




**PROPOSED
CONSTRUCTION OF THE
GRASKOPPIES WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
CRITICAL BIODIVERSITY AREAS
(TERRESTRIAL)**

Legend

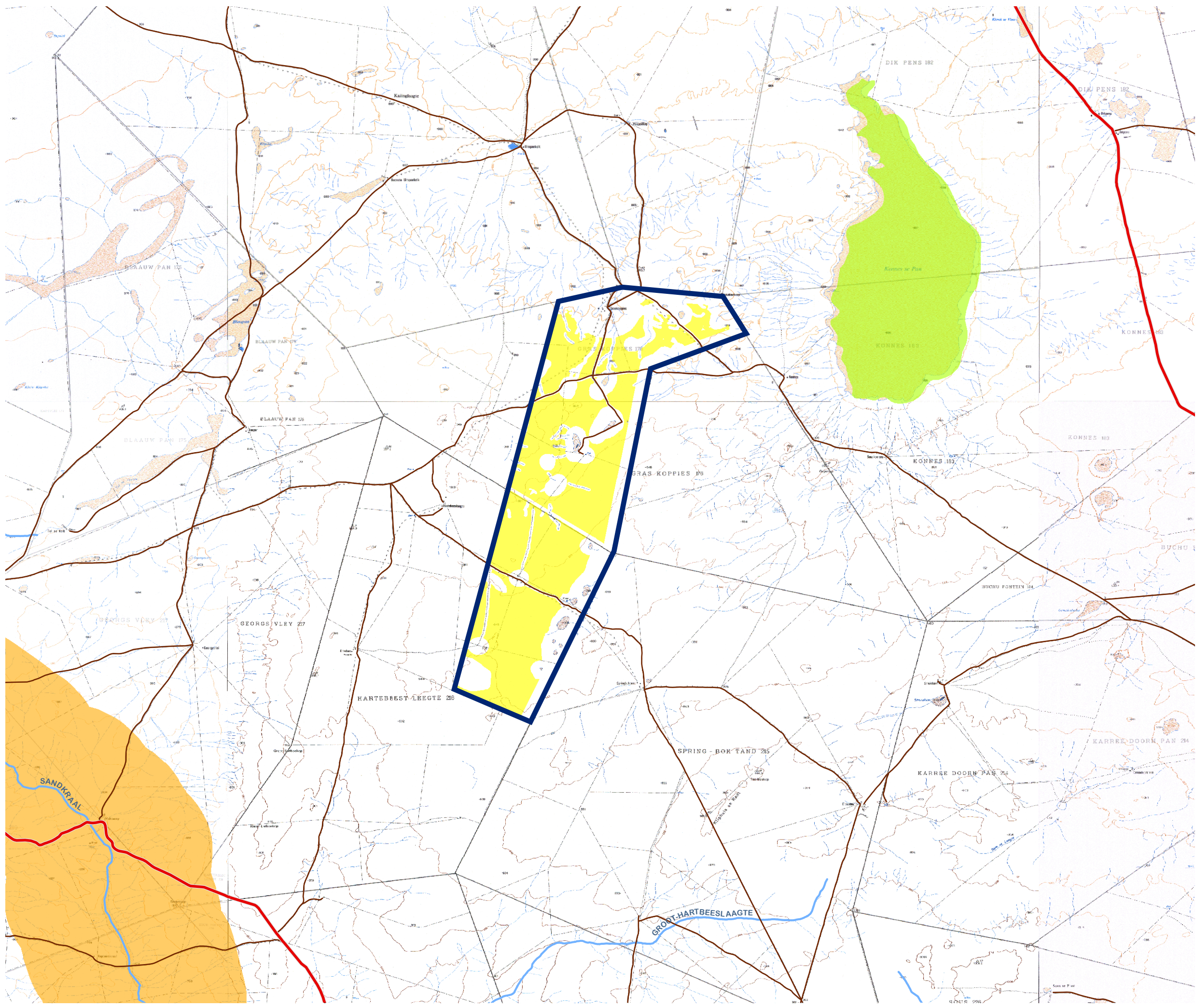
-  Secondary Roads
-  Local Access Roads
-  Main Watercourses

 Graskoppies Wind Farm Application Site

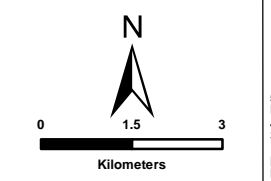
 Buildable Area

Critical Biodiversity Areas

-  CBA2
-  ESA



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



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Map Ref No 13622/EA_G07	Revision 0	Date

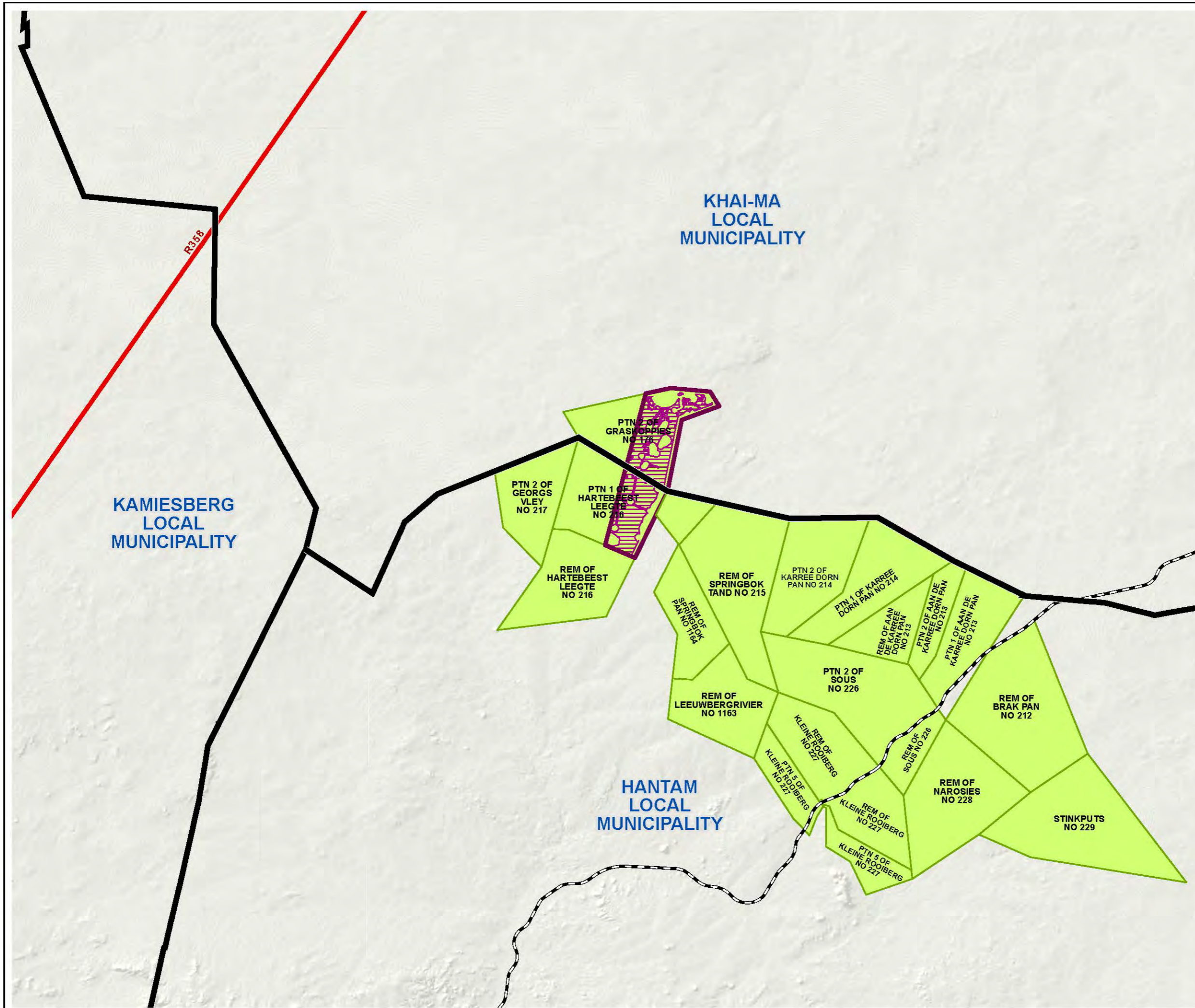
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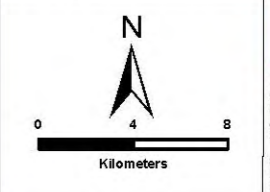
**PROPOSED
CONSTRUCTION OF THE
GRASKOPPIES WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
OTHER PROPOSED RENEWABLE
ENERGY DEVELOPMENTS**

Legend

-  Local Municipal Boundaries
-  Main Arterial Routes
-  Railways
-  Graskoppies Wind Farm Application Site
-  Buildable Area
-  Renewable Energy Application Sites



