
















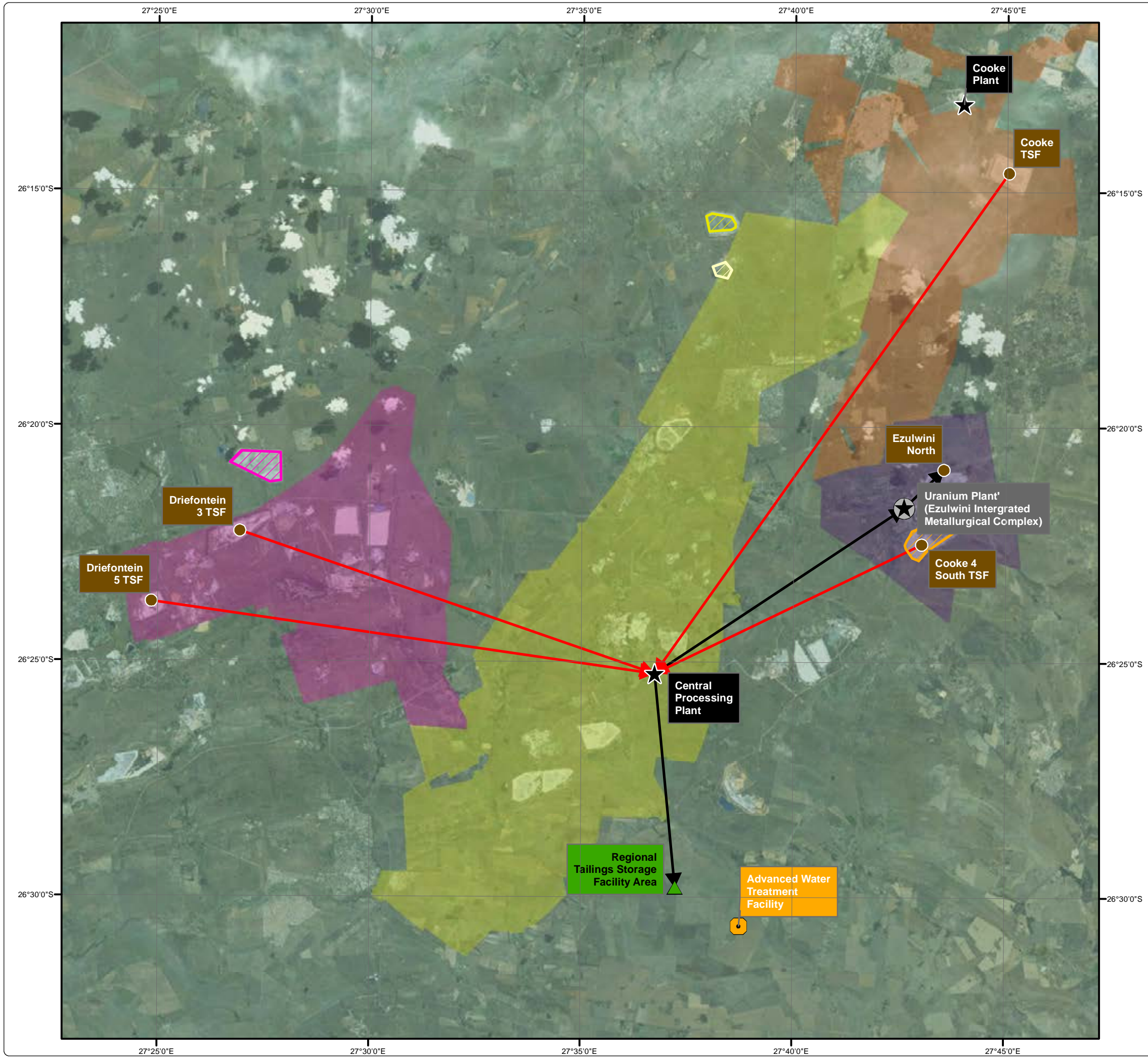
# Sibanye WRTRP EIA

## Initial Implementation

### Legend

#### Infrastructure

-  Advanced Water Treatment Facility
-  Historical Tailings
-  Regional Tailings Storage Facility
-  Surface Plant
-  Uranium Plant
-  Driefontein 4 TSF (To be included in Driefontein MRA)
-  Ezulwini South TSF (To be included in the Cooke MRA)
-  Venterspost North TSF (To be included in the Kloof MRA)
-  Venterspost South TSF (To be included in the Kloof MRA)
-  Deposition Line
-  Reclamation Line
-  Kloof Mining Right
-  Driefontein Mining Right
-  Cooke Mining Right
-  Ezulwini Mining Right



  
**DIGBY WELLS**  
ENVIRONMENTAL

• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator      Ref #: sdp.GOL2376.201508.196  
 Datum: WGS 1984                              Revision Number: 1  
 Central Meridian: 27°E                        Date: 26/08/2015



# Sibanye WRTRP EIA Kloof MRA

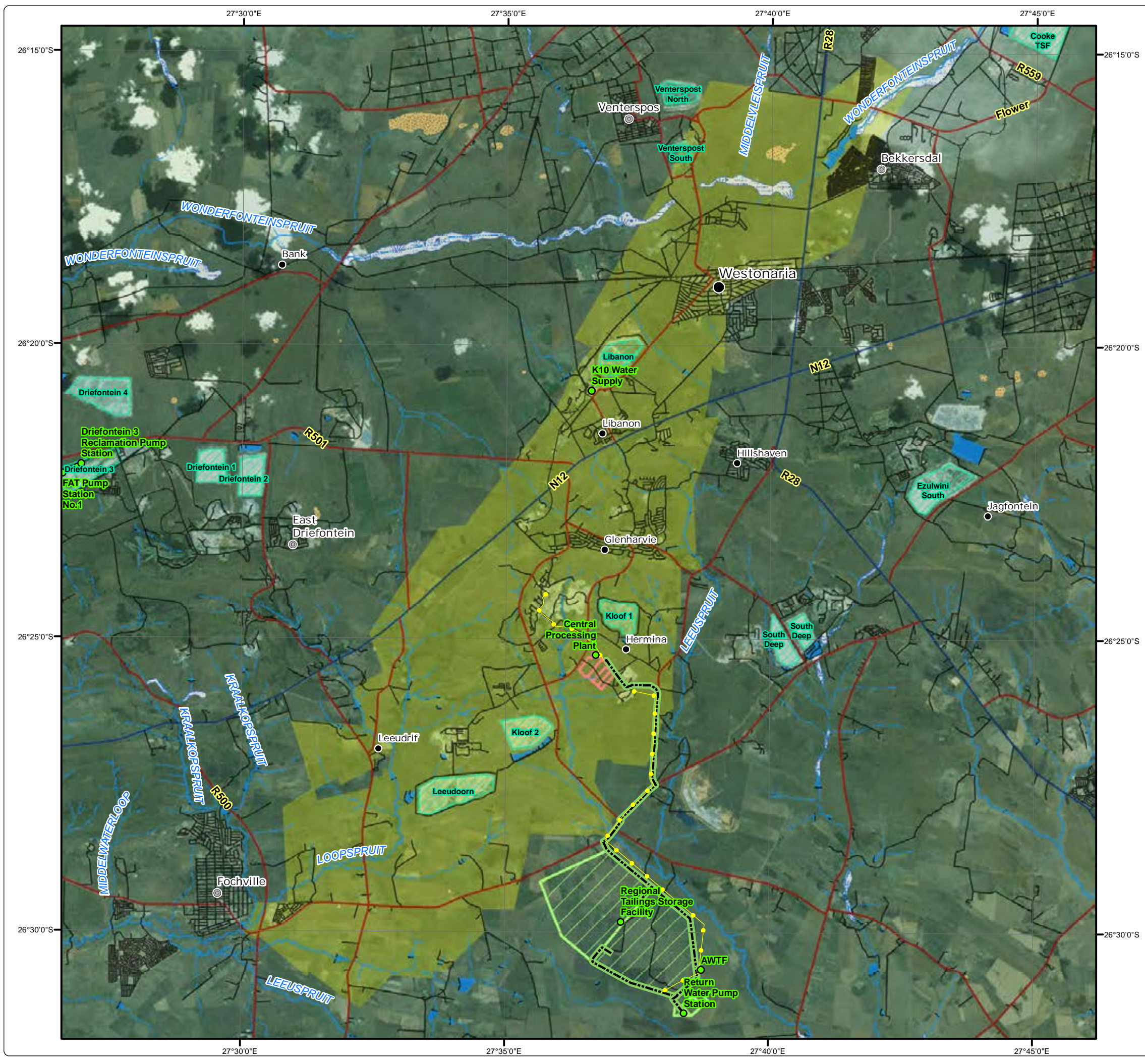
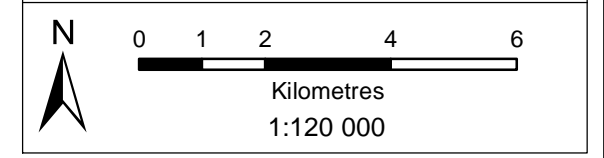
### Legend

- Major Town
- Other Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- +— Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Perennial Pan
- Non-Perennial Pan
- Wetland
- Infrastructure**
- Infrastructure Points
- Powerlines
- Pipelines: Kloof Mining Right
- CPP and Future Uranium Plant
- Regional Tailings Storage Facility
- TSF Infrastructure
- Kloof Mining Right



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator Datum: WGS 1984 Central Meridian: 27°E Ref #: sdp.GOL2376.201508.192 Revision Number: 1 Date: 26/08/2015

