

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

Legend

- Secondary Roads
- Local Access Roads
- Railways
- Existing High Voltage Power Lines ($\geq 132\text{kV}$)
- Hartebeest Leegte Wind Farm Application Site
- Helios Substation
- Proposed Linking Substation Site Alternatives
- Proposed Hartebeest Leegte Substation Site Alternatives

Proposed Corridor Alternatives

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

Critical Biodiversity Areas

- CBA2
- ESA

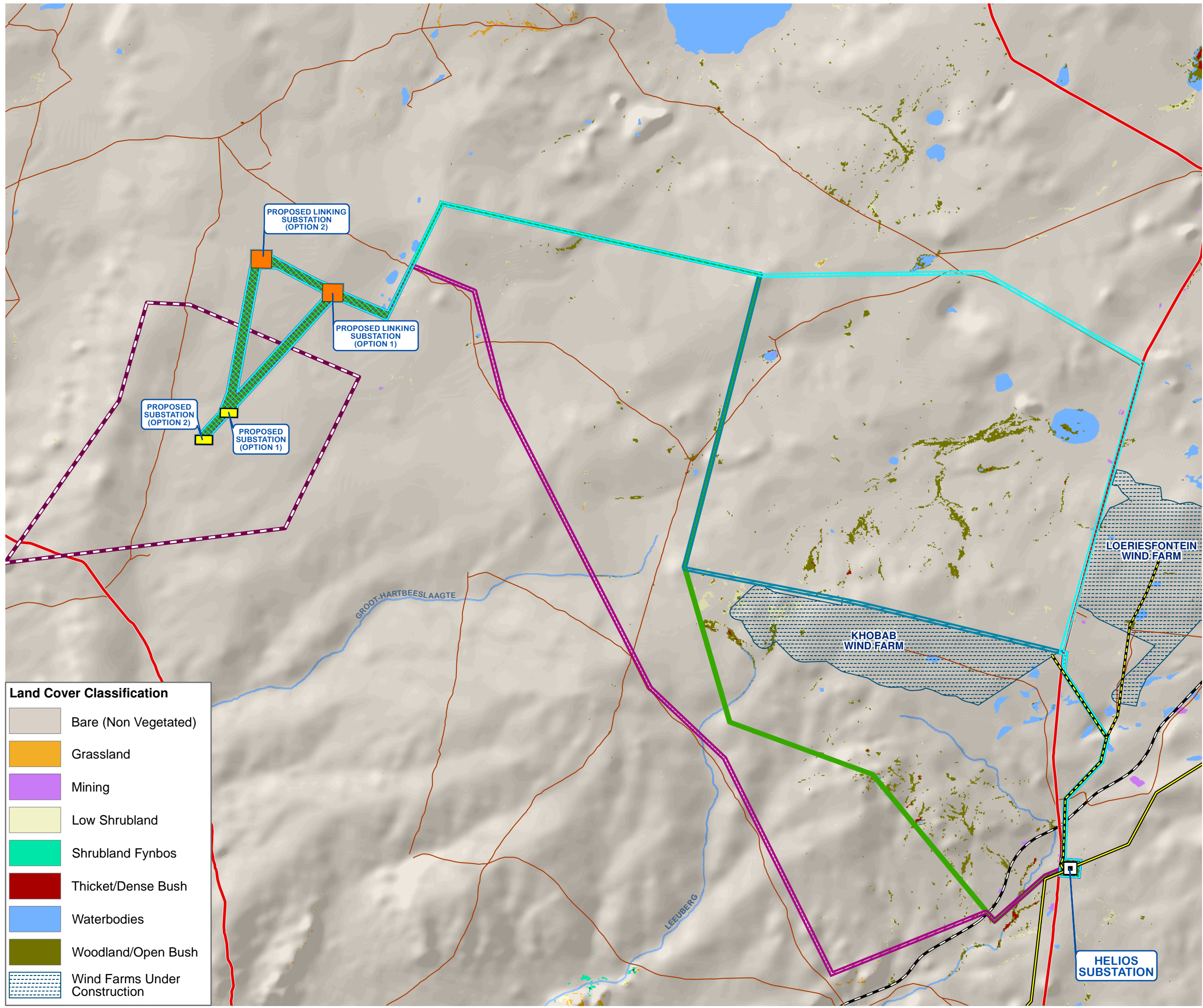
SOURCE:
NGI, 2014
SANBI, 2012
NAMA-KWA DISTRICT BIODIVERSITY SECTOR PLAN, 2008

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TO SERVE PROPOSED
WIND ENERGY FACILITIES
HARTEBEEST LEEGTE
WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE**

**BROAD LAND COVER
CLASSIFICATION**

- Legend**
- Secondary Roads
 - Local Access Roads
 - Railways
 - Existing High Voltage Power Lines ($\geq 132\text{kV}$)
 - Main Watercourses
 - Hartebeest Leegte Wind Farm Application Site
 - Helios Substation
 - Proposed Linking Substation Site Alternatives
 - Proposed Hartebeest Leegte 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

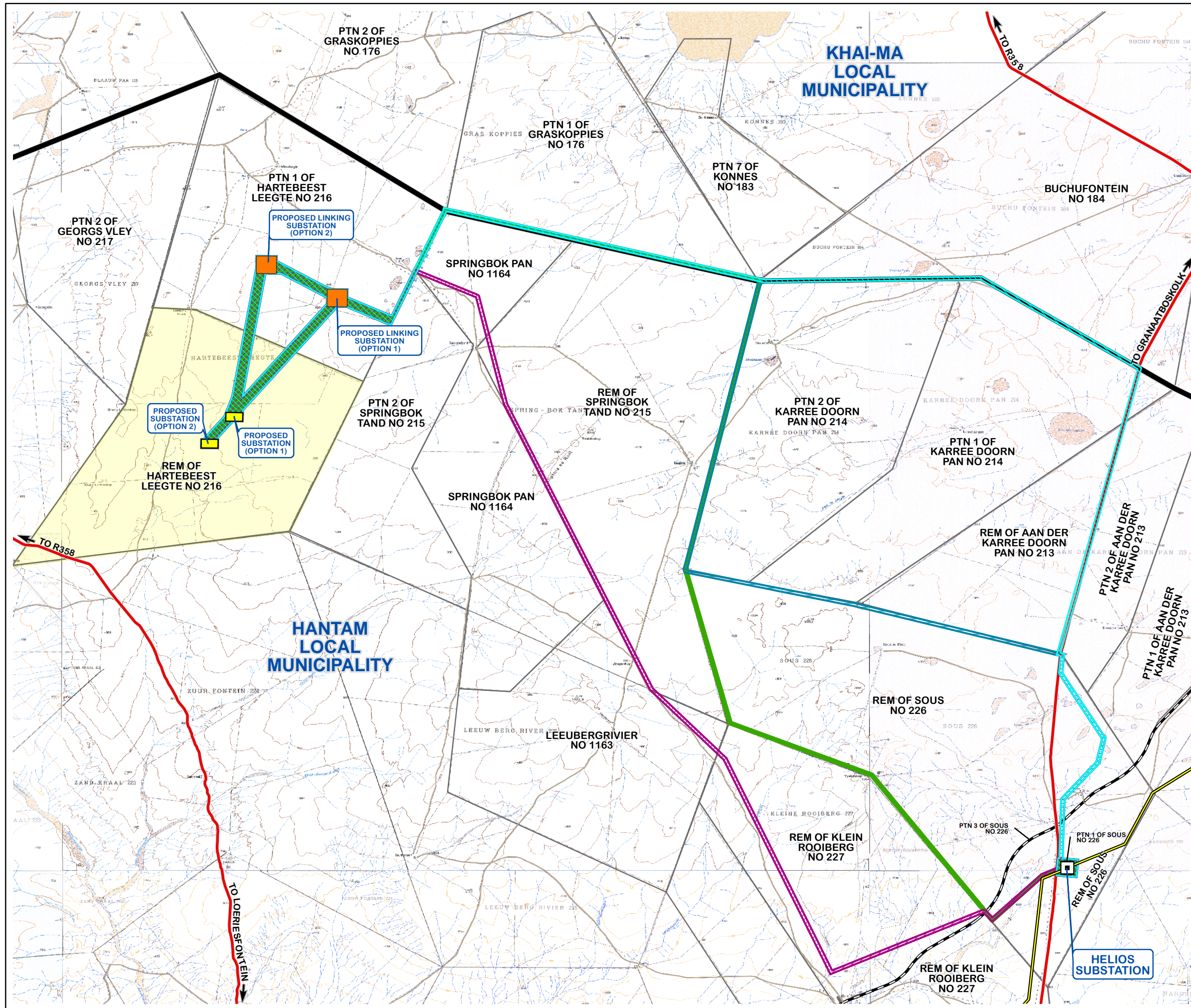
SOURCE:
2013-2014 SA NATIONAL LAND COVER
(© GEOTERRAIMAGE - 2014)

