








**PROPOSED
CONSTRUCTION OF
A 132kV POWER LINE
TO SERVE PROPOSED
PHOTOVOLTAIC (PV)
ENERGY FACILITIES**

**TLITSSENSOLAR 2
NEAR LICHTENBURG
NORTH WEST PROVINCE**

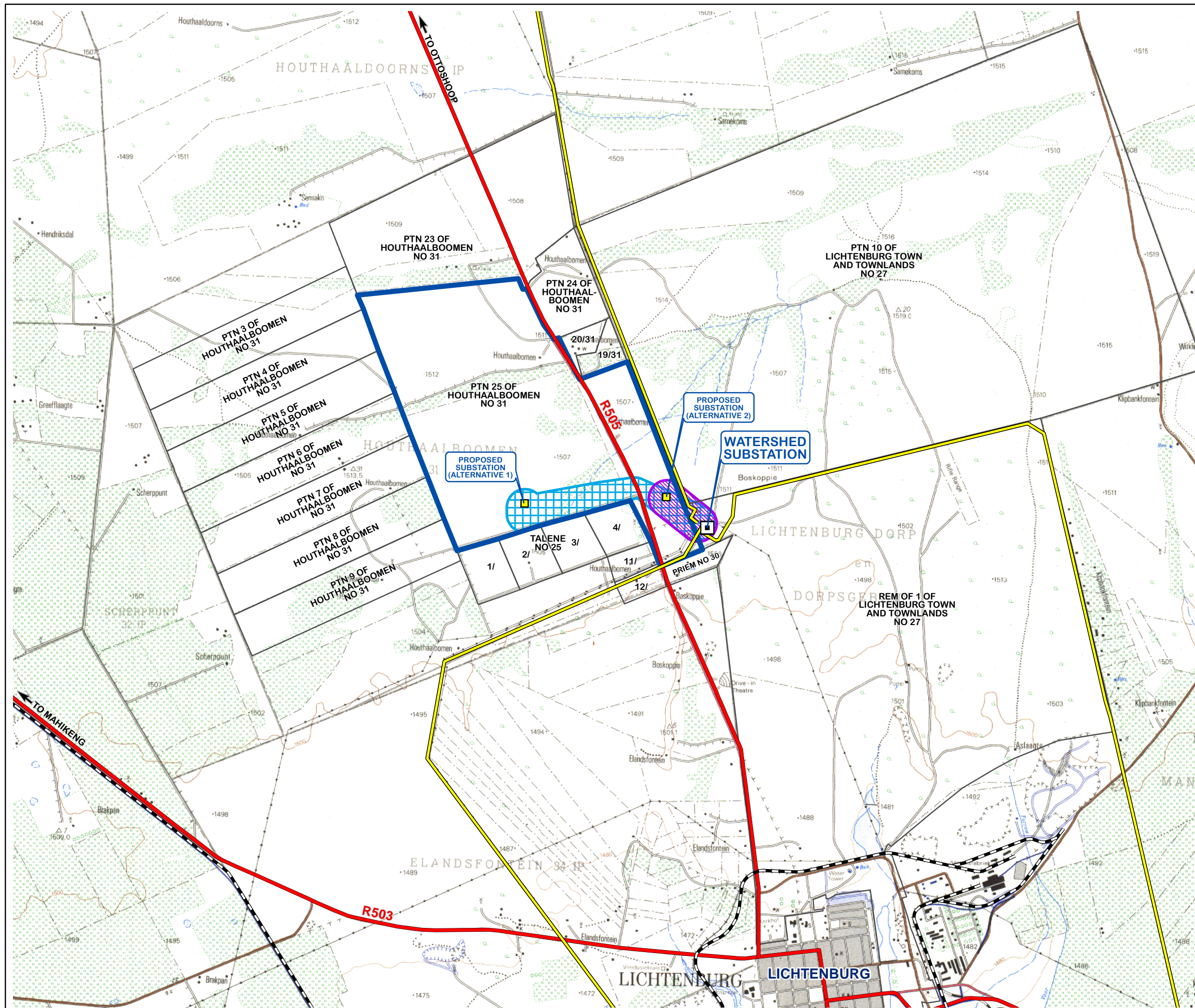
ROUTE OVERVIEW

Legend

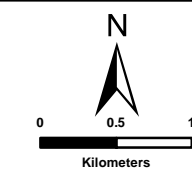
-  Main Roads
-  Railway Line
-  Existing High Voltage Power Lines (132kV)
-  Adjoining Farm Boundaries
-  Proposed Tlitsensol PV Application Site
-  Existing Substation
-  Proposed Substation Alternatives

**Proposed Power Line
Corridor Alternatives**

-  Alternative 1
-  Alternative 2



SOURCE:
ESKOM, 2012
BIOTHERM ENERGY, 2015
NGI, 2015



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ENERGY FACILITIES**

**TLISITSENG SOLAR 2
NEAR LICHTENBURG
NORTH WEST PROVINCE**


SLOPE CLASSIFICATION

Legend

-  Main Roads
-  Railway Line
-  Existing High Voltage Power Lines (132kV)
-  Main Rivers

 Proposed Tlisitseng PV Application Site

 Existing Substation

 Proposed Substation Alternatives

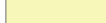
Proposed Power Line Corridor Alternatives

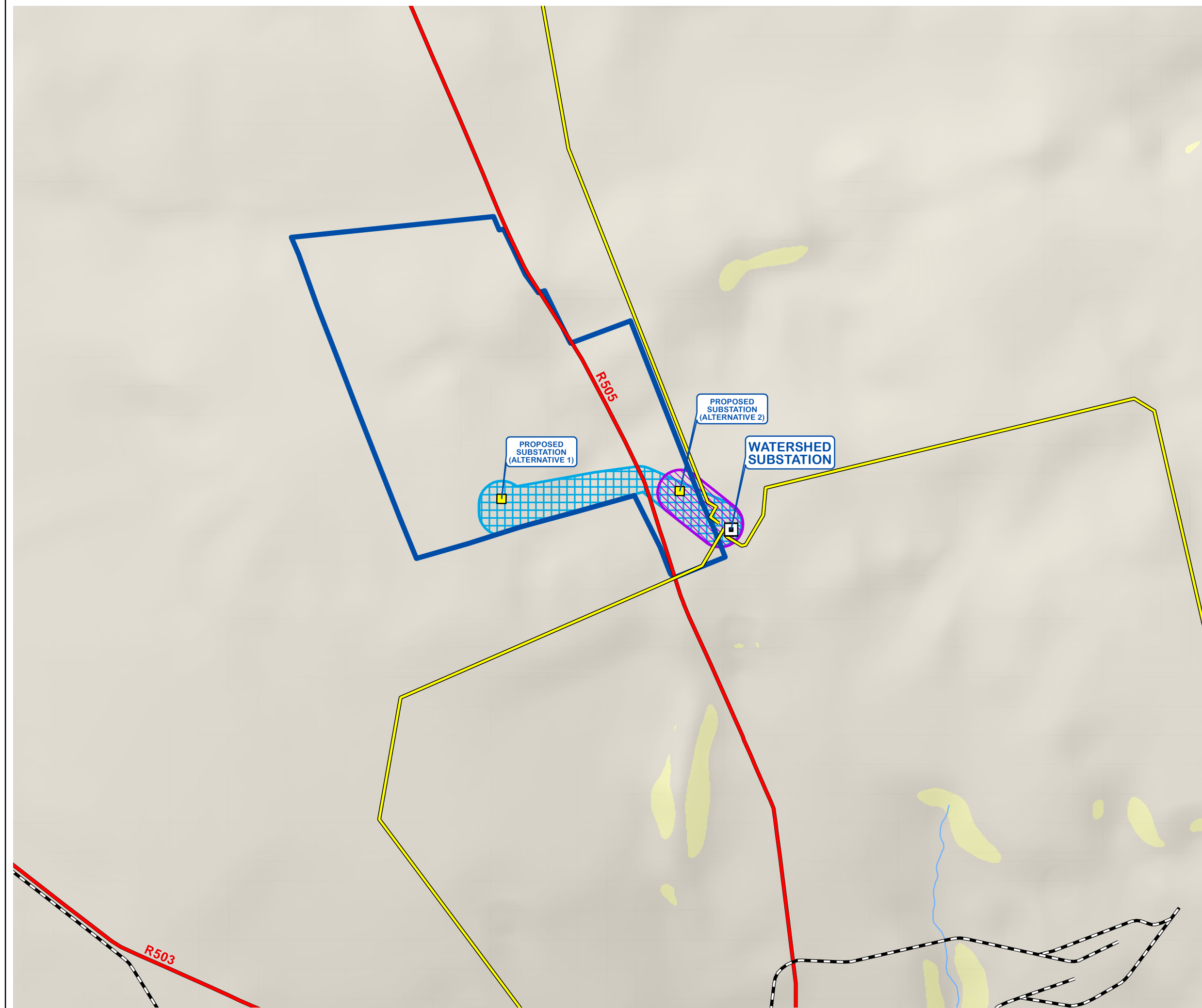
 Alternative 1

 Alternative 2

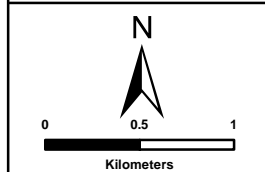
Slope Classification

 Flatter than 1:50

 1:50 - 1:20



SOURCE:
ESKOM, 2012
BIOTHERM ENERGY, 2015
NGI, 2015



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TO SERVE PROPOSED
PHOTOVOLTAIC (PV)
ENERGY FACILITIES**


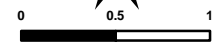

**TLISITSENG SOLAR 2
NEAR LICHTENBURG
NORTH WEST PROVINCE**

TOPOGRAPHY

Legend

-  Main Roads
 -  Railway Line
 -  Existing High Voltage Power Lines (132kV)
 -  Main Rivers
 -  Contours (20m Interval)
 -  Contours (5m Interval)
 -  Proposed Tlisitseng PV Application Site
 -  Existing Substation
 -  Proposed Substation Alternatives
- Proposed Power Line Corridor Alternatives**
-  Alternative 1
 -  Alternative 2
- Elevation (msl)**
-  High : >1,515
 -  Low : >1,470