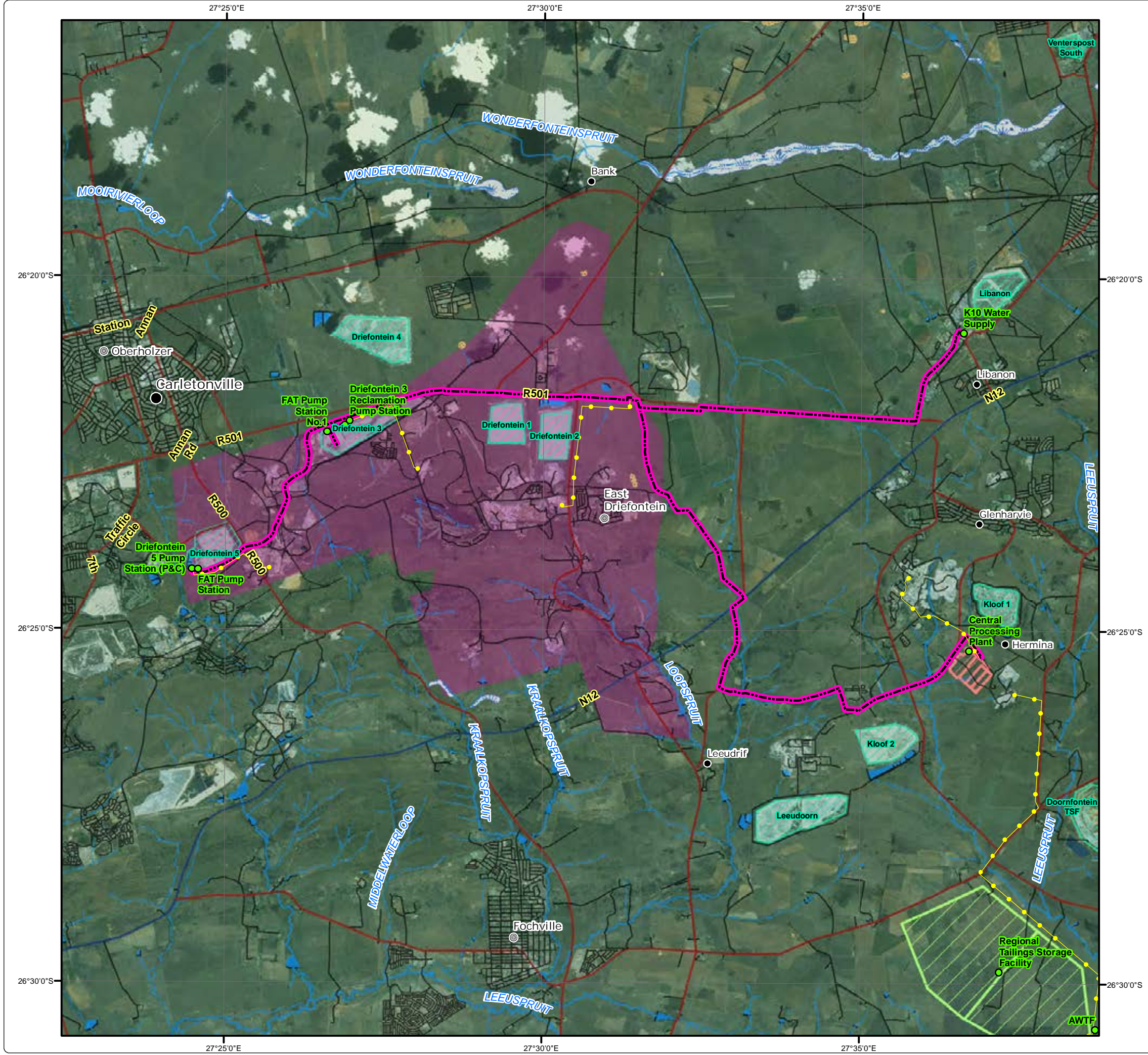


# Sibanye WRTRP EIA

## Driefontein MRA

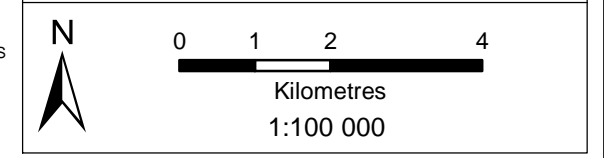
### Legend

- Major Town
- ⊙ Other Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Perennial Pan
- Non-Perennial Pan
- Wetland
- Infrastructure**
- Infrastructure Points
- Powerlines
- Pipelines: Driefontein Mining Right
- CPP and Future Uranium Plant
- Regional Tailings Storage Facility
- TSF Infrastructure
- Driefontein Mining Right



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator      Ref #: sdp.GOL2376.201508.193  
 Datum: WGS 1984      Revision Number: 1  
 Central Meridian: 27°E      Date: 26/08/2015



# Sibanye WRTRP EIA

## Cooke MRA

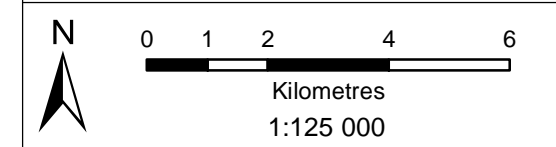
### Legend

- Major Town
- ⊙ Secondary Town
- ⦿ Other Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Perennial Pan
- Non-Perennial Pan
- Wetland
- Infrastructure**
- Infrastructure Points
- Pipelines: Cooke Mining Right
- TSF Infrastructure
- Cooke Mining Right



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator      Ref #: sdp.GOL2376.201508.194  
 Datum: WGS 1984      Revision Number: 1  
 Central Meridian: 27°E      Date: 25/08/2015

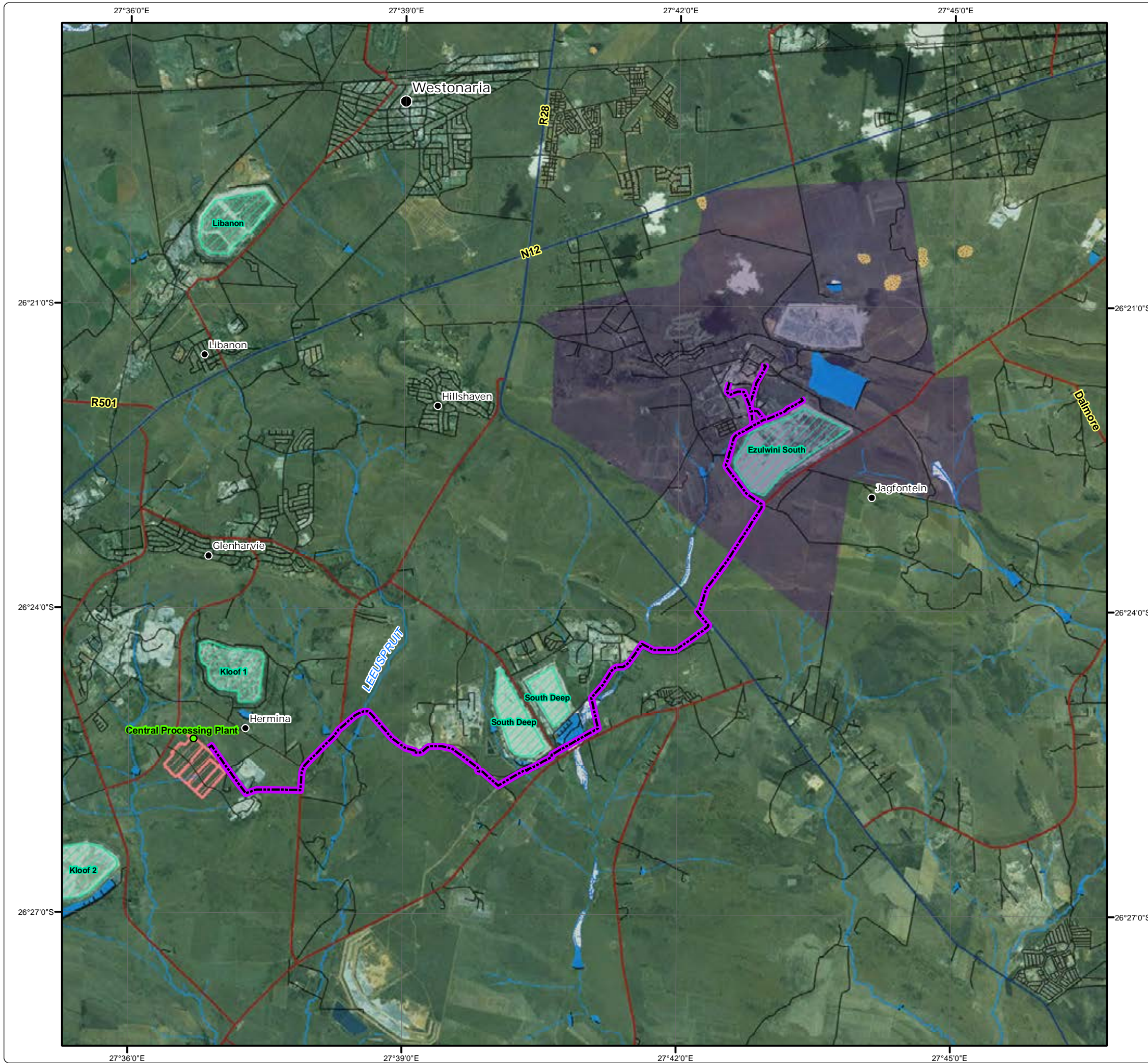


# Sibanye WRTRP EIA

## Ezulwini MRA

### Legend

- Major Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- +— Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Perennial Pan
- Non-Perennial Pan
- Wetland
- Infrastructure**
- Infrastructure Points
- Pipelines: Ezulwini Mining Right
- CPP and Future Uranium Plant
- TSF Infrastructure
- Ezulwini Mining Right



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator Ref #: sdp.GOL2376.201508.195  
 Datum: WGS 1984 Revision Number: 1  
 Central Meridian: 27°E Date: 25/08/2015



# Sibanye WRTRP EIA

## CPP Location

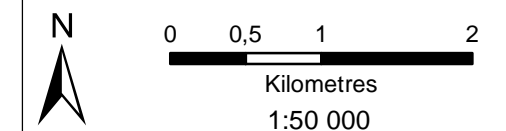
### Legend

- Settlement
  - Arterial / National Route
  - Main Road
  - Minor Road
  - +— Railway Line
  - Non-Perennial Stream
  - Perennial Stream
  - Dam Wall
  - Dam / Lake
  - Perennial Pan
  - Non-Perennial Pan
  - Wetland
- ### Infrastructure
- Infrastructure Points
  - Powerlines
  - Pipelines: Kloof Mining Right
  - CPP and Future Uranium Plant
  - Regional Tailings Storage Facility
  - TSF Infrastructure
  - Kloof Mining Right



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity





Projection: Transverse Mercator      Ref #: sdp.GOL2376.201508.198  
 Datum: WGS 1984                              Revision Number: 1  
 Central Meridian: 27°E                        Date: 25/08/2015



# Sibanye WRTRP EIA

## CPP Layout

### Legend

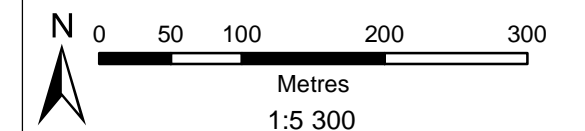
-  Main Road
-  Minor Road
-  CPP Infrastructure Lines
-  CPP Infrastructure Polygons