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

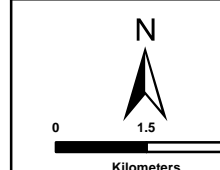
Legend

- Local Municipal Boundaries
- Secondary Roads
- Local Access Roads
- Existing High Voltage Power Lines ($\geq 132\text{kV}$)
- Railways
- Adjoining Farm Boundaries
- Hartebeest Leegte Wind Farm Application Site
- Helios Substation
- Proposed Linking Substation Site Alternatives
- Proposed Hartebeest Leegte Substation Site Alternatives

Proposed Corridor Alternatives

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

SOURCE:
MUNICIPAL DEMARCATION BOARD, 2011
NGI, 2014

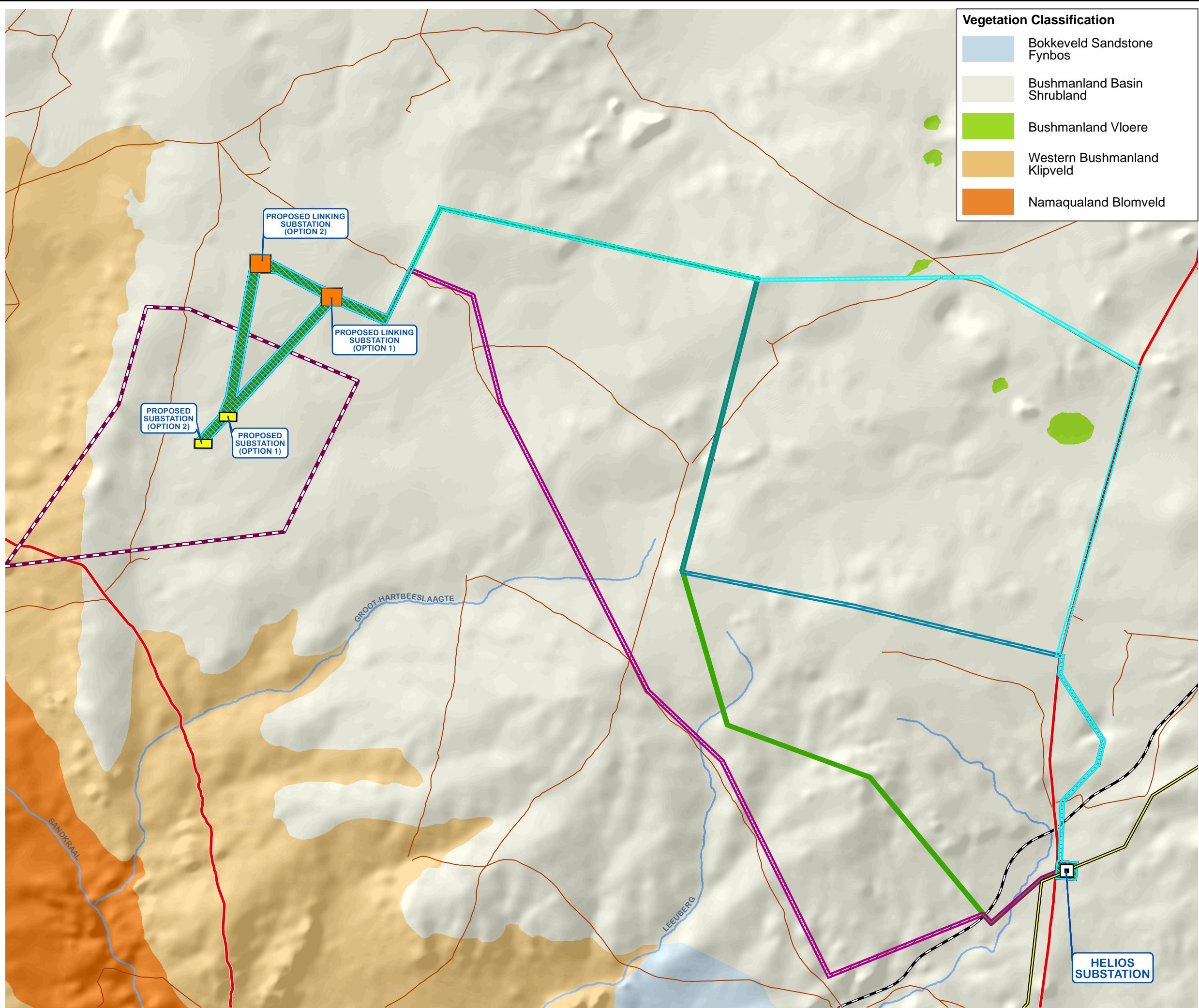


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Vegetation Classification

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

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WIND ENERGY FACILITIES
HARTEBEEST LEEGTE
WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
VEGETATION CLASSIFICATION**

Legend

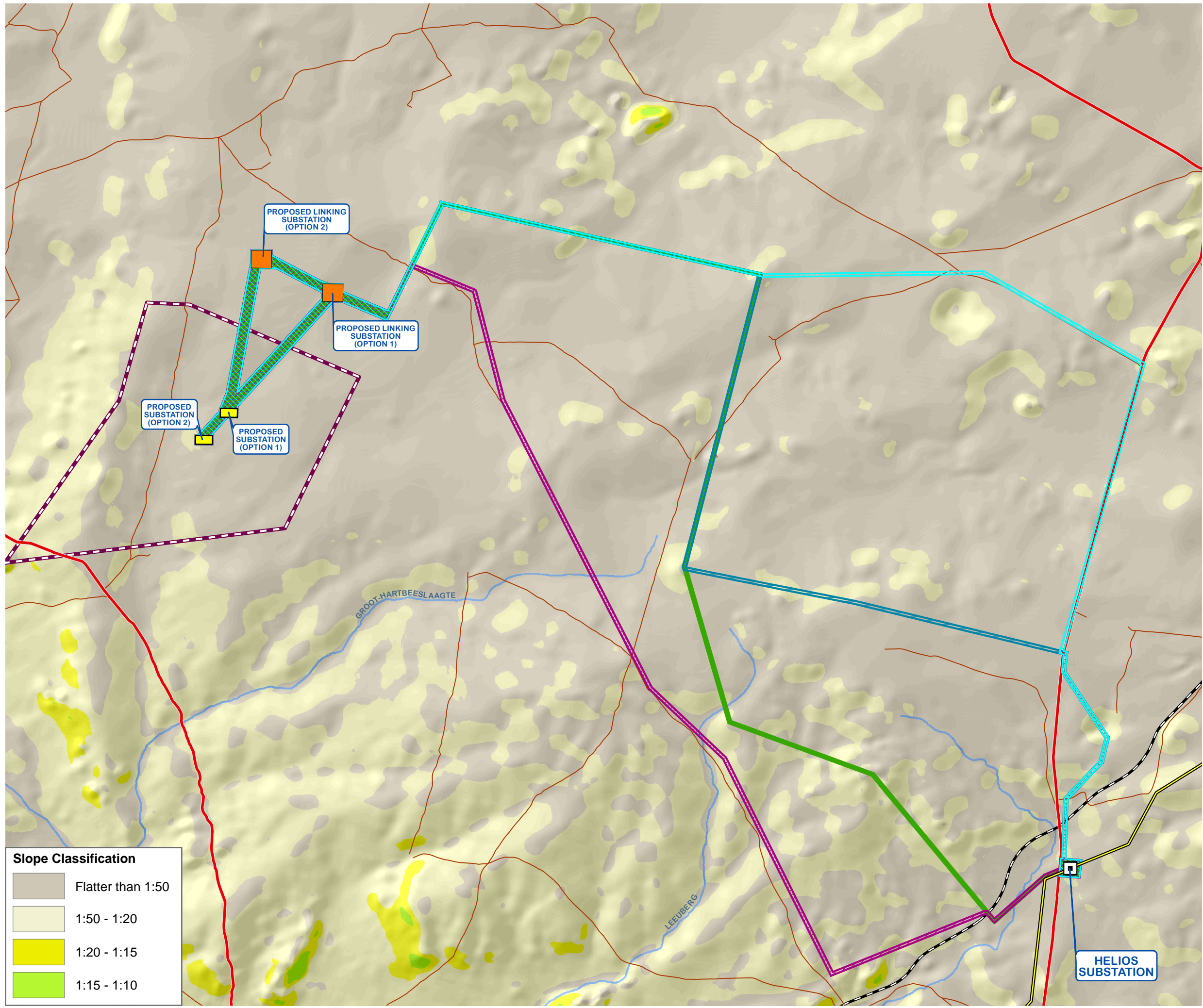
	Secondary Roads
	Local Access Roads
	Existing High Voltage Power Lines ($\geq 132\text{kV}$)
	Railways
	Main Watercourses
	Hartebeest Leegte Wind Farm Application Site
	Helios Substation
	Proposed Linking Substation Site Alternatives
	Proposed Hartebeest Leegte Substation Site Alternatives