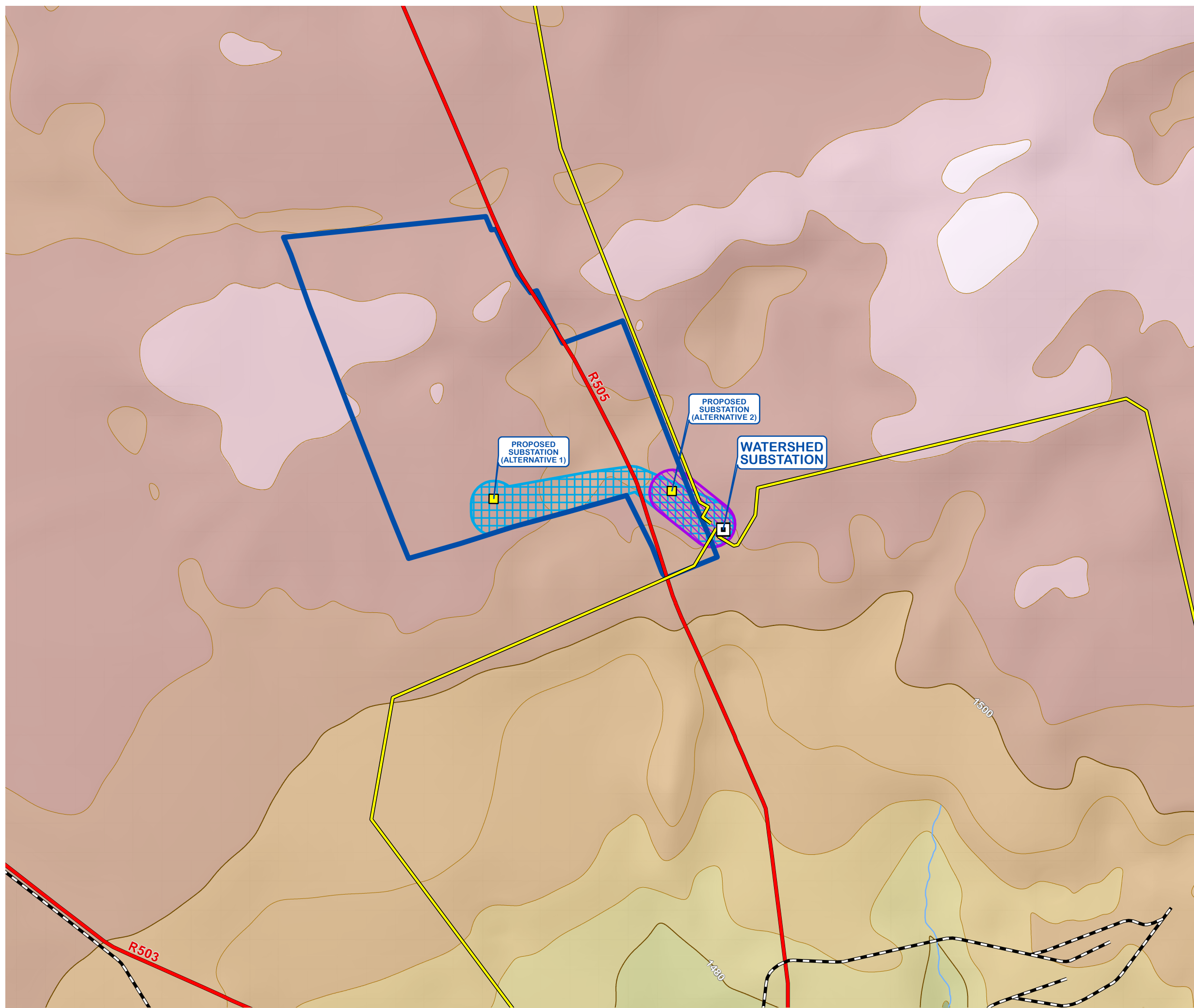
SOURCE:
ESKOM, 2012
BIOTHERM ENERGY, 2015
NGI, 2015

  Kilometers	 ENVIRONMENTAL DIVISION 51 WESSELS ROAD RIVONIA, 2128 JOHANNESBURG SOUTH AFRICA Phone: +27 11 798 0600 Fax: +27 11 803 7272 e-mail: info@sivest.co.za
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PHOTOVOLTAIC (PV)
ENERGY FACILITIES**

**TLISITSENG SOLAR 2
NEAR LICHTENBURG
NORTH WEST PROVINCE**

VEGETATION CLASSIFICATION



Legend

- Main Roads
- Railway Line
- Existing High Voltage Power Lines (132kV)
- Main Rivers
- Proposed Tlisitseng PV Application Site
- Existing Substation
- Proposed Substation Alternatives

Proposed Power Line Corridor Alternatives

- Alternative 1
- Alternative 2

Vegetation Classification

- Gh 14 Western Highveld Sandy Grassland
- Gh 15 Carletonville Dolomite Grassland

SOURCE:
ESKOM, 2012
BIOTERM ENERGY, 2015
SANBI, 2009

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PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED PHOTOVOLTAIC (PV) ENERGY FACILITIES

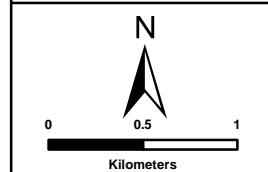
TLISITSENG SOLAR 2
NEAR LICHTENBURG
NORTH WEST PROVINCE

TERRESTRIAL CRITICAL
BIODIVERSITY AREAS

Legend

-  Main Roads
 -  Railway Line
 -  Existing High Voltage Power Lines (132kV)
 -  Main Rivers
 -  Proposed Tlisitseng PV Application Site
 -  Existing Substation
 -  Proposed Substation Alternatives
- Proposed Power Line Corridor Alternatives**
-  Alternative 1
 -  Alternative 2

SOURCE:
ESKOM, 2012
BIOTHERM ENERGY, 2015
NORTH WEST DEPT OF RURAL ENVIRONMENT &
AGRICULTURE, 2015



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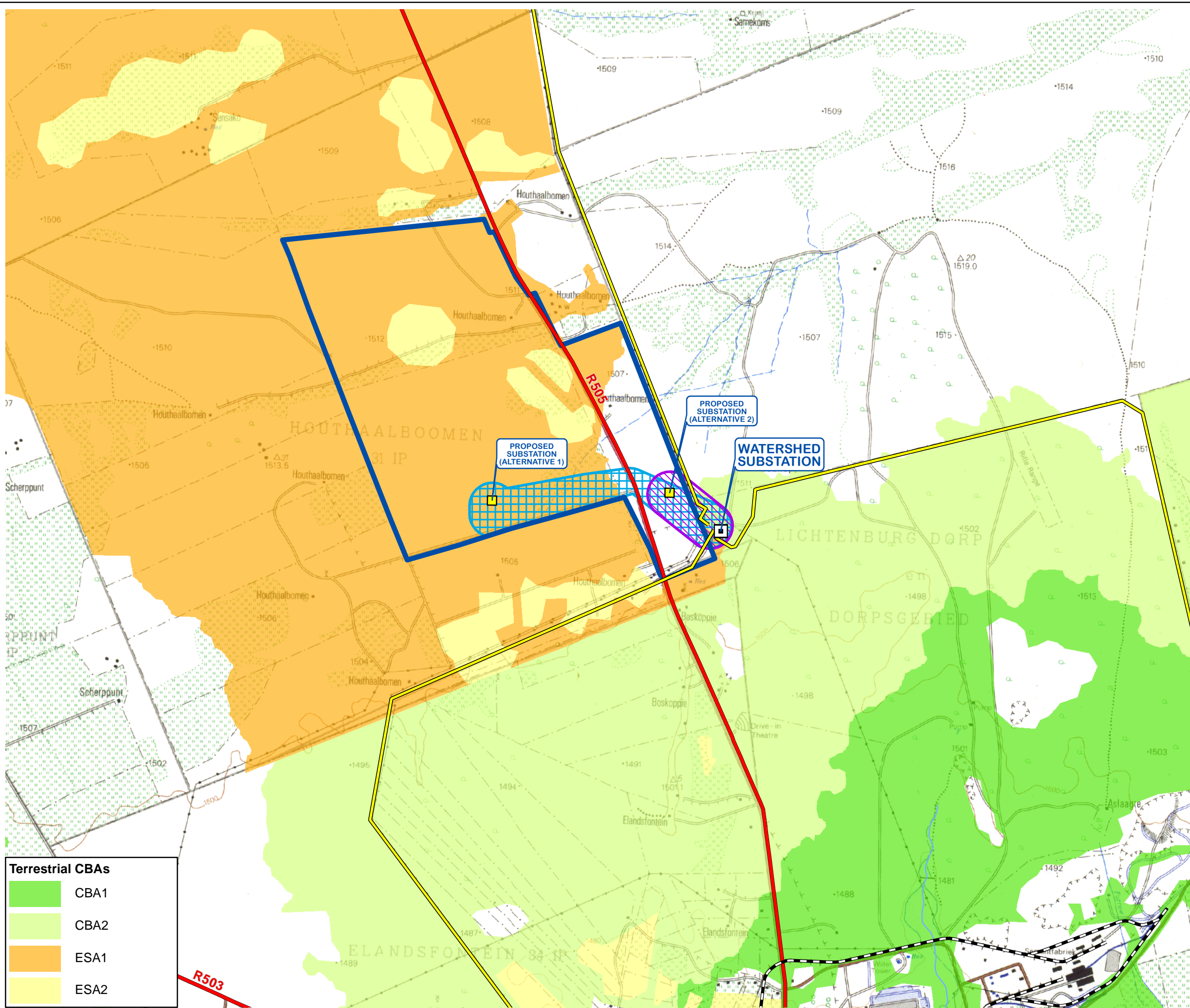
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Terrestrial CBAs












-  CBA1
-  CBA2
-  ESA1
-  ESA2

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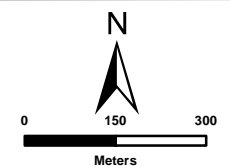
**TLISITSENG SOLAR 2
NEAR LICHTENBURG
NORTH WEST PROVINCE**

AREAS OF HIGH SENSITIVITY

Legend

-  Main Roads
-  Existing High Voltage Power Lines (132kV)
-  Proposed Tlisitseng Solar Application Site
-  Existing Substation
-  Proposed Substation Alternatives
- Proposed Power Line Corridor Alternatives**
-  Alternative 1
-  Alternative 2
- Areas of High Sensitivity**
-  Agricultural Sensitivity
-  Palaeontology Sensitivity
-  Wetlands
-  Surface Water Buffer: Operation Phase (18m)

