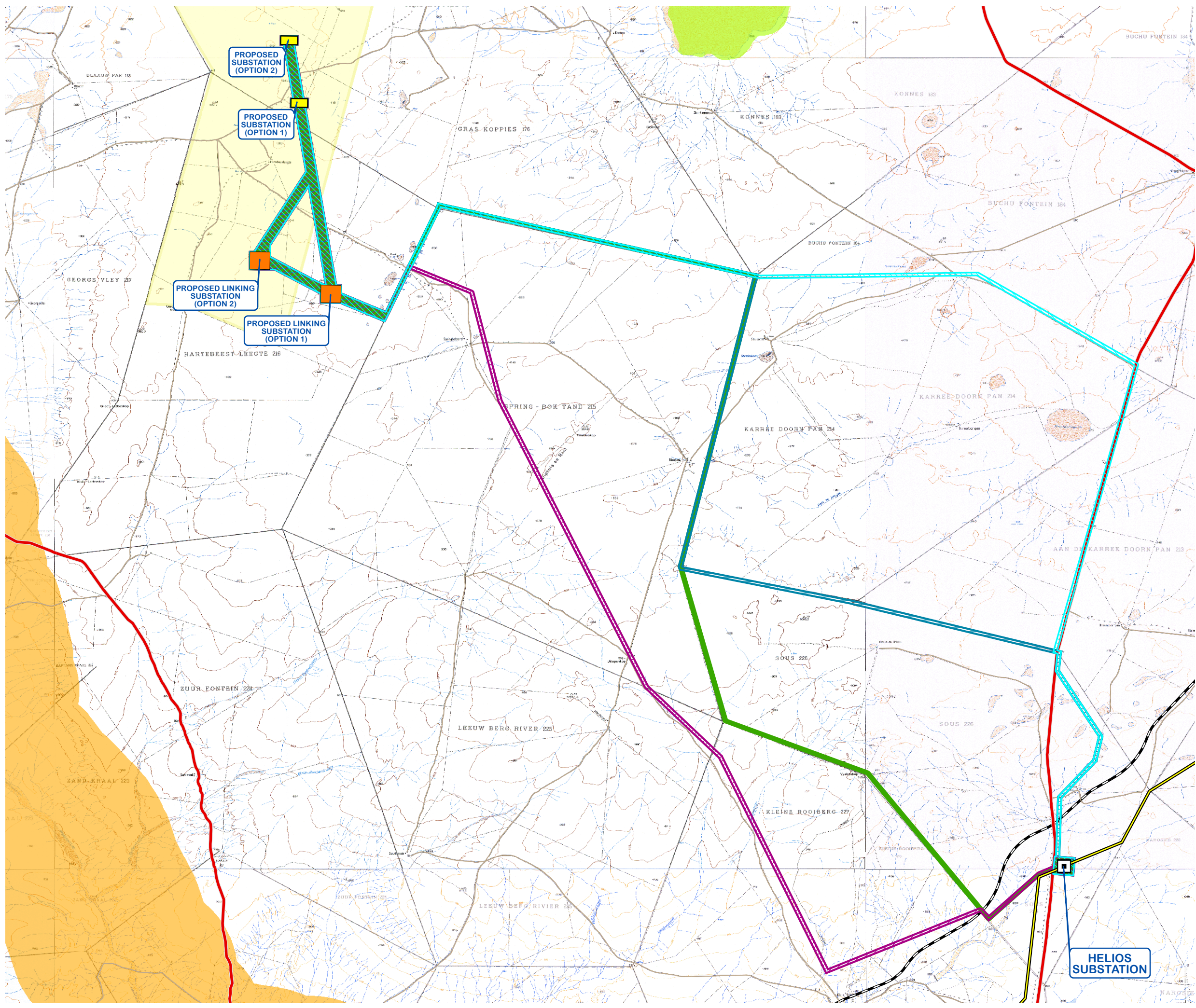
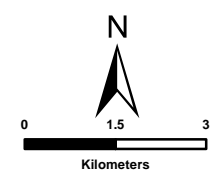


PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED WIND ENERGY FACILITIES
ITHEMBA WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE
CRITICAL BIODIVERSITY AREAS (TERRESTRIAL)



- Legend**
- Secondary Roads
 - Local Access Roads
 - Railways
 - Existing High Voltage Power Lines (>=132kV)
 - Ithemba Wind Farm Application Site
 - Helios Substation
 - Proposed Linking Substation Site Alternatives
 - Proposed Ithemba Substation Site Alternatives
- Proposed Corridor Alternatives**
- Option 1
 - Option 2
 - Option 3
 - Option 4
- Critical Biodiversity Areas**
- CBA2
 - ESA

SOURCE:
 NGI, 2014
 SANBI, 2012
 NAMAKWA DISTRICT BIODIVERSITY SECTOR PLAN, 2008



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Map Ref No 13622/BA_107	Revision 1	Date 23/05/2017

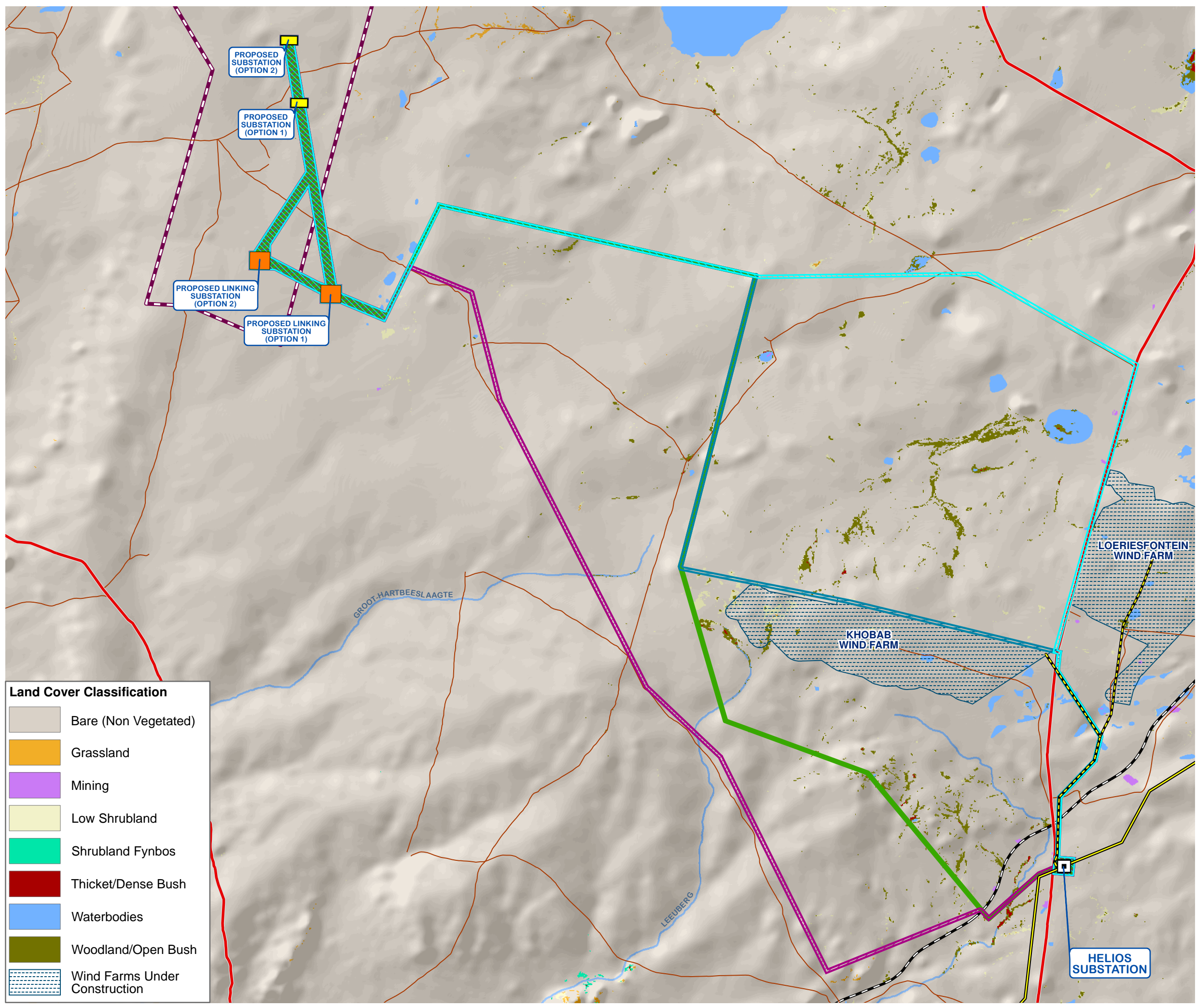
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HELIOS SUBSTATION

PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED WIND ENERGY FACILITIES
ITHEMBA WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE

BROAD LAND COVER CLASSIFICATION



Legend

- Secondary Roads
- Local Access
- Railways
- Existing High Voltage Power Lines (>=132kV)
- 132kV Power Lines Under Construction
- Main Watercourses
- Ithemba Wind Farm Application Site
- Helios Substation
- Proposed Linking Substation Site Alternatives
- Proposed Ithemba Substation Site Alternatives

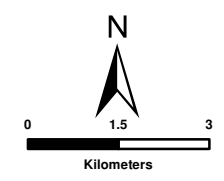
Proposed Corridor Alternatives

- Option 1
- Option 2
- Option 3
- Option 4

Land Cover Classification

- Bare (Non Vegetated)
- Grassland
- Mining
- Low Shrubland
- Shrubland Fynbos
- Thicket/Dense Bush
- Waterbodies
- Woodland/Open Bush
- Wind Farms Under Construction

SOURCE: 2013-2014 SA NATIONAL LAND COVER (© GEOTERRAIMAGE - 2014)



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


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PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED WIND ENERGY FACILITIES
ITHEMBA WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE
ROUTE OVERVIEW

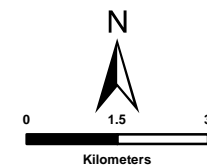
Legend

-  Local Municipal Boundaries
-  Secondary Roads
-  Local Access Roads
-  Railways
-  Existing High Voltage Power Lines (>=132kV)
-  Adjoining Farm Boundaries
-  Ithemba Wind Farm Application Site
-  Helios Substation
-  Proposed Linking Substation Site Alternatives
-  Proposed Ithemba Substation Site Alternatives