SOURCE: MUNICIPAL DEMARCATION BOARD, 2011
NGI, 2014



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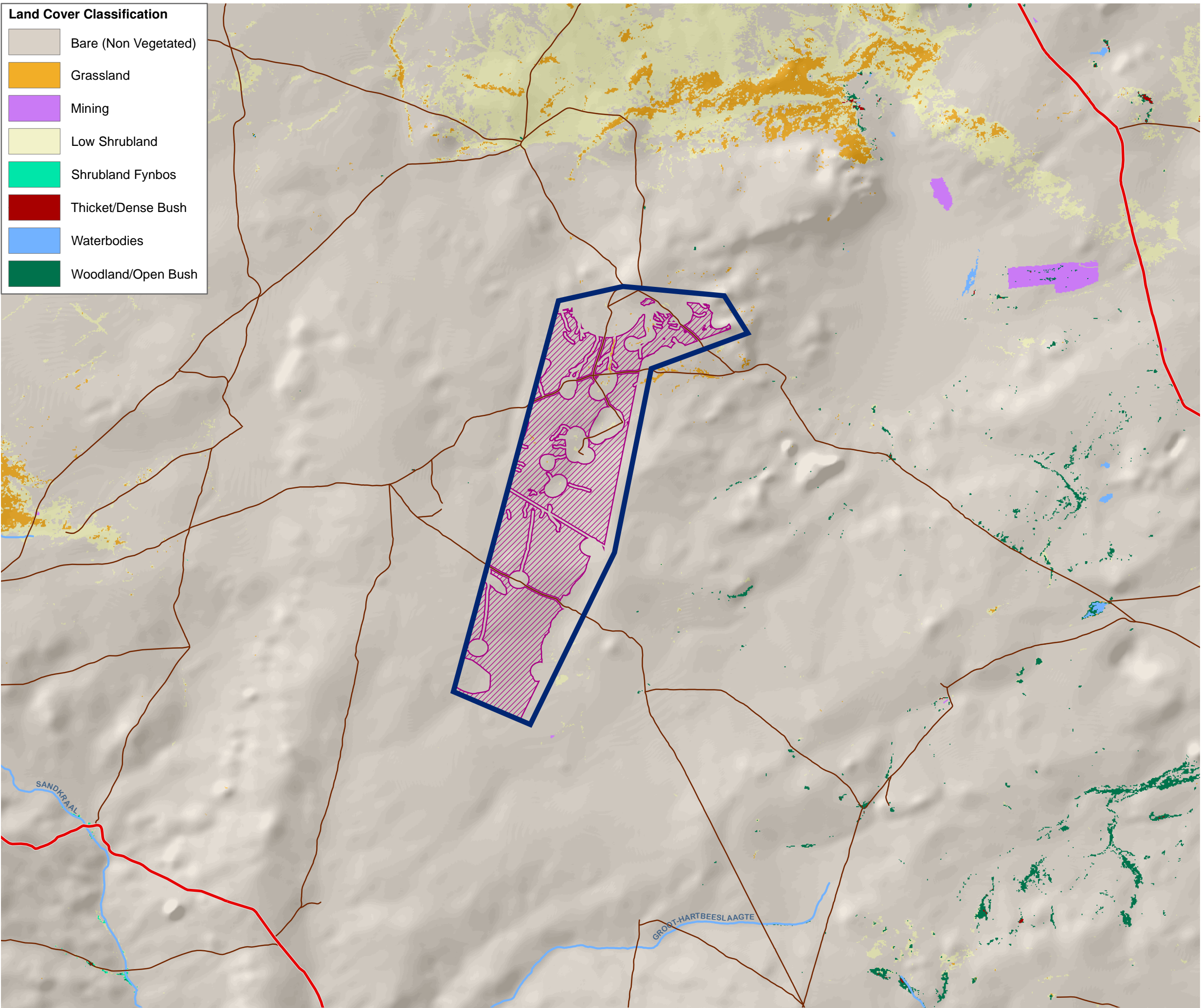
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Land Cover Classification

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

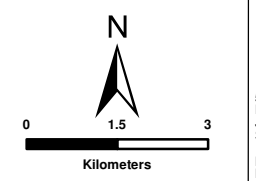


**PROPOSED
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GRASKOPPIES WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
BROAD LAND COVER
CLASSIFICATION**

Legend

-  Secondary Roads
-  Local Access Roads
-  Main Watercourses
-  Graskoppies Wind Farm Application Site
-  Buildable Area

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



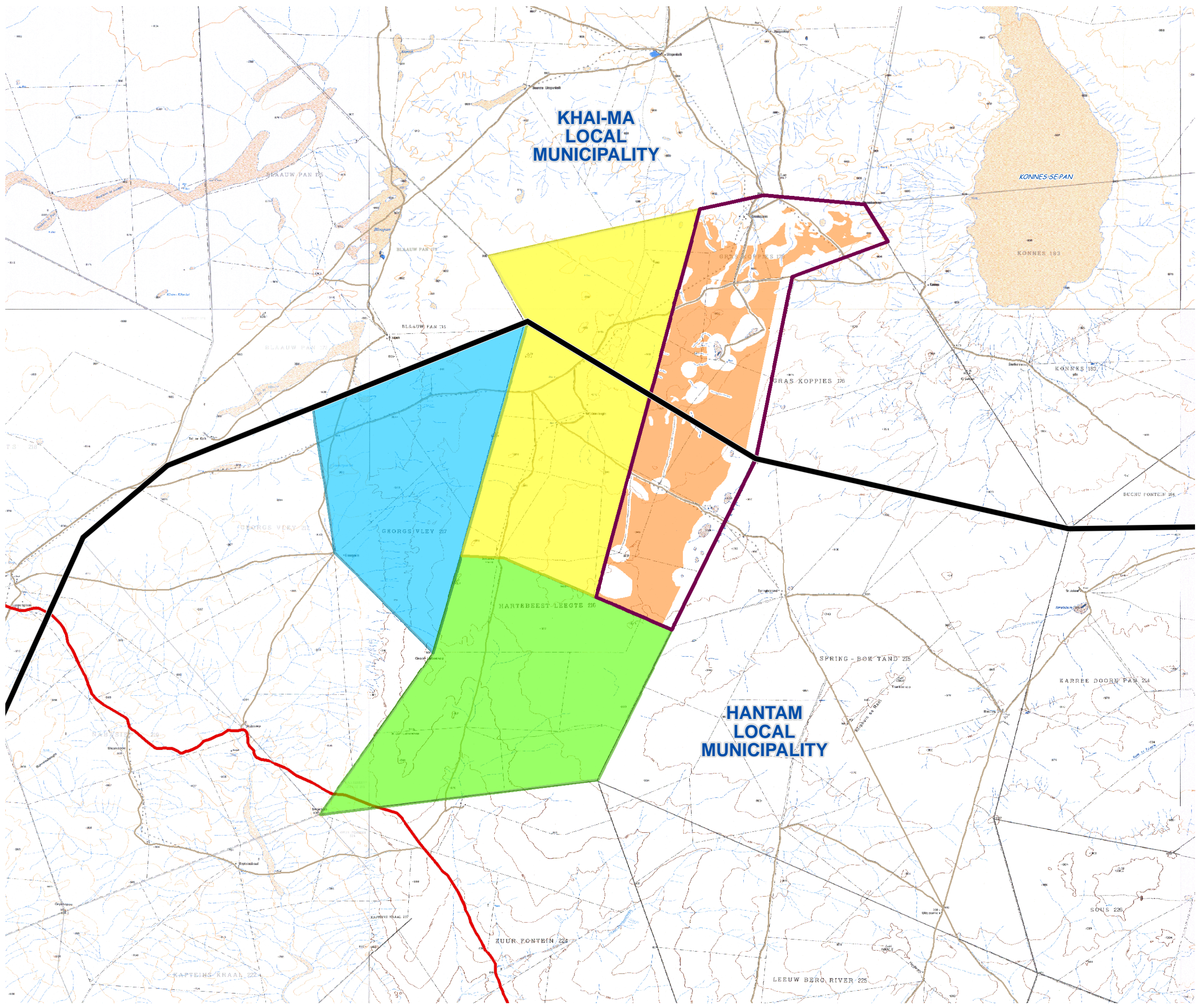
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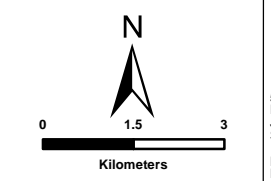
**PROPOSED
CONSTRUCTION OF THE
GRASKOPPIES WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
ADJACENT MAINSTREAM WIND FARM
WIND FARM PROJECTS**



Legend

-  Local Municipal Boundaries
-  Secondary Roads
-  Local Access Roads
-  Graskoppies Wind Farm Application Site
-  Buildable Area
- Adjacent Mainstream Wind Farm Projects**
-  Hartebeest Leegte Wind Farm Application Site
-  Ithemba Wind Farm Application Site
-  Xha! Boom Wind Farm Application Site

SOURCE:
MUNICIPAL DEMARCATION BOARD, 2011
NGI, 2014




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Avifaunal 'No-Go' Areas

 Turbines and Infrastructure


Bat 'No-Go' Areas

 Turbines Only


Ecological 'No-Go' Areas

 Turbines Only

Heritage 'No-Go' Areas

 Turbines and Infrastructure

Noise 'No-Go' Areas

 Turbines Only

**PROPOSED CONSTRUCTION OF THE GRASKOPPIES WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
'NO GO' AREAS
(PREFERRED LAYOUT)**