SOURCE:
ESKOM, 2012
GOOGLE EARTH, 2016
BIOTHERM ENERGY, 2015
NGI, 2015

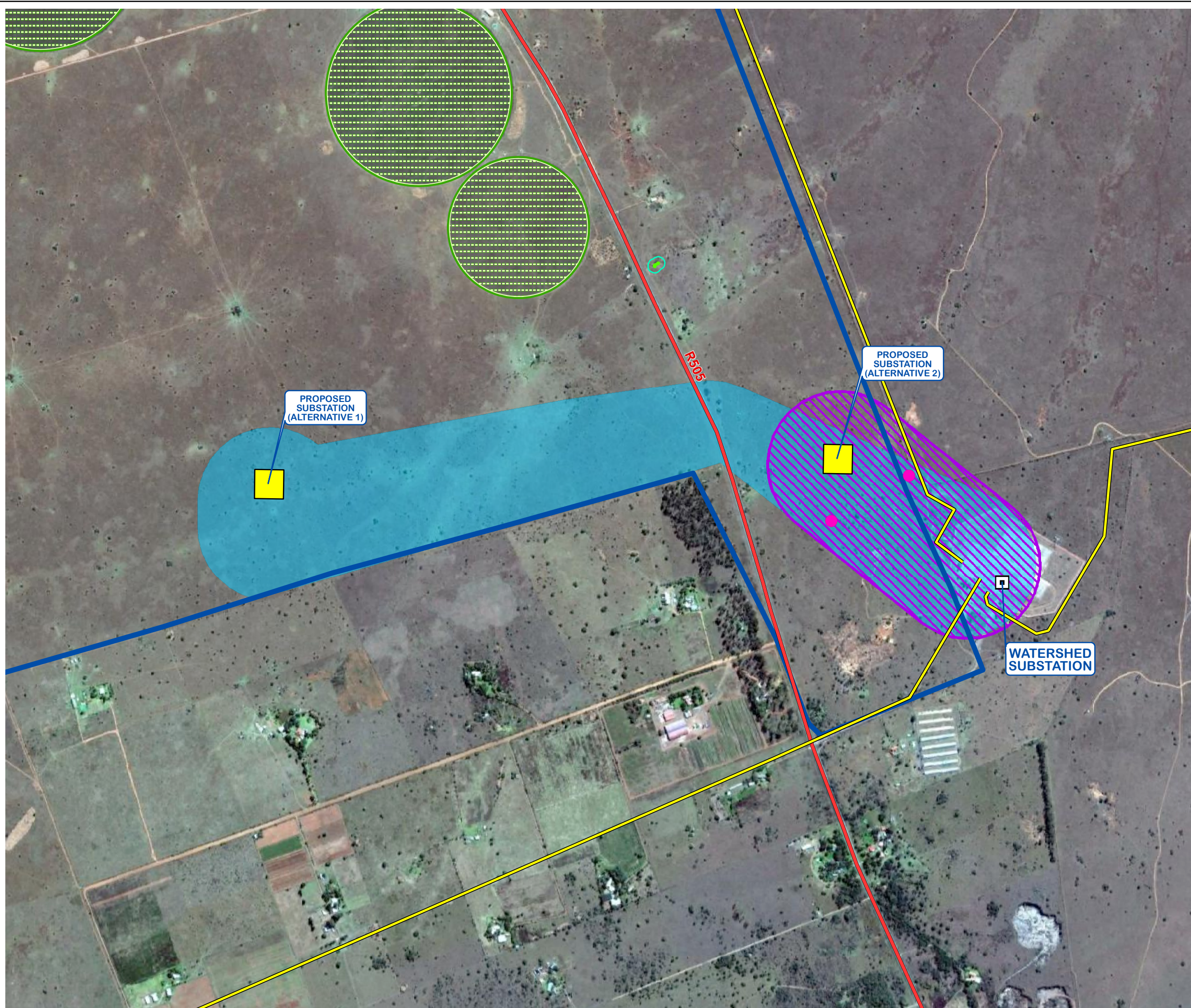


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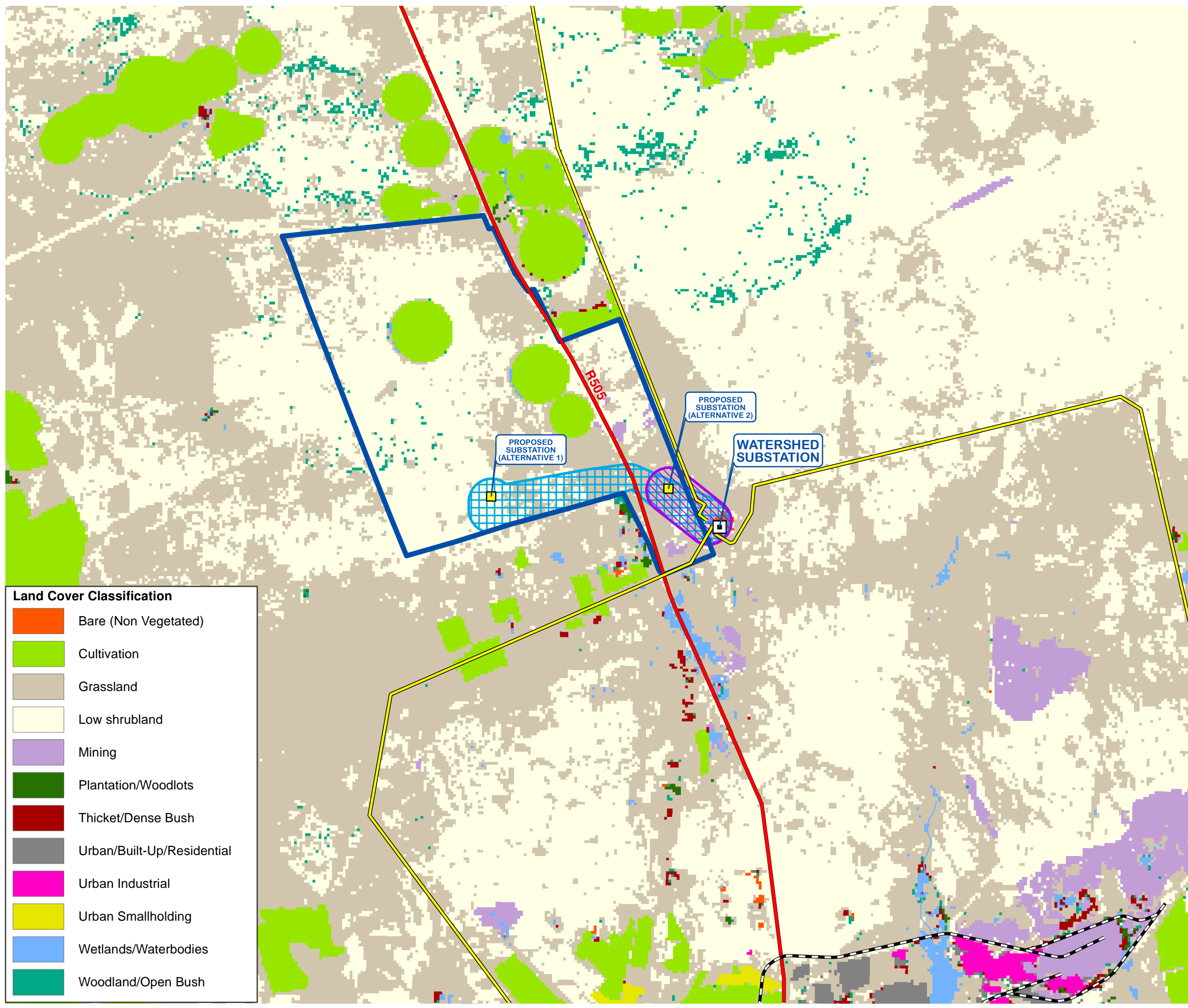
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ENERGY FACILITIES**

**TLISITSENG SOLAR 2
NEAR LICHTENBURG
NORTH WEST PROVINCE**

**BROAD LAND COVER
CLASSIFICATION**



Legend

-  Main Roads
-  Railway Line
-  Existing High Voltage Power Lines (132kV)
-  Main Rivers
-  Proposed Tlisitseng PV Application Site
-  Existing Substation
-  Proposed Substation Alternatives

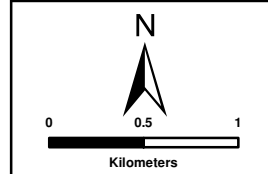
**Proposed Power Line
Corridor Alternatives**

-  Alternative 1
-  Alternative 2

Land Cover Classification

-  Bare (Non Vegetated)
-  Cultivation
-  Grassland
-  Low shrubland
-  Mining
-  Plantation/Woodlots
-  Thicket/Dense Bush
-  Urban/Built-Up/Residential
-  Urban Industrial
-  Urban Smallholding
-  Wetlands/Waterbodies
-  Woodland/Open Bush

SOURCE:
ESKOM, 2012
BIOTHERM ENERGY, 2015
2013-2014 SA NATIONAL LAND COVER
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PHOTOVOLTAIC (PV)
ENERGY FACILITIES**