Proposed Corridor Alternatives

-  Option 1
-  Option 2
-  Option 3
-  Option 4

SOURCE: MUNICIPAL DEMARCATION BOARD, 2011
 NGI, 2014

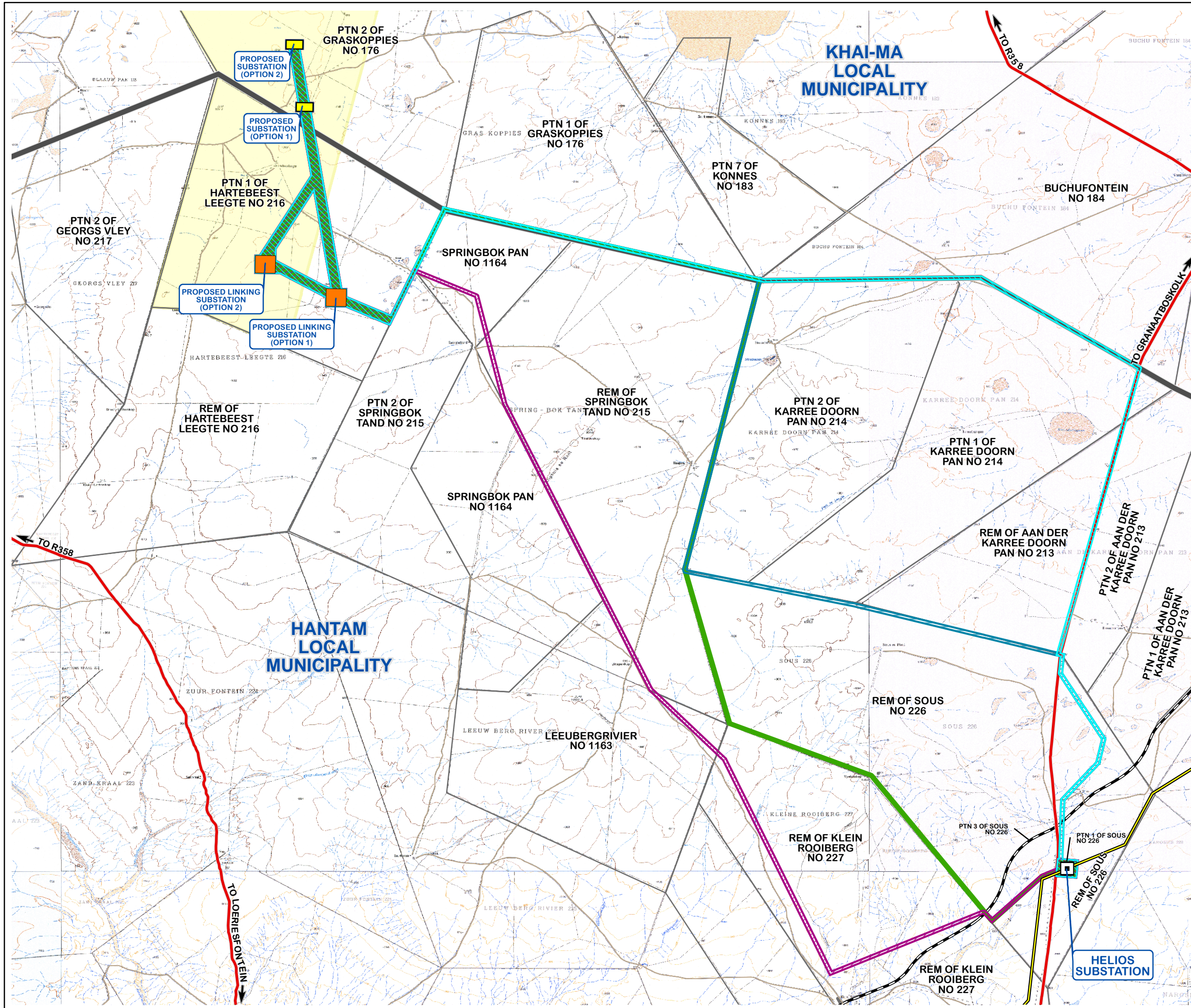


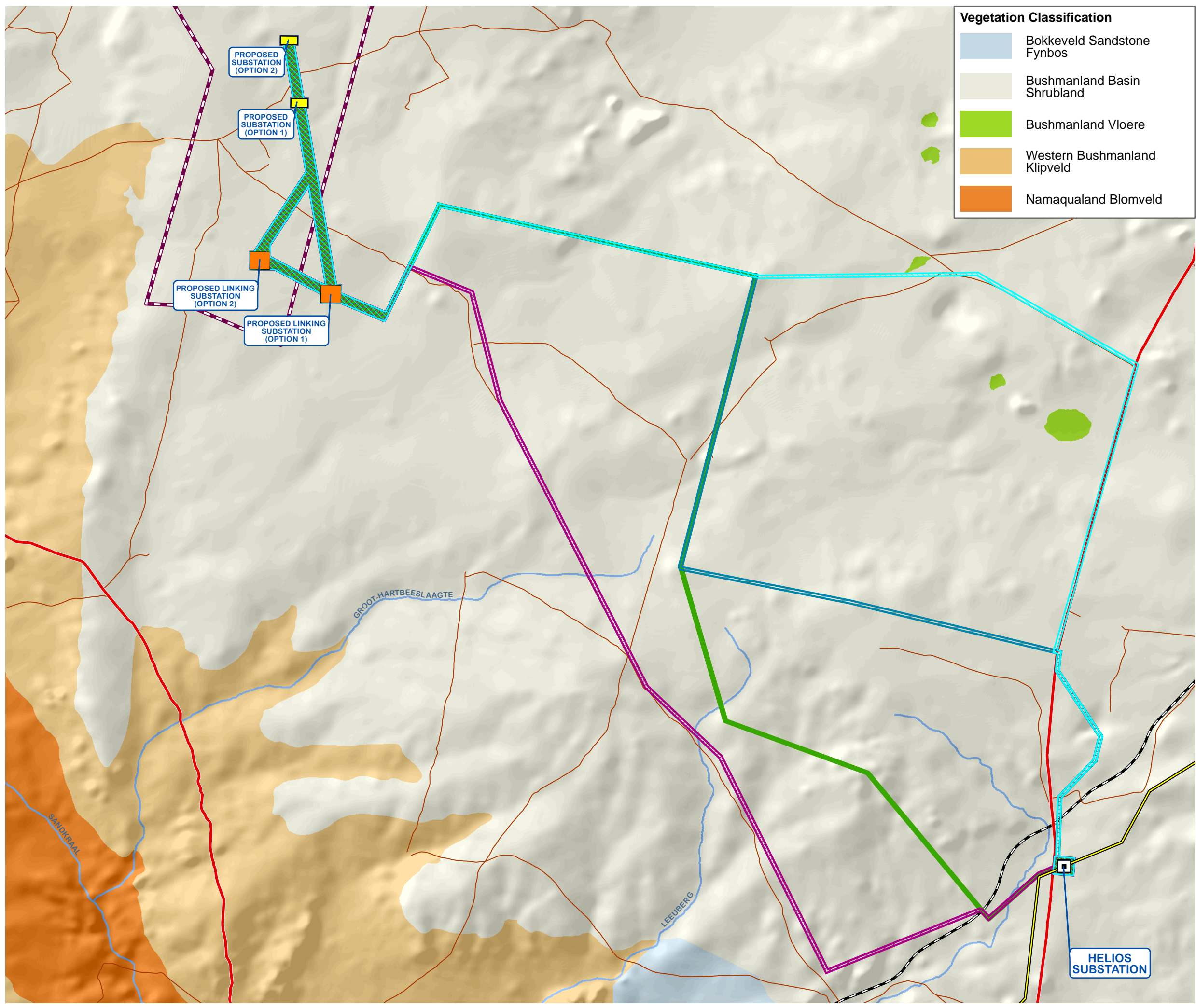
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Vegetation Classification

- Bokkeveld Sandstone Fynbos
- Bushmanland Basin Shrubland
- Bushmanland Vloere
- Western Bushmanland Klipveld
- Namaqualand Blomveld

PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED WIND ENERGY FACILITIES
ITHEMBA WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE
VEGETATION CLASSIFICATION

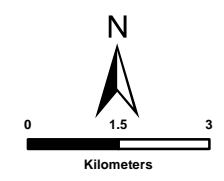
Legend

- Secondary Roads
- Local Access Roads
- Railways
- Existing High Voltage Power Lines (>=132kV)
- Main Watercourses
- Ithemba Wind Farm Application Site
- Helios Substation
- Proposed Linking Substation Site Alternatives
- Proposed Ithemba Substation Site Alternatives

Proposed Corridor Alternatives

- Option 1
- Option 2
- Option 3
- Option 4

SOURCE:
 NGI, 2014
 SANBI, 2012



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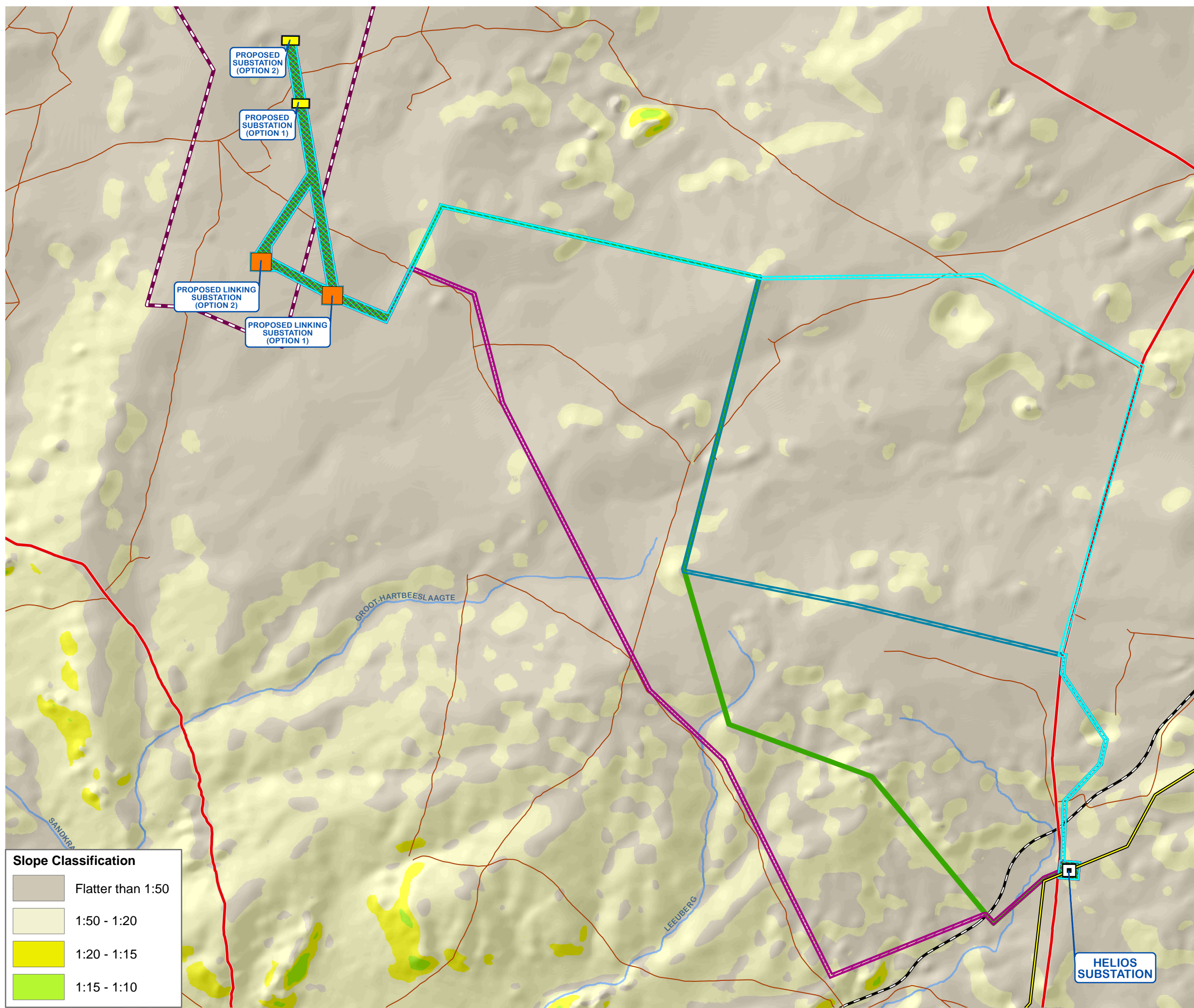
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Map Ref No 13622/BA_I05	Revision 1	Date 23/05/2017