Proposed Corridor Alternatives

	Option 1
	Option 2
	Option 3
	Option 4

SOURCE:
NGI, 2014
SANBI, 2012

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TO SERVE PROPOSED
WIND ENERGY FACILITIES
HARTEBEEST LEEGTE
WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
SLOPE CLASSIFICATION**

Legend

- Secondary Roads
- Local Access Roads
- Existing High Voltage Power Lines ($\geq 132\text{kV}$)
- Railways
- Main Watercourses
- Hartebeest Leegte Wind Farm Application Site
- Helios Substation
- Proposed Linking Substation Site Alternatives
- Proposed Hartebeest Leegte Substation Site Alternatives

Proposed Corridor Alternatives

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

Slope Classification	
Flatter than 1:50	
1:50 - 1:20	
1:20 - 1:15	
1:15 - 1:10	

SOURCE:
NGI, 2014

0 1.5 3
Kilometers

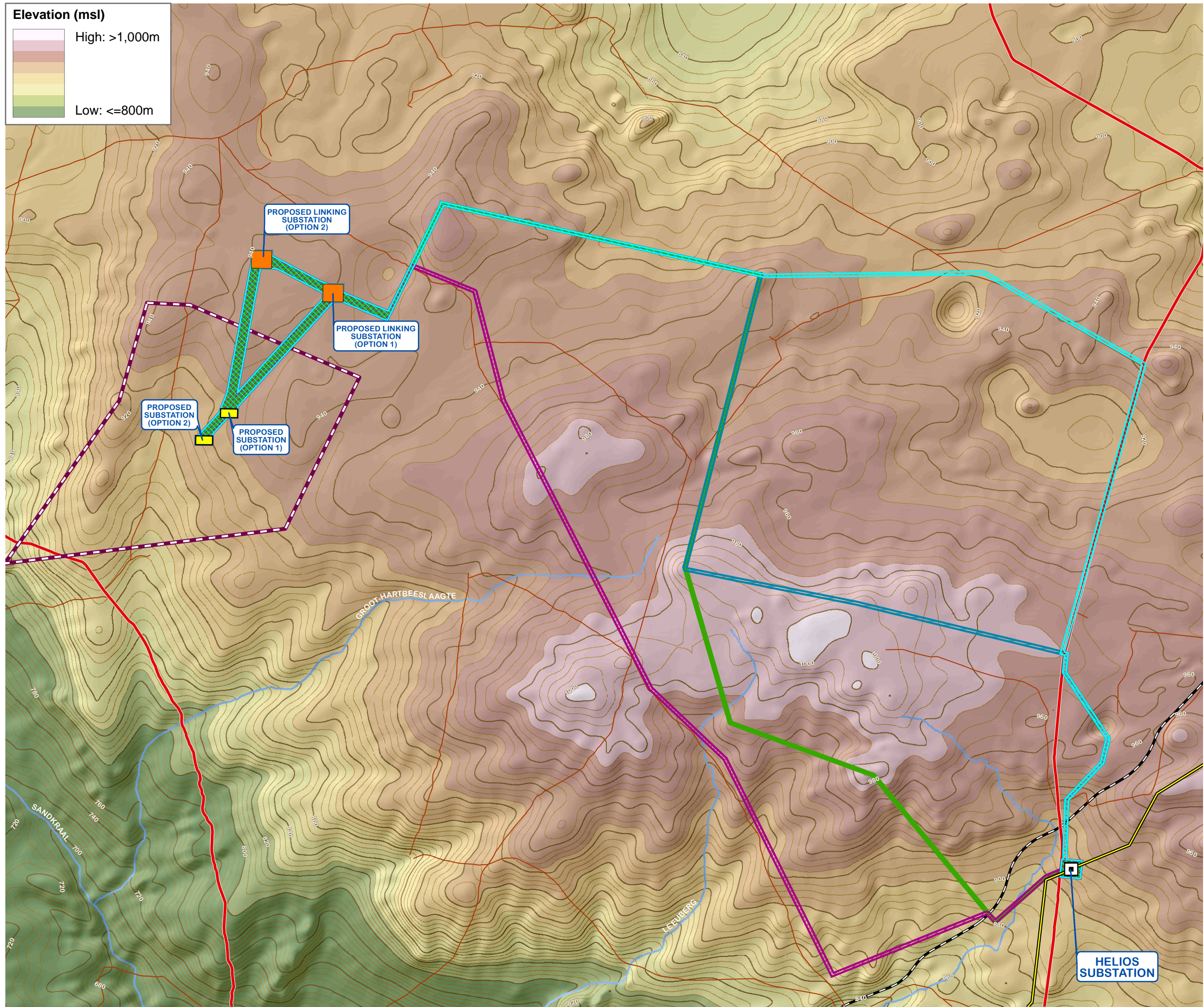
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HELIOS
SUBSTATION



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

- Legend**
- Secondary Roads
 - Local Access Roads
 - Railways
 - Existing High Voltage Power Lines ($\geq 132\text{kV}$)
 - Main Watercourses
 - Contours (20m Interval)
 - Contours (5m Interval)
 - Hartebeest Leegte Wind Farm Application Site
 - Helios Substation
 - Proposed Linking Substation Site Alternatives
 - Proposed Hartebeest Leegte Substation Site Alternatives
- Proposed Corridor Alternatives**
- Option 1
 - Option 2
 - Option 3
 - Option 4

SOURCE:
NGI, 2014

N

0 1.5 3

Kilometers

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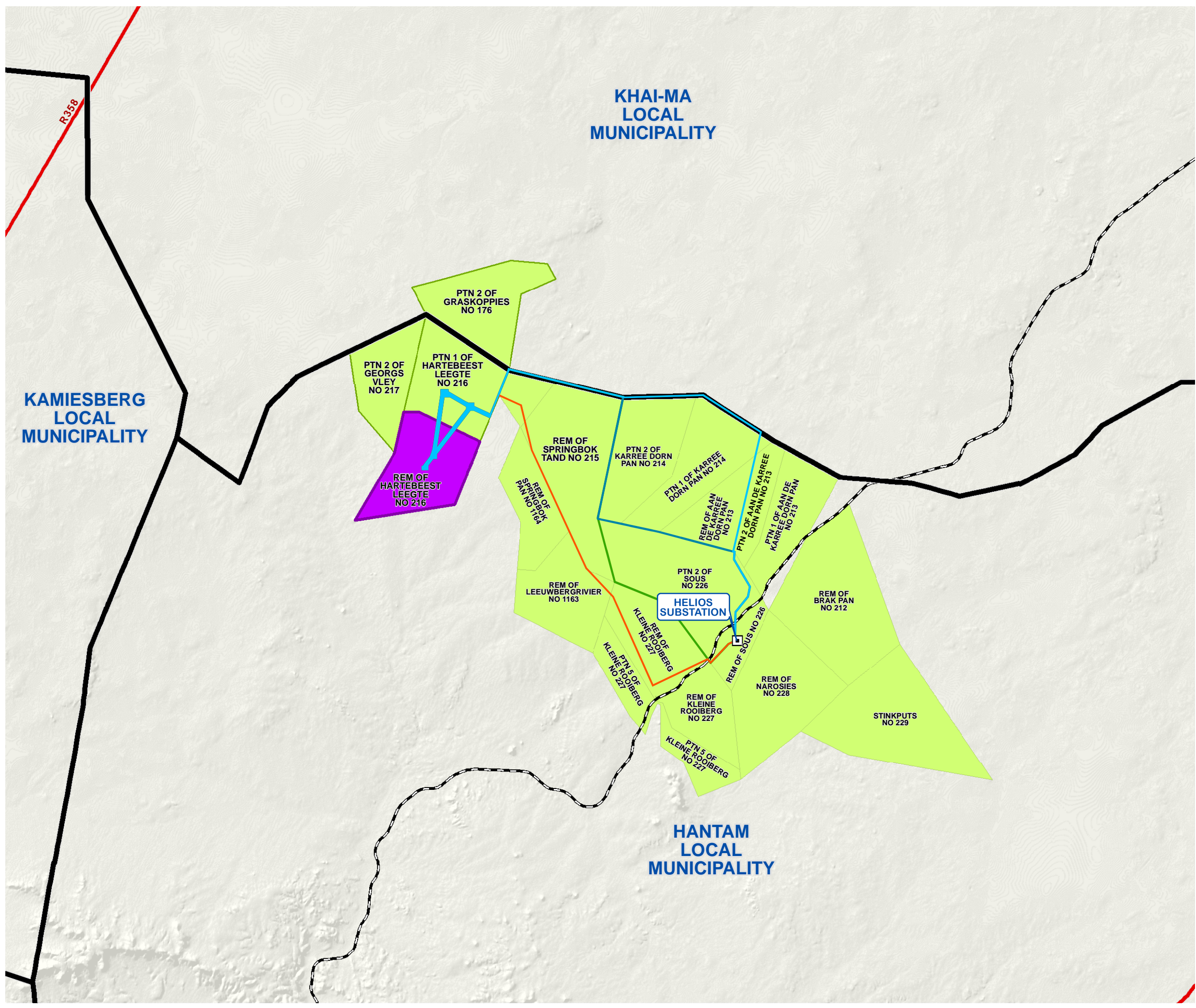
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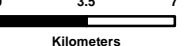