Legend


 Local Access Roads


 Graskoppies Wind Farm Application Site


Layout Components

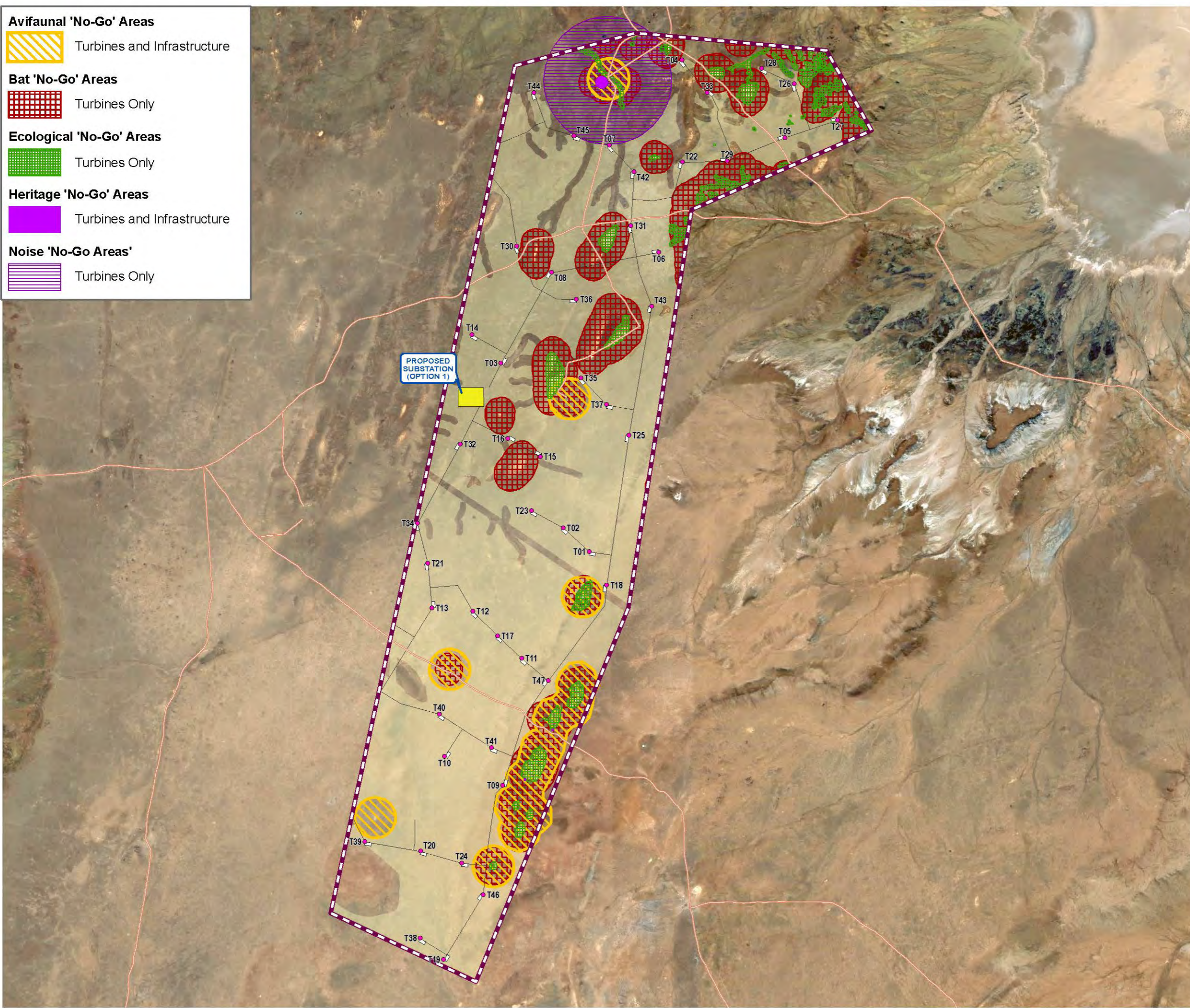
 Buildable Area

 Preferred Graskoppies Substation Site Alternative

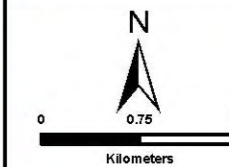
 Proposed Turbine Positions

 Proposed Hardstand Areas

 Proposed Internal Road Network



SOURCE:
GOOGLE EARTH, 2016
NGI, 2014



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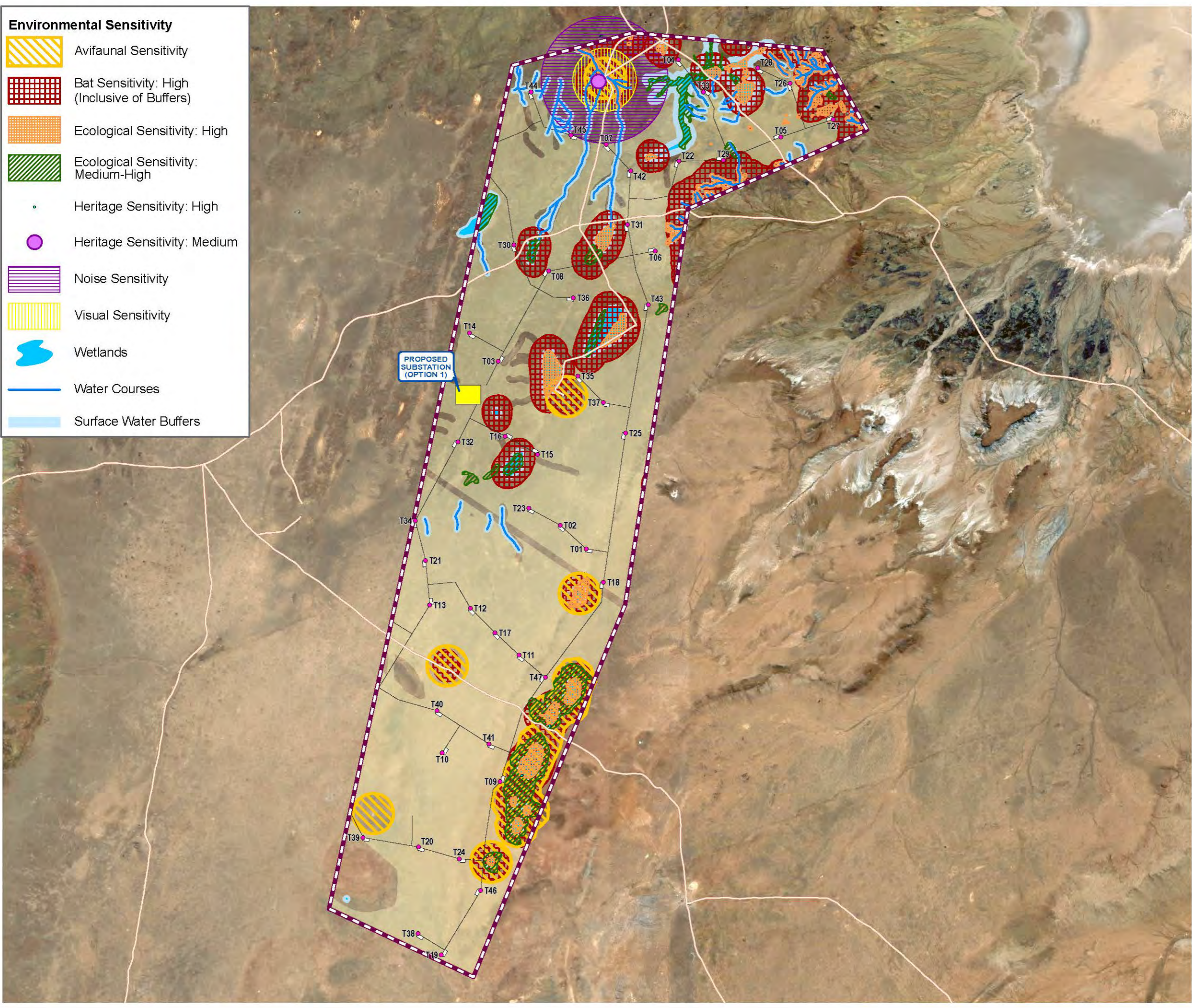
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Environmental Sensitivity

-  Avifaunal Sensitivity
-  Bat Sensitivity: High (Inclusive of Buffers)
-  Ecological Sensitivity: High
-  Ecological Sensitivity: Medium-High
-  Heritage Sensitivity: High
-  Heritage Sensitivity: Medium
-  Noise Sensitivity
-  Visual Sensitivity
-  Wetlands
-  Water Courses
-  Surface Water Buffers



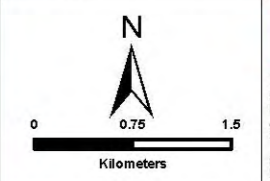
PROPOSED CONSTRUCTION OF THE GRASKOPPIES WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE SENSITIVITY OVERLAY (PREFERRED LAYOUT)

Legend

-  Local Access Roads
-  Graskoppies Wind Farm Application Site
- Layout Components**
-  Buildable Area
-  Preferred Graskoppies Substation Site Alternative*
-  Proposed Turbine Positions
-  Proposed Hardstand Areas
-  Proposed Internal Road Network

*400m x 300m Footprint to include:
Graskoppies Substation
Operation & Maintenance Buildings
Construction Laydown Area