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HELIOS SUBSTATION

**PROPOSED CONSTRUCTION
OF A 132kV POWER LINE
TO SERVE PROPOSED
WIND ENERGY FACILITIES
ITHEMBA WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
SLOPE CLASSIFICATION**

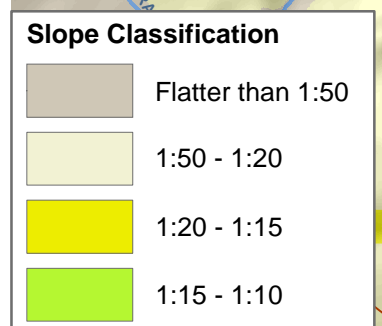


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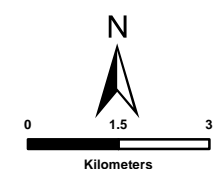
- Secondary Roads
- Local Access Roads
- Existing High Voltage Power Lines (>=132kV)
- Railways
- Main Watercourses
- Ithemba Wind Farm Application Site
- Helios Substation
- Proposed Linking Substation Site Alternatives
- Proposed Ithemba Substation Site Alternatives

Proposed Corridor Alternatives

- Option 1
- Option 2
- Option 3
- Option 4



SOURCE:
NGI, 2014



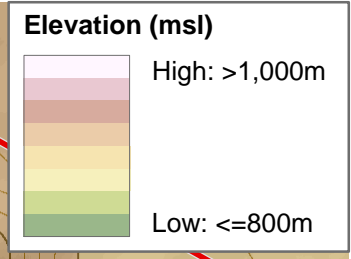
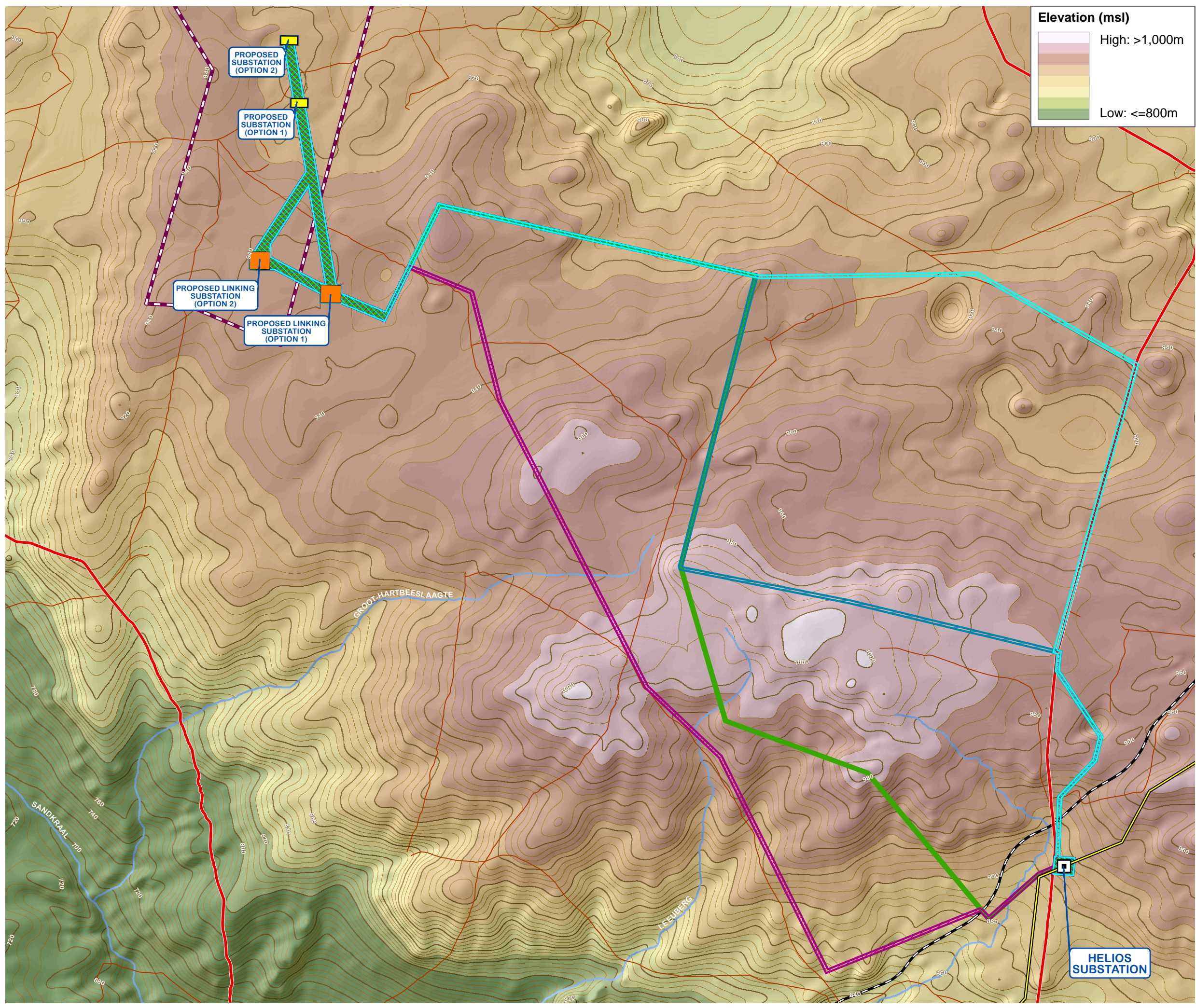
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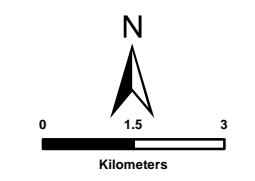
**HELIOS
SUBSTATION**



PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED WIND ENERGY FACILITIES
ITHEMBA WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE
TOPOGRAPHY

- Legend**
- Secondary Roads
 - Local Access Roads
 - Railways
 - Existing High Voltage Power Lines (>=132kV)
 - Main Watercourses
 - Contours (20m Interval)
 - Contours (5m Interval)
 - Ithemba Wind Farm Application Site
 - Helios Substation
 - Proposed Linking Substation Site Alternatives
 - Proposed Ithemba Substation Site Alternatives
- Proposed Corridor Alternatives**
- Option 1
 - Option 2
 - Option 3
 - Option 4

SOURCE: MUNICIPAL DEMARCATION BOARD, 2011
 NGI, 2014

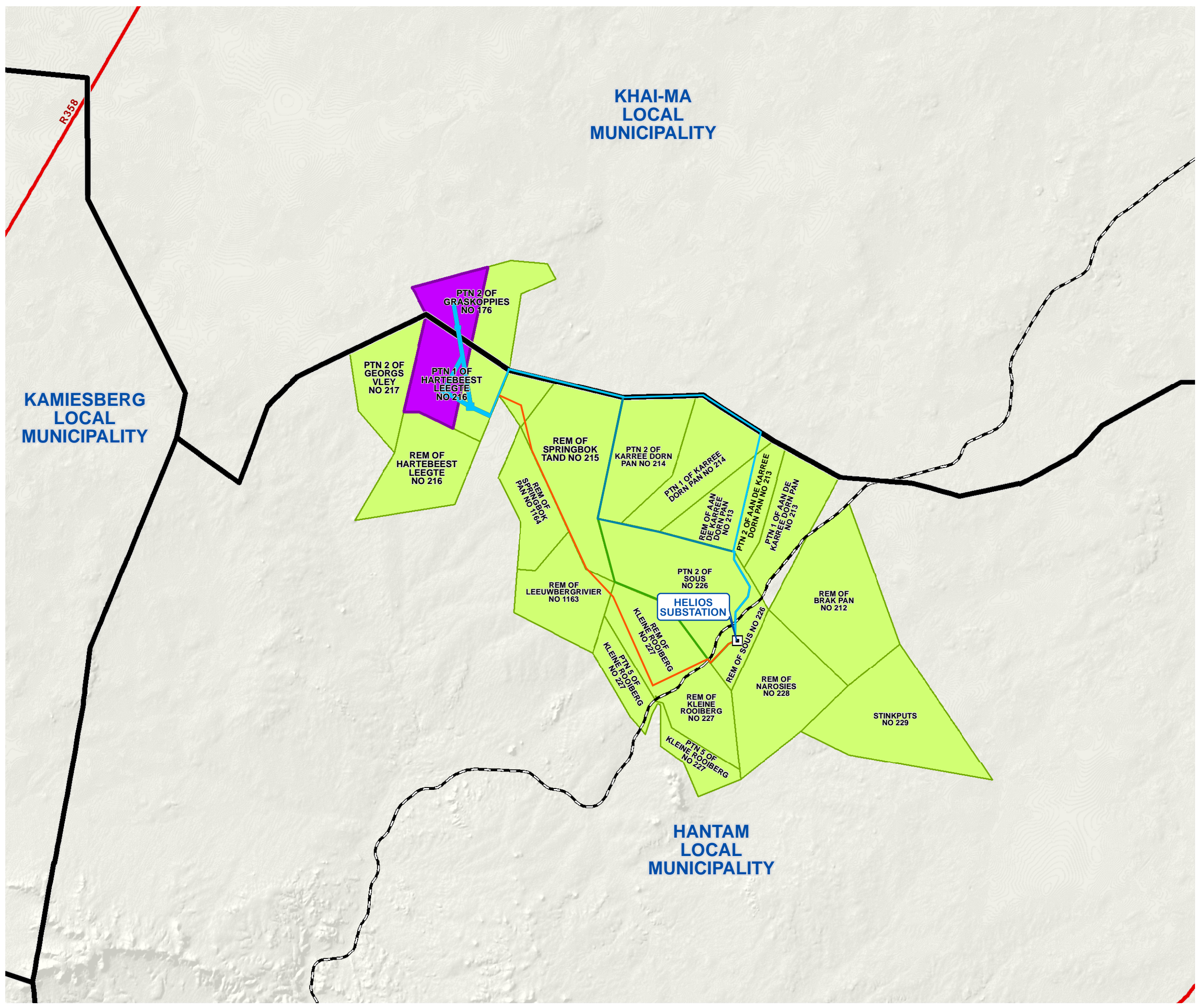


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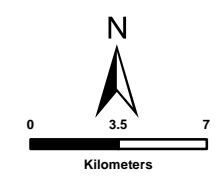
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PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED WIND ENERGY FACILITIES
ITHEMBA WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE
OTHER PROPOSED RENEWABLE ENERGY DEVELOPMENTS