Infrastructure	Label	Infrastructure	Label
Sulphide Flotation Feed (Plant Feed)	1	Cooke Rougher Flotation/pH Adjustment	47
Sulphate Flotation	2	Cooke Uranium Rip Effluent	48
Oxide Flotation	3	Elution Wash Clarifier Effluent	49
Ultra Fine Grinding (Milling)	4	Cooke Uranium Tailings Thickener	50
Sulphide	5	Cooke Uranium SX	51
Oxide Concentrate Thickener	6	Central Uranium Leach Plant - 1	52
Carbon in Leach (Oil)	7	Central Uranium pH Adjust - 1	53
Cyanide Detox	8	Central Uranium Rip - 1	54
CI Dewatering	9	Central Uranium Leach Plant - 2	55
Acid Wash, Elution and Regeneration	10	Central Uranium pH Adjust - 2	56
Tailings Thickener	11	Central Uranium Rip - 2	57
Water Services	12	Central Uranium Rip Elution - 2	58
Plant Run-Off	13	Central Uranium SX	59
Process Water Run-Off Dam	14	Central Uranium Adu Plant	60
Air Services	15	Adu Calcining Plant	61
Gold Room	16	Roaster Plant	62
Med, Eng Offices and Lab	17	Sulphuric Acid Storage Tanks	63
Sulphide Flotation Run-Off Dam	18	SX Fire Water	64
Oxide Flotation Run-Off Dam	19	U Raw/Potable Water Storage Tanks	65
MCC and Control Room	20	Cooke Flotation Blowers	66
AU Workshop	21	Air Services U Plant	67
Main Stores	22	Boiler	68
Floculant Plant	23	Diesel Storage Area (U-Plant)	69
Diesel Off Loading and Storage	24	Xanthate and Frother Plant	70
Cyanide Off Loading and Storage	25	Depressant Make-Up System	71
Caustic Off Loading and Storage	26	Ammonia Storage	72
Hydrochloric Acid Off Loading and Storage	27	Security and Change House - U	73
Copper Sulphide Off Loading and Storage	28	Workshop - U	74
Lime Off Loading and Storage	29	Chop House - U	75
SMBS Storage and Make-Up	30	Control Room - U	76
Flotation Regents	31	Met and Engineering Offices - U	77
Weigh Bridge	32	Lab - U	78
Security and Change House	33	Central U Plant Sub	79
Admin Building and Parking	34	Cooke U Plant Sub	80
Equipment Off Loading (Airlock)	35	Medical Station U Plant	81
Heli Pad	36	Acid Storage Weighbridge	82
Temporary Parking	37	Acid Plant	83
MCC	38	Pyrite Dam	84
Plant Entrance	39	U Event Dam	85
Sewerage Plant	40	Converter Maintenance Area	86
Emergency Power Generators	41	Cooling Water Plant	87
Reagents Run-Off Pond	42	Pyrite Feed Preparation	88
Cooke Tailings Feed Plant	43	Gas Cleaning Plant	89
Cooke Uranium Leach	44	Coal Stockpile	90
Cooke Rip Pre-Screening and pH Adjustment	45	Attenuation Dam	91
Cooke Rip Screening and Rip Section 1 and 2	46	Boiler Feed Water Plant	92



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator Ref #: sdp.GOL2376.201508.199  
 Datum: WGS 1984 Revision Number: 1  
 Central Meridian: 27°E Date: 26/08/2015



# Sibanye WRTRP EIA

## RTSF Location

### Legend

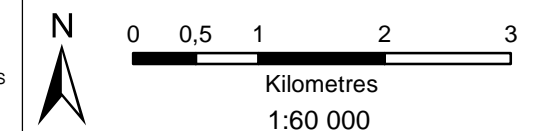
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- +— Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Perennial Pan
- Non-Perennial Pan
- Wetland
- Infrastructure**
- Infrastructure Points
- Powerlines
- Pipelines: Kloof Mining Right
- CPP and Future Uranium Plant
- Regional Tailings Storage Facility
- TSF Infrastructure
- Kloof Mining Right



**DIGBY WELLS**  
ENVIRONMENTAL

• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

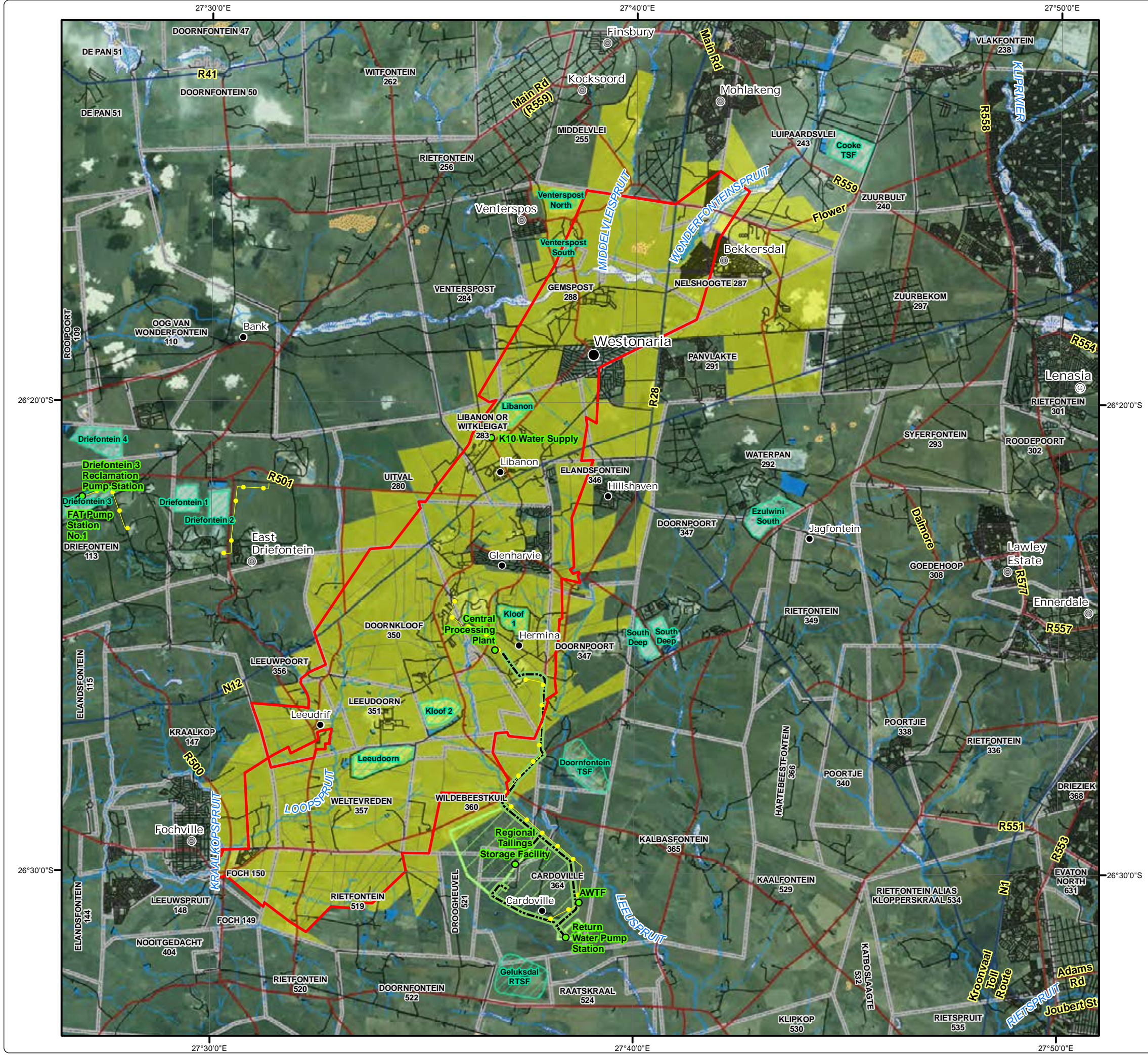
Projection: Transverse Mercator      Ref #: sdp.GOL2376.201508.200  
 Datum: WGS 1984                              Revision Number: 1  
 Central Meridian: 27°E                        Date: 26/08/2015





# Sibanye WRTRP EIA

## Kloof Land Tenure



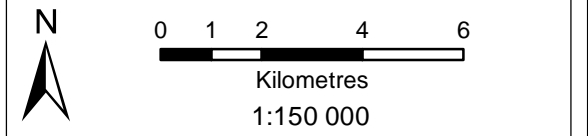
### Legend

- Major Town
- Secondary Town
- ⊙ Other Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Perennial Pan
- Non-Perennial Pan
- Wetland
- Farm Boundary
- Directly Affected Farms
- Infrastructure**
- Infrastructure Points
- Powerlines
- Pipelines: Kloof Mining Right
- Regional Tailings Storage Facility
- TSF Infrastructure
- Kloof Mining Right



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator      Ref #: sdp.GOL2376.201508.218  
 Datum: WGS 1984      Revision Number: 1  
 Central Meridian: 27°E      Date: 25/08/2015



