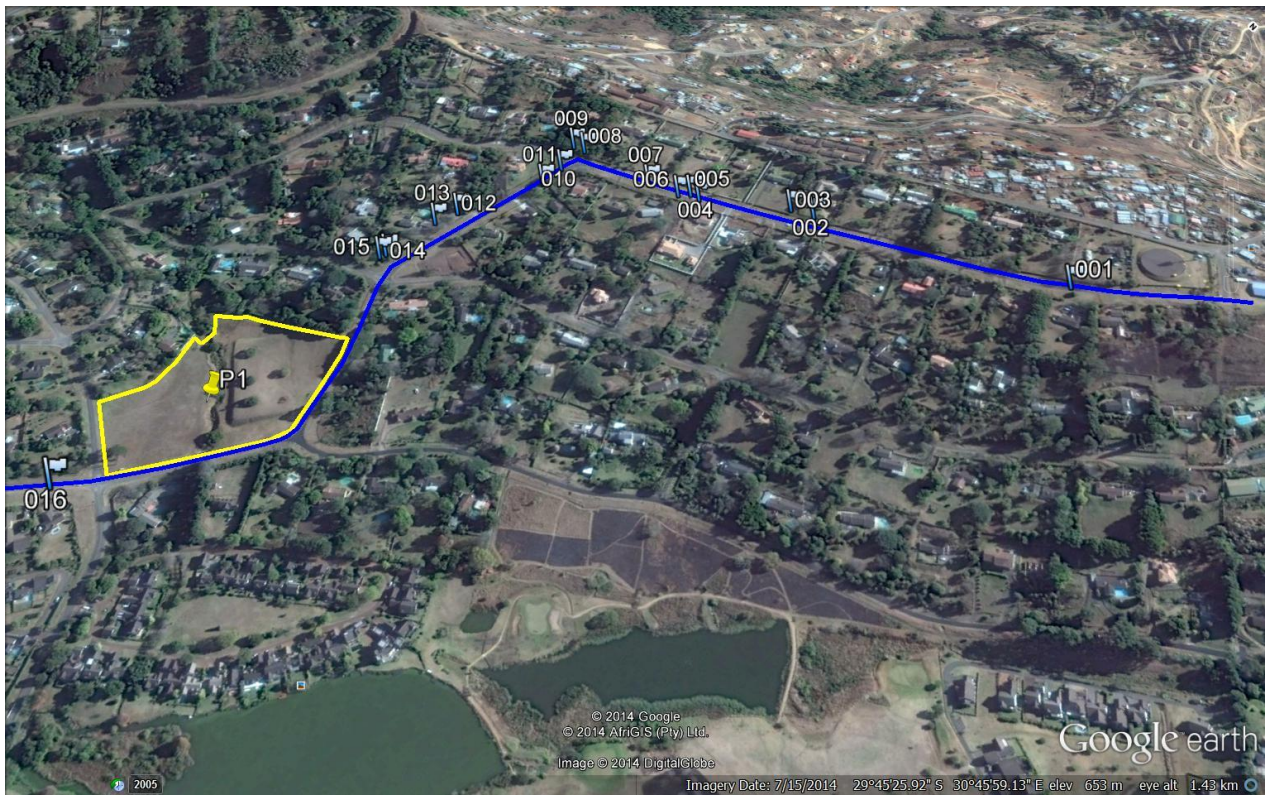
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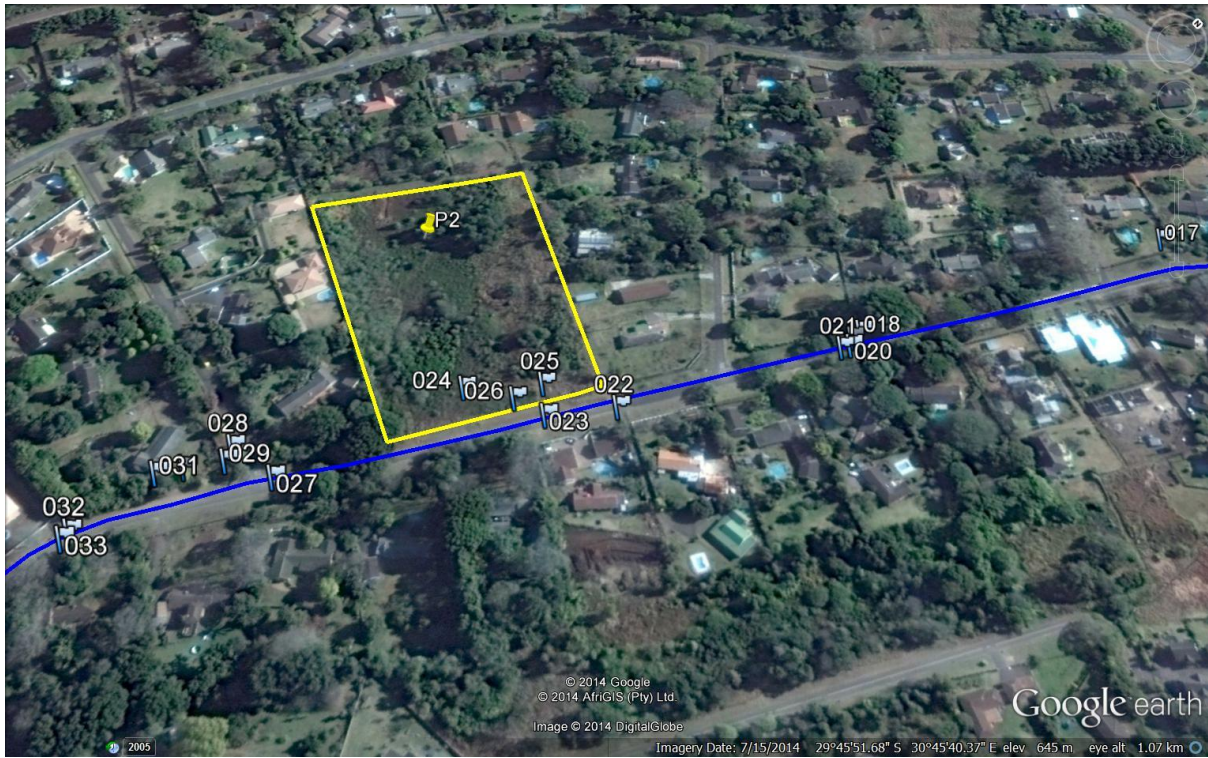
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APPENDIX 1 – Map of route showing open space areas (P1 to P4) and numbered occurrences of protected plants