**TLISITSENG SOLAR 2
NEAR LICHTENBURG
NORTH WEST PROVINCE**

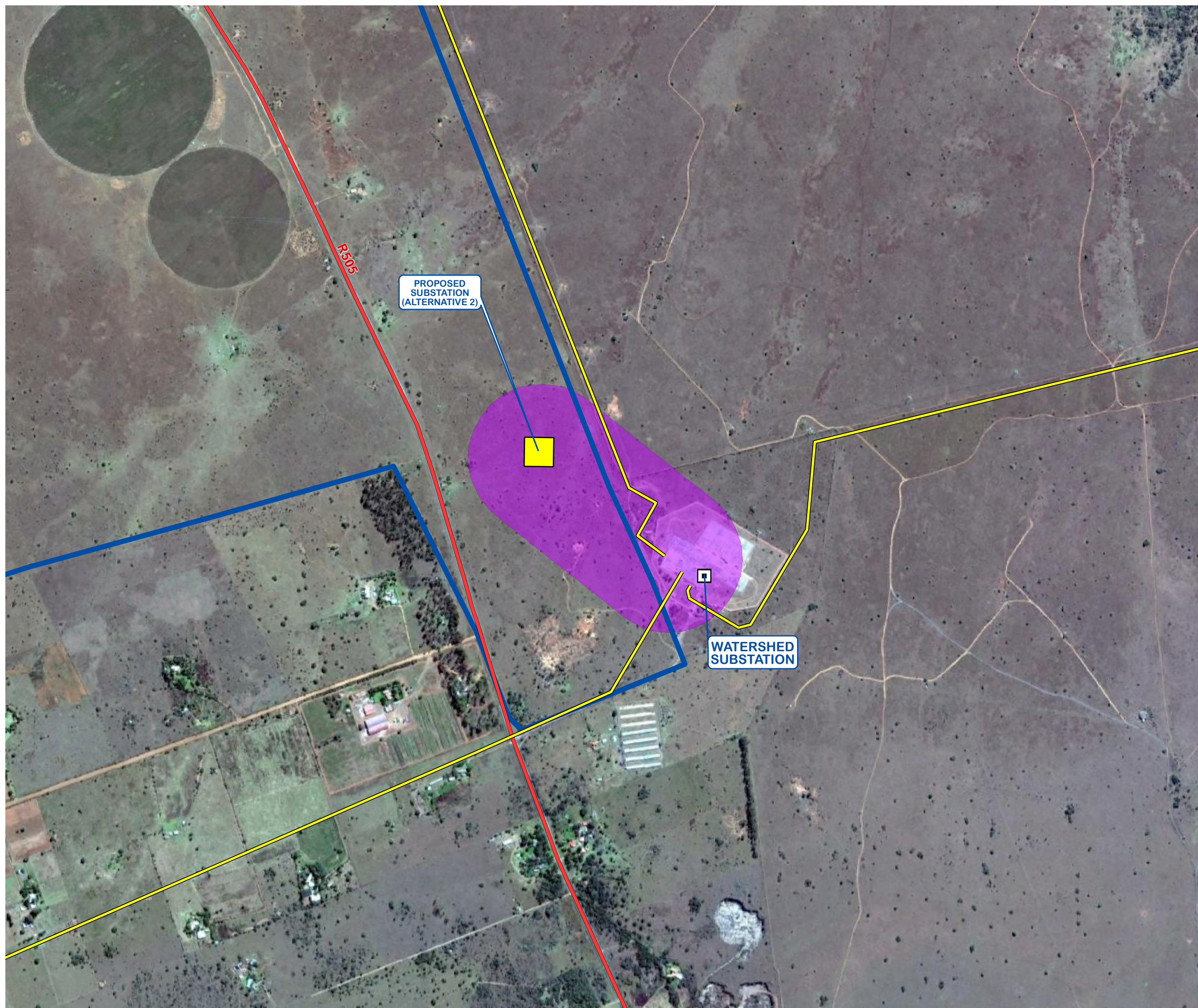
PREFERRED ALTERNATIVES

Legend

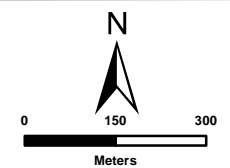
-  Main Roads
-  Existing High Voltage Power Lines (132kV)
-  Proposed Tlisitseng Solar Application Site
-  Existing Substation
-  Preferred Substation Site

Preferred Corridor Alternative

-  Alternative 2



SOURCE:
ESKOM, 2012
GOOGLE EARTH, 2016
BIOTERM ENERGY, 2015
NGI, 2015



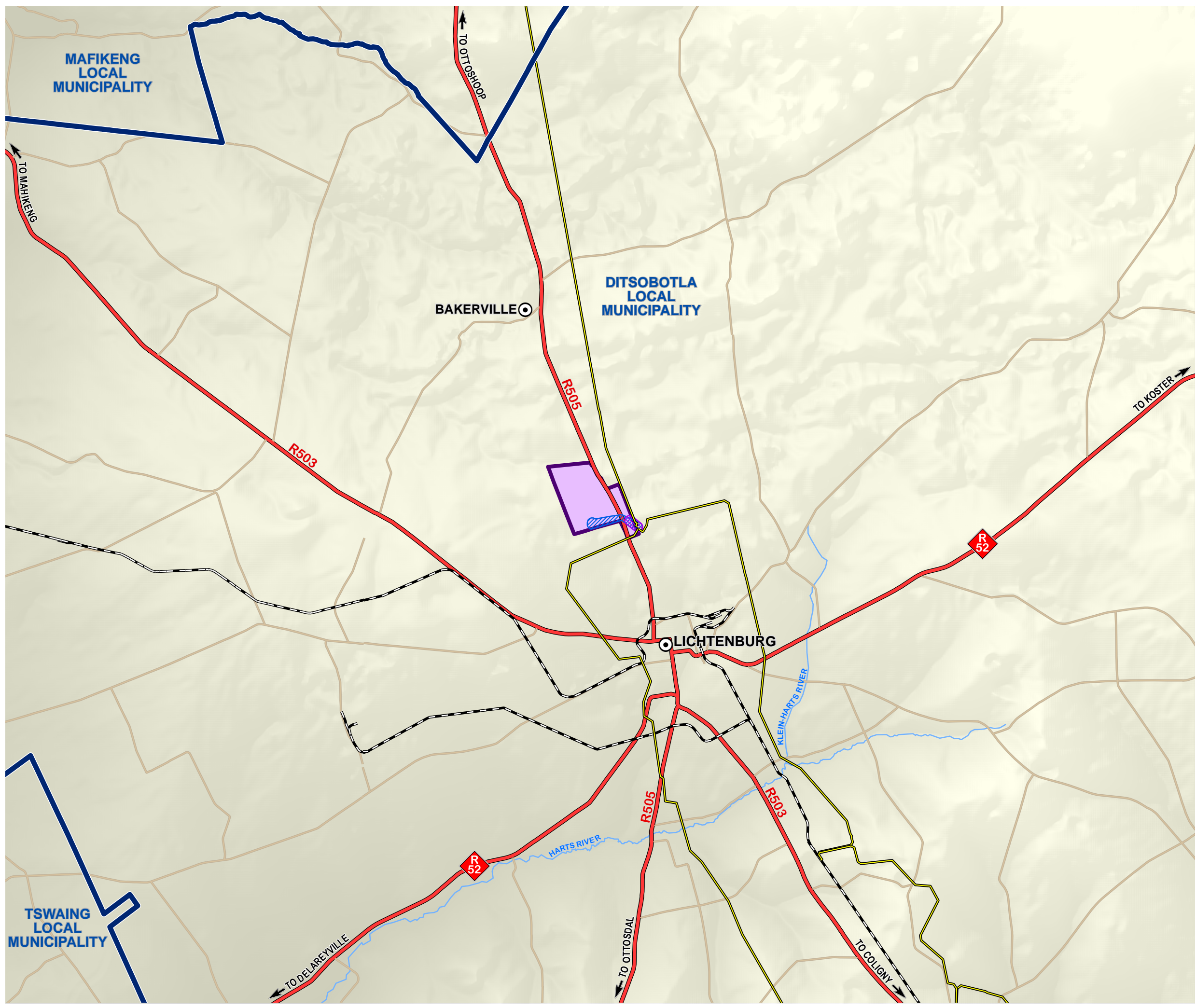
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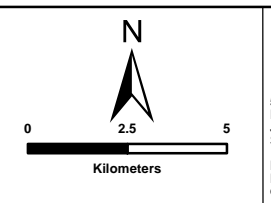
**PROPOSED
CONSTRUCTION OF
A 132kV POWER LINE
TO SERVE PROPOSED
PHOTOVOLTAIC (PV)
ENERGY FACILITIES**

**TLISITSENG SOLAR 2
NEAR LICHTENBURG
NORTH WEST PROVINCE**

REGIONAL CONTEXT

- Legend**
- Local Municipal Boundaries
 - Main Roads
 - Secondary Roads
 - Railway Line
 - Existing High Voltage Power Lines (<=132kV)
 - Main Rivers
 - Main Towns
 - Proposed Tlisitseng Application Site
- Proposed Power Line Corridor Alternatives**
- Alternative 1
 - Alternative 2

SOURCE:
ESKOM, 2012
BIOTHERM ENERGY, 2015



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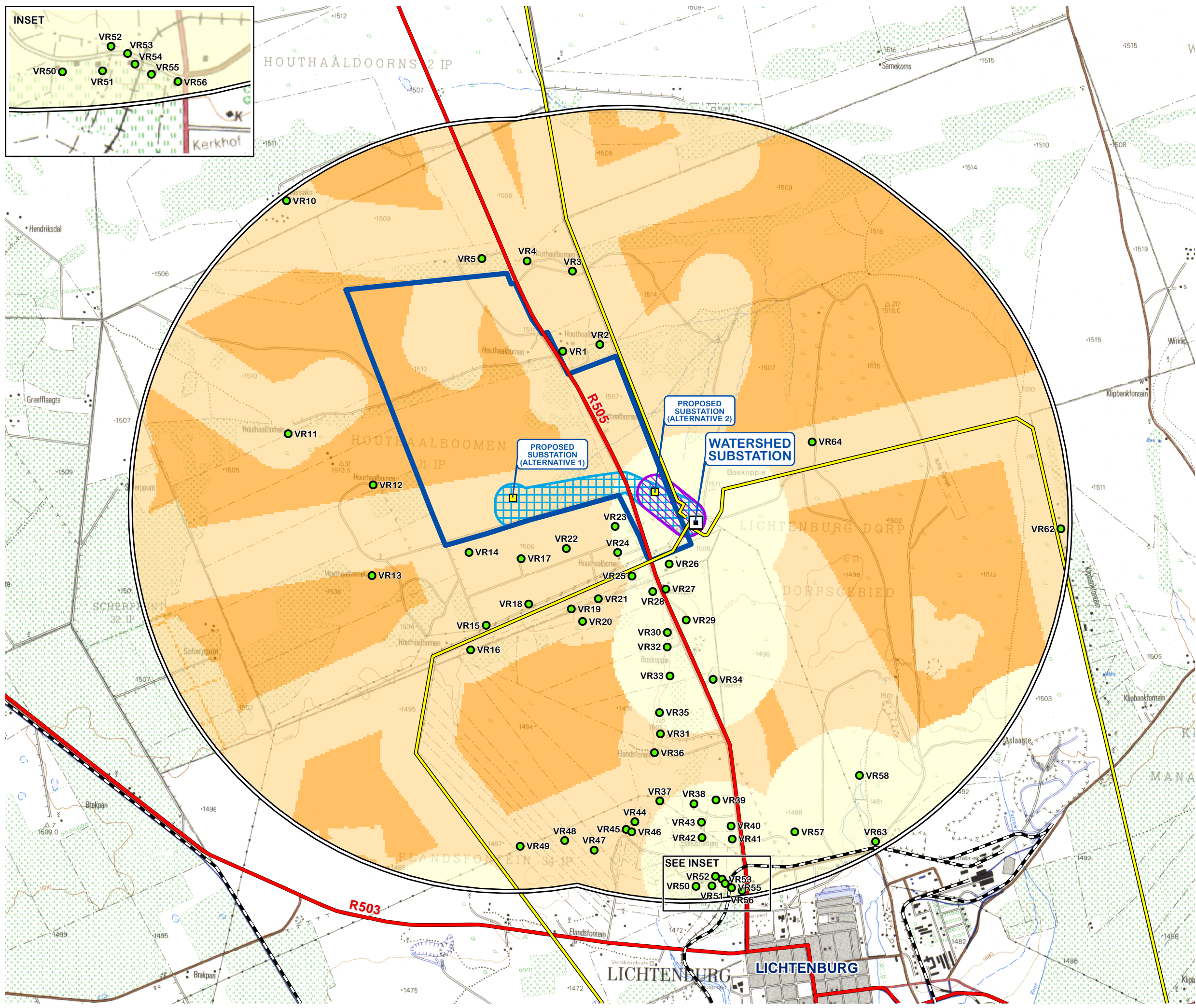
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PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED PHOTOVOLTAIC (PV) ENERGY FACILITIES
TLITSENG SOLAR 2 NEAR LICHTENBURG NORTH WEST PROVINCE