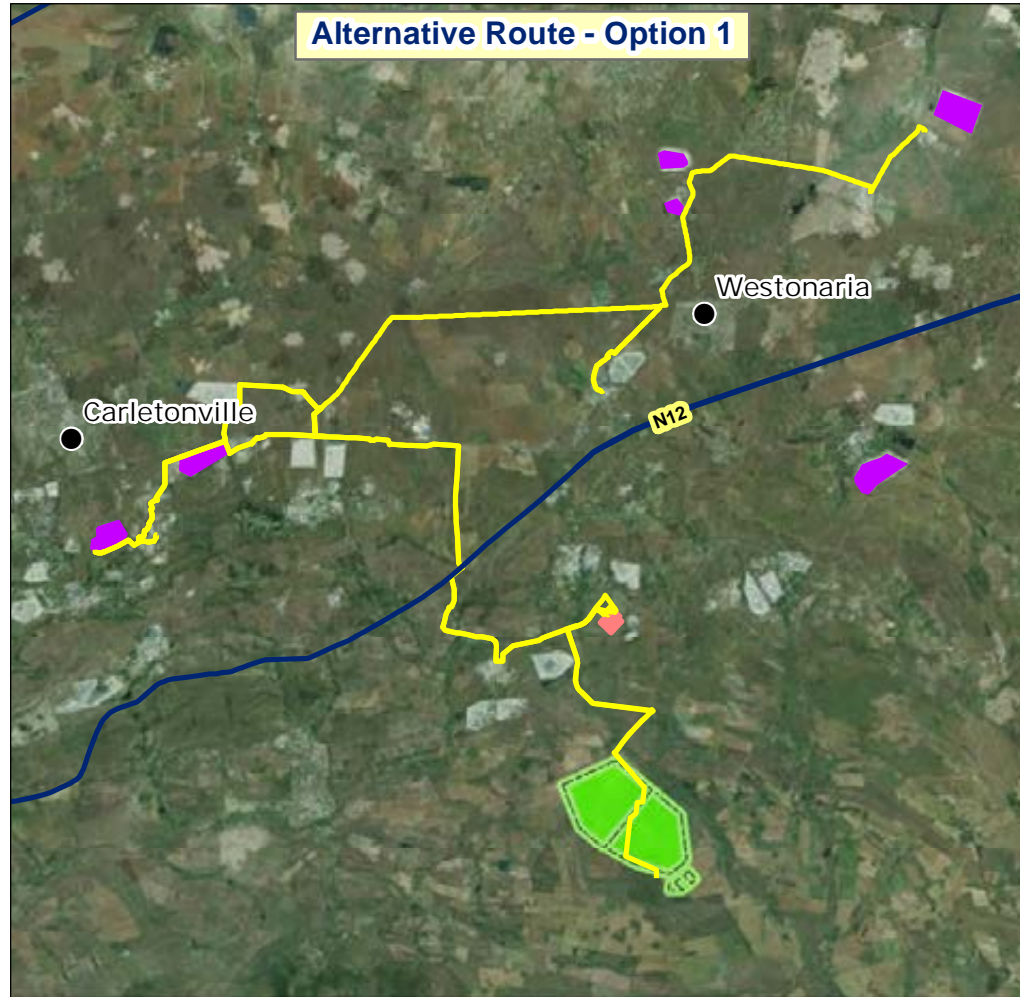
# Sibanya WRTRP EIA

## Pipeline Alternatives

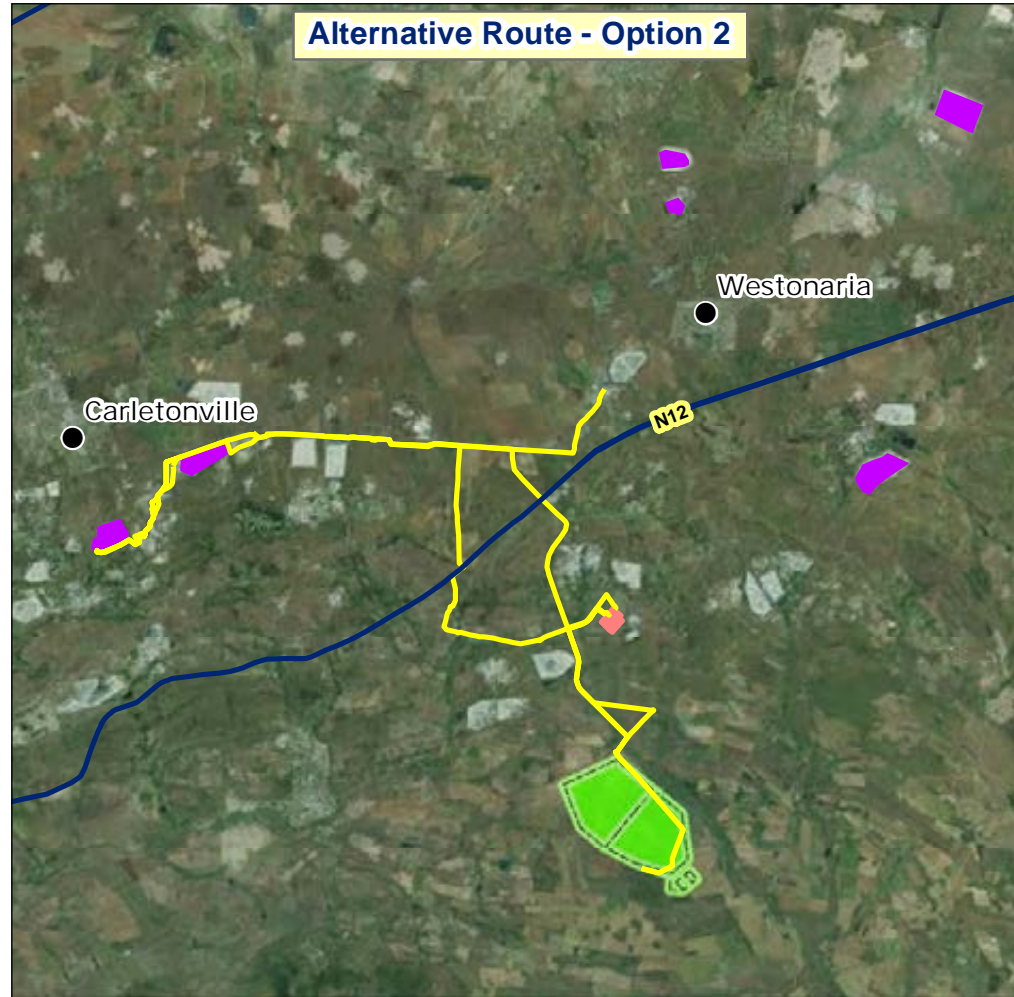
### Legend

- Major Town
- Arterial / National Route
- Proposed Pipeline Infrastructure
- TSF Infrastructure
- CPP
- RTSF

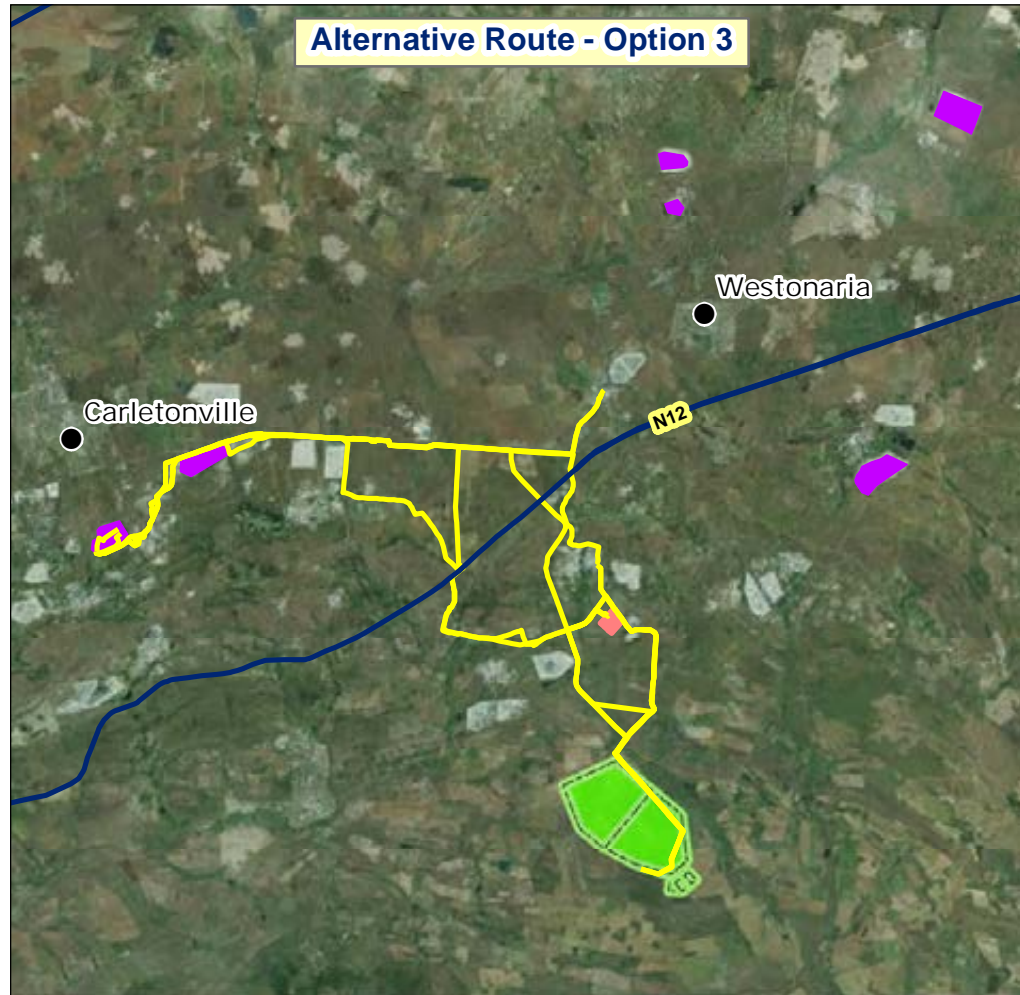
Alternative Route - Option 1



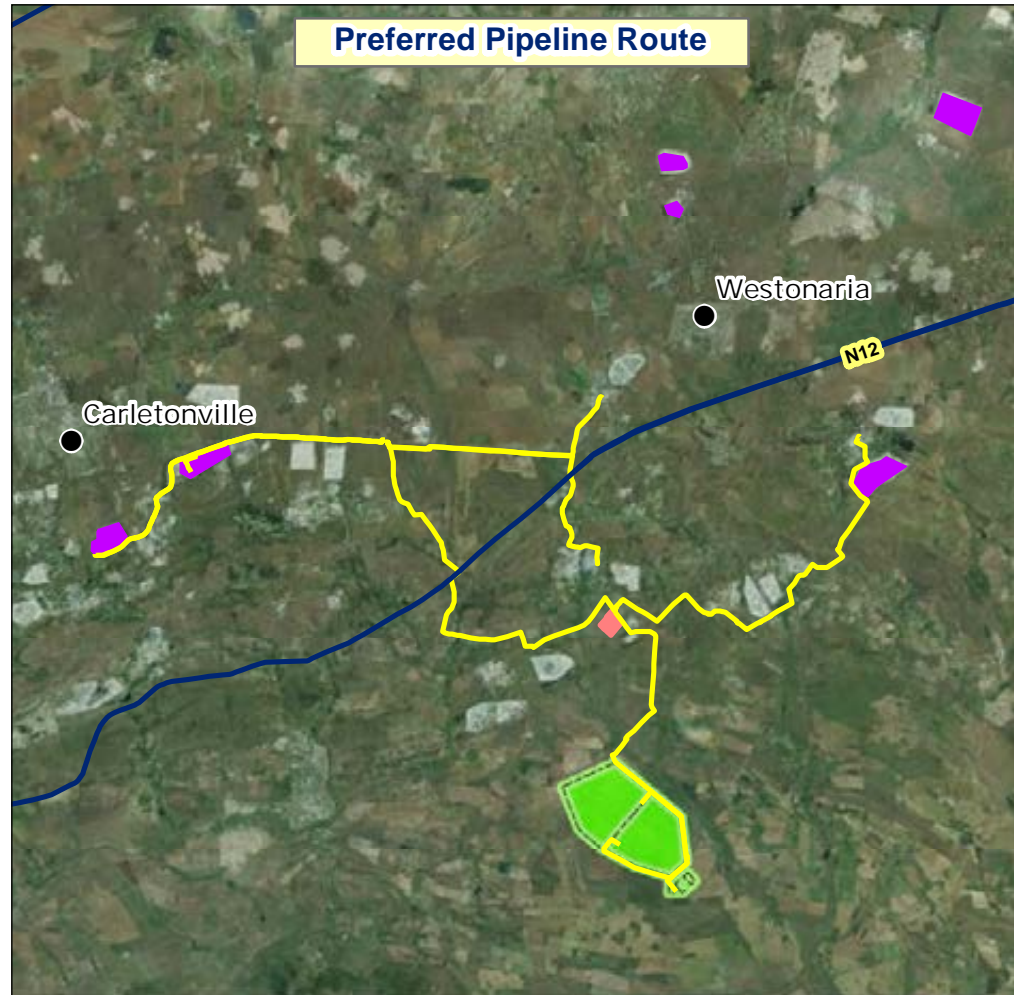
Alternative Route - Option 2



Alternative Route - Option 3

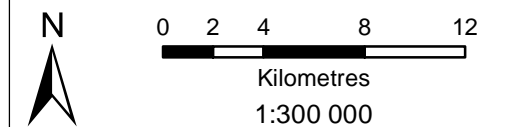


Preferred Pipeline Route



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator	Ref #: meg.GOL2376.201508.067
Datum: WGS 1984	Revision Number: 1
Central Meridian: 29°E	Date: 11/08/2015