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TO SERVE PROPOSED
WIND ENERGY FACILITIES
HARTEBEEST LEEGTE
WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
OTHER PROPOSED RENEWABLE
ENERGY DEVELOPMENTS**

- Legend**
- Local Municipal Boundaries
 - Main Arterial Routes
 - Railways
 - Helios Substation
 - Hartebeest Leegte 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



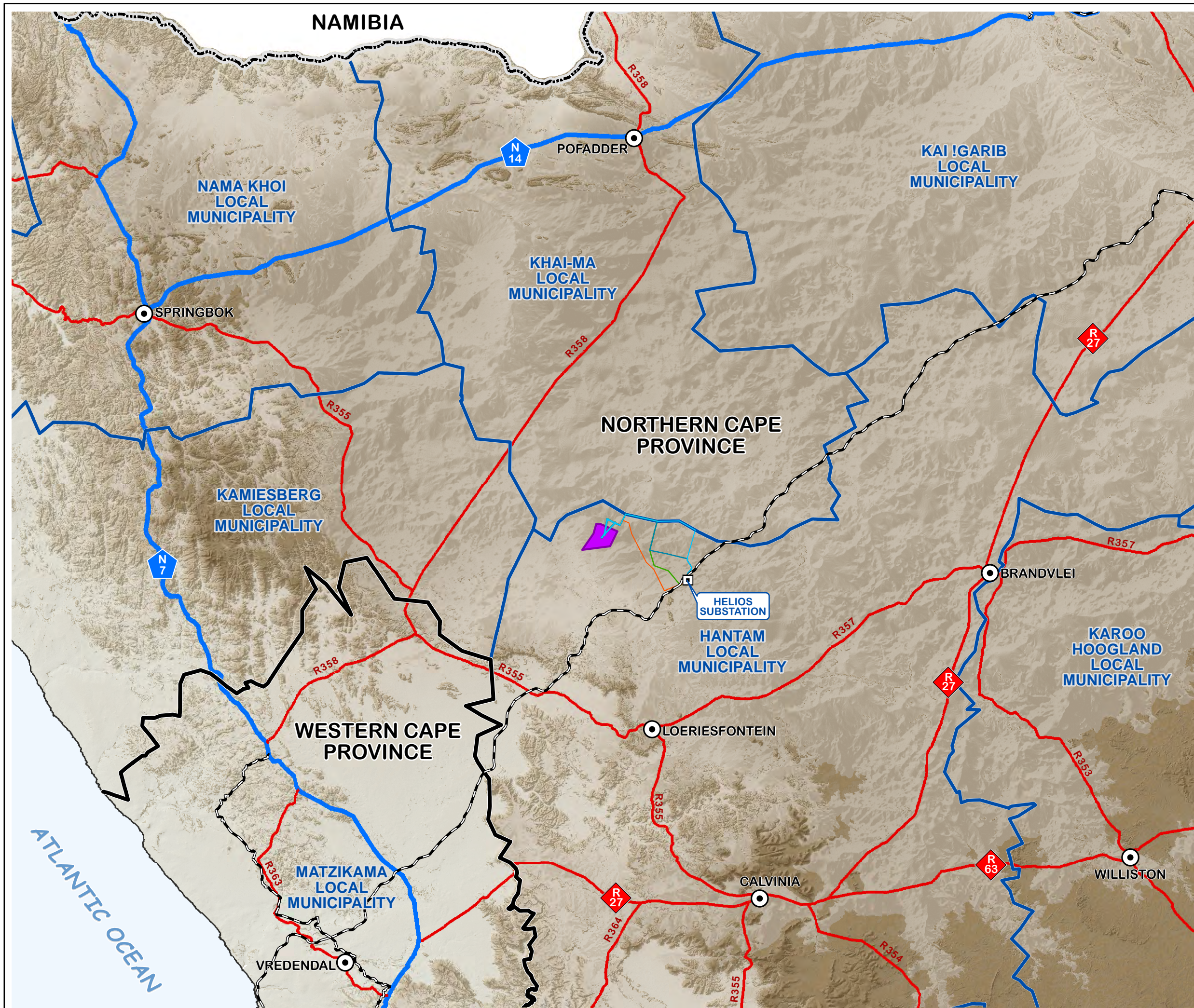


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TO SERVE PROPOSED
WIND ENERGY FACILITIES
HARTEBEEST LEEGTE
WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
REGIONAL CONTEXT**

Legend

- National Boundary
- Provincial Boundaries
- Local Municipal Boundaries
- National Routes
- Main Arterial Routes
- Railways
- Main Towns
- Hartebeest Leegte Wind Farm Application Site

Proposed Corridor Alternatives

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

SOURCE:
MUNICIPAL DEMARCATION BOARD, 2011
NGI, 2014

N

0 10 20
Kilometers

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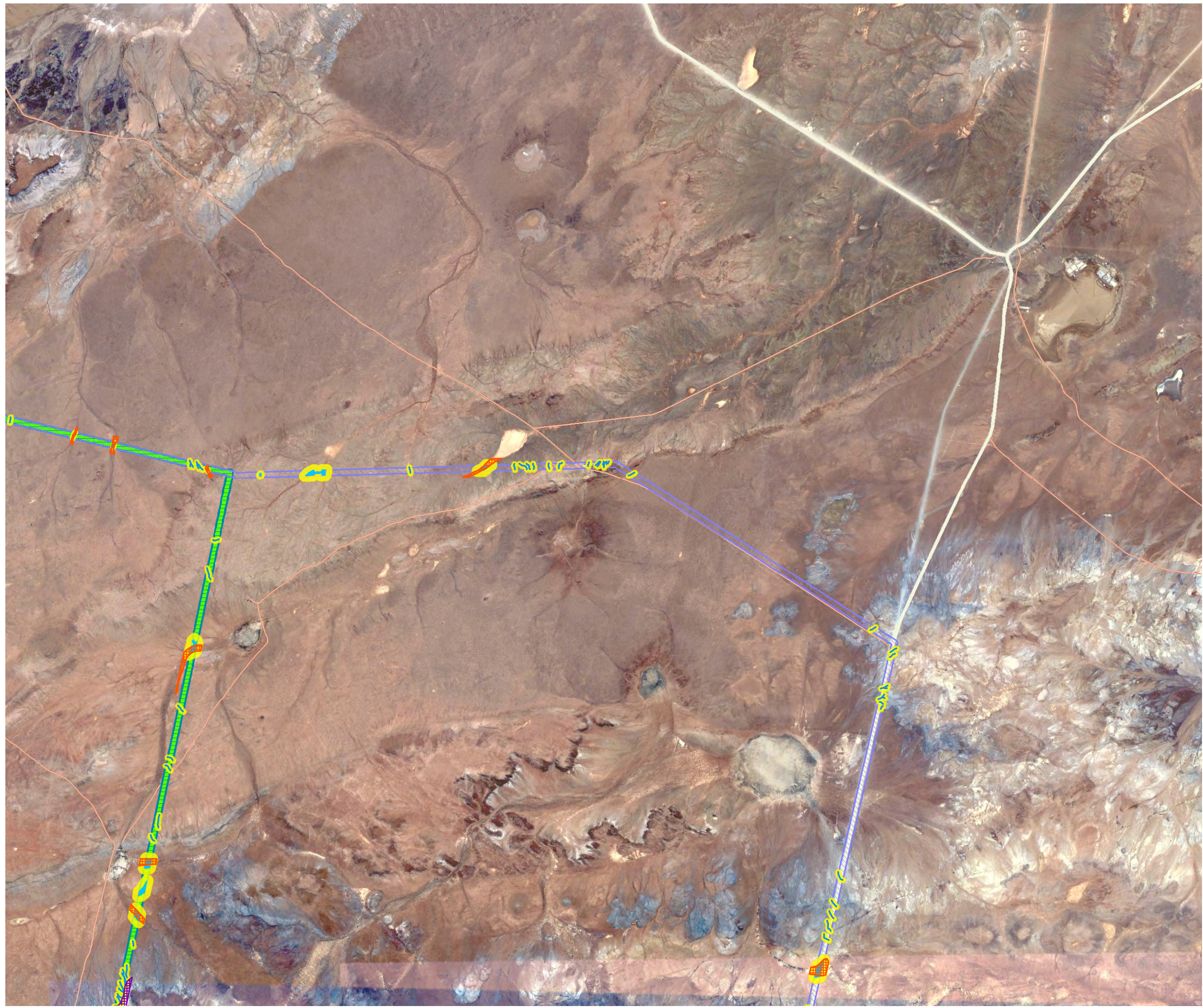
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WIND ENERGY FACILITIES
HARTEBEEST LEEGTE
WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
ENVIRONMENTAL SENSITIVITY
(NORTH-EASTERN SECTION)**