SOURCE:
GOOGLE EARTH, 2016
NGI, 2014

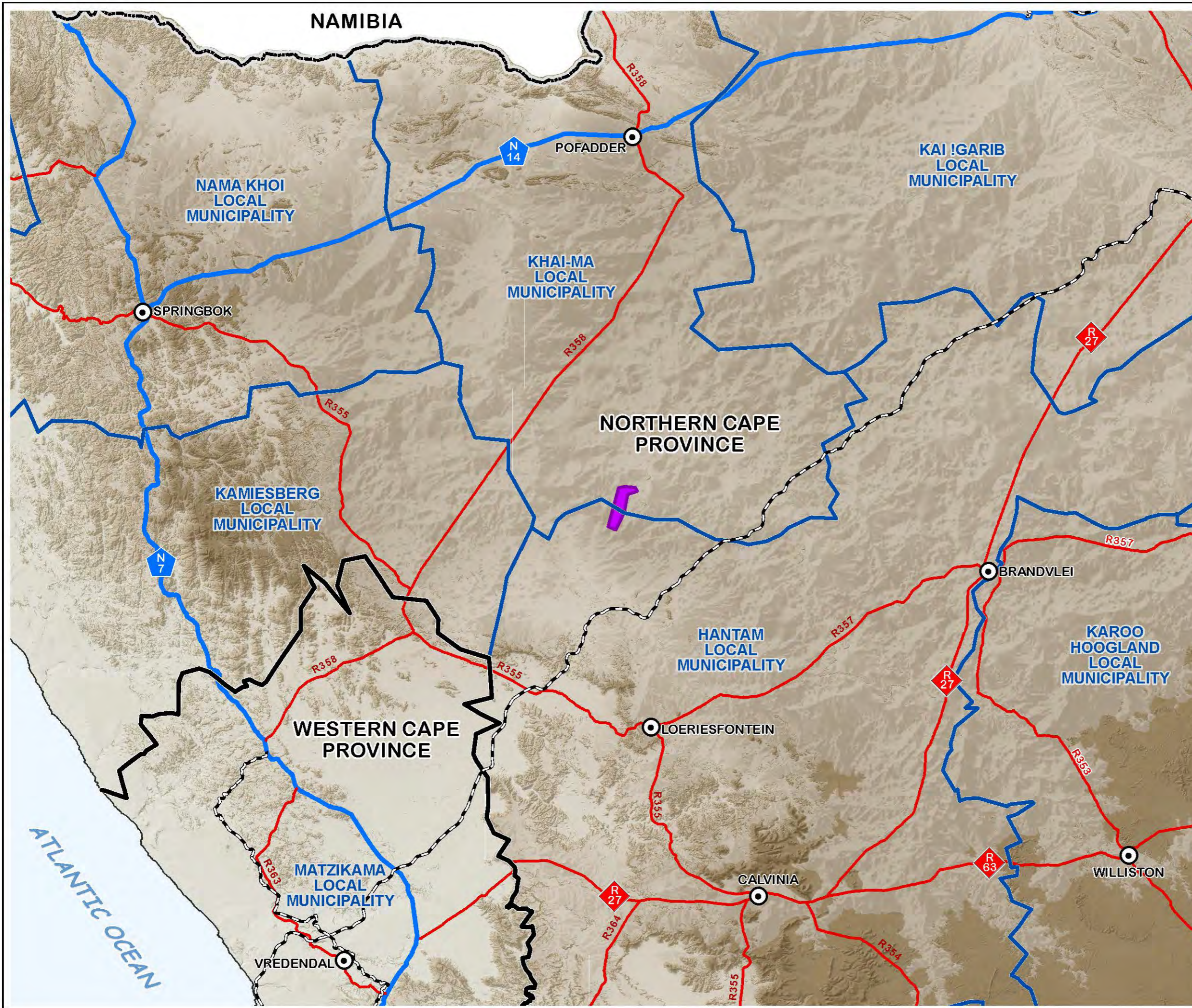


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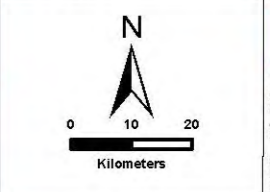
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**PROPOSED
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GRASKOPPIES WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
REGIONAL CONTEXT**

- Legend**
- National Boundary
 - Provincial Boundaries
 - Local Municipal Boundaries
 - National Routes
 - Main Arterial Routes
 - Railways
 - Main Towns
 - Graskoppies Wind Farm Application Site

SOURCE: MUNICIPAL DEMARCATION BOARD, 2011
NGI, 2014



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**PROPOSED
CONSTRUCTION OF THE
GRASKOPPIES WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
VEGETATION CLASSIFICATION**

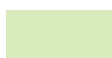




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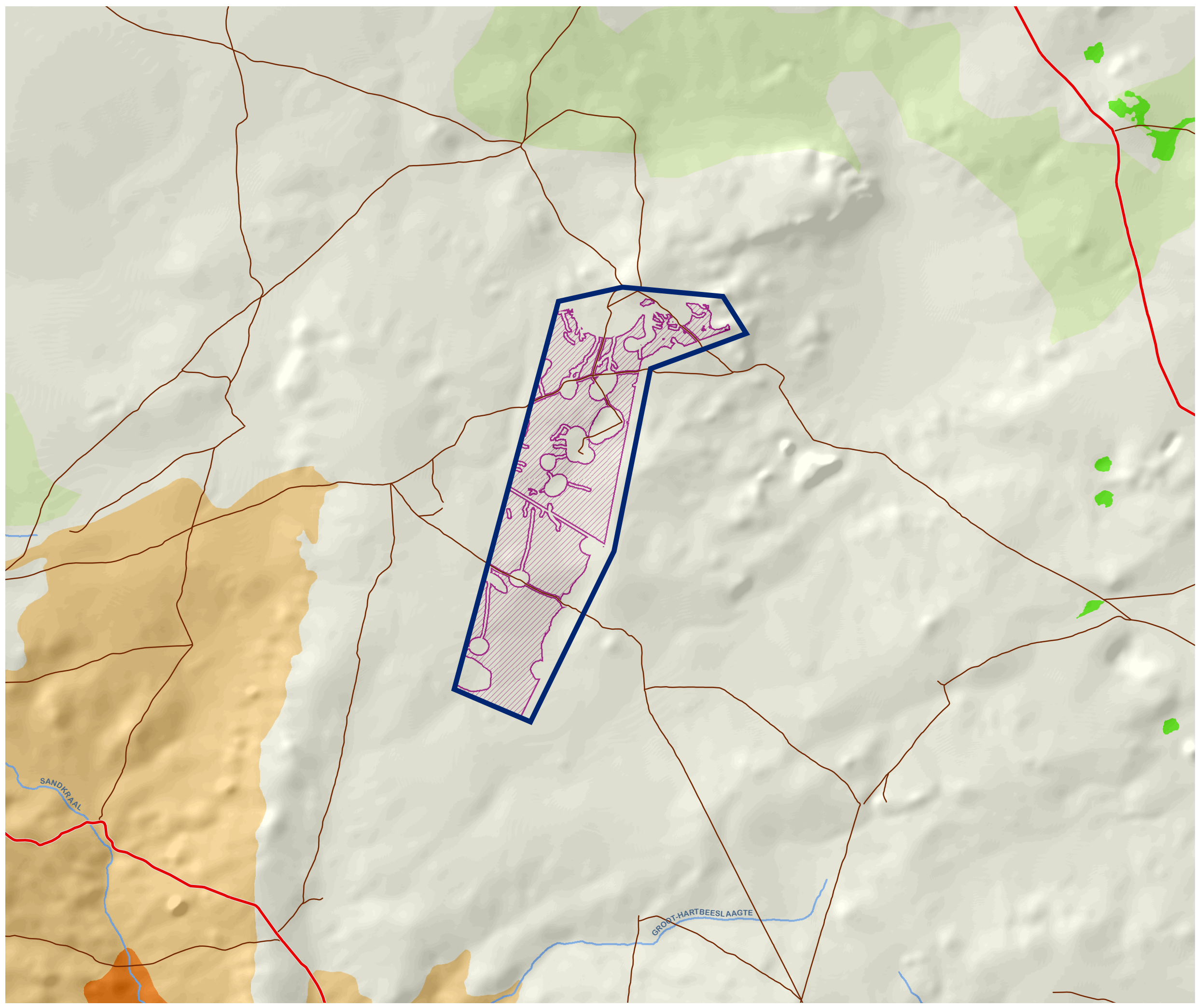
-  Secondary Roads
-  Local Access Roads
-  Main Watercourses

 Graskoppies Wind Farm Application Site

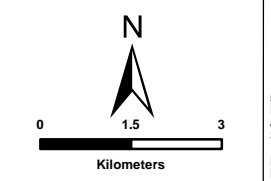
 Buildable Area

Vegetation Classification

-  Bushmanland Arid Grassland
-  Bushmanland Basin Shrubland
-  Bushmanland Vloere
-  Western Bushmanland Klipveld
-  Namaqualand Blomveld



SOURCE:
NGI, 2014
SANBI, 2012



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**PROPOSED
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GRASKOPPIES WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
PROPOSED SITE LAYOUT**

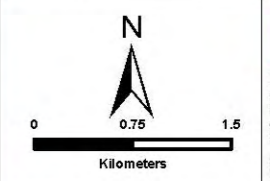
Legend

-  Local Access Roads
-  Graskoppies Wind Farm Application Site
-  Buildable Area
-  Preferred Graskoppies Substation Site Alternative
-  Proposed Turbine Positions



PROPOSED SUBSTATION (OPTION 1)