Closer view of the route from east to west







Route's position within vegetation types according to the National Vegetation Map (Mucina & Rutheford 2006) and National List of Threatened Ecosystems (South African National Biodiversity Institute 2009). Maroon area indicates KwaZulu-Natal Sandstone Sourveld with the blue area to the north Ngongoni Veld. Both are grassland types but the route passes through densely developed suburbia and no grassland that can be referred to these types occurs along it.



APPENDIX 2: Approximate positions of protected plants / noteworthy features *

Point (in Appendix 1)	GPS Position	Description
1	S29 45 14.0 E30 46 07.3	Single Podocarpus henkellii
2-3	S29 45 16.9 E30 45 58.2 to S29 45 17.1 E30 45 57.3	Row of Podocarpus henkellii (6 small trees) and (5 small trees)
4-5	S29 45 18.8 E30 45 54.2 to S29 45 18.8 E30 45 53.8	Dietes grandiflora - Scattered plantings
6-7	S29 45 19.1 E30 45 53.5 to S29 45 19.4 E30 45 52.1	Aloe arborescens in a row and 1 patch of Dietes grandiflora
8-9	S29 45 19.9 E30 45 48.9 to S29 45 20.0 E30 45 48.4	Dietes grandiflora planted along a fence line
10	S29 45 21.1 E30 45 49.0	Patch of Dietes grandiflora
11	S29 45 22.0 E30 45 49.1	Aloe arborescens - 1 x large plant
12-13	S29 45 25.0 E30 45 47.9 to S29 45 25.8 E30 45 47.7	Dietes grandiflora planted along a fence line
14-15	S29 45 27.9 E30 45 47.6 to S29 45 28.1 E30 45 47.6	Dietes grandiflora patch and 1 Aloe arborescens planted at a gate
16	S29 45 40.2 E30 45 48.7	Aloe ferox - 1 plant
17	S29 45 42.3 E30 45 45.9	Aloe arborescens - 1 x large plant
18-19	S29 45 47.9 E30 45 43.1 to S29 45 48.2 E30 45 43.1	Podocarpus henkellii - 2 x larger trees with 4 x aloe arborescens and some Dietes grandiflora beneath
20-21	S29 45 48.3 E30 45 43.2 to S29 45 48.4 E30 45 43.1	Aloe arborescens - 3 x plants and 1 x Aloe vanbalenii or Aloe hybrid
22-23	S29 45 52.1 E30 45 41.2 to S29 45 53.0 E30 45 40.4	Aloe arborescens - scattered plants
24	S29 45 53.7 E30 45 38.9	Aristea ecklonii - patch 10 m2 in extent but only just touching edge of road reserve
25-26	S29 45 52.7 E30 45 39.9 to S29 45 53.2 E30 45 39.8	Aristea ecklonii - mown down plants amongst grass in road reserve, estimated at 20
27	S29 45 56.9 E30 45 38.2	Aloe arborescens - 2 x plants
28-29	S29 45 57.0 E30 45 37.1 to S29 45 57.2 E30 45 37.3	Aloe arborescens - 1 x large plant & patches/beds of Dietes grandiflora
30-31	S29 45 57.8 E30 45 37.0 to S29 45 58.1 E30 45 36.7	Aloe arborescens - 2 x plants & beds of Dietes grandiflora
32-33	S29 45 59.6 E30 45 36.8 to S29 45 59.7 E30 45 36.8	Scadoxus puniceus & a few Dietes grandiflora in a line
34-35	S29 46 05.7 E30 45 32.8 to S29 46 06.3 E30 45 30.9	Line of Dietes grandiflora planted along verge side of wall along property boundary
36	S29 46 05.8 E30 45 31.5	Aloe barberae
37-38	S29 46 06.6 E30 45 30.7 to S29 46 07.3 E30 45 30.2	Dietes grandiflora - line planted along fence
39	S29 46 03.90 E30 45 26.10	Cussonia spicata
40	S29 46 02.78 E30 45 25.37	Cussonia spicata
41-42	S29 46 00.2 E30 45 12.7 to S29 46 00.4 E30 45 12.6	Aloes - species indeterminate but possibly A. rupestris - 5 x plants