Legend

- Secondary Roads
- Local Access Roads

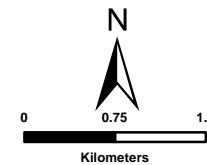
Proposed Corridor Alternatives

- 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

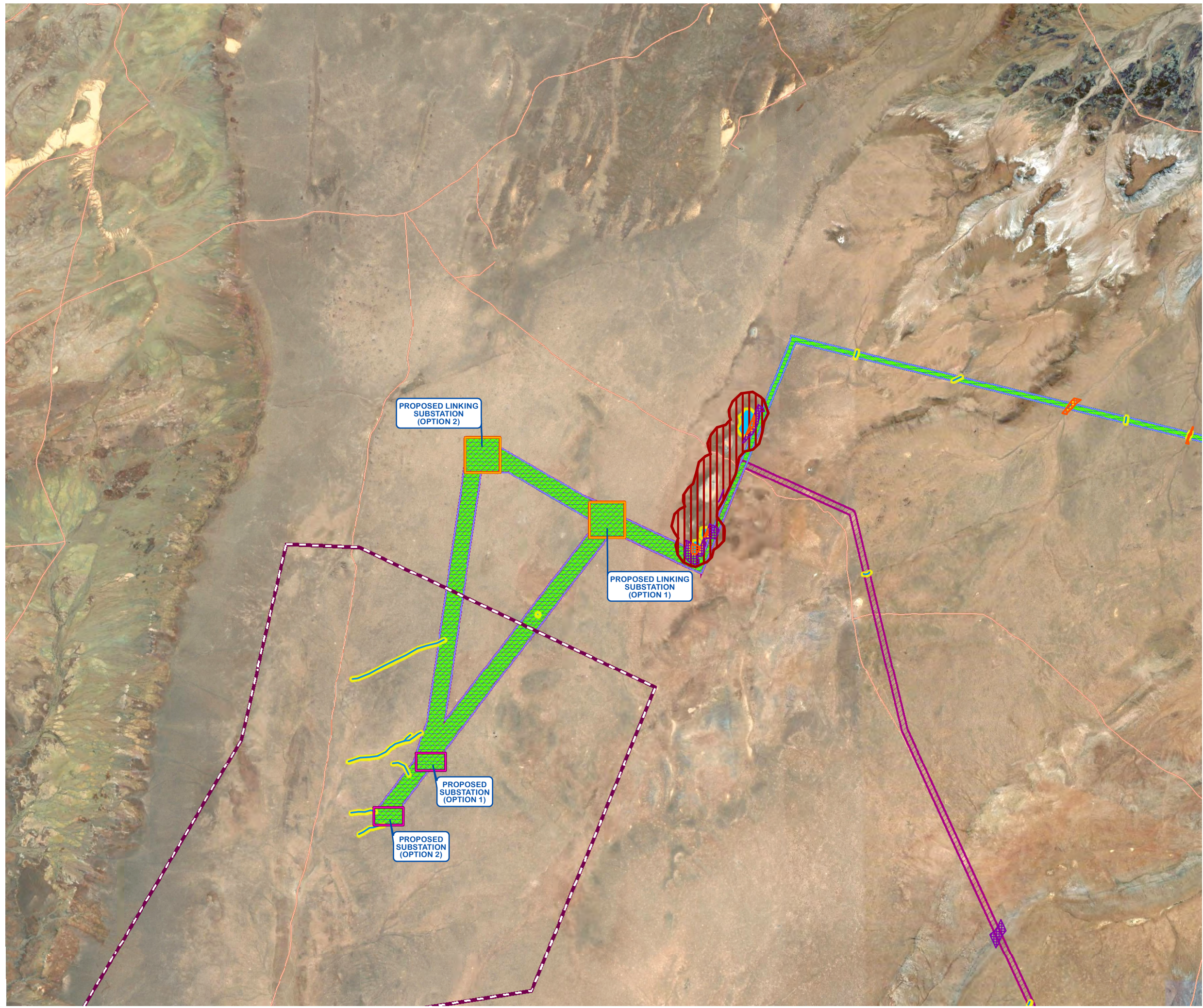


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HARTEBEEST LEEGTE
WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
ENVIRONMENTAL SENSITIVITY
(NORTH-WESTERN SECTION)**

- Legend**
- Local Access Roads
 - Hartebeest Leegte Wind Farm Application Site
 - Proposed Linking Substation Site Alternatives
 - Proposed Hartebeest Leegte 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

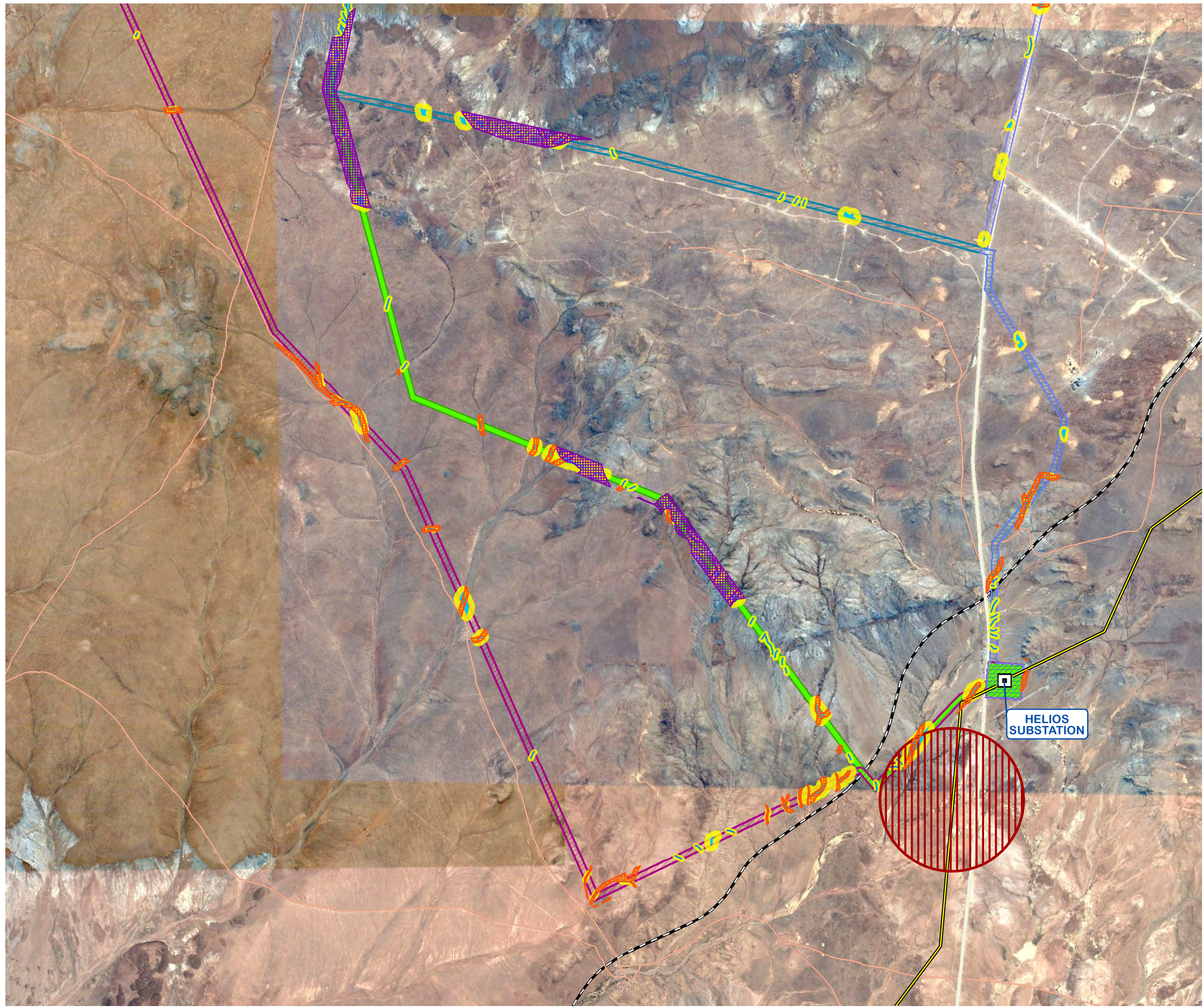
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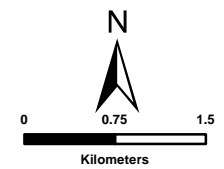