- Legend**
- Local Municipal Boundaries
 - Main Arterial Routes
 - Railways
 - Helios Substation
 - Ithemba Wind Farm Application Site
 - Other Renewable Energy Application Sites
- Proposed Corridor Alternatives**
- Option 1
 - Option 2
 - Option 3
 - Option 4

SOURCE: MUNICIPAL DEMARCATION BOARD, 2011
 NGI, 2014

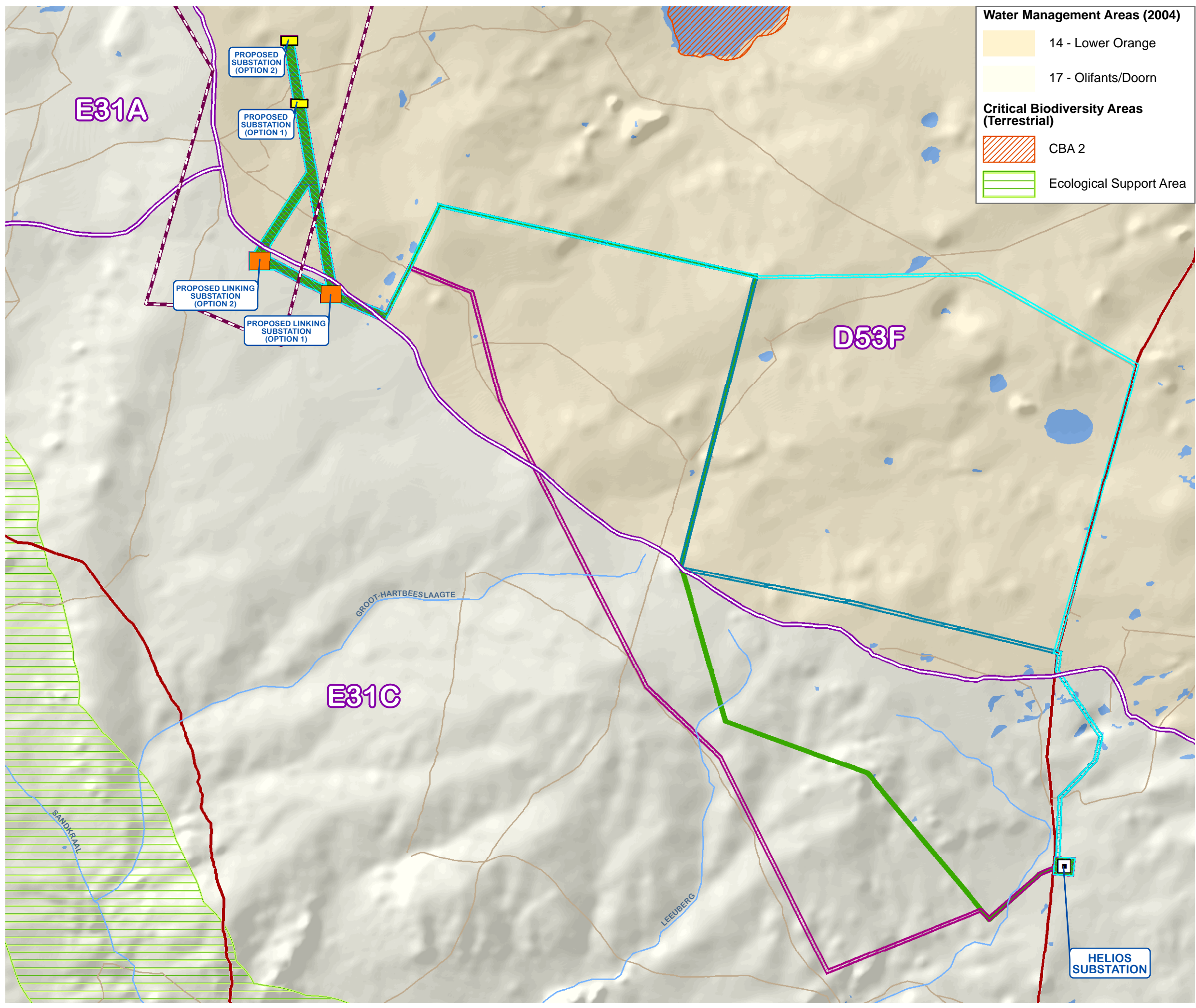


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Water Management Areas (2004)

- 14 - Lower Orange
- 17 - Olifants/Doorn

Critical Biodiversity Areas (Terrestrial)

- CBA 2
- Ecological Support Area

PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED WIND ENERGY FACILITIES

ITHEMBA WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE

SURFACE WATER ASSESSMENT: DATABASE SURFACE WATER OCCURRENCE

Legend

- Secondary Roads
- Local Access Roads
- Ithemba Wind Farm Application Site
- Helios Substation
- Proposed Linking Substation Site Alternatives
- Proposed Itthemba Substation Site Alternatives

Proposed Corridor Alternatives

- Option 1
- Option 2
- Option 3
- Option 4

Surface Water Features

- Quaternary Catchment Boundaries
- Rivers
- Wetlands

SOURCE:
DWS, 2004
NFEPA, 2011
NAMAKWA DISTRICT BIODIVERSITY SECTOR PLAN, 2008

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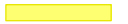


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HELIOS SUBSTATION

**PROPOSED CONSTRUCTION
OF A 132kV POWER LINE
TO SERVE PROPOSED
WIND ENERGY FACILITIES
ITHEMBA WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE**

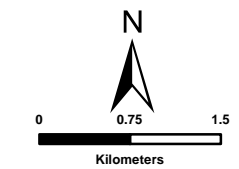
**SURFACE WATER ASSESSMENT:
DELINEATED SURFACE WATER
FEATURES
(NORTH-EASTERN SECTION)**

Legend

-  Secondary Roads
-  Local Access
- Proposed Corridor Alternatives**
-  Option 1
-  Option 2
-  Option 3
-  Option 4
- Surface Water Features**
-  Major Drainage Line
-  Wetland
-  Major Drainage Line/
Wetland Buffers*
-  Drainage Lines
-  Drainage Line Buffers (50m)