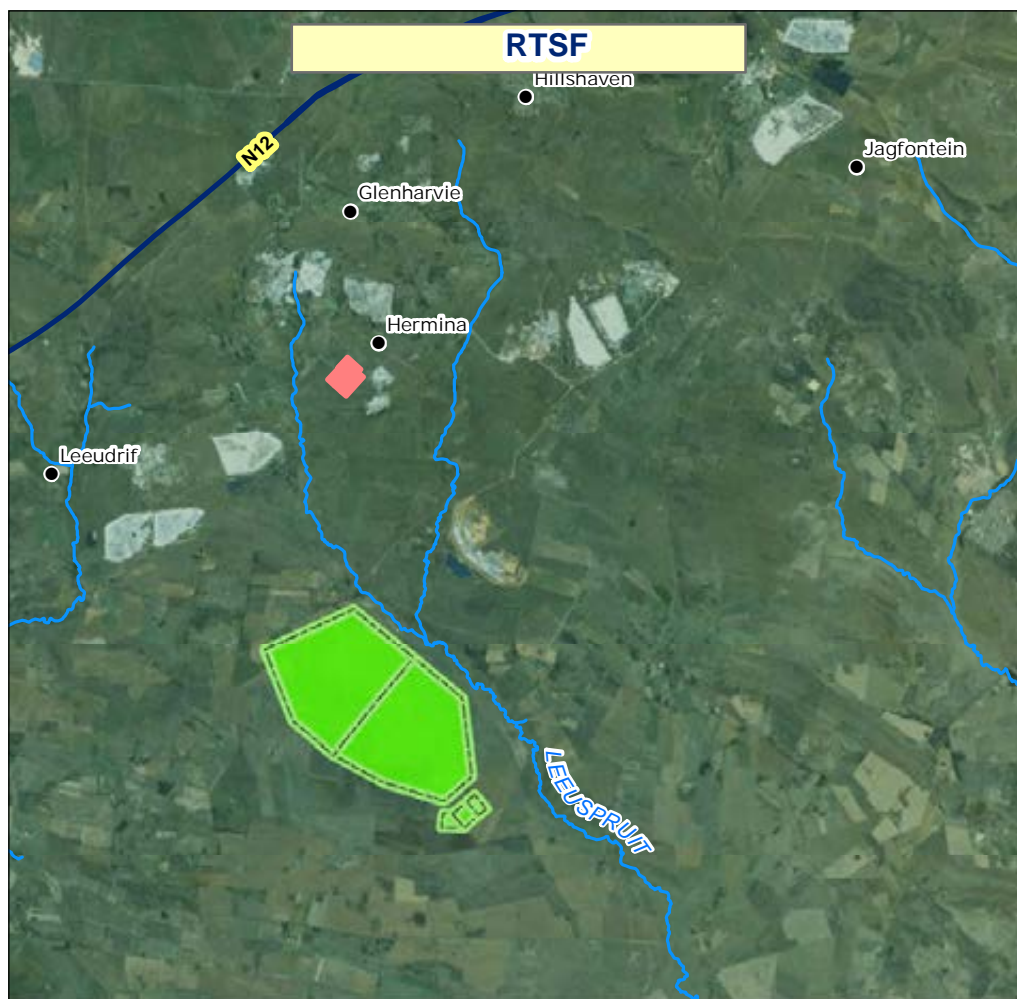
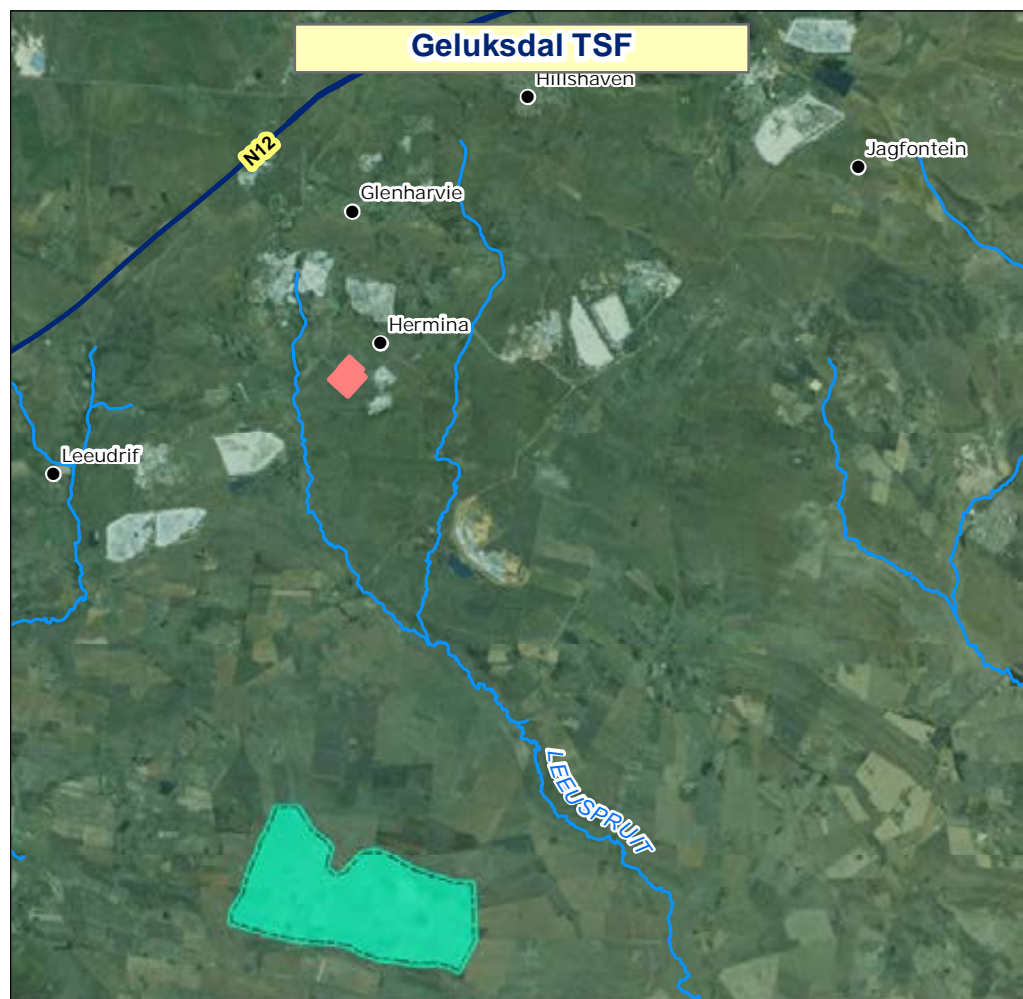
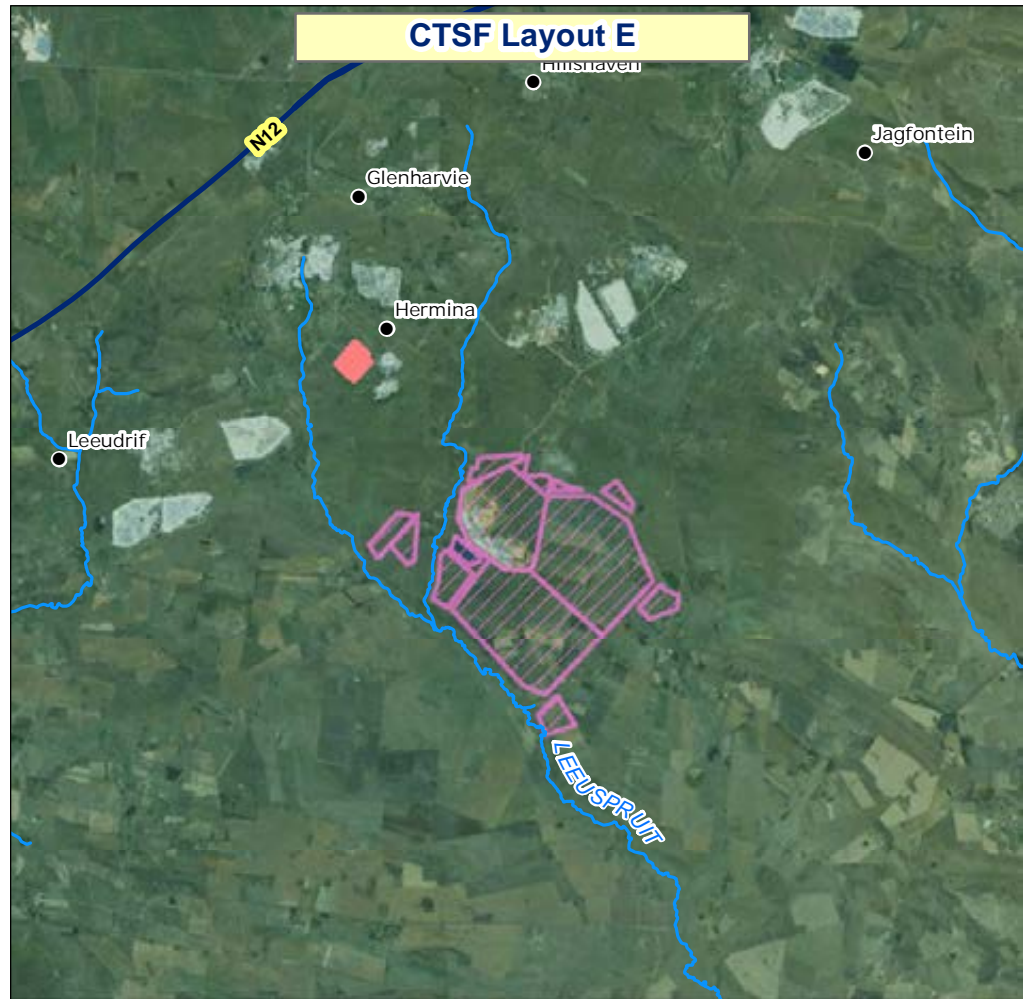


# Sibanya WRTRP EIA

## RTSF Alternatives

### Legend

- Settlement
- Arterial / National Route
- Perennial Stream
- ▨ CTSF Infrastructure
- Geluksdal TSF
- CPP
- ▭ RTSF



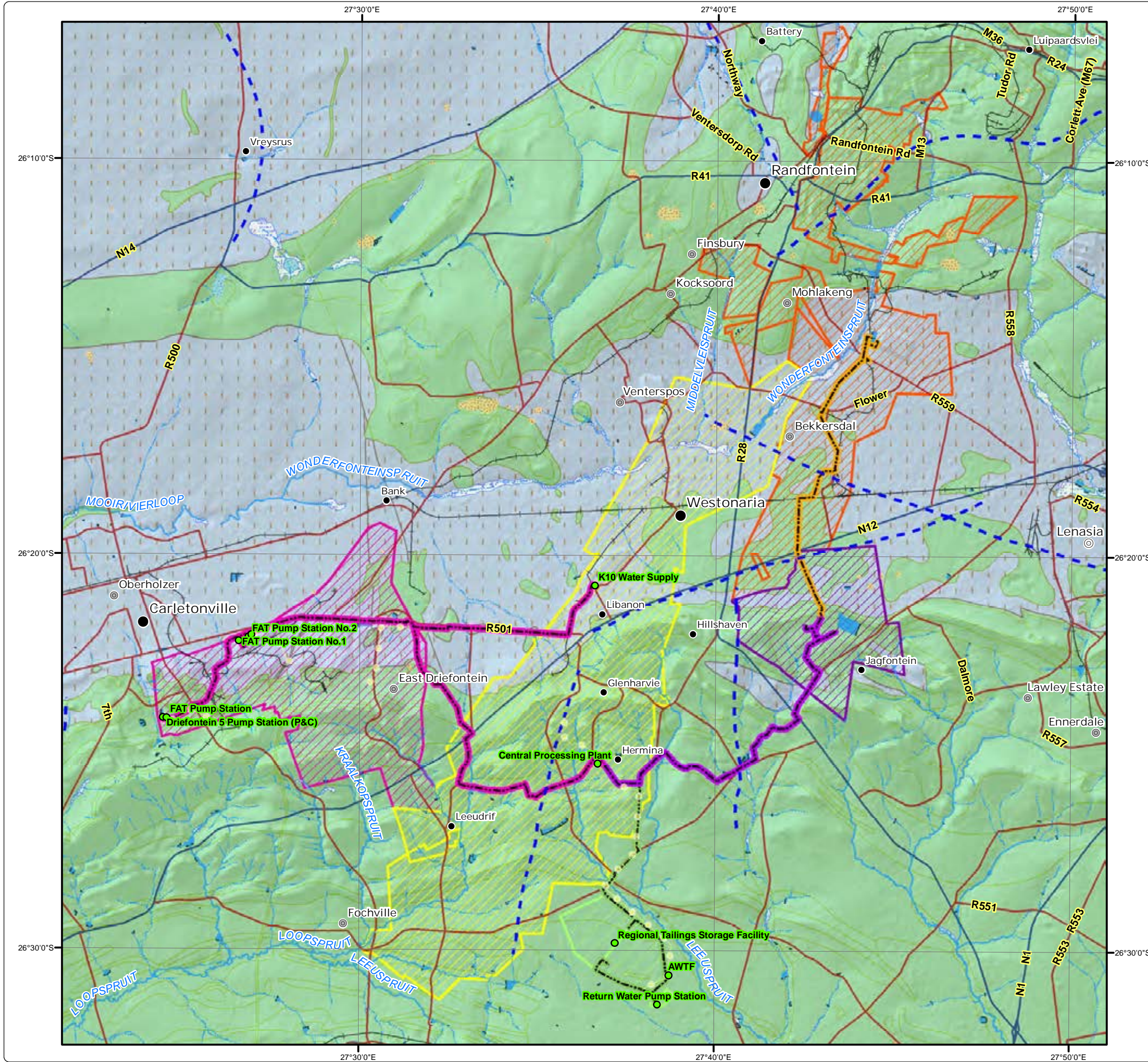
• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator Ref #: sdp.GOL2376.201508.200  
 Datum: WGS 1984 Revision Number: 1  
 Central Meridian: 27°E Date: 25/08/2015