**PROPOSED CONSTRUCTION
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WIND ENERGY FACILITIES
HARTEBEEST LEEGTE
WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
ENVIRONMENTAL SENSITIVITY
(SOUTHERN SECTION)**

Legend

- Secondary Roads
- Local Access Roads
- Railways
- Existing High Voltage Power Lines ($\geq 132\text{kV}$)
- 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

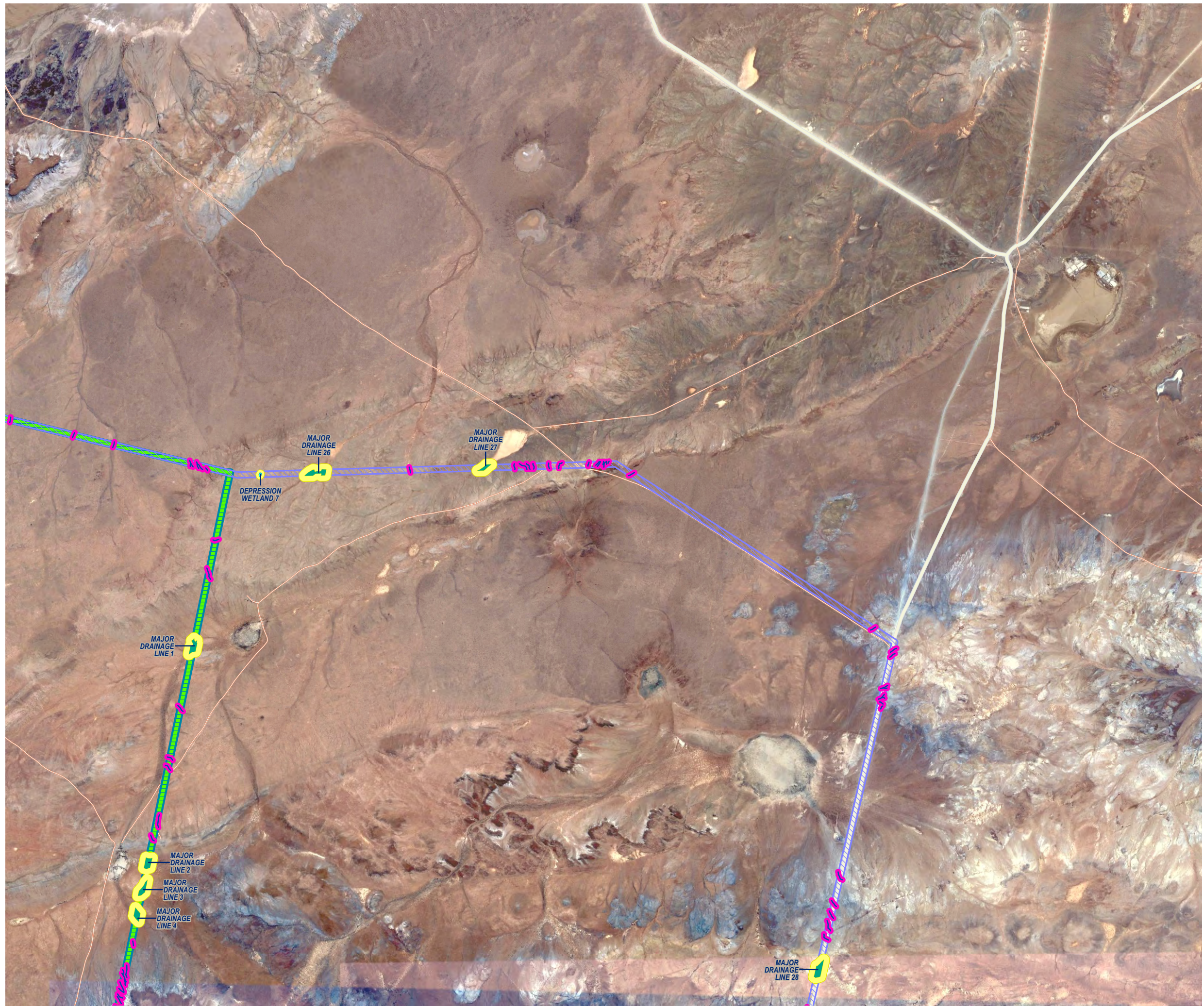


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HARTEBEEST LEEGTE
WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
SURFACE WATER ASSESSMENT:
DELINEATED SURFACE WATER
FEATURES
(NORTH-EASTERN SECTION)**

Legend

- Secondary Roads
- Local Access Roads
- 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

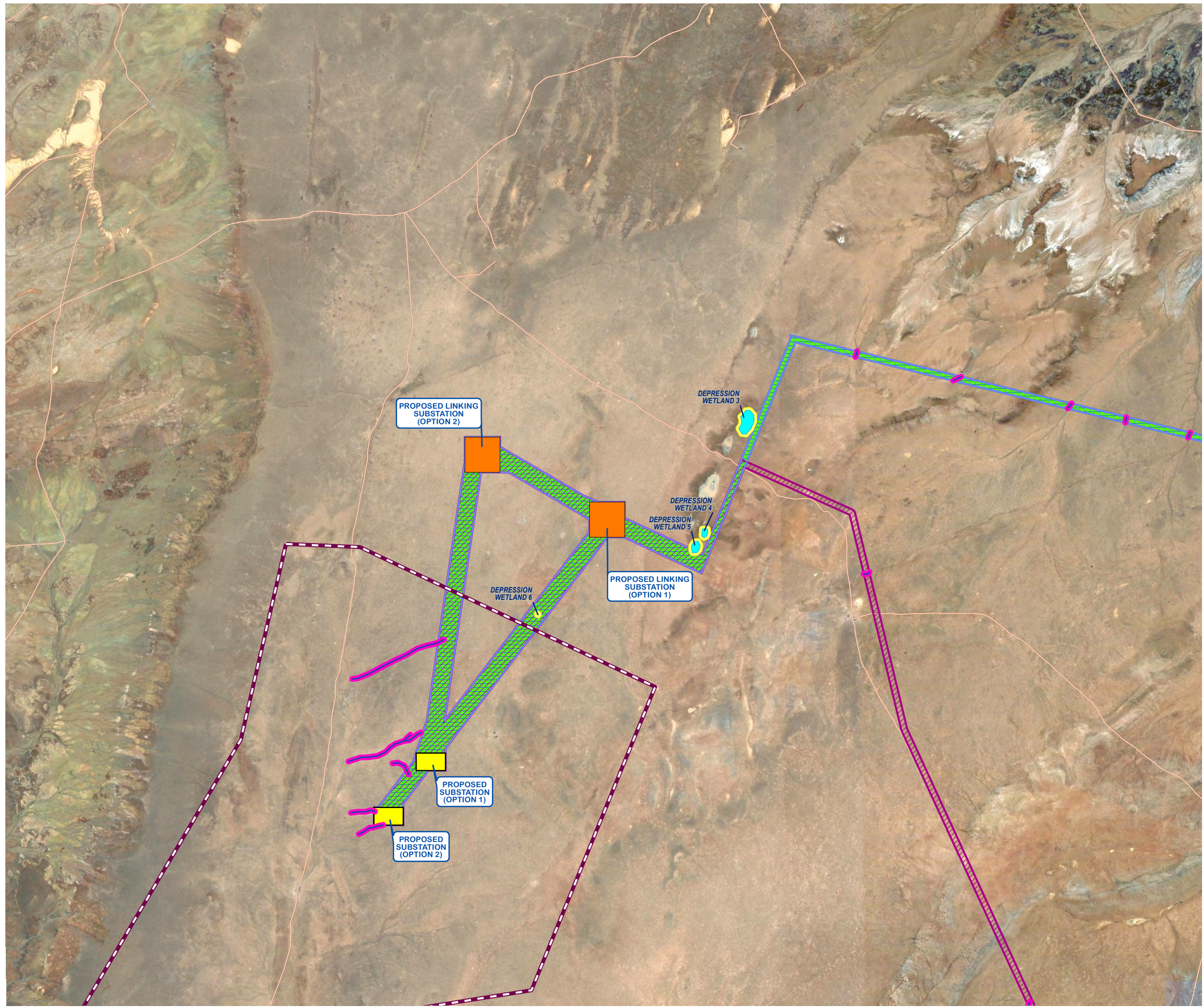
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WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
SURFACE WATER ASSESSMENT:
DELINEATED SURFACE WATER
FEATURES
(NORTH-WESTERN SECTION)**