VISUAL ASSESSMENT: ZONES OF VISUAL CONTRAST

- Legend**
- Main Roads
 - Railway Line
 - Existing High Voltage Power Lines (132kV)
 - Proposed Tlitseng PV Application Site
 - 5km Visual Assessment Zone
 - Existing Substation
 - Proposed Substation Alternatives
 - Potentially Sensitive Receptor Locations

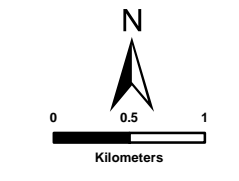
Proposed Power Line Corridor Alternatives

- Alternative 1
- Alternative 2

Zones of Visual Contrast

- High
- Moderate
- Low

SOURCE:
 ESKOM, 2012
 BIOTHERM ENERGY, 2015
 NGI, 2015



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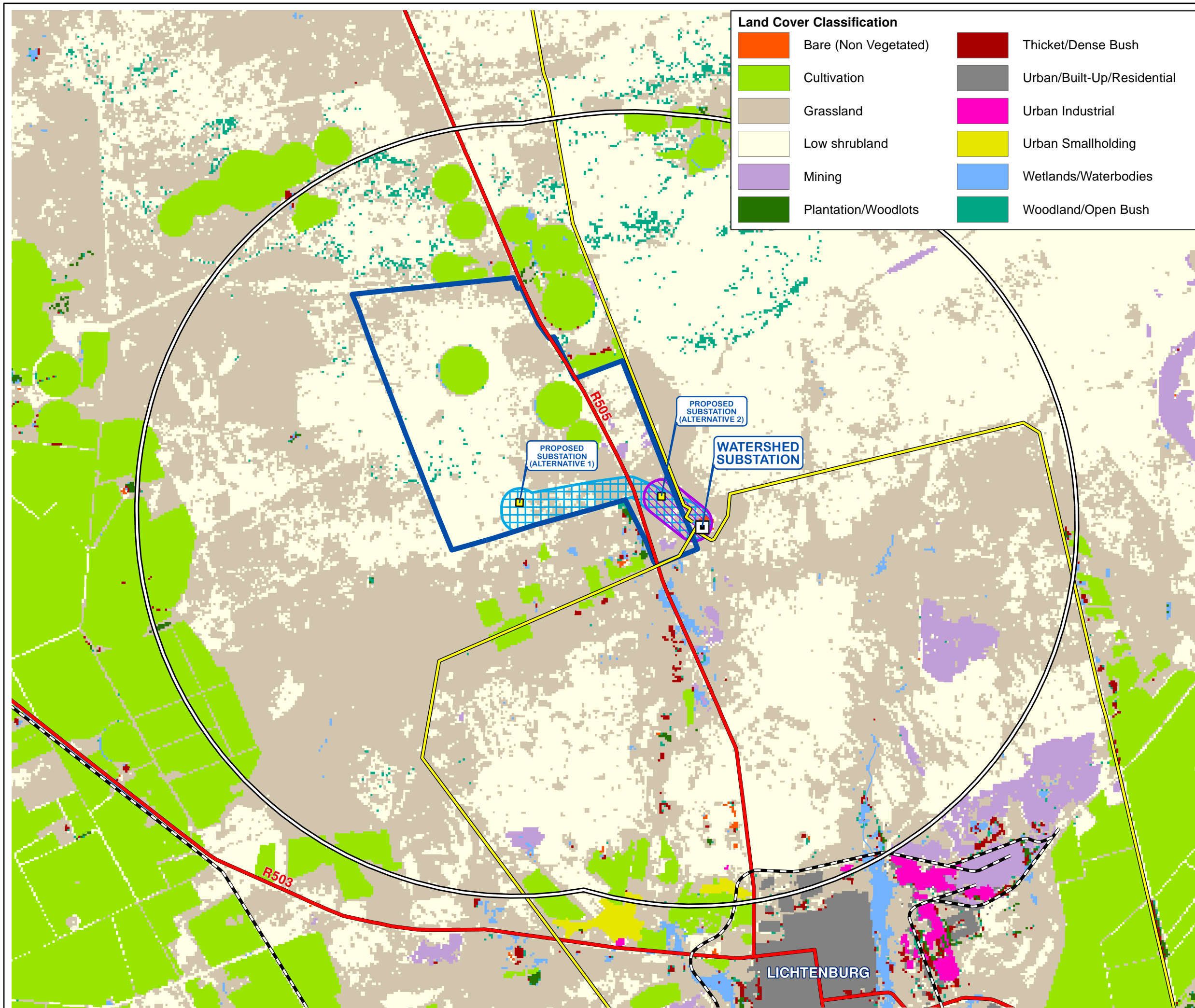
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Land Cover Classification

	Bare (Non Vegetated)		Thicket/Dense Bush
	Cultivation		Urban/Built-Up/Residential
	Grassland		Urban Industrial
	Low shrubland		Urban Smallholding
	Mining		Wetlands/Waterbodies
	Plantation/Woodlots		Woodland/Open Bush

PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED PHOTOVOLTAIC (PV) ENERGY FACILITIES

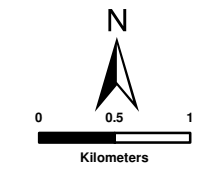
TLISITSENG SOLAR 2 NEAR LICHTENBURG NORTH WEST PROVINCE

VISUAL ASSESSMENT: BROAD LAND COVER CLASSIFICATION

Legend

	Main Roads
	Railway Line
	Existing High Voltage Power Lines (132kV)
	Main Rivers
	Proposed Tlisitseng PV Application Site
	5km Visual Assessment Zone
	Existing Substation
	Proposed Substation Alternatives
Proposed Power Line Corridor Alternatives	
	Alternative 1
	Alternative 2

SOURCE:
 ESKOM, 2012
 BIOTHERM ENERGY, 2015
 2013-2014 SA NATIONAL LAND COVER
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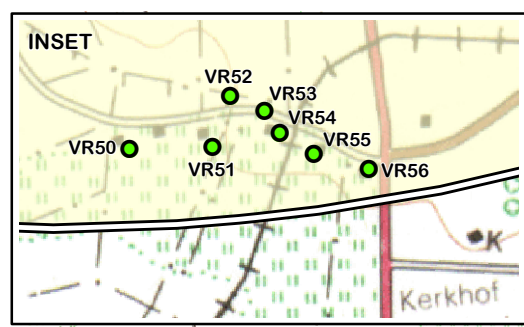
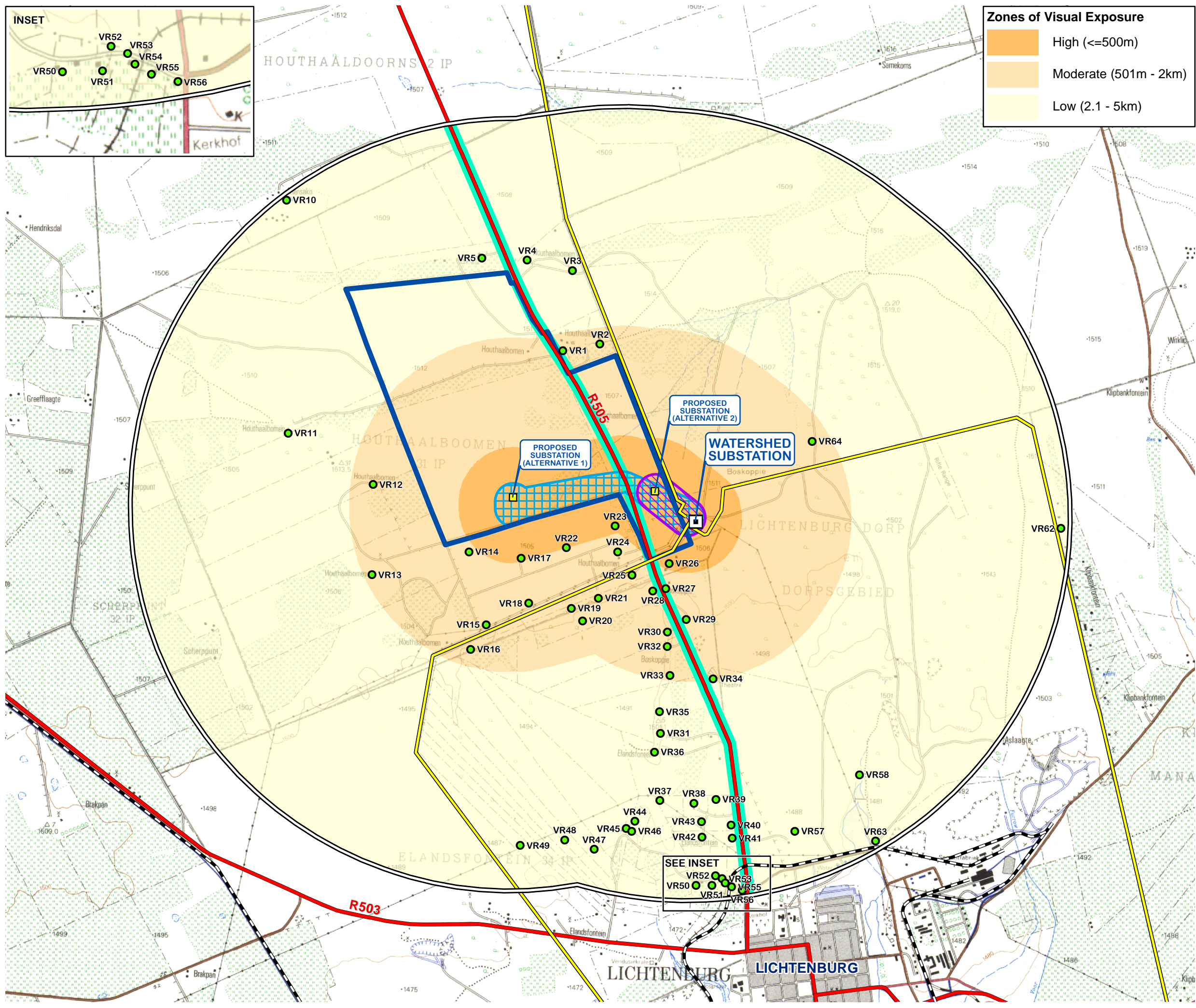
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LICHTENBURG