43-44	S29 46 00.8 E30 45 12.3 to S29 46 01.6 E30 45 11.6	Dietes grandiflora along fence line
45-46	S29 46 02.1 E30 45 11.3 to S29 46 02.8 E30 45 11.2	Aloe arborescens planted along fence line
47-48	S29 46 03.2 E30 45 11.3 to S29 46 05.0 E30 45 12.0	Aloe arborescens planted along fence line
49	S29 46 06.1 E30 45 12.6	Dietes grandiflora - patch at property gate
50	S29 46 08.0 E30 45 13.1	Kniphofia species (possibly a hybrid) - 2 x plants with patch of Dietes grandiflora
51	S29 46 09.0 E30 45 13.4	Dietes grandiflora - patch
52	S29 46 09.2 E30 45 12.6	Aloe ferox - 2 x plants at gate
53	S29 46 12.0 E30 45 11.5	Aloe arborescens - 2 x plants at gate
54	S29 46 10.03 ES 30 45 12.10	Kniphofia species (possibly a hybrid) - 1 x plant
55-56	S29 46 10.7 E30 45 08.7 to S29 46 10.7 E30 45 08.6	Aloe cliatus plants
57-58	S29 46 10.5 E30 45 08.3 to S29 46 10.4 E30 45 07.7	Dietes grandiflora plantings
59	S29 46 10.4 E30 45 07.4	Aloes - mixed & patch of Dietes grandiflora
60	S29 46 11.1 E30 45 06.0	Dietes grandiflora - bed at driveway entrance
61-62	S29 46 14.5 E30 45 05.5 to S29 46 15.1 E30 45 05.0	Dietes grandiflora - row planted along fence line
63-64	S29 46 21.0 E30 45 01.5 to S29 46 21.4 E30 45 01.2	Dietes grandiflora - planted on fence line
65	S29 46.175 E30 45.209	Barringtonia racemosa

Open space areas (position alongside road)	GPS position
P1	S29 45 30.81 E30 45 49.68 to S29 45 34.00 E30 45 51.88 to S29 45 38.90 E30 45 49.11
P2	S29 45 51.89 E30 45 40.21 to S29 45 54.68 E30 45 38.77
P3	S29 46 7.80 E30 45 29.08 to S29 46 2.32 E30 45 24.74
P4	S29 45 57.67 E30 45 19.29 to S29 45 57.96 E30 45 16.72

* This schedule does not warrant that the position of every single *Aloe* or *Dietes grandiflora* plant along the route is included, and the contractor must be alert and be aware of possible issues relating to these plants if they are encountered. Many and perhaps even most of these plants are close to fence lines and so may not be at risk of damage or destruction. Depending on this being required by Ezemvelo KwaZulu-Natal Wildlife, presence of these plants must form part of environmental orientation and plants relocated where found within the construction footprint.