Legend

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

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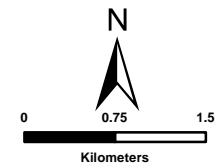
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OF A 132kV POWER LINE
TO SERVE PROPOSED
WIND ENERGY FACILITIES**
**HARTEBEEST LEEGTE
WIND FARM**
**NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE**
**SURFACE WATER ASSESSMENT:
DELINEATED SURFACE WATER
FEATURES
(SOUTHERN SECTION)**

Legend

- Secondary Roads
 - Local Access Roads
 - Railways
 - Existing High Voltage Power Lines ($\geq 132\text{kV}$)
 - Helios Substation
- Proposed Corridor Alternatives**
- Option 1
 - Option 2
 - Option 3
 - Option 4

SOURCE:
GOOGLE EARTH, 2016

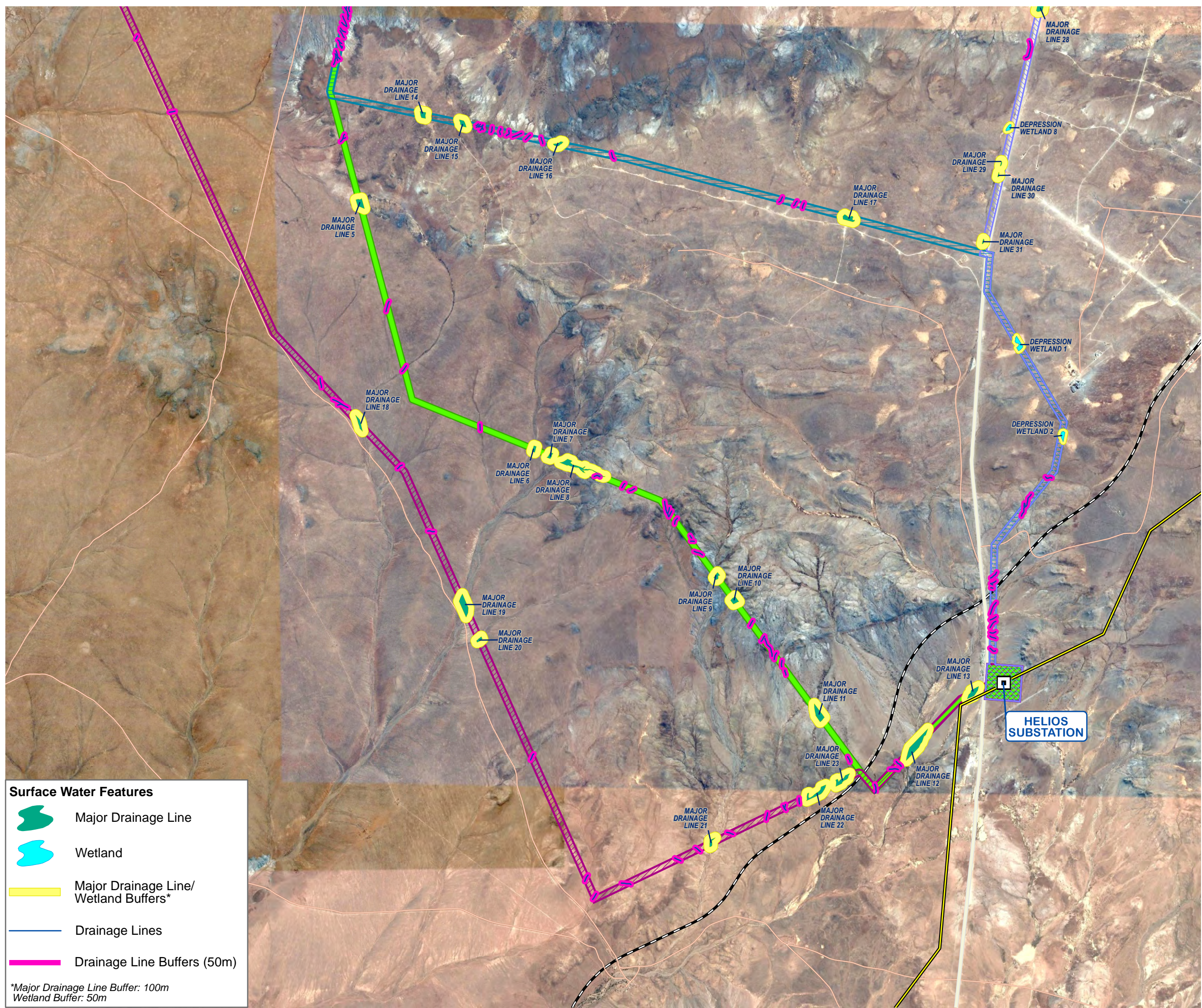


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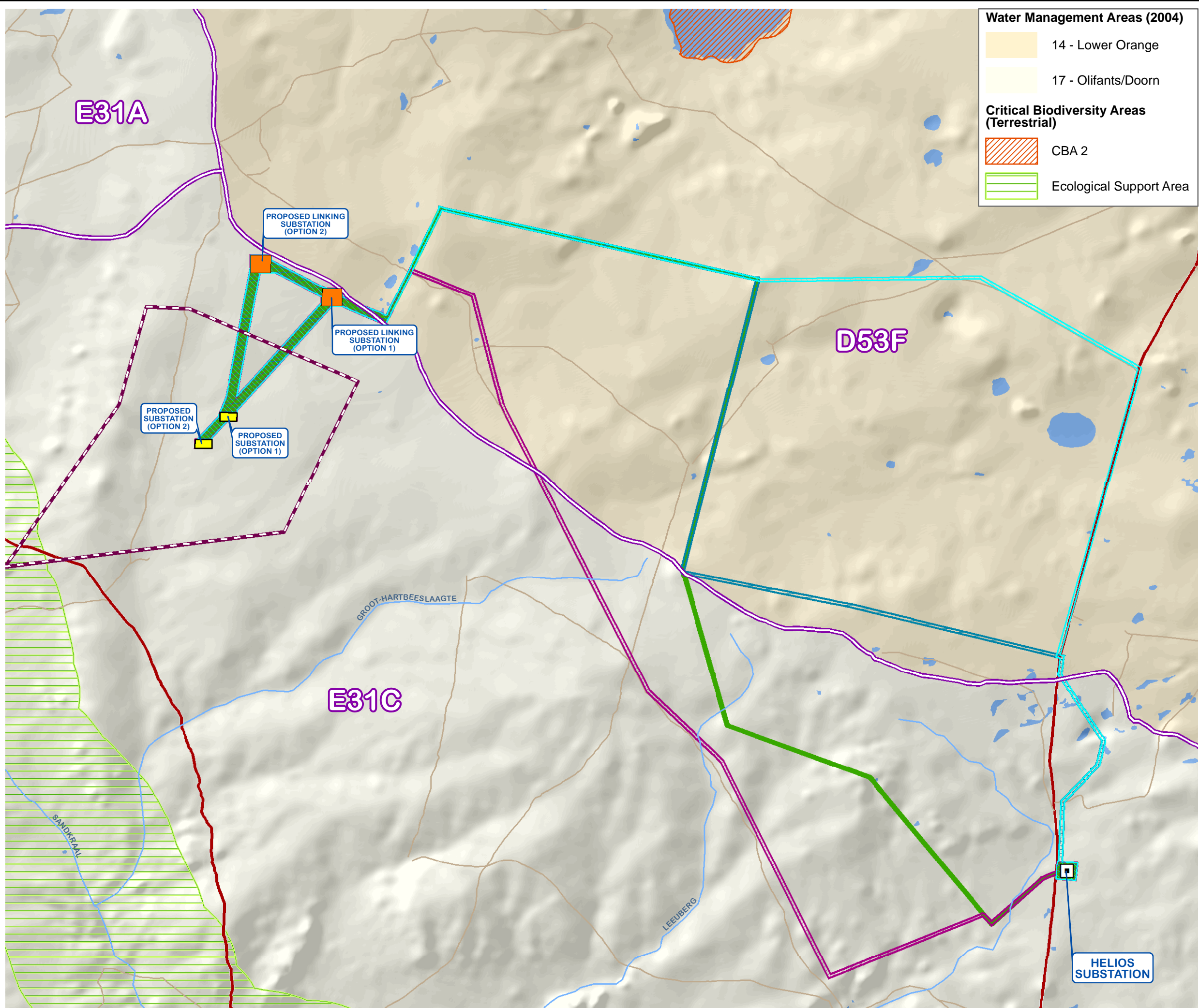
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Surface Water Features

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

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



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
HARTEBEEST LEEGTE
WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
SURFACE WATER ASSESSMENT:
DATABASE SURFACE WATER
OCCURRENCE**