Zones of Visual Exposure

- High (<=500m)
- Moderate (501m - 2km)
- Low (2.1 - 5km)

PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED PHOTOVOLTAIC (PV) ENERGY FACILITIES
TLITSSENG SOLAR 2 NEAR LICHTENBURG NORTH WEST PROVINCE
VISUAL ASSESSMENT: POTENTIALLY SENSITIVE VISUAL RECEPTOR LOCATIONS

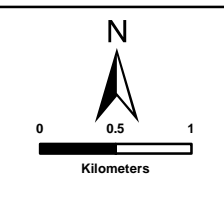
Legend

- Main Roads
- Railway Line
- Existing High Voltage Power Lines (132kV)
- Proposed Trisitseng PV Application Site
- 5km Visual Assessment Zone
- Existing Substation
- Proposed Substation Alternatives
- Potentially Sensitive Receptor Locations
- Receptor Road

Proposed Power Line Corridor Alternatives

- Alternative 1
- Alternative 2

SOURCE:
 ESKOM, 2012
 BIOTHERM ENERGY, 2015
 NGI, 2015

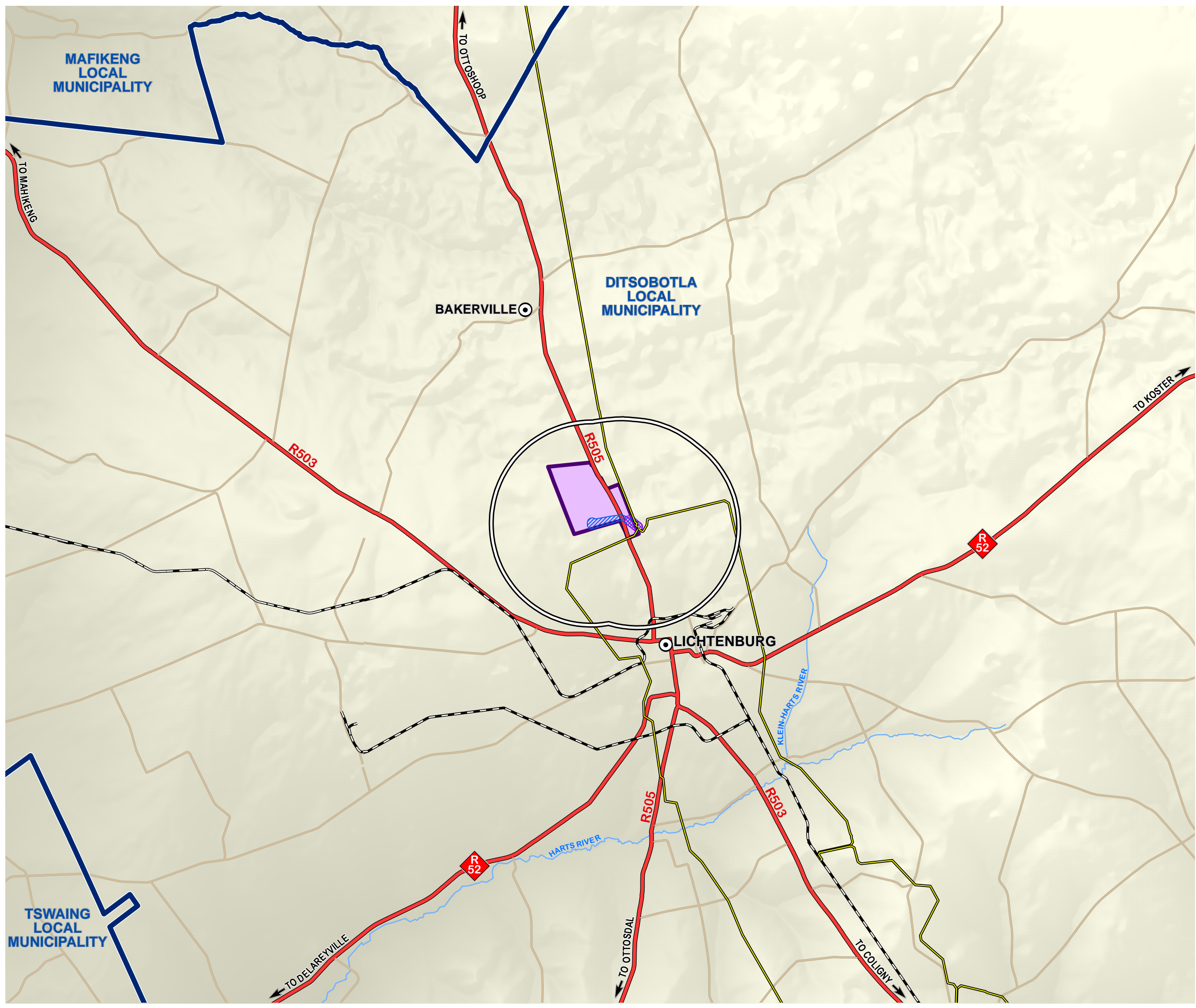


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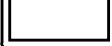




**PROPOSED
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TO SERVE PROPOSED
PHOTOVOLTAIC (PV)
ENERGY FACILITIES**

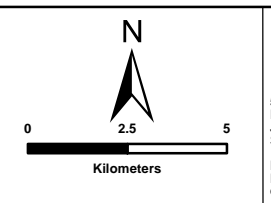
**TLISITSENG SOLAR 2
NEAR LICHTENBURG
NORTH WEST PROVINCE**

**VISUAL ASSESSMENT:
REGIONAL CONTEXT**

Legend

-  Local Municipal Boundaries
 -  Main Roads
 -  Secondary Roads
 -  Railway Line
 -  Existing High Voltage Power Lines (<=132kV)
 -  Main Rivers
 -  Main Towns
 -  Proposed Tlisitseng Application Site
 -  5km Visual Assessment Zone
- Proposed Power Line Corridor Alternatives**
-  Alternative 1
 -  Alternative 2

SOURCE:
ESKOM, 2012
BIOTHERM ENERGY, 2015



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Map Ref No 13303TPL/BA2_V02	Revision 1	Date 27/06/2016

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PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED PHOTOVOLTAIC (PV) ENERGY FACILITIES

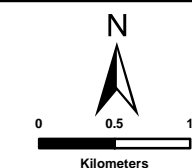
TLITSSENSOLAR 2
NEAR LICHTENBURG
NORTH WEST PROVINCE

VISUAL ASSESSMENT:
ROUTE OVERVIEW

Legend

-  Main Roads
 -  Railway Line
 -  Existing High Voltage Power Lines (132kV)
 -  Adjoining Farm Boundaries
 -  Proposed Tlitsensol PV Application Site
 -  5km Visual Assessment Zone
 -  Existing Substation
 -  Proposed Substation Alternatives
- ### Proposed Power Line Corridor Alternatives
-  Alternative 1
 -  Alternative 2