APPENDIX 3: Species Lists

(Note that only alien invasive species and indigenous species are listed. It is not feasible to list all garden ornamentals planted along the 4 km of suburbia and road verges)

2.1 Alien species

Name	Plant form / description (A = Alien, F = Fern, H = Herb, Rd – Reed, Rs – Rush, S – Shrub, Sd = Sedge, Su = Succulent, T = Tree, V = Vine)
Acacia mearnsii (Black Wattle)	T
Agave sp.	Su
Ageratum conyzoides (Blue Weed)	H
Ageratum houstonianum (Blue Weed)	H
Ambrosia artemisiifolia (Ragweed)	H
Canna indica (Canna)	H
Cardiospermum grandiflorum (Balloon Vine)	V
Cestrum laevigatum (Cestrum)	S / T
Chromolaena odorata (Chromolaena)	S
Cinnamomum camphora (Camphor Tree)	T
Cirsium vulgare (Scotchman's Thistle)	H
Conyza (Erigeron) Canadensis (Fleabane)	H
Conyza (Erigeron) sumatrensis (Fleabane)	H
Eriobotrya japonica (Loquat)	T
Eugenia uniflora (Surinam Cherry)	T
Hedychium sp. (Wild Ginger)	H
Hypochaeris radicata	H
Jacaranda mimosifolia (Jacaranda)	T
Lantana camara (Lantana)	S
Ligustrum sp. (Privet)	T
Lilium formosanum (Formosa Lily)	H
Litsea sebifera (Litsea)	T
Melia azedarach (Syringa)	T
Morus alba (Mulberry)	T
Nephrolepis exaltata (Sword Fern)	F
Passiflora suberosa (Granadilla)	V
Pinus sp. (Pine Tree)	T
Plantago sp.	H
Plectranthus comosus	S / Su
Psidium guajava (Guava)	T
Ricinus communis Castor Oil Bush)	S / T
Rubus sp. (Bramble)	S
Schefflera actinophylla	T
Schinus terebinthifolius (Pepper Tree)	T
Senecio madagascariensis	H
Senna didymobotrya (Peanut Butter Senna)	S / T
Senna pendula	S / T
Solanum mauritianum (Bugweed)	T
Solanum sp.	H
Spathodea campanulata (African Flame Tree)	T

<i>Syncarpia glomulifera</i> (Turpentine Tree)	T
<i>Syzygium paniculatum</i>	T
<i>Tagetes minuta</i> (Khaki Weed)	H
<i>Taraxacum</i> sp.	H
<i>Tecoma stans</i> (Yellow Bells)	T
<i>Tithonia diversifolia</i> (Mexican Daisy)	H / S
<i>Verbena</i> spp.	H
<i>Wedelia trilobata</i> (Singapore Daisy)	H

2.2 Indigenous species

<i>Acacia sieberiana</i> var. <i>woodii</i> (Paper-bark Acacia)	T
<i>Acacia xanthophloea</i> (Fever Tree)	T
<i>Albizia adianthifolia</i> (Flatcrown)	T
<i>Aloe tenuior</i>	S
<i>Asystasia gangetica</i>	H
<i>Barringtonia racemosa</i> (Powder-puff Tree)	T
<i>Berkheya bipinnatifida</i>	H
<i>Bridelia micrantha</i> (Mitzeeri)	T
<i>Canthium inerme</i> (Common Turkey-berry)	T
<i>Centella asiatica</i>	H
<i>Chlorophytum comosum</i>	H
<i>Clerodendrum glabrum</i> (White Cat's Whiskers)	T
<i>Combretum kraussii</i> (Forest Bushwillow)	T
<i>Conostomium natalense</i>	H
<i>Croton sylvaticus</i> (Forest Fever-berry)	T
<i>Cussonia spicata</i> (Common Cabbage Tree)	T
<i>Dalbergia obovata</i> (Climbing Flat-bean)	T
<i>Erythrina lysistemon</i> (Common Coral Tree)	T
<i>Ficus burkei</i> (Common Wild Fig)	T
<i>Ficus sur</i> (Broom Cluster Fig)	T
<i>Gomphocarpus physocarpus</i>	H
<i>Harpephyllum caffrum</i> (Wild Plum)	T
<i>Helichrysum panduratum</i>	H
<i>Helichrysum ruderales</i>	H
<i>Hewittea malabarica</i>	H / V
<i>Hibiscus cannabinus</i>	H
<i>Hibiscus surattensis</i>	H
<i>Hippobromus pauciflorus</i> (False Horsewood)	T
<i>Ipomoea cairica</i>	H / V
<i>Maesa lanceolata</i> (False Assegai)	T
<i>Phaulopsis imbricata</i>	H
<i>Podocarpus henkellii</i> (Henkell's / Drooping-leaf Yellowwood)	T
<i>Protorhus longifolia</i> (Red Beech)	T
<i>Rothmannia globosa</i> (September Bells)	T
<i>Senecio polyanthemoides</i>	H
<i>Senecio tamoides</i>	H / V
<i>Smilax anceps</i>	V
<i>Strelitzia nicolai</i> (Wild Banana)	T

Syzygium cordatum (Umdoni)	T
Trema orientalis (Pigeonwood)	T
Trichilia dregeana (Forest Mahogany)	T
Trimera grandifolia (Wild Mulberry)	T

APPENDIX 4: Photographs



4.1 Typical scene along the route, comprising road verges alongside suburban properties. Vegetation comprises mown verges and trees that are either garden ornaments, alien species or sometimes more common indigenous trees.