SOURCE:
GOOGLE EARTH, 2016
NGI, 2014



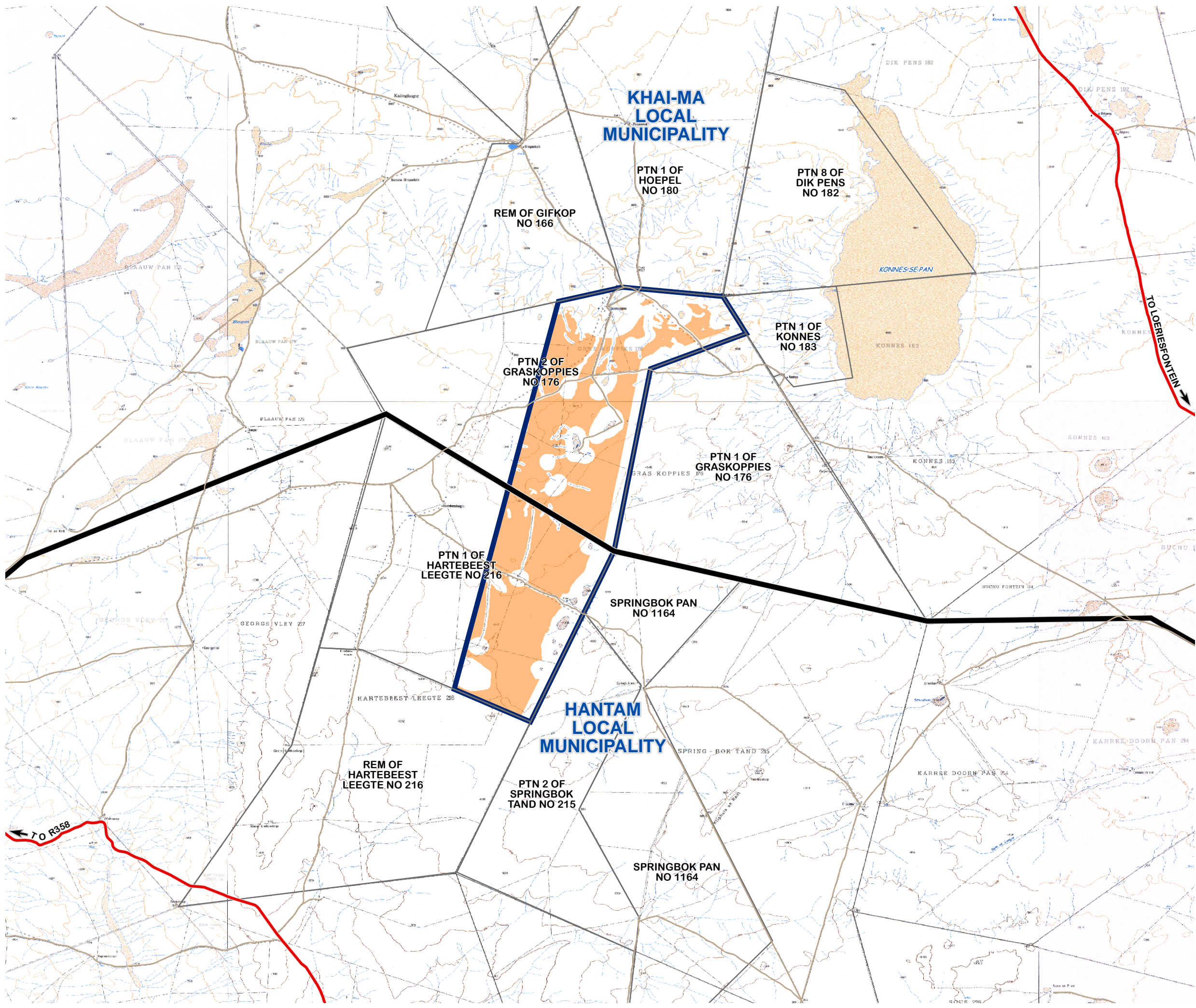
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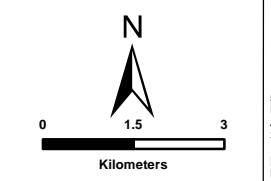
**PROPOSED
CONSTRUCTION OF THE
GRASKOPPIES WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
SITE LOCALITY**



Legend

-  Local Municipal Boundaries
-  Secondary Roads
-  Local Access Roads
-  Adjoining Farm Boundaries
-  Graskoppies Wind Farm Application Site
-  Buildable Area

SOURCE:
MUNICIPAL DEMARCATION BOARD, 2011
NGI, 2014



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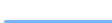


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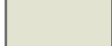

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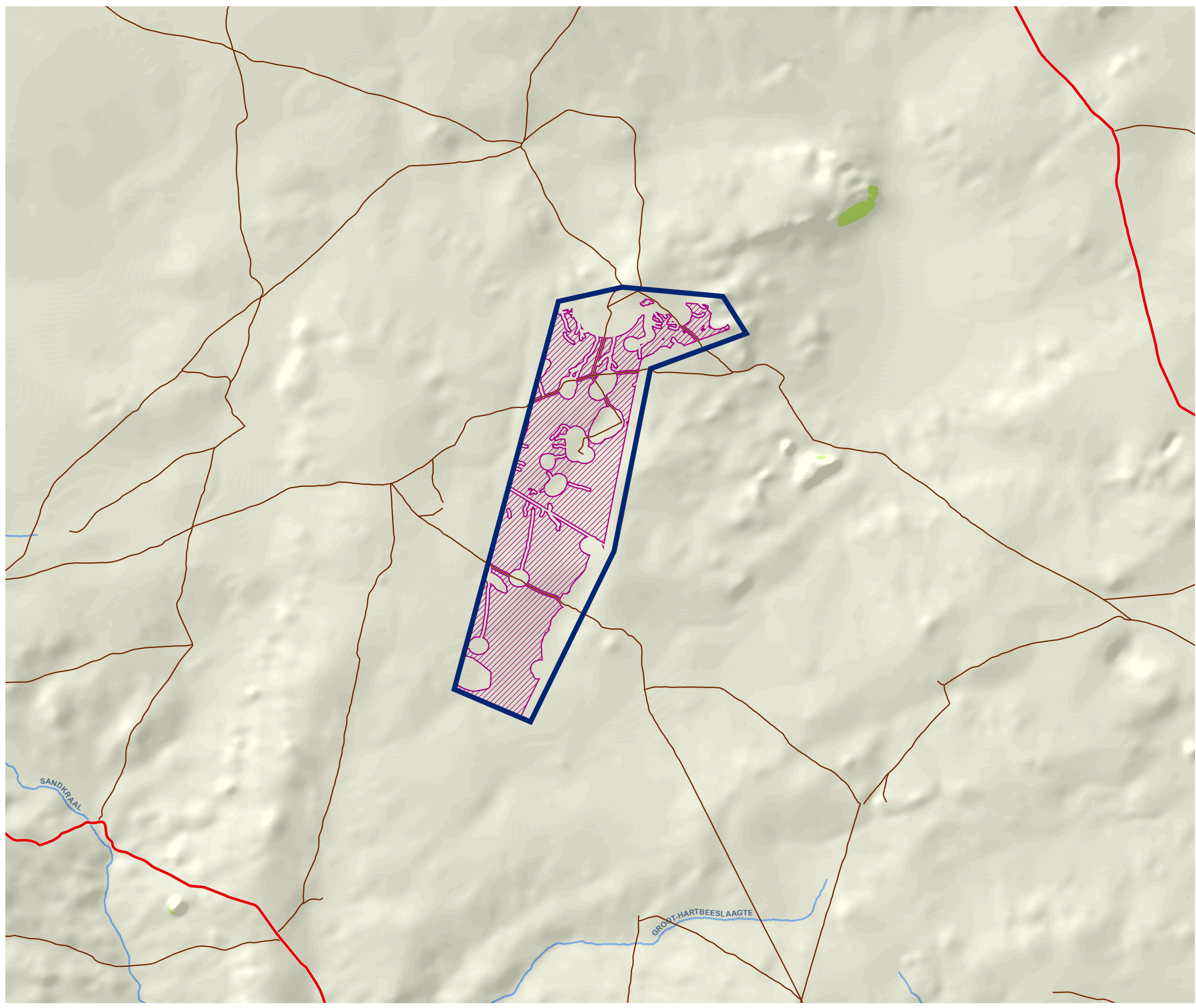
**PROPOSED
CONSTRUCTION OF THE
GRASKOPPIES WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
SLOPE CLASSIFICATION**

Legend

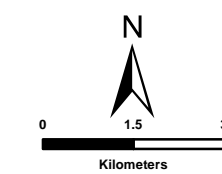
-  Secondary Roads
-  Local Access Roads
-  Main Watercourses
-  Graskoppies Wind Farm Application Site
-  Buildable Area

**Slope Classification
(Percent Rice)**

-  <= 8%
-  8.01 - 12%



SOURCE:
NGI, 2014

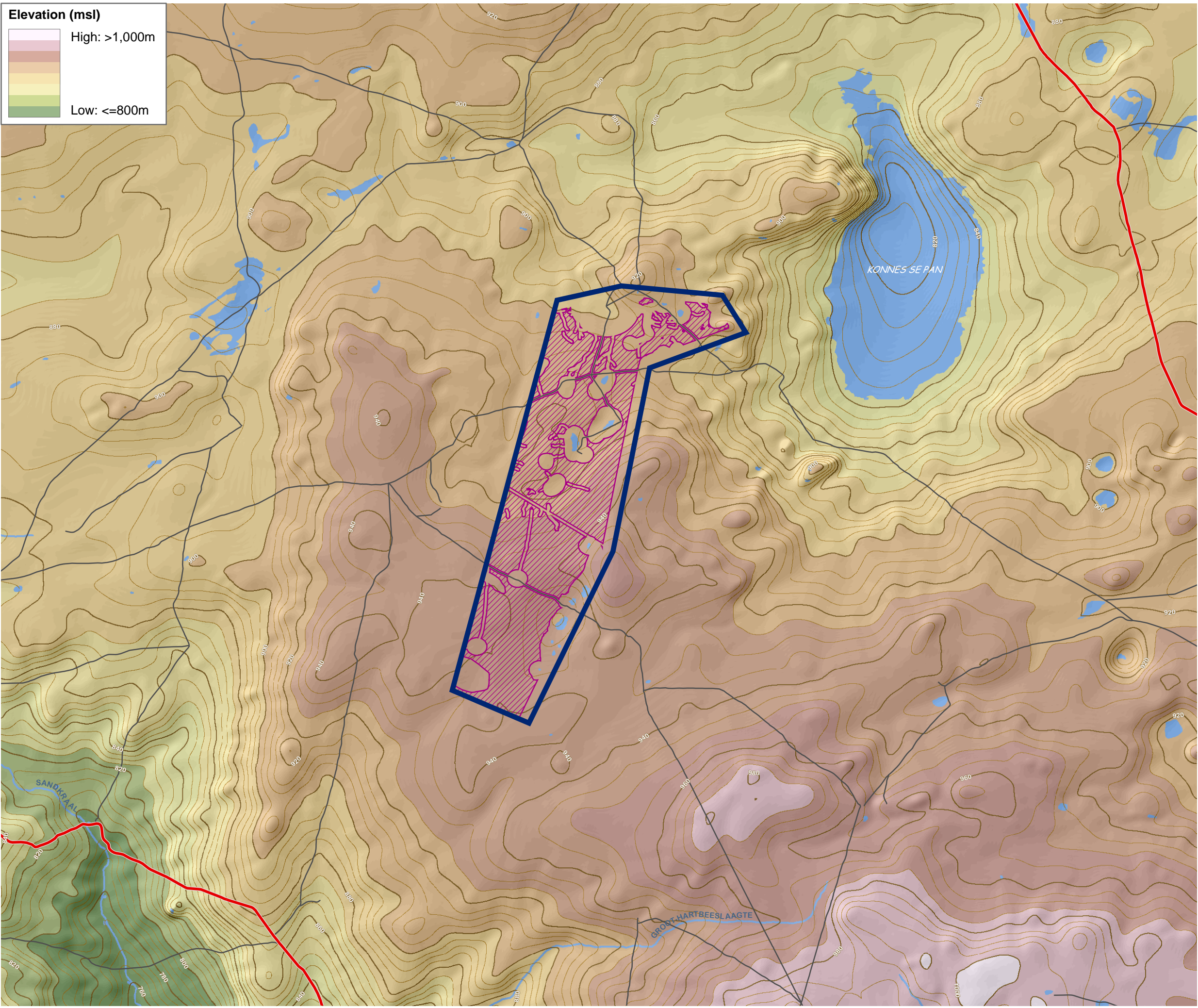
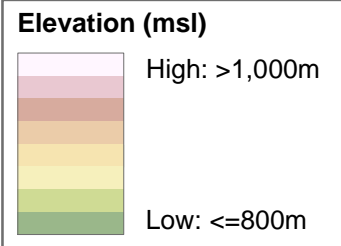