Legend

- Secondary Roads
- Local Access Roads
- Hartebeest Leegte Wind Farm Application Site
- Helios Substation
- Proposed Linking Substation Site Alternatives
- Proposed Hartebeest Leegte Substation Site Alternatives

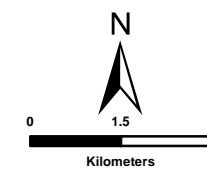
Proposed Corridor Alternatives

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

Surface Water Features

- Quaternary Catchment Boundaries
- Rivers
- Wetlands

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



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**PROPOSED CONSTRUCTION
OF A 132kV POWER LINE
TO SERVE PROPOSED
WIND ENERGY FACILITIES
HARTEBEEST LEEGTE
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 ($\geq 132\text{kV}$)
 - Hartebeest Leegte Wind Farm Application Site
 - Helios Substation
 - Proposed Linking Substation Site Alternatives
 - Proposed Hartebeest Leegte 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

N

0 1.5 3

Kilometers

SIVEST

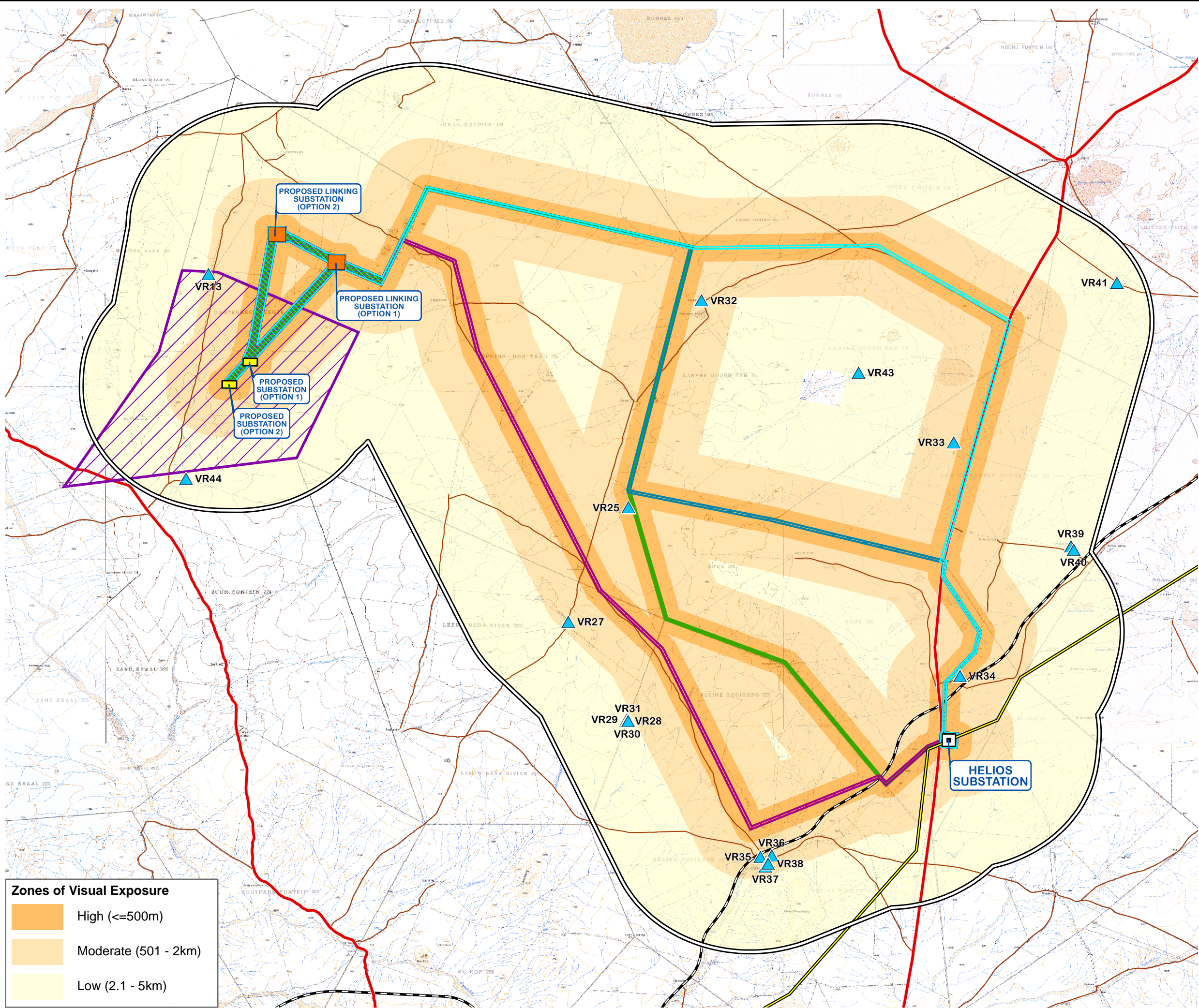
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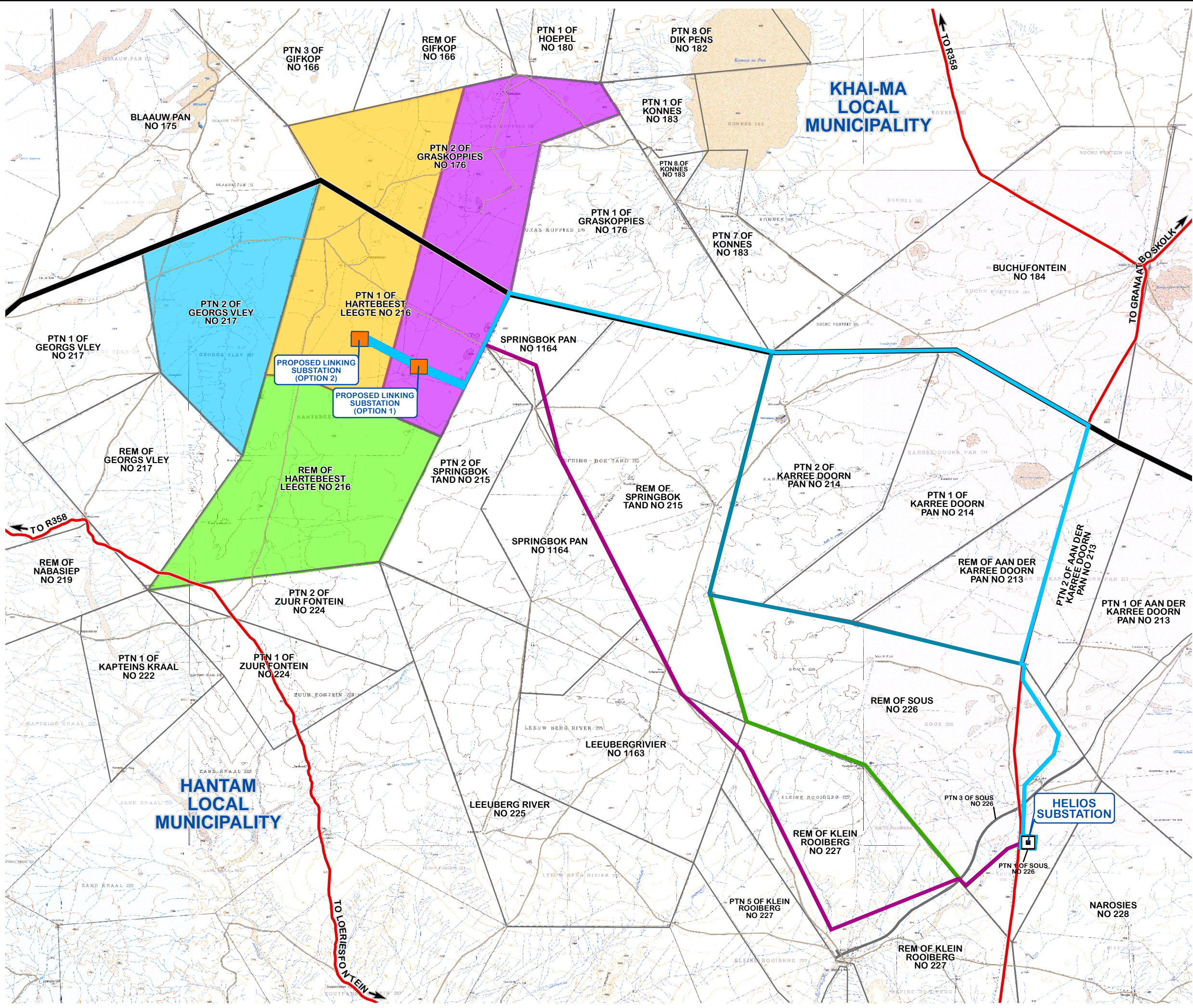
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Zones of Visual Exposure

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



**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 Bundaries
 - 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
NGI, 2014

0 1.5 3
Kilometers

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