*Major Drainage Line Buffer: 100m
Wetland Buffer: 50m

SOURCE:
GOOGLE EARTH, 2016

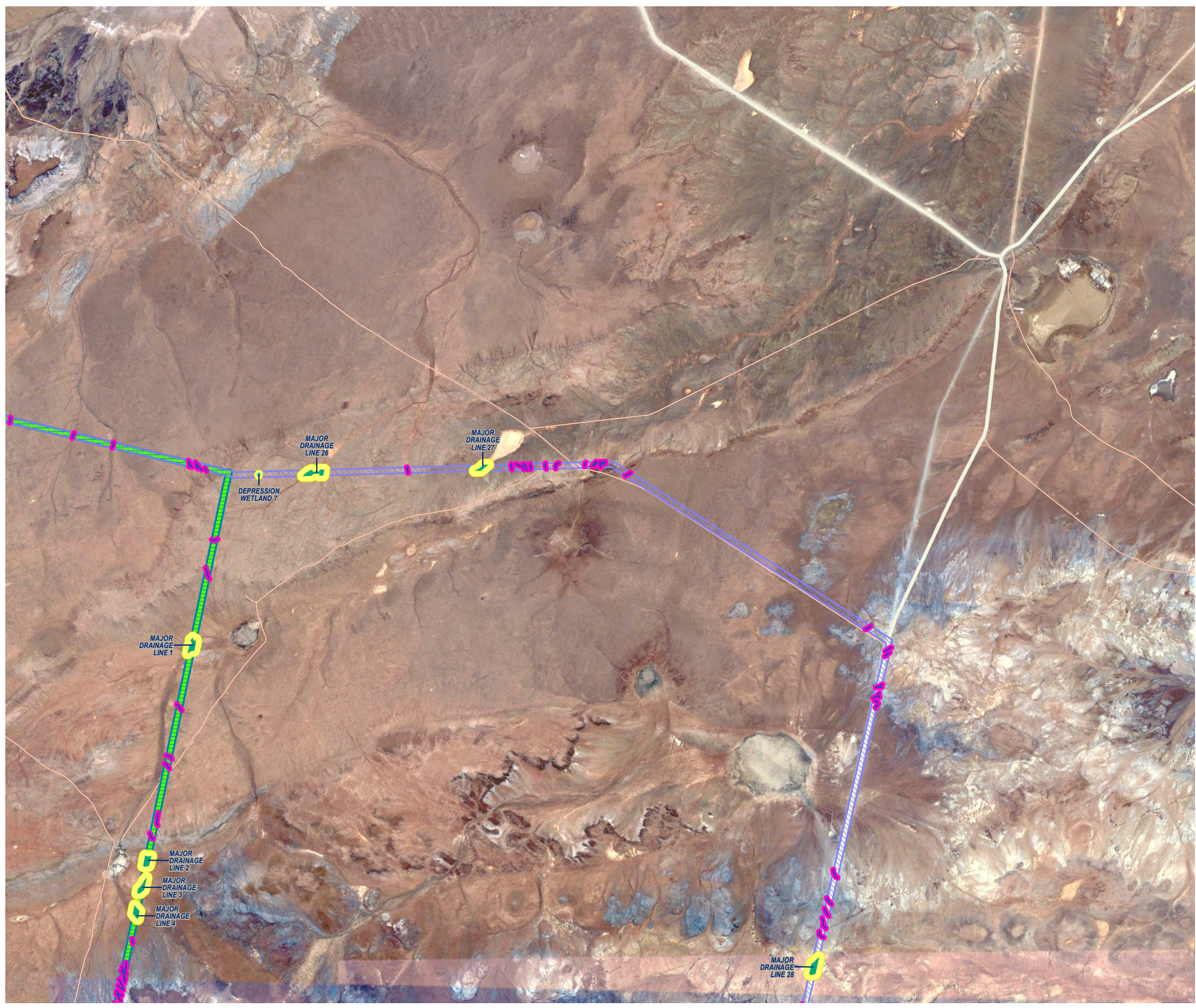


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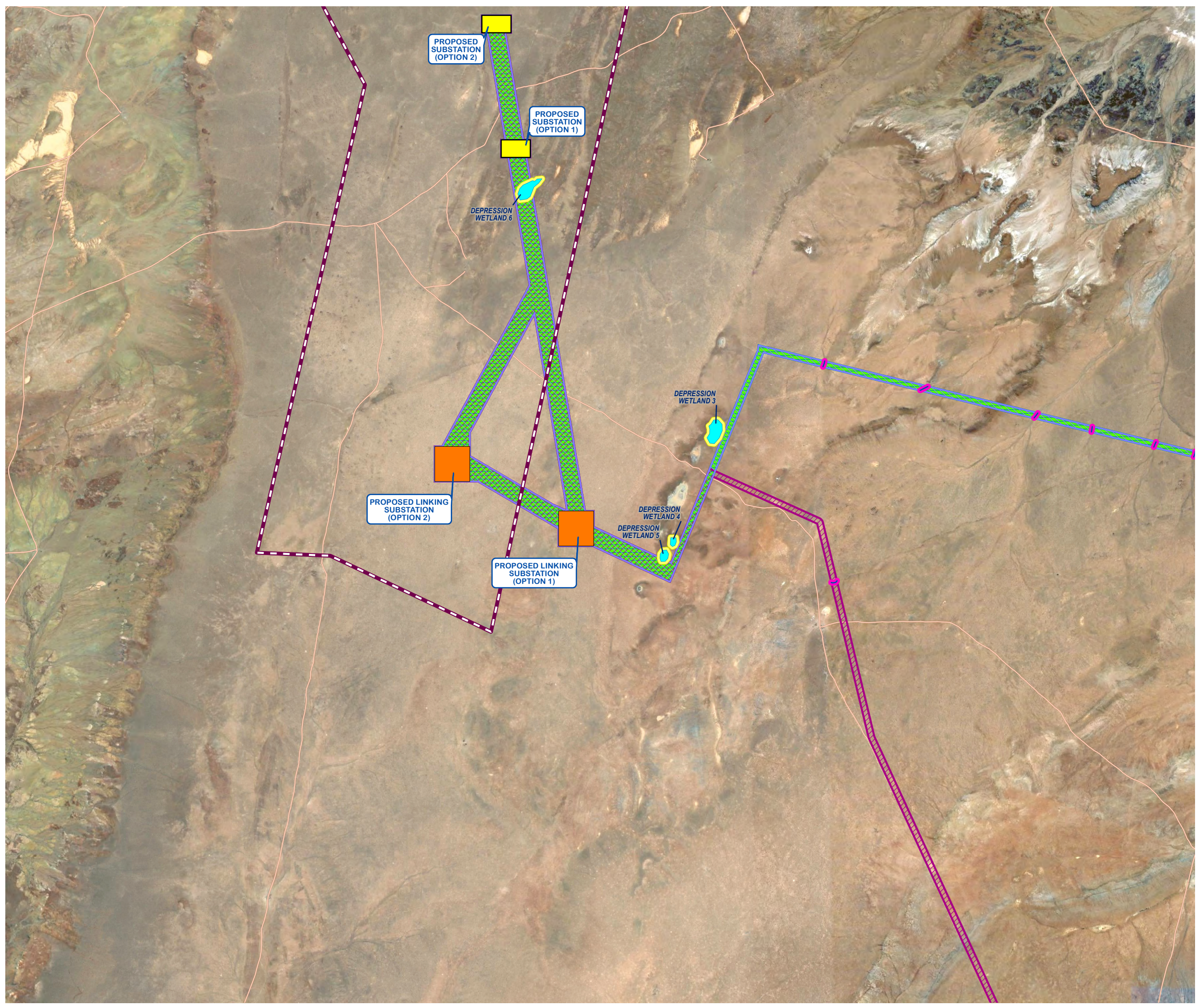
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PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED WIND ENERGY FACILITIES
ITHEMBA WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE
SURFACE WATER ASSESSMENT: DELINEATED SURFACE WATER FEATURES (NORTH-WESTERN SECTION)



Legend

- Local Access Roads
- Ithemba Wind Farm Application Site
- Proposed Linking Substation Site Alternatives
- Proposed Ithemba Substation Site Alternatives

Proposed Corridor Alternatives

- Option 1
- Option 2
- Option 3
- Option 4

Surface Water Features

- Major Drainage Line
- Wetland
- Major Drainage Line/ Wetland Buffers*
- Drainage Lines
- Drainage Line Buffers (50m)

*Major Drainage Line Buffer: 100m
 Wetland Buffer: 50m

SOURCE: GOOGLE EARTH, 2016

0 0.75 1.5
Kilometers

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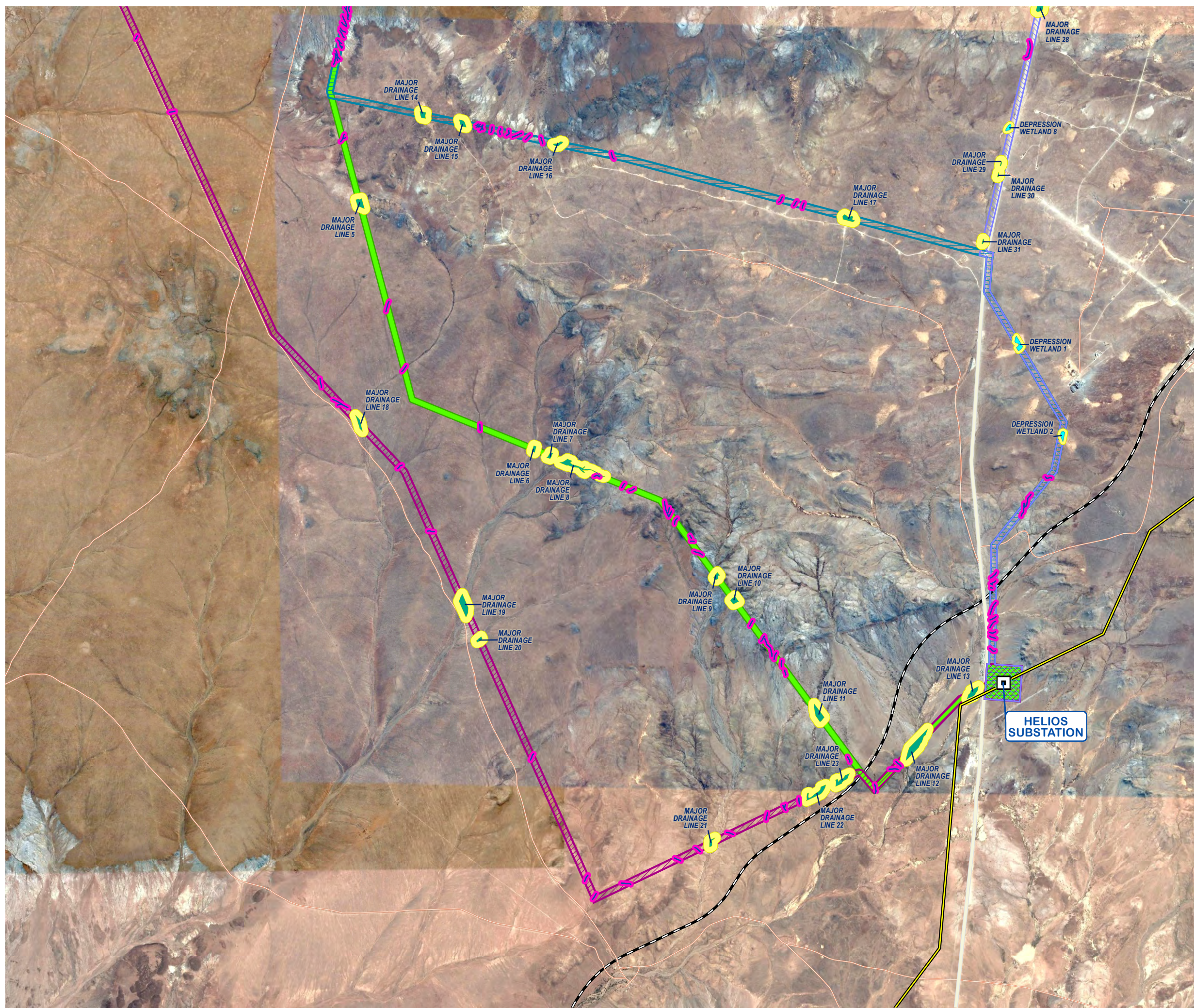
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Map Ref No 13622/BAS_102	Revision 1	Date 24/07/2017

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**PROPOSED CONSTRUCTION
OF A 132kV POWER LINE
TO SERVE PROPOSED
WIND ENERGY FACILITIES
ITHEMBA WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE**

**SURFACE WATER ASSESSMENT:
DELINEATED SURFACE WATER
FEATURES
(SOUTHERN SECTION)**

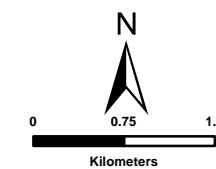


Legend

- Secondary Roads
 - Local Access
 - Railways
 - Existing High Voltage Power Lines (>=132kV)
 - Helios Substation
- Proposed Corridor Alternatives**
- Option 1
 - Option 2
 - Option 3
 - Option 4
- Surface Water Features**
- Major Drainage Line
 - Wetland
 - Major Drainage Line/Wetland Buffers*
 - Drainage Lines
 - Drainage Line Buffers (50m)