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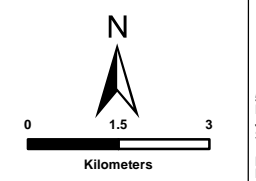
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**PROPOSED
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GRASKOPPIES WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
TOPOGRAPHY**

- Legend**
- Secondary Roads
 - Local Access Roads
 - Main Watercourses
 - Contours (20m Interval)
 - Contours (5m Interval)
 - Pans/Wetlands/Waterbodies
 - Graskoppies Wind Farm Application Site
 - Buildable Area

SOURCE:
NGI, 2014



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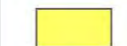

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**PROPOSED
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NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
SURFACE WATER ASSESSMENT:
GROUND TRUTHED FIELDWORK
DELINEATIONS**

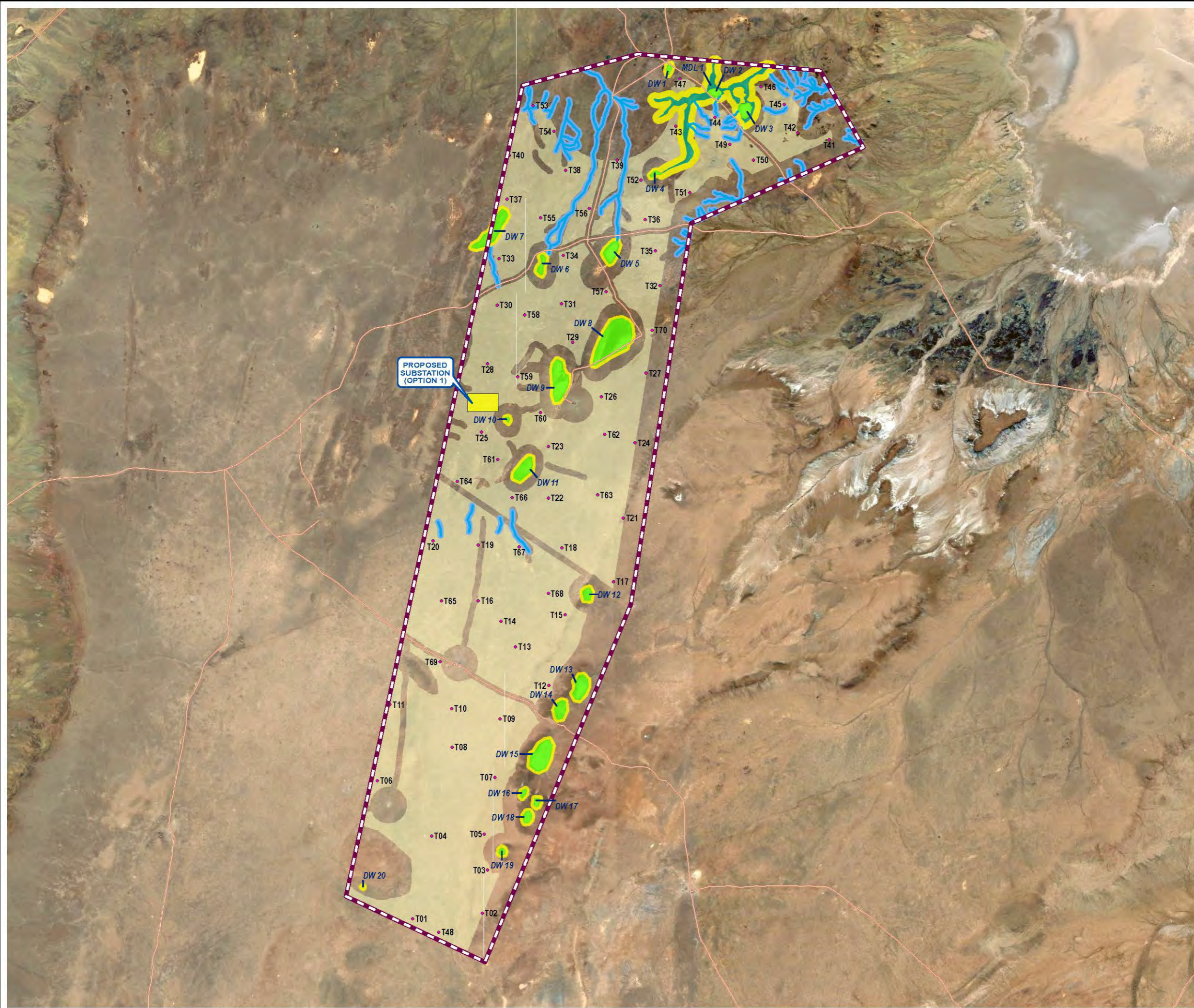
Legend

-  Local Access Roads
-  Graskoppies Wind Farm Application Site
-  Buildable Area
-  Preferred Graskoppies Substation Site Alternative
-  Proposed Turbine Positions

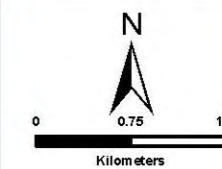
Surface Water Features

-  Major Drainage Line
-  Depression 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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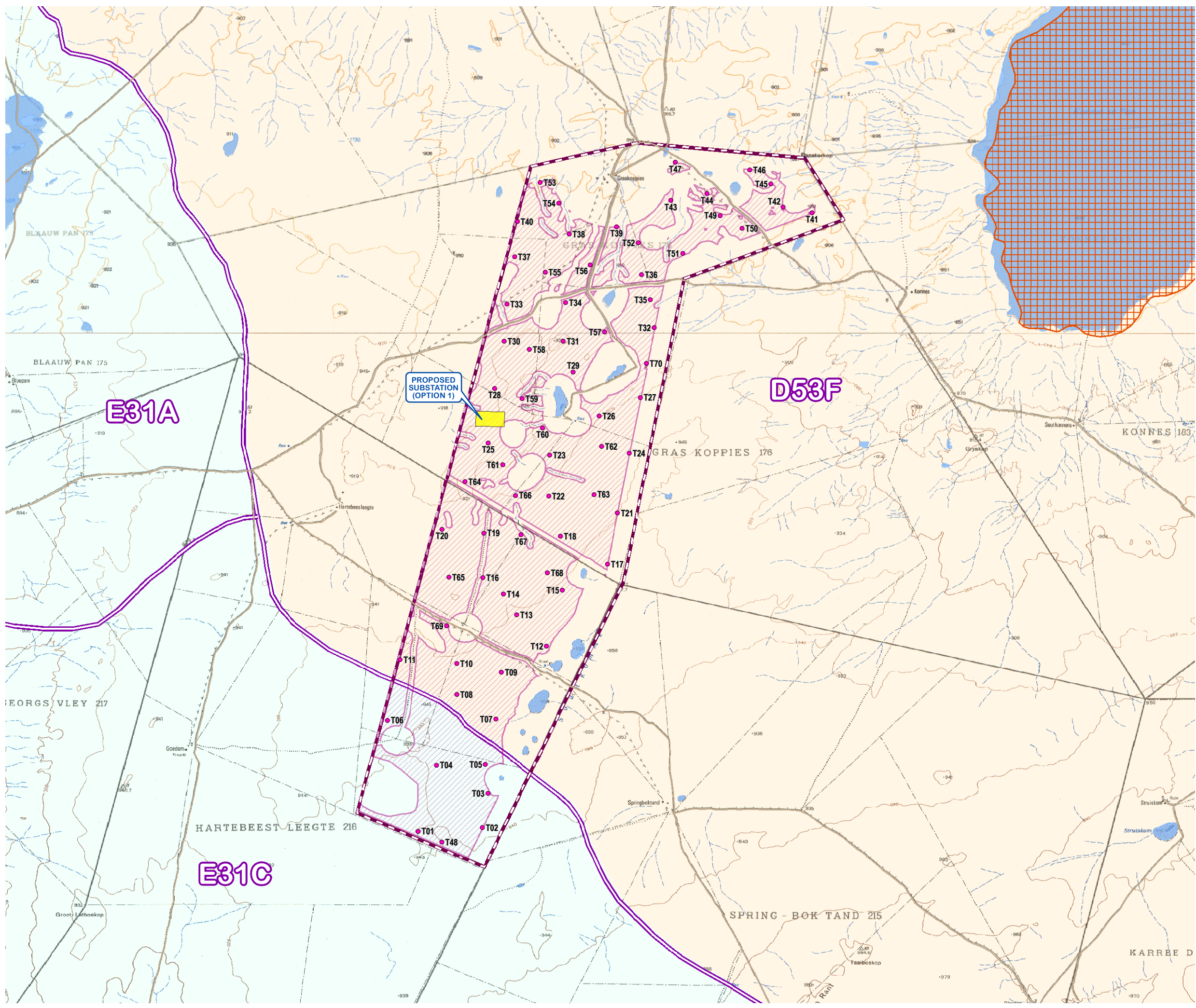
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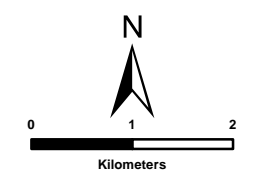
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NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
SURFACE WATER ASSESSMENT:
DATABASE SURFACE WATER
OCCURRENCE**