# Sibanye WRTRP EIA

## Regional Geology



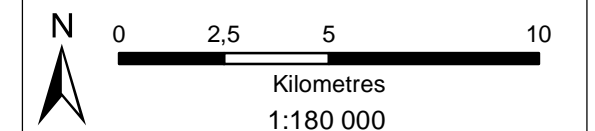
### Legend

- Major Town
- Secondary Town
- ⊙ Other Town
- Settlement
- Arterial / National Route
- Main Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Perennial Pan
- Non-Perennial Pan
- Wetland
- Infrastructure**
- Infrastructure Points
- Powerlines
- Pipelines: Kloof Mining Right
- Pipelines: Driefontein Mining Right
- Pipelines: Cooke Mining Right
- Pipelines: Ezulwini Mining Right
- Regional Tailings Storage Facility
- Kloof Mining Right
- Driefontein Mining Right
- Cooke Mining Right
- Ezulwini Mining Right
- Geology**
- Structures
- Dolomite
- Transvaal Rocks



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator      Ref #: sdp.GOL2376.201508.201  
 Datum: WGS 1984                              Revision Number: 1  
 Central Meridian: 27°E                        Date: 25/08/2015



# Sibanye WRTRP EIA Hydrocensus Boreholes and Groundwater Usage

## Legend


- Main Road
- Minor Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Perennial Pan
- Non-Perennial Pan
- Wetland

## Infrastructure

- Infrastructure Points
- Pipelines: Kloof Mining Right
- Regional Tailings Storage Facility
- Kloof Mining Right

## Hydrocensus Boreholes and Groundwater Usage


- |                                  |                              |
|----------------------------------|------------------------------|
| Drinking                         | Livestock and Irrigation     |
| Drinking and Livestock           | Irrigation                   |
| Drinking and Irrigation          | Sibanye Monitoring Boreholes |
| Drinking, Livestock & Irrigation | None                         |
| Livestock                        |                              |



**DIGBY WELLS**  
ENVIRONMENTAL

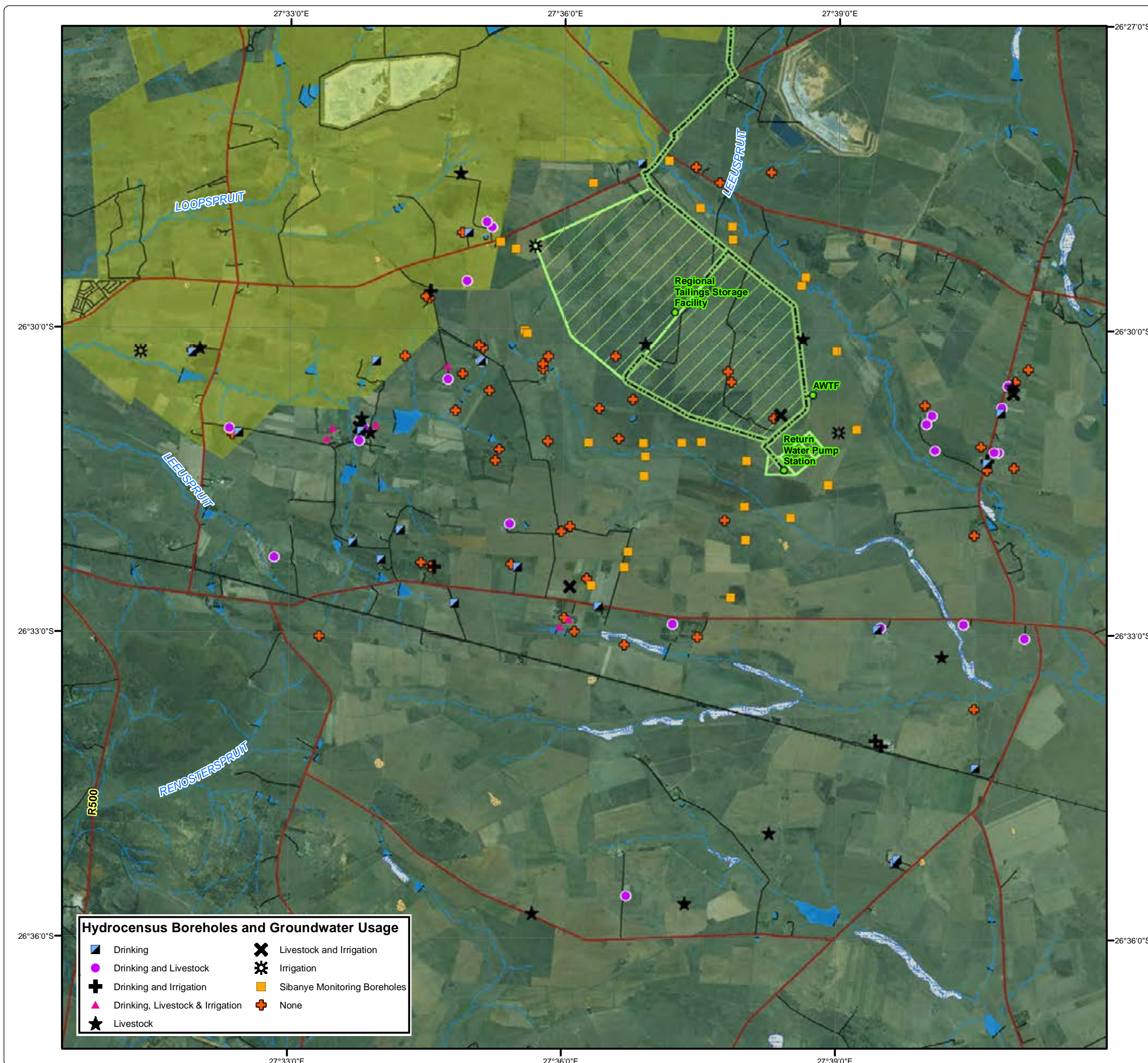
• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator      Ref #: sdp.GOL2376.201508.202  
 Datum: WGS 1984                              Revision Number: 1  
 Central Meridian: 27°E                        Date: 26/08/2015



0 0,5 1 2 3  
Kilometres  
1:70 000

www.digbywells.com                              © Digby Wells Environmental

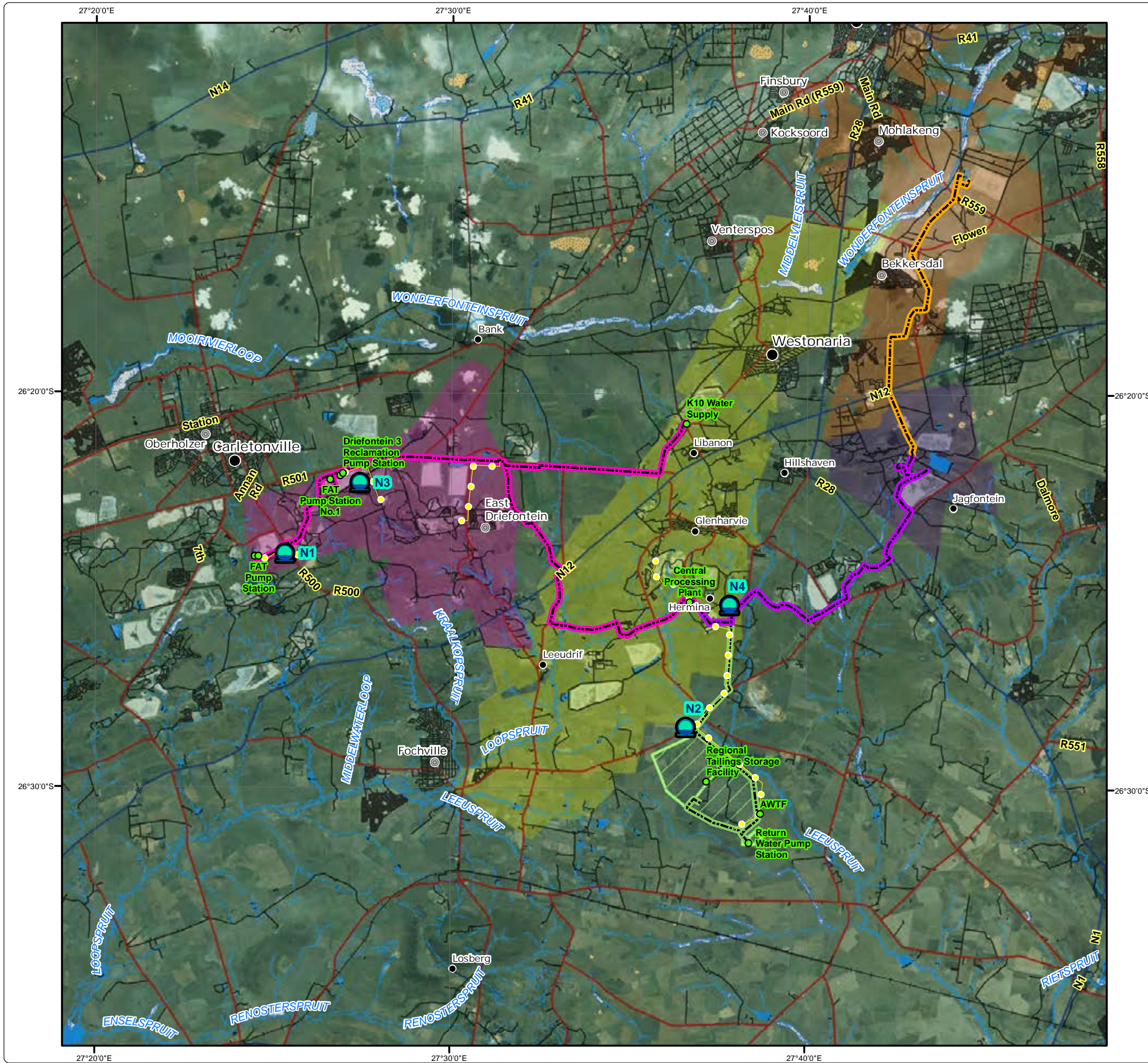



# Sibanye WRTRP EIA

## Noise Monitoring Points

### Legend

- Noise Monitoring Locations
- Major Town
- Secondary Town
- Other Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Perennial Pan
- Non-Perennial Pan
- Wetland
- Infrastructure**
- Infrastructure Points
- Powerlines
- Pipelines: Kloof Mining Right
- Pipelines: Driefontein Mining Right
- Pipelines: Cooke Mining Right
- Pipelines: Ezulwini Mining Right
- Regional Tailings Storage Facility
- Kloof Mining Right
- Driefontein Mining Right
- Cooke Mining Right
- Ezulwini Mining Right