*Major Drainage Line Buffer: 100m
Wetland Buffer: 50m

SOURCE:
GOOGLE EARTH, 2016



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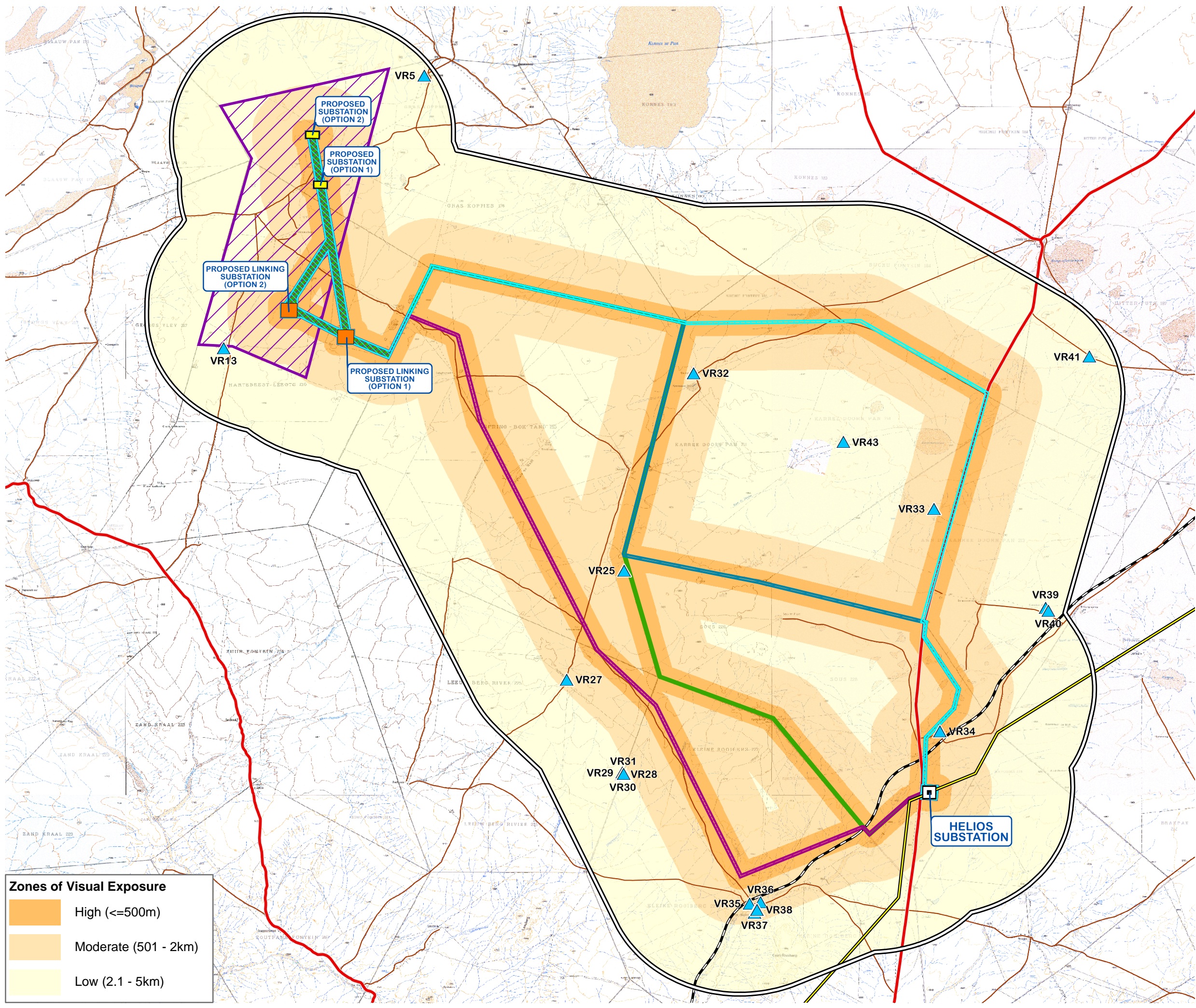
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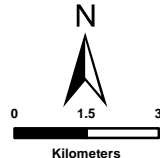
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ITHEMBA WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE
VISUAL ASSESSMENT: POTENTIALLY SENSITIVE VISUAL RECEPTOR LOCATIONS



Legend

- Secondary Roads
 - Local Access Roads
 - Railways
 - Existing High Voltage Power Lines ($\geq 132kV$)
 - Ithemba Wind Farm Application Site
 - Helios Substation
 - Proposed Linking Substation Site Alternatives
 - Proposed Ithemba Substation Site Alternatives
 - 5km Visual Assessment Zone
 - Potentially Sensitive Receptor Locations
- Proposed Corridor Alternatives**
- Option 1
 - Option 2
 - Option 3
 - Option 4

SOURCE:
 NGI, 2014
 SANBI, 2012



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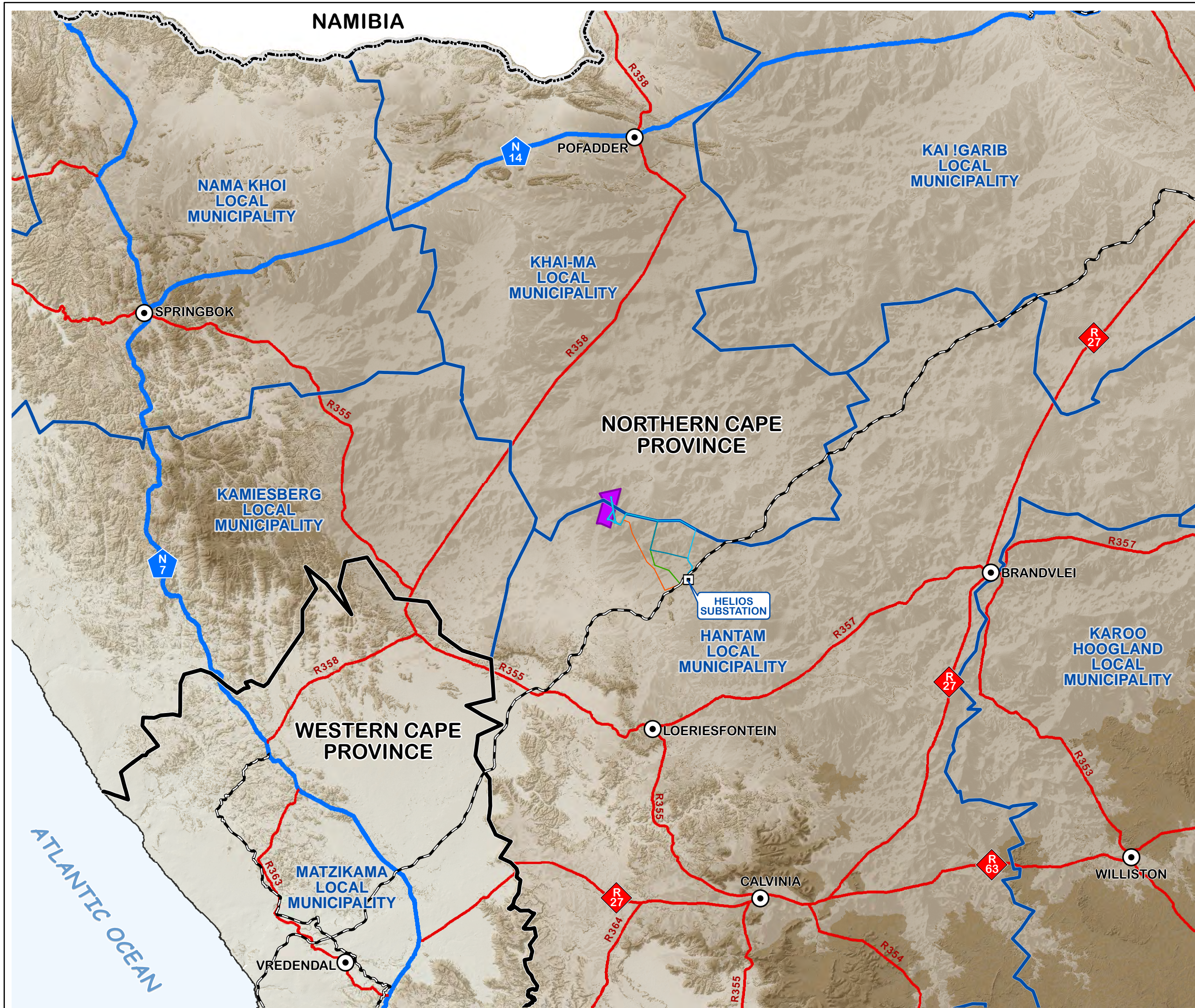
Zones of Visual Exposure

- High ($\leq 500m$)
- Moderate (501 - 2km)
- Low (2.1 - 5km)

Project No 13622	Prepared By KLS	Date 15/12/2016
Map Ref No 13622/BAV_107	Revision 2	Date 21/08/2017

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ITHEMBA WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE
REGIONAL CONTEXT

- Legend**
- National Boundary
 - Provincial Boundaries
 - Local Municipal Boundaries
 - National Routes
 - Main Arterial Routes
 - Railways
 - Main Towns
 - Ithemba Wind Farm Application Site
- Proposed Corridor Alternatives**
- Option 1
 - Option 2
 - Option 3
 - Option 4

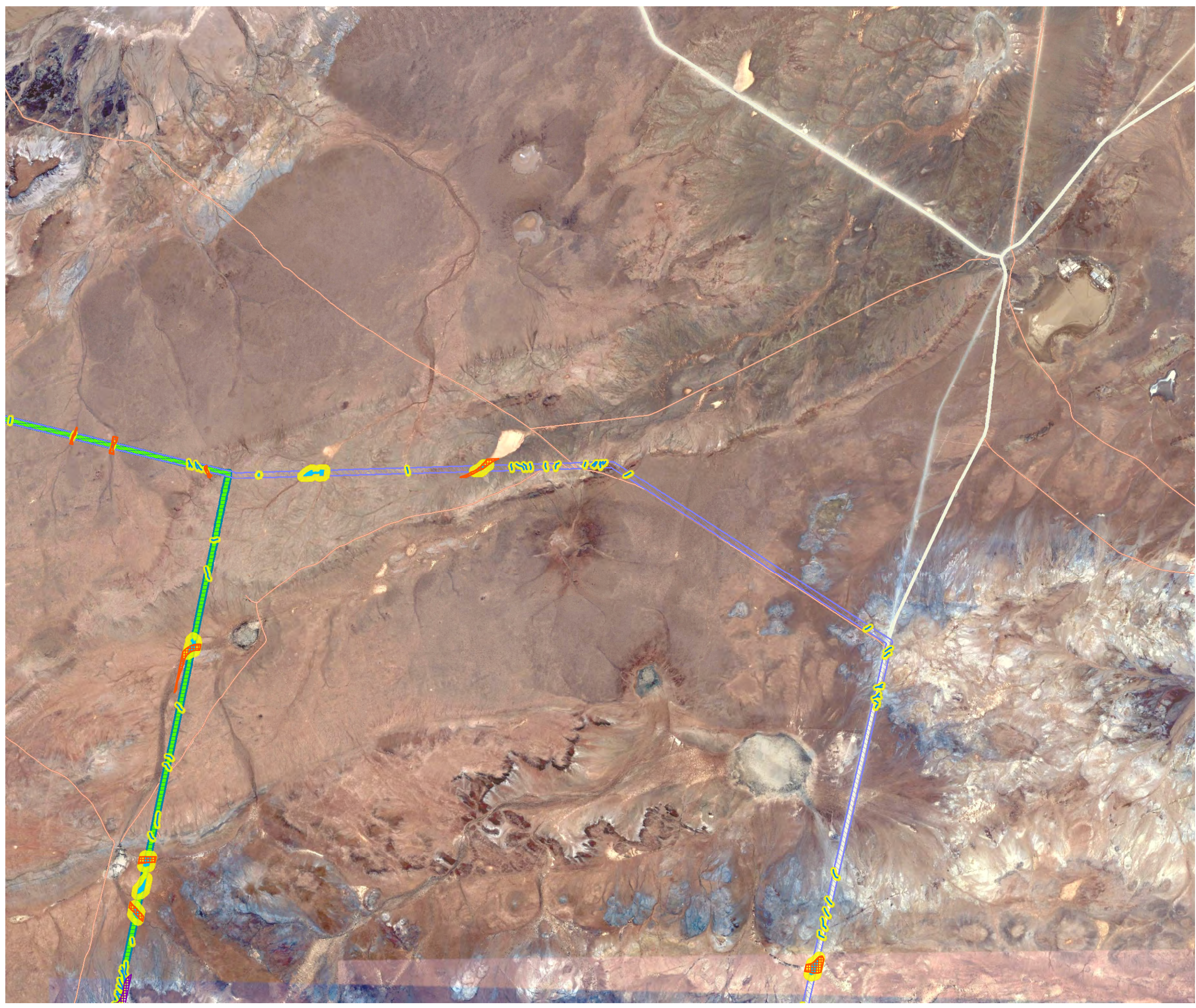
SOURCE: MUNICIPAL DEMARCATION BOARD, 2011
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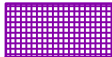