- Legend**
- Secondary Roads
 - Local Access Roads
 - Graskoppies Wind Farm Application Site
 - Buildable Area
 - Preferred Graskoppies Substation Site Alternative
 - Proposed Turbine Positions
- Surface Water Features**
- Quaternary Catchment Boundaries
 - Rivers
 - Wetlands
- Water Management Areas (2004)**
- 14 - Lower Orange
 - 17 - Olifants/Doorn
- Critical Biodiversity Areas (Terrestrial)**
- CBA 2

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



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**PROPOSED
CONSTRUCTION OF THE
GRASKOPPIES WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE**

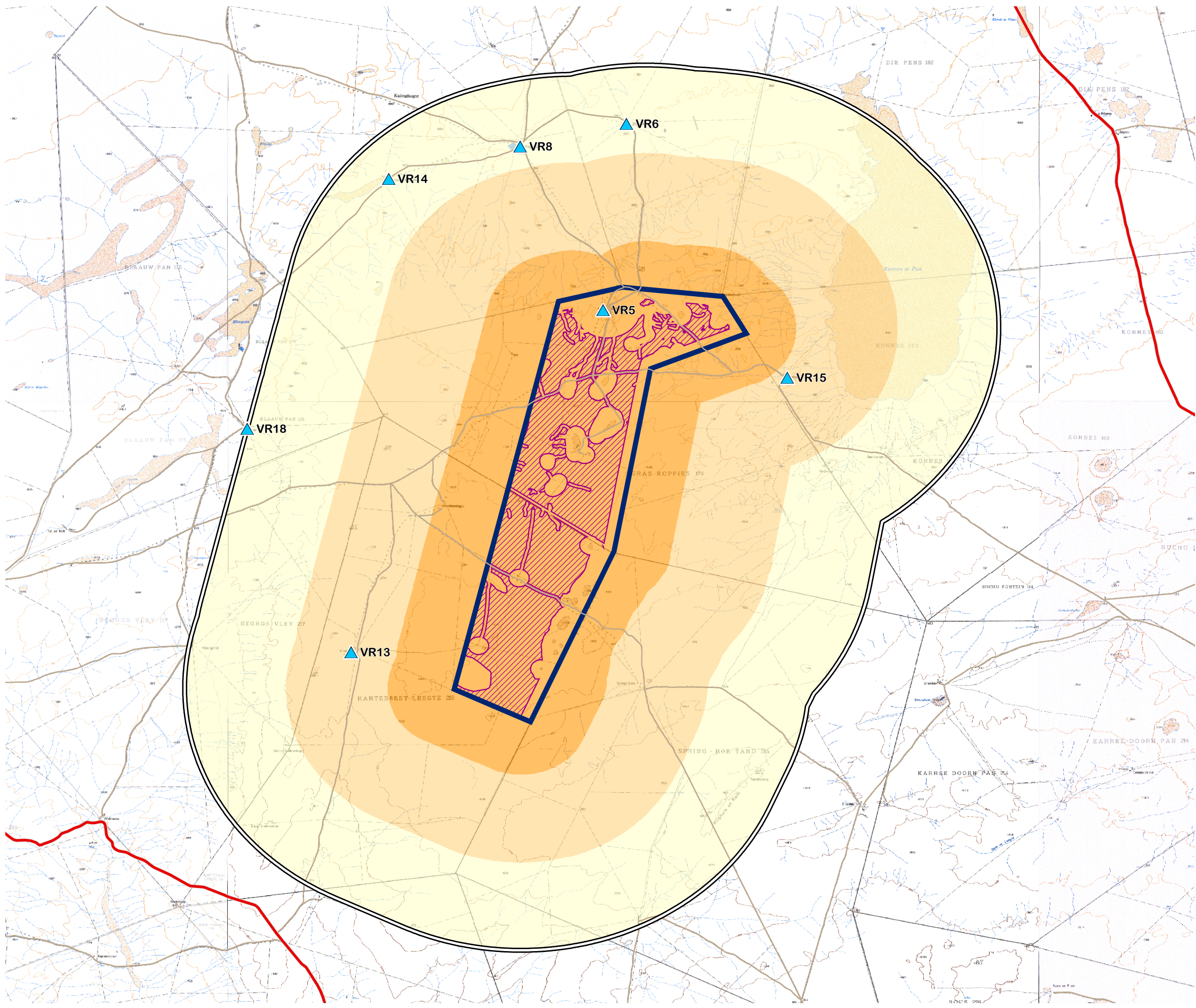
**VISUAL ASSESSMENT:
POTENTIALLY SENSITIVE
VISUAL RECEPTOR LOCATIONS**

Legend

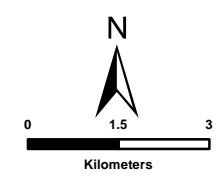
-  Secondary Roads
-  Local Access Roads
-  Graskoppies Wind Farm Application Site
-  8km Visual Assessment Zone
-  Buildable Area
-  Potentially Sensitive Receptor Locations

Zones of Potential Visual Impact

-  High Impact (<=2kms)
-  Moderate Impact (2.1 - 5kms)
-  Low Impact (>5kms)



SOURCE:
NGI, 2014



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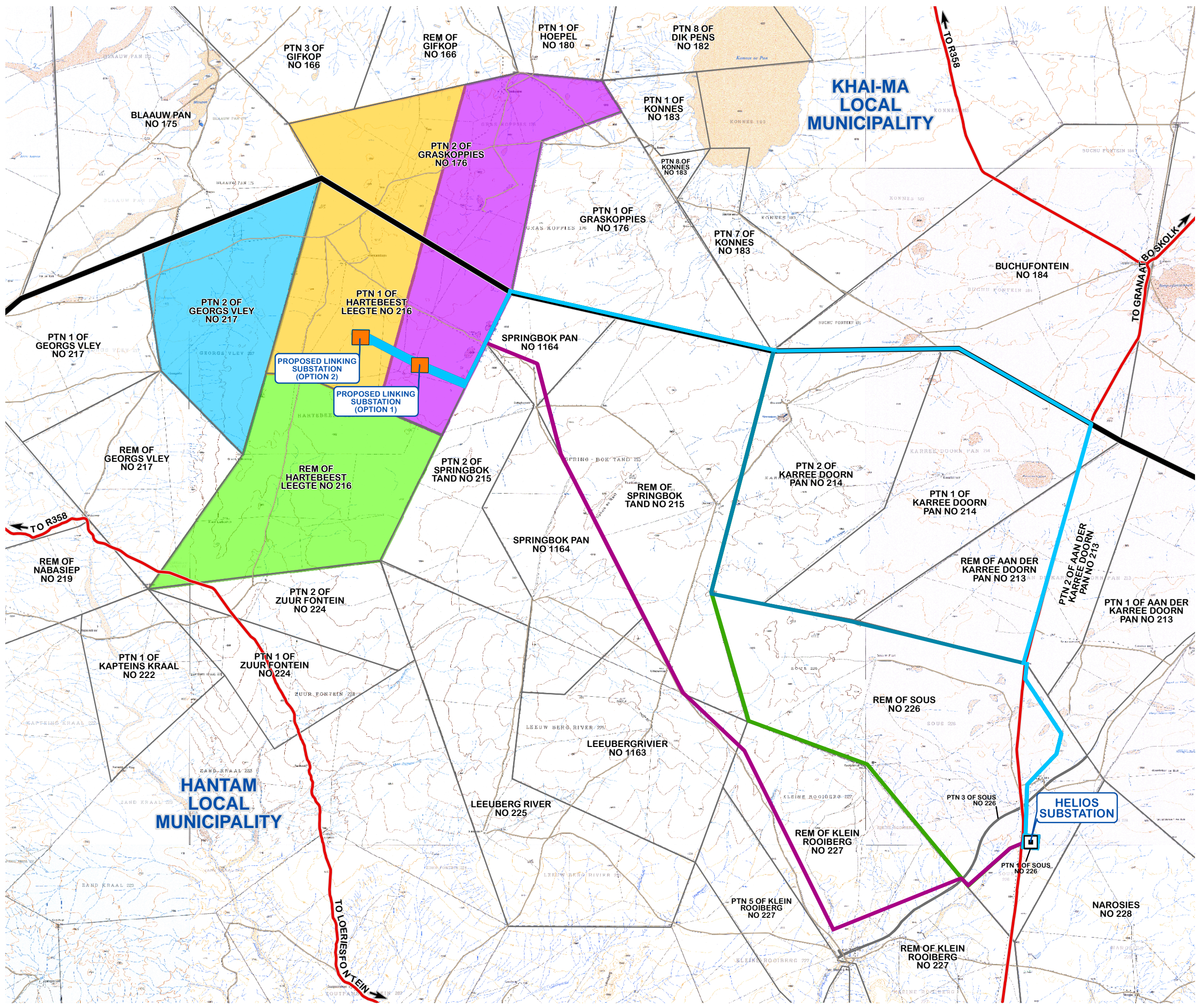
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PROPOSED CONSTRUCTION OF FOUR WIND FARMS AND ASSOCIATED GRID CONNECTION
NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE
PROJECT OVERVIEW