SOURCE:
ESKOM, 2012
BIOTHERM ENERGY, 2015
NGI, 2015



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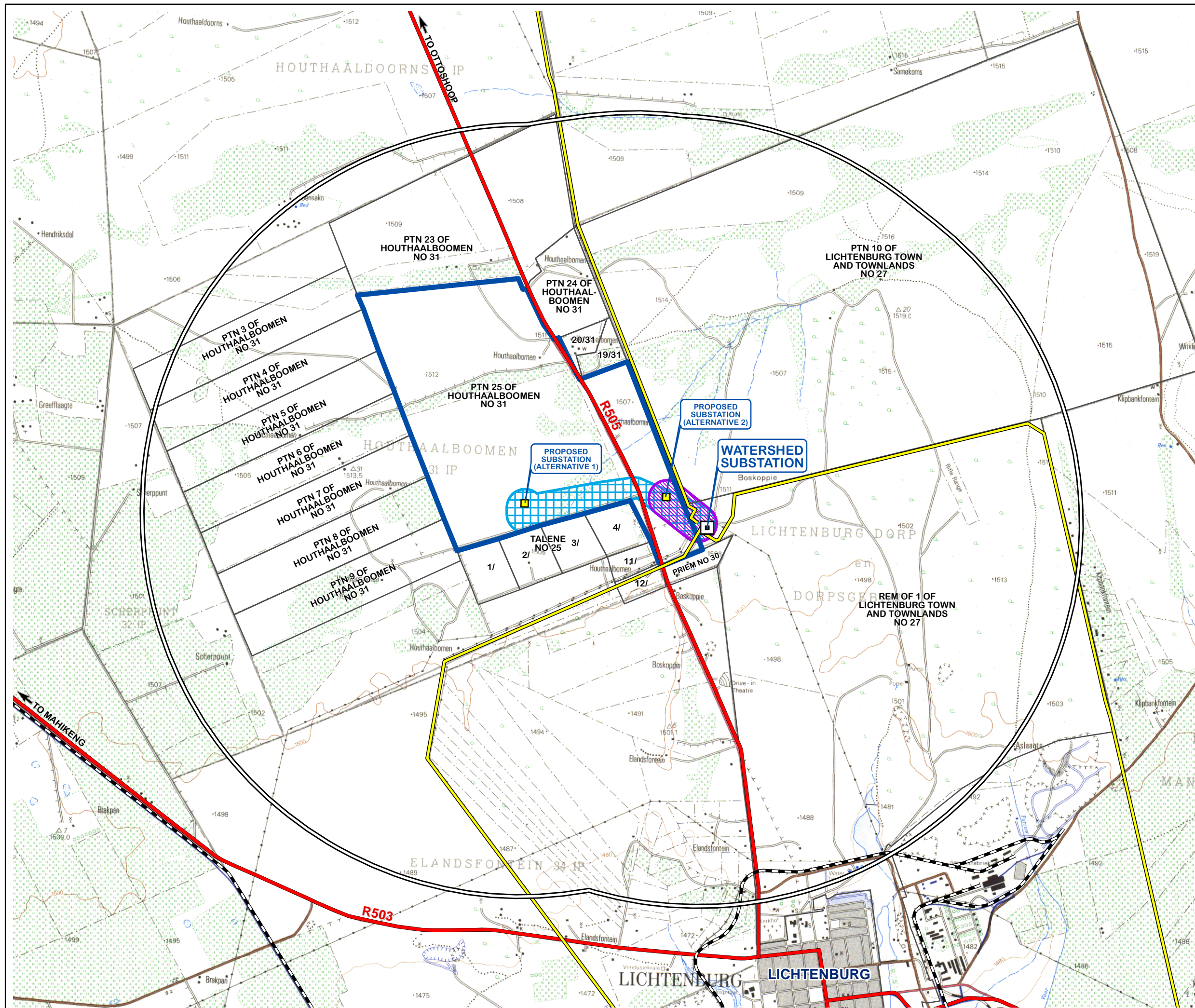
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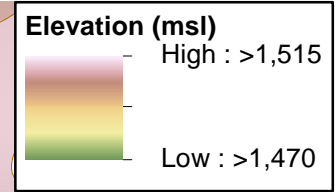
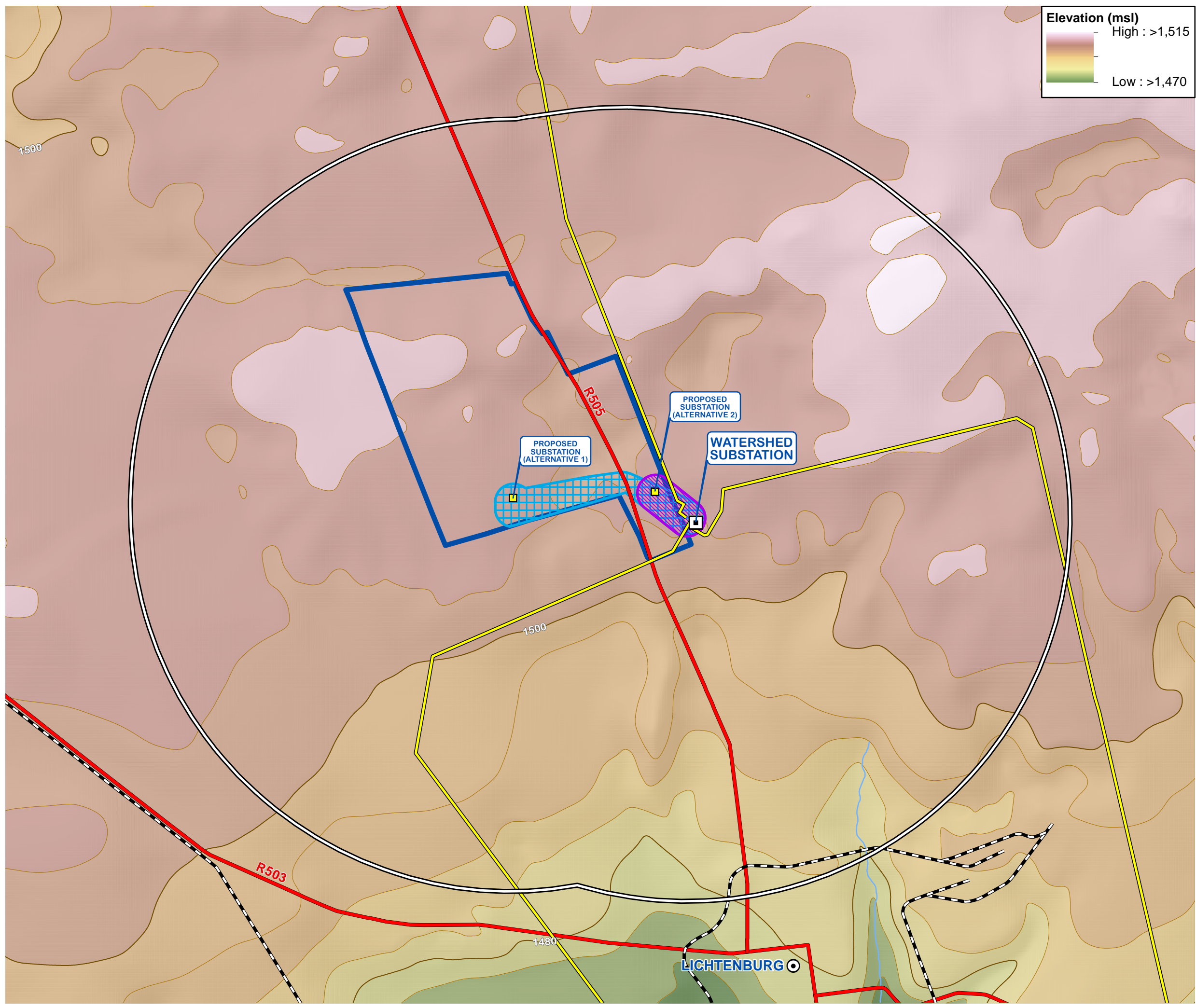
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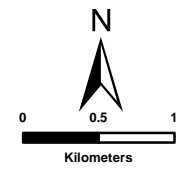




PROPOSED CONSTRUCTION OF A 132kV POWER LINE TO SERVE PROPOSED PHOTOVOLTAIC (PV) ENERGY FACILITIES
TLISITSENG SOLAR 2 NEAR LICHTENBURG NORTH WEST PROVINCE
VISUAL ASSESSMENT: TOPOGRAPHY

- Legend**
- Main Roads
 - Railway Line
 - Existing High Voltage Power Lines (132kV)
 - Main Rivers
 - Contours (20m Interval)
 - Contours (5m Interval)
 - Proposed Tlisitseng PV Application Site
 - 5km Visual Assessment Zone
 - Main Towns
 - Existing Substation
 - Proposed Substation Alternatives
- Proposed Power Line Corridor Alternatives**
- Alternative 1
 - Alternative 2

SOURCE:
 ESKOM, 2012
 BIOTHERM ENERGY, 2015
 NGI, 2015



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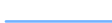





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**PROPOSED
CONSTRUCTION OF
A 132kV POWER LINE
TO SERVE PROPOSED
PHOTOVOLTAIC (PV)
ENERGY FACILITIES**

**TLISITSENG SOLAR 2
NEAR LICHTENBURG
NORTH WEST PROVINCE**

**VISUAL ASSESSMENT:
VEGETATION CLASSIFICATION**



Legend

-  Main Roads
-  Railway Line
-  Existing High Voltage Power Lines (132kV)
-  Main Rivers
-  Proposed Tlisitseng PV Application Site
-  5km Visual Assessment Zone
-  Main Towns
-  Existing Substation
-  Proposed Substation Alternatives

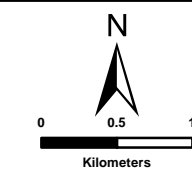
**Proposed Power Line
Corridor Alternatives**

-  Alternative 1
-  Alternative 2

Vegetation Classification

-  Gh 14 Western Highveld Sandy Grassland
-  Gh 15 Carletonville Dolomite Grassland