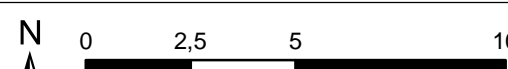




**DIGBY WELLS**  
ENVIRONMENTAL

• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator	Ref #: sdp.GOL2376.201508.203
Datum: WGS 1984	Revision Number: 1
Central Meridian: 27°E	Date: 27/08/2015



0    2,5    5    10  
Kilometres  
1:180 000

[www.digbywells.com](http://www.digbywells.com)                      © Digby Wells Environmental

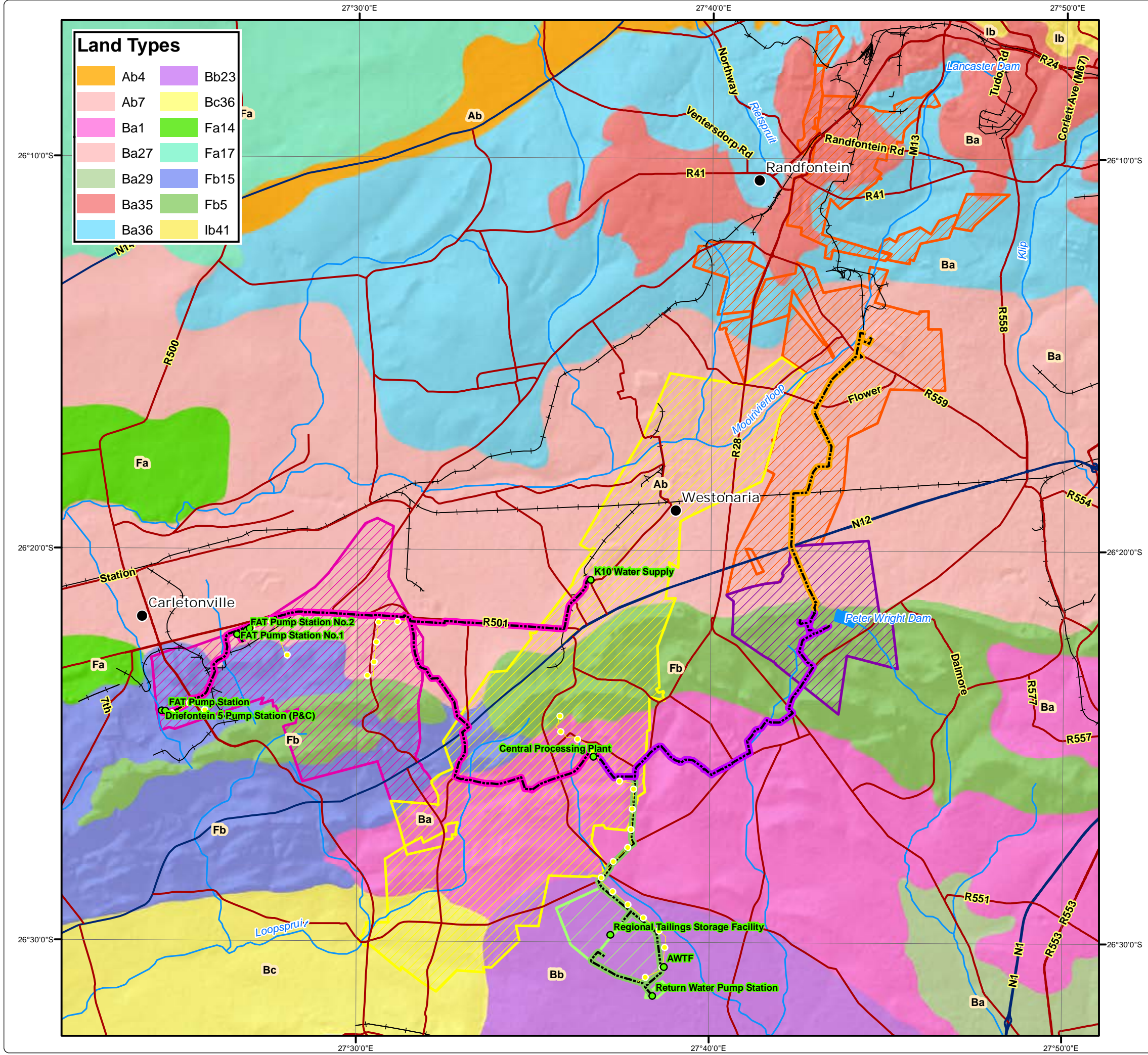
# Sibanye WRTRP EIA

## Land Types

Land Types			
Ab4	Bb23		
Ab7	Bc36		
Ba1	Fa14		
Ba27	Fa17		
Ba29	Fb15		
Ba35	Fb5		
Ba36	Ib41		

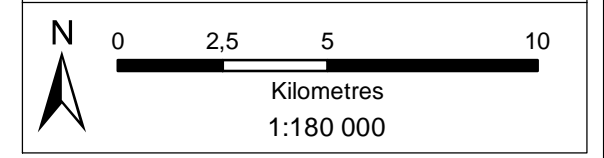
## Legend

- Major Town
  - Main Roads
  - National Roads
  - River
  - Railway Line
  - Dam
- ### Infrastructure
- Infrastructure Points
  - Powerlines
  - Pipelines: Kloof Mining Right
  - Pipelines: Driefontein Mining Right
  - Pipelines: Cooke Mining Right
  - Pipelines: Ezulwini Mining Right
  - ▨ Regional Tailings Storage Facility
  - ▨ Kloof Mining Right
  - ▨ Driefontein Mining Right
  - ▨ Cooke Mining Right
  - ▨ Ezulwini Mining Right



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator Ref #: sdp.GOL2376.201508.204  
 Datum: WGS 1984 Revision Number: 1  
 Central Meridian: 27°E Date: 25/08/2015







# Sibanye WRTRP EIA

## Land Capability

**Land Capability**  
Klingebeiel, A., & Montgomery, P. (1961)

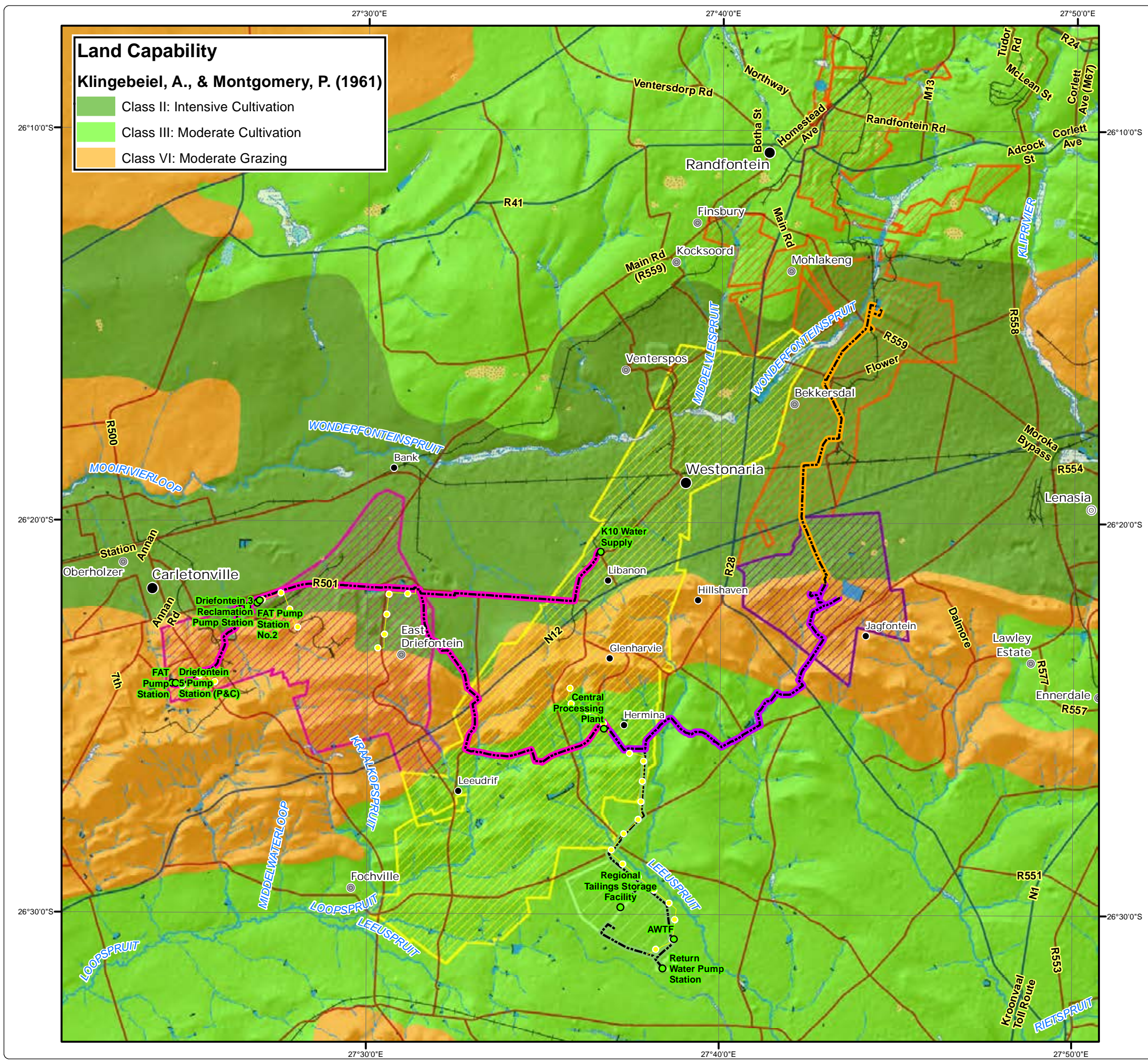
- Class II: Intensive Cultivation
- Class III: Moderate Cultivation
- Class VI: Moderate Grazing

**Legend**

- Major Town
- Secondary Town
- Other Town
- Settlement
- Arterial / National Route
- Main Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Perennial Pan
- Non-Perennial Pan
- Wetland