4.2 Occasional homeowners have planted verges with indigenous plants such as *Acacia xanthophoea* (Fever Tree) and aloes, such as *Aloe arborescens* in orange flower against the concrete wall.



4.3 Here a homeowner has planted two *Podocarpus henkellii* (Henkell's or Drooping-leaf Yellowwood) on the road verge (exact location provided in this report). Although quite common as a garden tree and not occurring naturally in the coastal part of KwaZulu-Natal, this species is protected by the National Forests Act and a permit is required before any plant may be damaged or destroyed.



4.4 The first of the transformed open space areas identified along the route (position provided in Appendices 1 and 2). The level ground is little more than lawn that appears to have been mown short continuously for years, while brush-cutting also appears to regularly occur into the drainage line, and so little plant biodiversity persists except for a small number of common indigenous pioneers, alien species and weeds of disturbance.



4.5 The second transformed open space area identified in the report, comprising grassy scrub invaded by pioneer indigenous species and alien invasive species.



4.6 In grassy scrub alongside the road verge however, amongst a dense infestation of *Rubus* (Bramble), *Aristea ecklonii* occurs in numbers. This indigenous member of the iris family is common and has a preference for disturbed grassland and scrubby situations.



4.7 The third open space area identified in the report, and through which the route runs, also has a railway line running through most of it. Grassy growth appears regularly brush-cut and only weeds of disturbance and alien species persist. However, there are two *Cussonia spicata* (Common Cabbage Trees) that can be seen in the background of the top image in the left of the railway line, in front of the taller gums. These are likely relics from a time when this once comprised better natural vegetation and they should be avoided if possible.

4.8: Another view of part of this area, with all the trees comprising garden ornamentals or alien species, such as *Bougainvillea* and *Syncarpia glomerata* (Turpentine Tree) on the left and *Cinnamomum camphora* (Camphor Trees) in the distance on the right.



4.9: The last open space area identified along the route in this report. This is the edge of the area, which is dominated almost uniformly by tall alien *Eucalyptus grandis* (Saligna Gum) trees.



4.10: Side view of the same area, with smaller alien trees including *Tecoma stans* (Yellow Bells) and some smaller pioneer indigenous trees also scattered under the gums (mainly *Trema orientalis*, the Pigeonwood).



4.11: The protected *Barringtonia raceomsa* (Powder-puff Tree) that one homeowner has planted on the road verge along his fence line.

APPENDIX 5: Indigenous trees suitable for use in replacement planting

(Note that this list is by no means exhaustive)

Albizia adianthifolia (Flatcrown)
Antidesma venosum (Tassel Berry)
Bersama lucens (Glossy White Ash)
Bridelia micrantha (Mitzeeri)
Calodendrum capense (Cape Chestnut)
Chaetacme aristata (Thorny Elm)
Combretum kraussii (Forest Bushwillow)
Commiphora harveyi (Copper-stem Corkwood)
Croton sylvaticus (Forest Fever-berry)
Cussonia spicata (Common Cabbage Tree)
Cussonia sphaerocephala (Forest Cabbage Tree)
Dombeya tileacea (Forest Wild-pear)
Ekebergia capensis (Cape Ash)
Erythrina lysistemon (Common Coral Tree)
Ficus burkei (Common Wild Fig)
Ficus glumosa (Mountain Rock Fig)
Ficus ingens (Red-leaved Rock Fig)
Halleria lucida (Halleria)
Heteropyxis natalensis (Lavender Tree)
Millettia grandis (Umzimbeet)
Protorhus longifolia (Red Beech)
Rauvolfia caffra (Quinine Tree)
Rothmannia globosa (September Bells)
Rothmannia capensis (Cape Rothmannia)
Strelitzia nicolai (Wild Banana)
Syzygium cordatum (Umdoni)
Trichilia dregeana (Forest Mahogany)
Turraea florubunda (Wild Honeysuckle)
Vepris lanceolata (White Ironwood)