- 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
 NGI, 2014


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Avifaunal 'No-Go' Areas

 Turbines and Infrastructure


Bat 'No-Go' Areas

 Turbines Only


Ecological 'No-Go' Areas

 Turbines Only

Heritage 'No-Go' Areas


 Turbines and Infrastructure

Noise 'No-Go' Areas

 Turbines Only

**PROPOSED CONSTRUCTION OF THE GRASKOPPIES WIND FARM
NEAR LOERIESFONTEIN,
NORTHERN CAPE PROVINCE
'NO GO' AREAS
(PREFERRED LAYOUT)**

Legend


 Local Access Roads


 Graskoppies Wind Farm Application Site


Layout Components

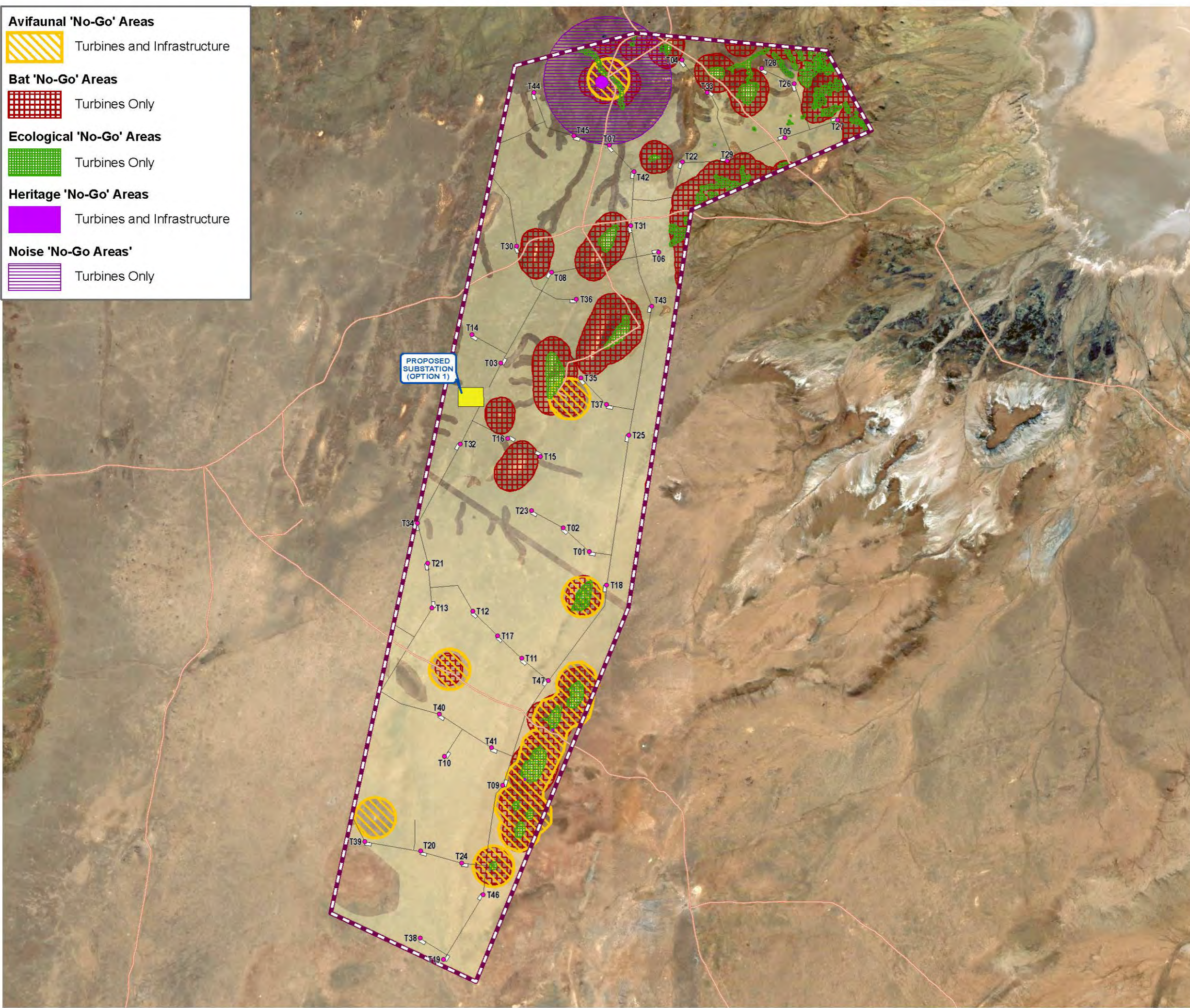
 Buildable Area

 Preferred Graskoppies Substation Site Alternative

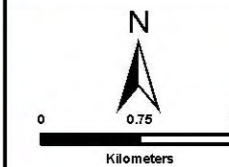
 Proposed Turbine Positions

 Proposed Hardstand Areas

 Proposed Internal Road Network



SOURCE:
GOOGLE EARTH, 2016
NGI, 2014














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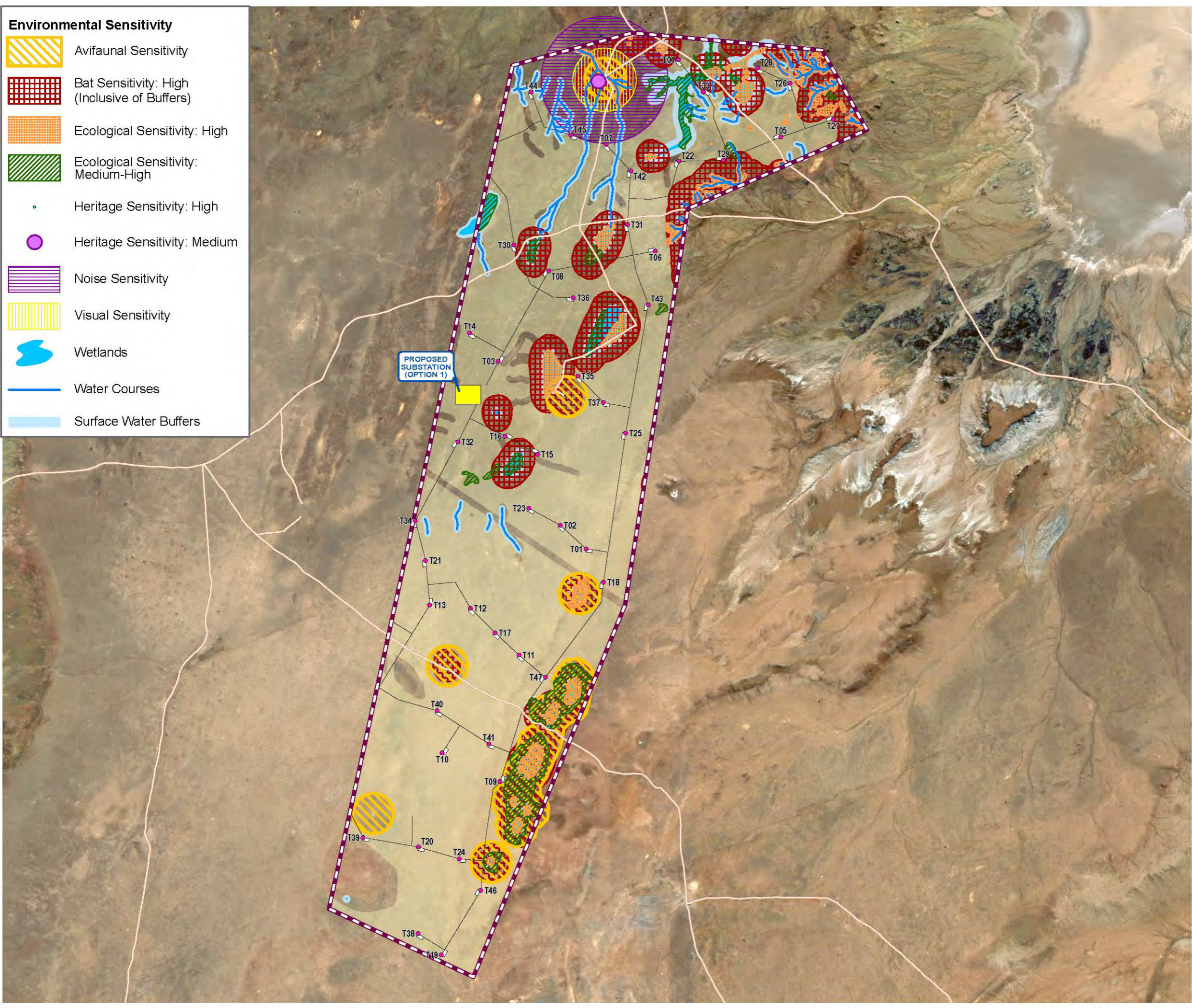
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Map Ref No 13622/EA_G14	Revision 0	Date

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Environmental Sensitivity

-  Avifaunal Sensitivity
-  Bat Sensitivity: High (Inclusive of Buffers)
-  Ecological Sensitivity: High
-  Ecological Sensitivity: Medium-High
-  Heritage Sensitivity: High
-  Heritage Sensitivity: Medium
-  Noise Sensitivity
-  Visual Sensitivity
-  Wetlands
-  Water Courses
-  Surface Water Buffers

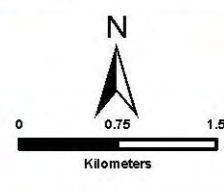



PROPOSED CONSTRUCTION OF THE GRASKOPPIES WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE
SENSITIVITY OVERLAY (PREFERRED LAYOUT)

- Legend**
-  Local Access Roads
 -  Graskoppies Wind Farm Application Site
- Layout Components**
-  Buildable Area
 -  Preferred Graskoppies Substation Site Alternative*
 -  Proposed Turbine Positions
 -  Proposed Hardstand Areas
 -  Proposed Internal Road Network

*400m x 300m Footprint to include:
 Graskoppies Substation
 Operation & Maintenance Buildings
 Construction Laydown Area

SOURCE:
 GOOGLE EARTH, 2016
 NGI, 2014





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