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Map Ref No 13622/BA_I02	Revision 1	Date 25/05/2017

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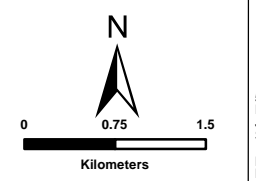
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**PROPOSED CONSTRUCTION
OF A 132kV POWER LINE
TO SERVE PROPOSED
WIND ENERGY FACILITIES
ITHEMBA WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
ENVIRONMENTAL SENSITIVITY
(NORTH-EASTERN SECTION)**

- Legend**
-  Secondary Roads
 -  Local Access Roads
- Proposed Corridor Alternatives**
-  Option 1
 -  Option 2
 -  Option 3
 -  Option 4
- Environmental Sensitivity**
-  Avifaunal Sensitivity
 -  Ecological Sensitivity: High
 -  Ecological Sensitivity: Medium-High
 -  Wetlands/Major Drainage Lines
 -  Drainage Lines
 -  Surface Water Buffers

SOURCE:
GOOGLE EARTH, 2016



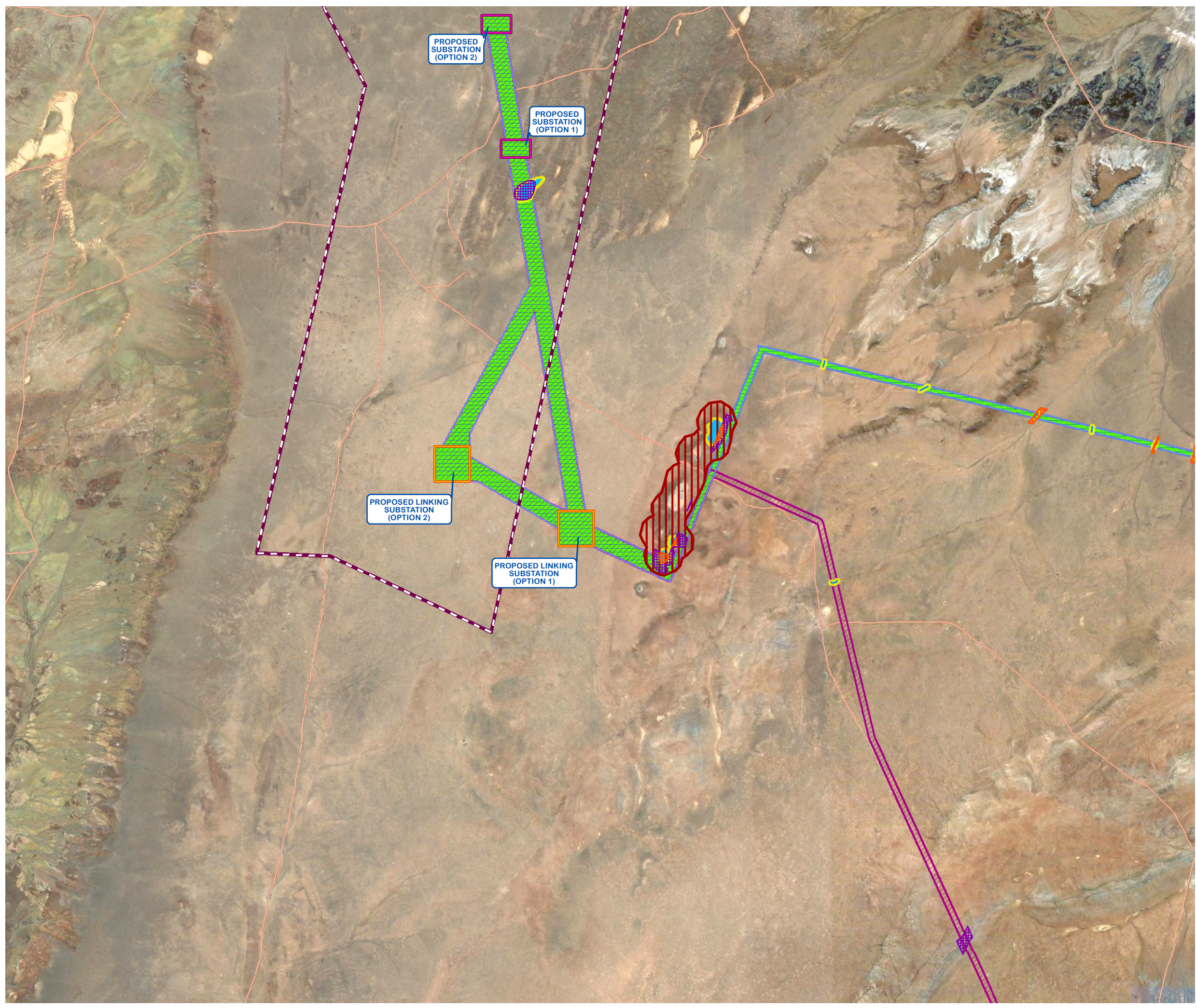
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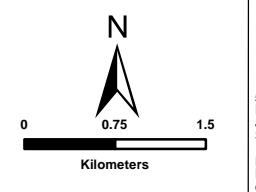
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ITHEMBA WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE
ENVIRONMENTAL SENSITIVITY (NORTH-WESTERN SECTION)



- Legend**
- Local Access Roads
 - Ithemba Wind Farm Application Site
 - Proposed Linking Substation Site Alternatives
 - Proposed Ithemba Substation Site Alternatives
- Proposed Corridor Alternatives**
- Option 1
 - Option 2
 - Option 3
 - Option 4
- Environmental Sensitivity**
- Avifaunal Sensitivity
 - Ecological Sensitivity: High
 - Ecological Sensitivity: Medium-High
 - Wetlands/Major Drainage Lines
 - Drainage Lines
 - Surface Water Buffers

SOURCE: GOOGLE EARTH, 2016



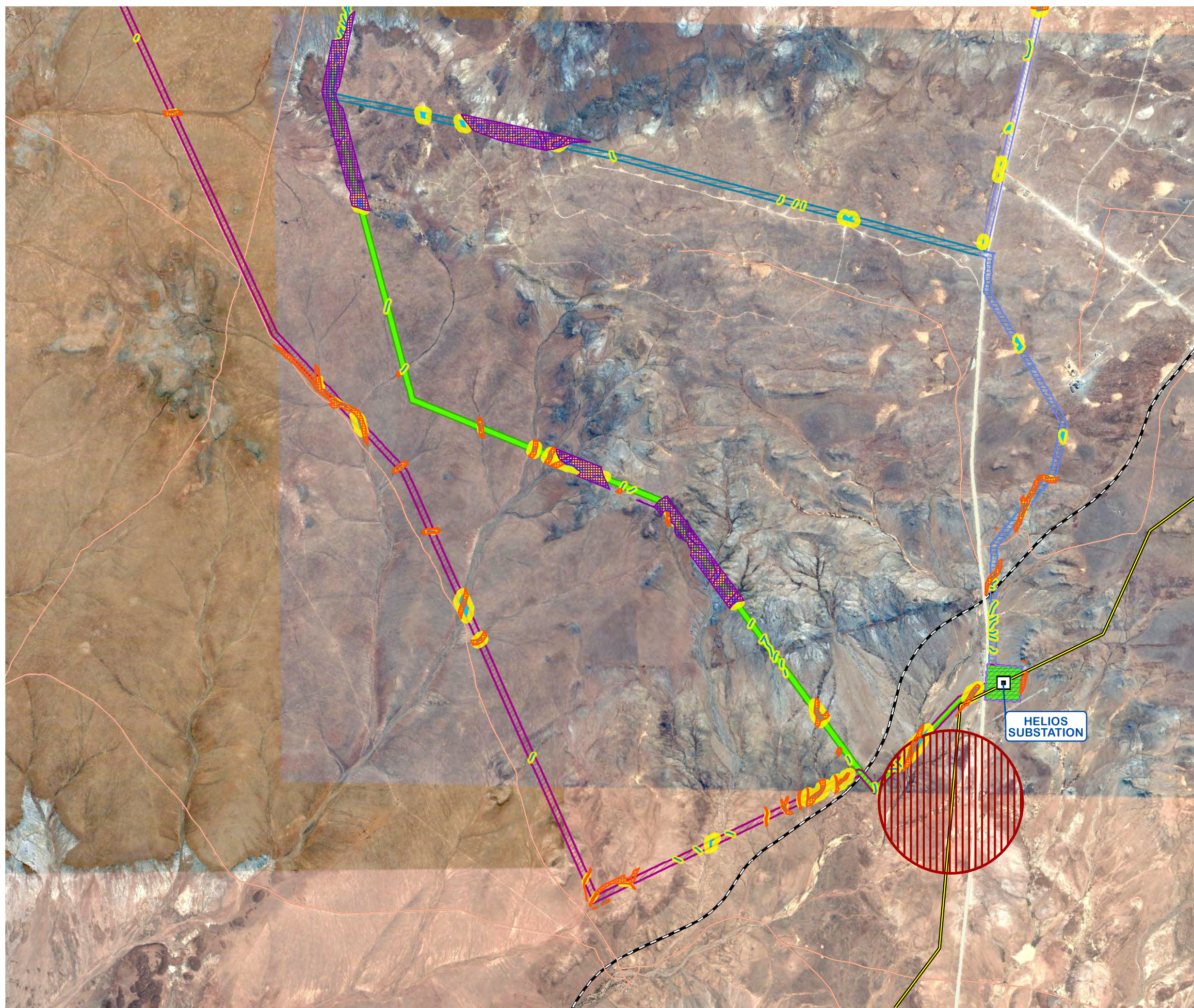
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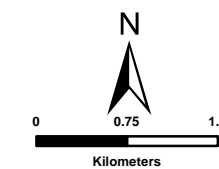
PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED WIND ENERGY FACILITIES
ITHEMBA WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE
ENVIRONMENTAL SENSITIVITY (SOUTHERN SECTION)