SOURCE:
ESKOM, 2012
BIOTHERM ENERGY, 2015
SANBI, 2009



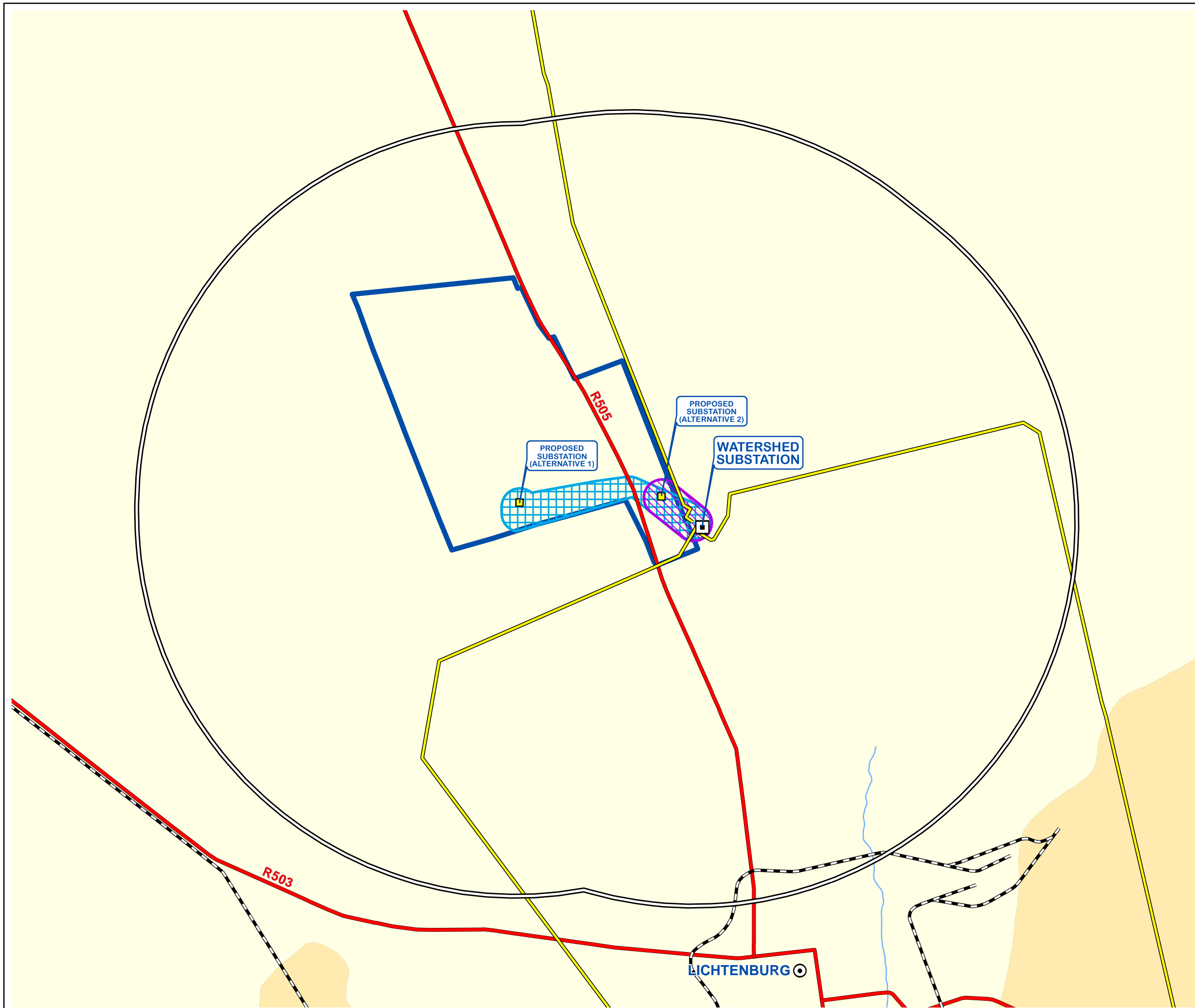
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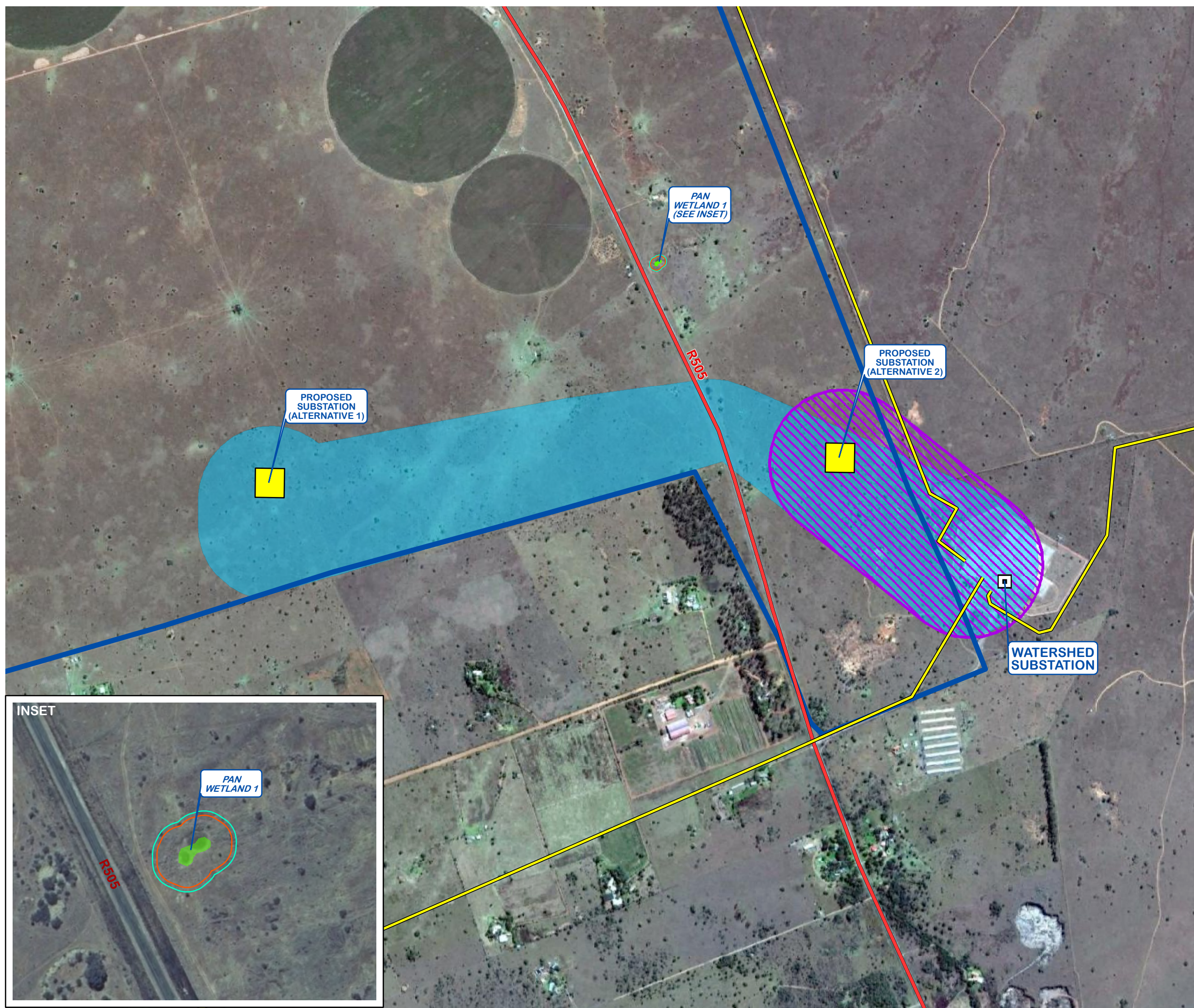
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**PROPOSED
CONSTRUCTION OF
A 132kV POWER LINE
TO SERVE PROPOSED
PHOTOVOLTAIC (PV)
ENERGY FACILITIES**

**TLISITSENG SOLAR 2
NEAR LICHTENBURG
NORTH WEST PROVINCE**

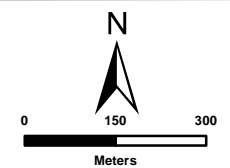
**SURFACE WATER ASSESSMENT:
SURFACE WATER DELINEATION**



Legend

-  Main Roads
-  Existing High Voltage Power Lines (132kV)
-  Proposed Tlisitseng Solar Application Site
-  Existing Substation
-  Proposed Substation Alternatives
- Proposed Power Line Corridor Alternatives**
-  Alternative 1
-  Alternative 2
- Surface Water Features**
-  Wetlands
-  15m Construction Phase Buffer
-  18m Operation Phase Buffer

SOURCE:
ESKOM, 2012
GOOGLE EARTH, 2016
BIOTHERM ENERGY, 2015
NGI, 2015

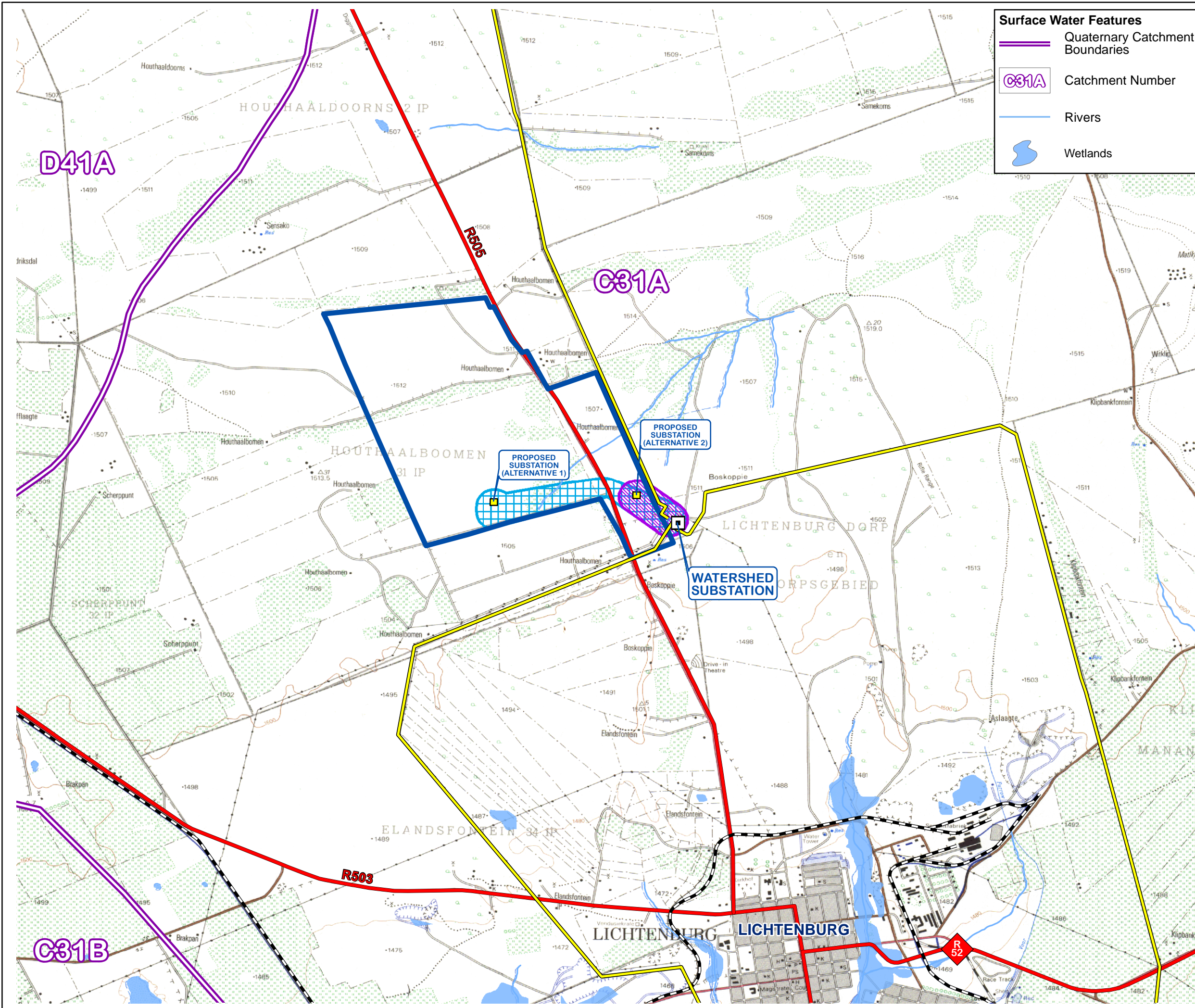


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Surface Water Features

- Quaternary Catchment Boundaries
- Catchment Number
- Rivers
- Wetlands

**PROPOSED
CONSTRUCTION OF A
132kV POWERLINE AND
SUBSTATION TO SERVE
PROPOSED PHOTOVOLTAIC
(PV) ENERGY FACILITIES**

**TLITSSENSOLAR 2
NEAR LICHTENBURG
NORTH WEST PROVINCE**

**SURFACE WATER ASSESSMENT:
DATABASE SURFACE WATER
RESOURCES**

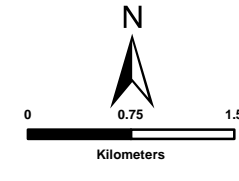
Legend

- Main Roads
- Railway Line
- Existing High Voltage Power Lines (132kV)
- Proposed Tlitsensol PV Application Site
- Existing Substation
- Proposed Substation Alternatives

Proposed Power Line Corridor Alternatives

- Alternative 1
- Alternative 2

SOURCE:
ESKOM, 2012
BIOTERM ENERGY, 2015
NFEPA, 2011
NGI, 2015



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