Legend

- Secondary Roads
- Local Access Roads
- Railways
- Existing High Voltage Power Lines (>=132kV)
- Helios Substation
- Proposed Corridor Alternatives**
- Option 1
- Option 2
- Option 3
- Option 4
- Environmental Sensitivity**
- Avifaunal Sensitivity
- Ecological Sensitivity: High
- Ecological Sensitivity: Medium-High
- Wetlands/Major Drainage Lines
- Drainage Lines
- Surface Water Buffers

SOURCE: GOOGLE EARTH, 2016



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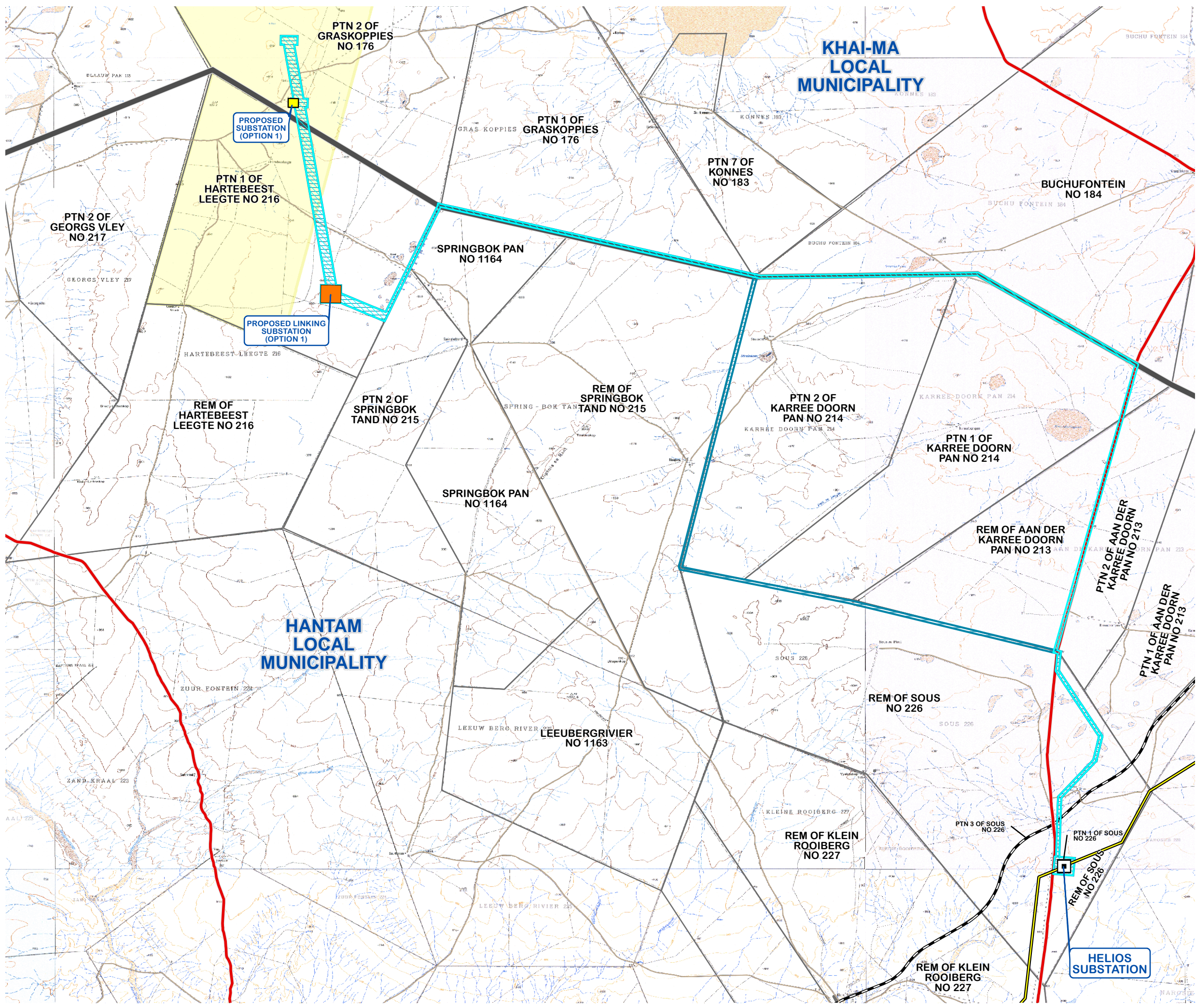
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PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED WIND ENERGY FACILITIES
ITHEMBA WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE
FAVOURABLE ALTERNATIVES



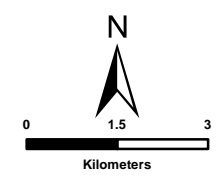
Legend

- Local Municipal Boundaries
- Secondary Roads
- Local Access Roads
- Railways
- Existing High Voltage Power Lines (>=132kV)
- Adjoining Farm Boundaries
- Ithemba Wind Farm Application Site
- Helios Substation
- Preferred Linking Substation Site Alternative
- Preferred Ithemba Substation Site Alternative

Favourable Corridor Alternatives

- Option 2
- Option 4

SOURCE: MUNICIPAL DEMARCATION BOARD, 2011
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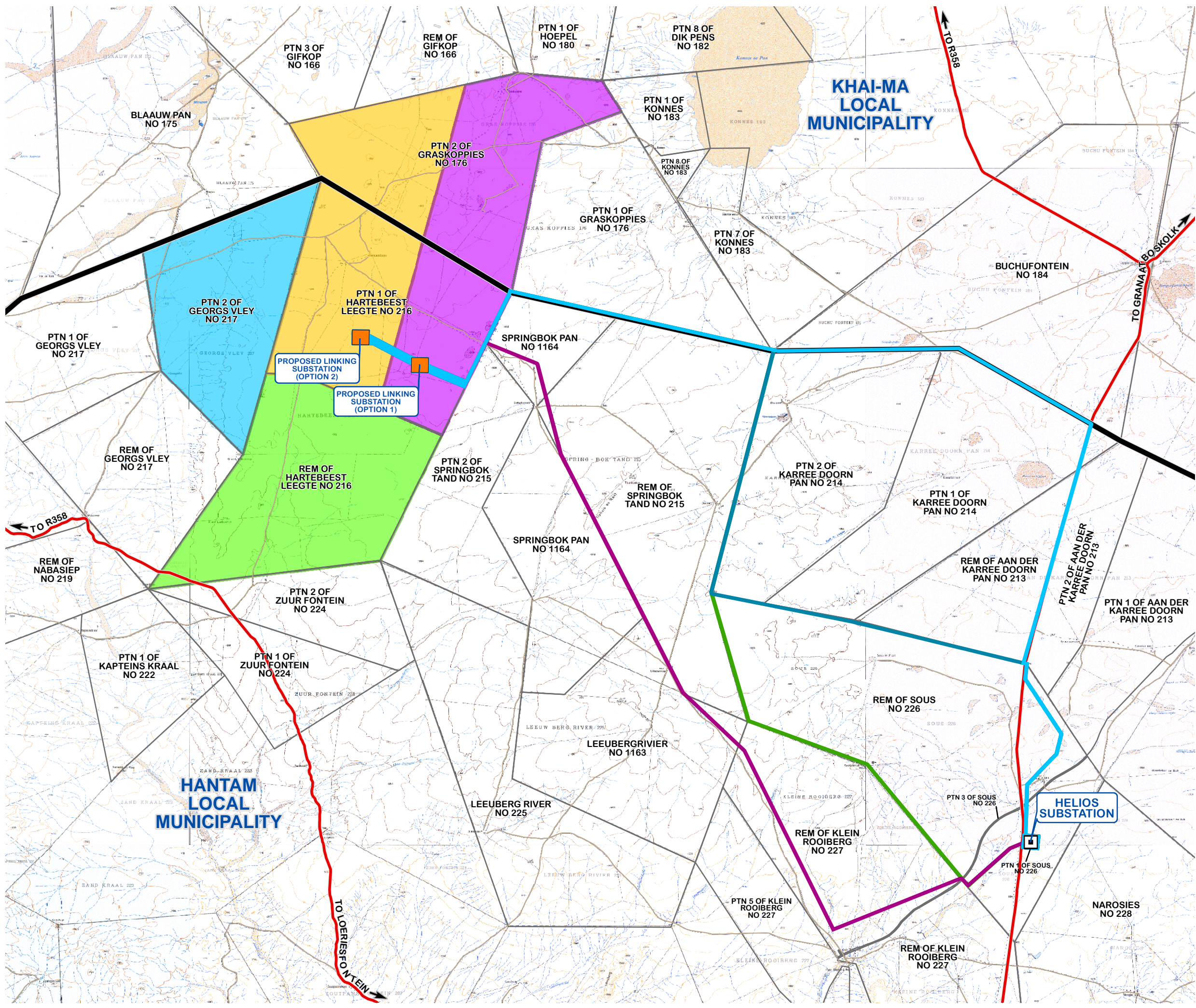
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PROPOSED CONSTRUCTION OF FOUR WIND FARMS AND ASSOCIATED GRID CONNECTION
NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE
PROJECT OVERVIEW



- Legend**
- Local Municipal Boundaries
 - Secondary Roads
 - Local Access Roads
 - Adjoining Farm Boundaries
 - Helios Substation
 - Proposed Linking Substation Site Alternatives
- Proposed Wind Farm Projects**
- Graskoppies Wind Farm
 - Hartebeestleegte Wind Farm
 - Ithemba Wind Farm
 - Xha! Boom Wind Farm
- Proposed Corridor Alternatives**
- Option 1
 - Option 2
 - Option 3
 - Option 4

SOURCE: MUNICIPAL DEMARCATION BOARD, 2011
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