**Infrastructure**

- Infrastructure Points
- Powerlines
- Pipelines: Kloof Mining Right
- Pipelines: Driefontein Mining Right
- Pipelines: Cooke Mining Right
- Pipelines: Ezulwini Mining Right
- Regional Tailings Storage Facility
- Kloof Mining Right
- Driefontein Mining Right
- Cooke Mining Right
- Ezulwini Mining Right



**DIGBY WELLS ENVIRONMENTAL**

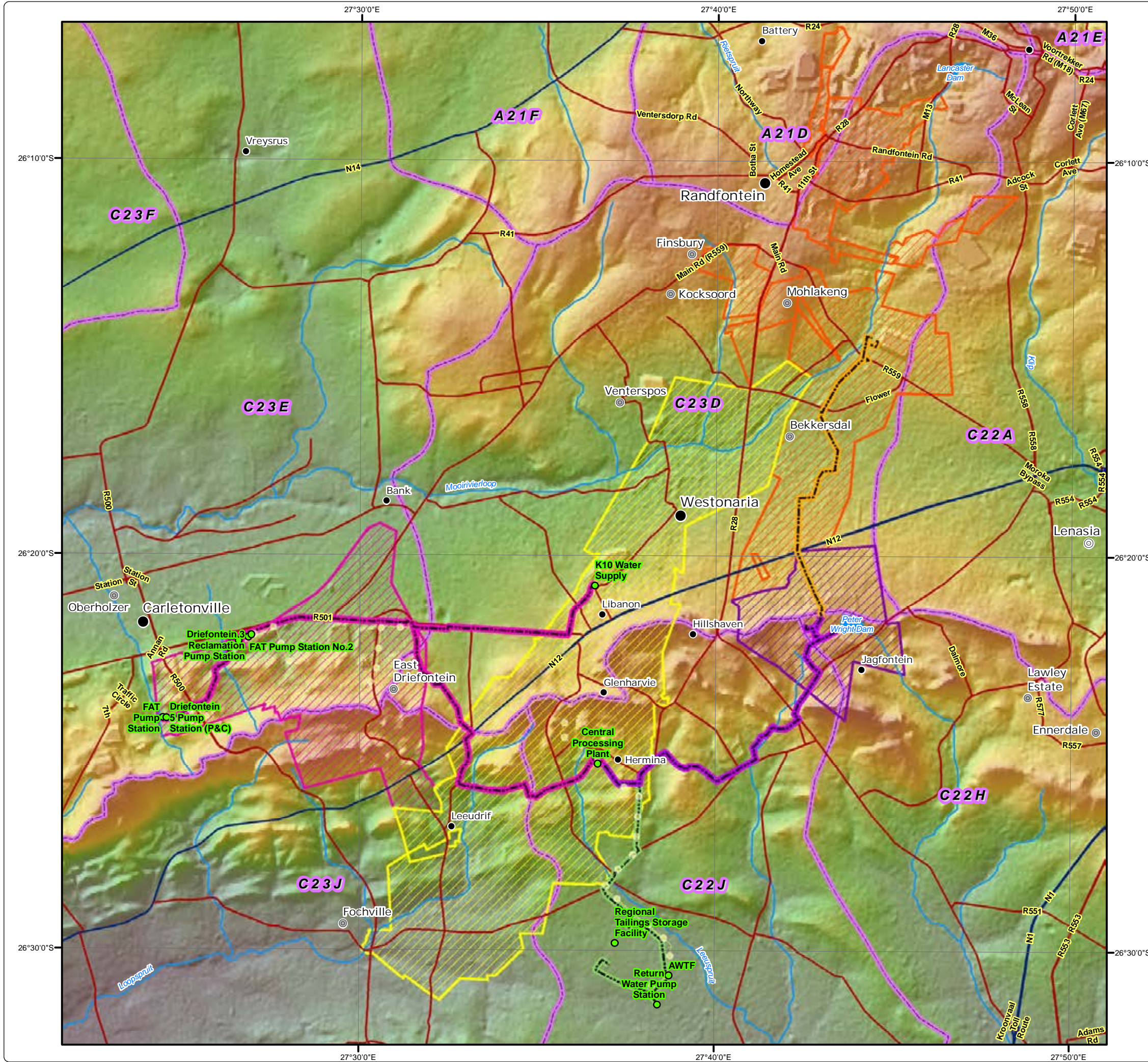
Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator    Ref #: sdp.GOL2376.201508.206  
 Datum: WGS 1984    Revision Number: 1  
 Central Meridian: 27°E    Date: 25/08/2015

0 2,5 5 10  
Kilometres  
1:180 000

www.digbywells.com    © Digby Wells Environmental

# Sibanye WRTRP EIA Catchment Area



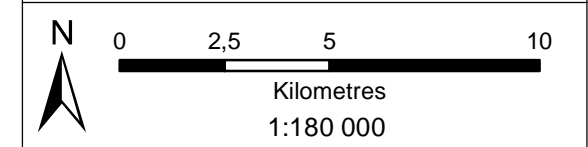
### Legend

- Major Town
- Secondary Town
- ⊙ Other Town
- Settlement
- Main Roads
- National Roads
- River
- Dam
- Quaternary Catchment Boundary
- Infrastructure**
- Infrastructure Points
- Powerlines
- Pipelines: Kloof Mining Right
- Pipelines: Driefontein Mining Right
- Pipelines: Cooke Mining Right
- Pipelines: Ezulwini Mining Right
- ▨ Kloof Mining Right
- ▨ Driefontein Mining Right
- ▨ Cooke Mining Right
- ▨ Ezulwini Mining Right
- Digital Elevation Model (DEM)**
- Elevation (m.am.s.l.)**
- High : 1838
- Low : 1396



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator      Ref #: sdp.GOL2376.201508.207  
 Datum: WGS 1984                              Revision Number: 1  
 Central Meridian: 27°E                        Date: 27/08/2015



# Sibanye WRTRP EIA

## Vegetation Types

**Vegetation Types**  
Mucina & Rutherford, 2006

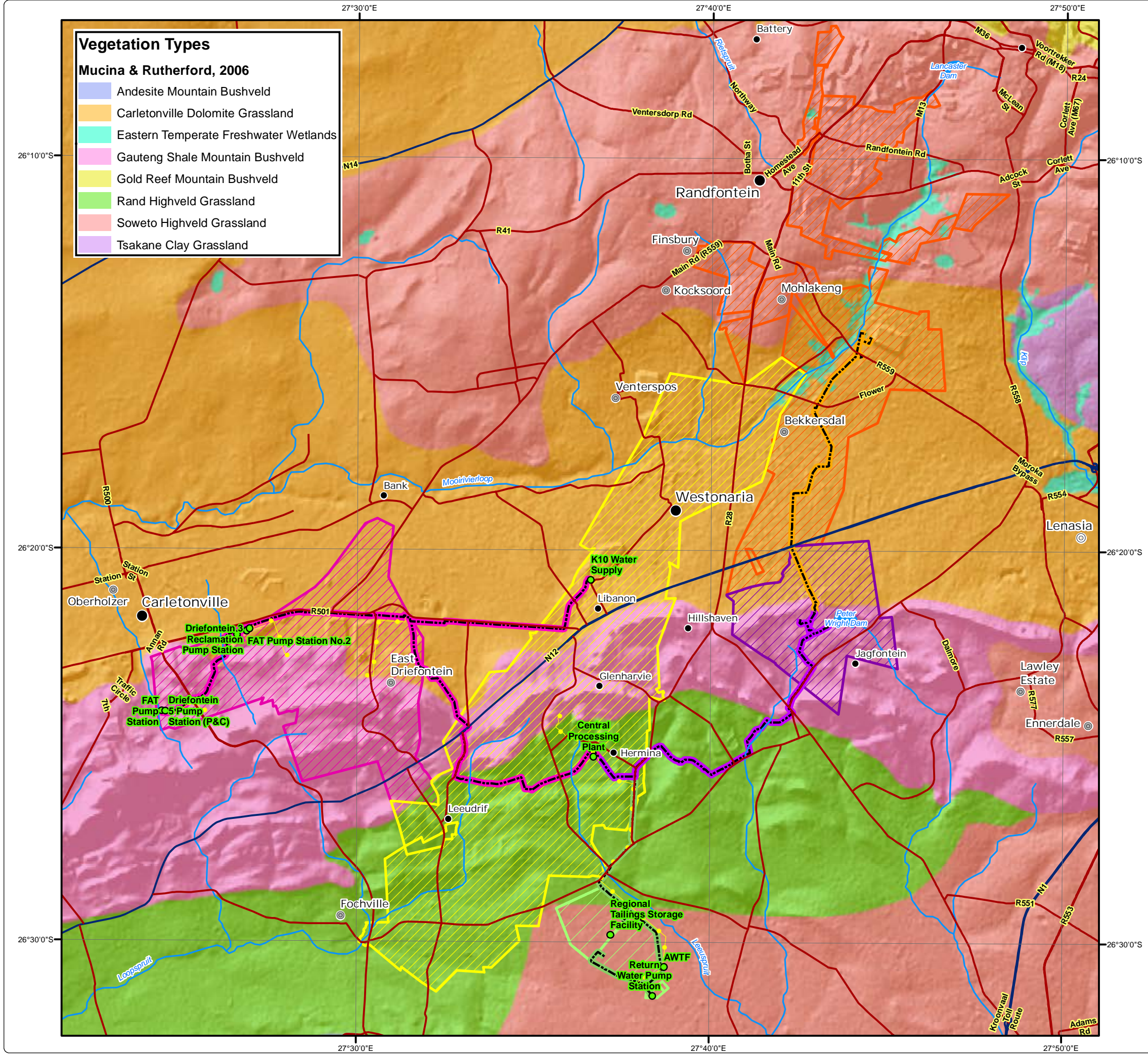
- Andesite Mountain Bushveld
- Carletonville Dolomite Grassland
- Eastern Temperate Freshwater Wetlands
- Gauteng Shale Mountain Bushveld
- Gold Reef Mountain Bushveld
- Rand Highveld Grassland
- Soweto Highveld Grassland
- Tsakane Clay Grassland

**Legend**

- Major Town
- Secondary Town
- Other Town
- Settlement
- Main Roads
- National Roads
- River
- Dam

**Infrastructure**

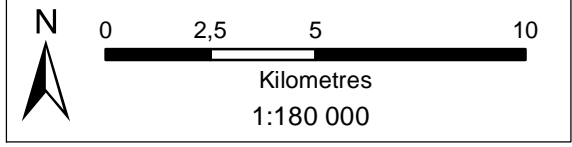
- Infrastructure Points
- Powerlines
- Pipelines: Kloof Mining Right
- Pipelines: Driefontein Mining Right
- Pipelines: Cooke Mining Right
- Pipelines: Ezulwini Mining Right
- Regional Tailings Storage Facility
- Kloof Mining Right
- Driefontein Mining Right
- Ezulwini Mining Right
- Cooke Mining Right



**DIGBY WELLS ENVIRONMENTAL**

• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator      Ref #: sdp.GOL2376.201508.208  
 Datum: WGS 1984                              Revision Number: 1  
 Central Meridian: 27°E                        Date: 27/08/2015

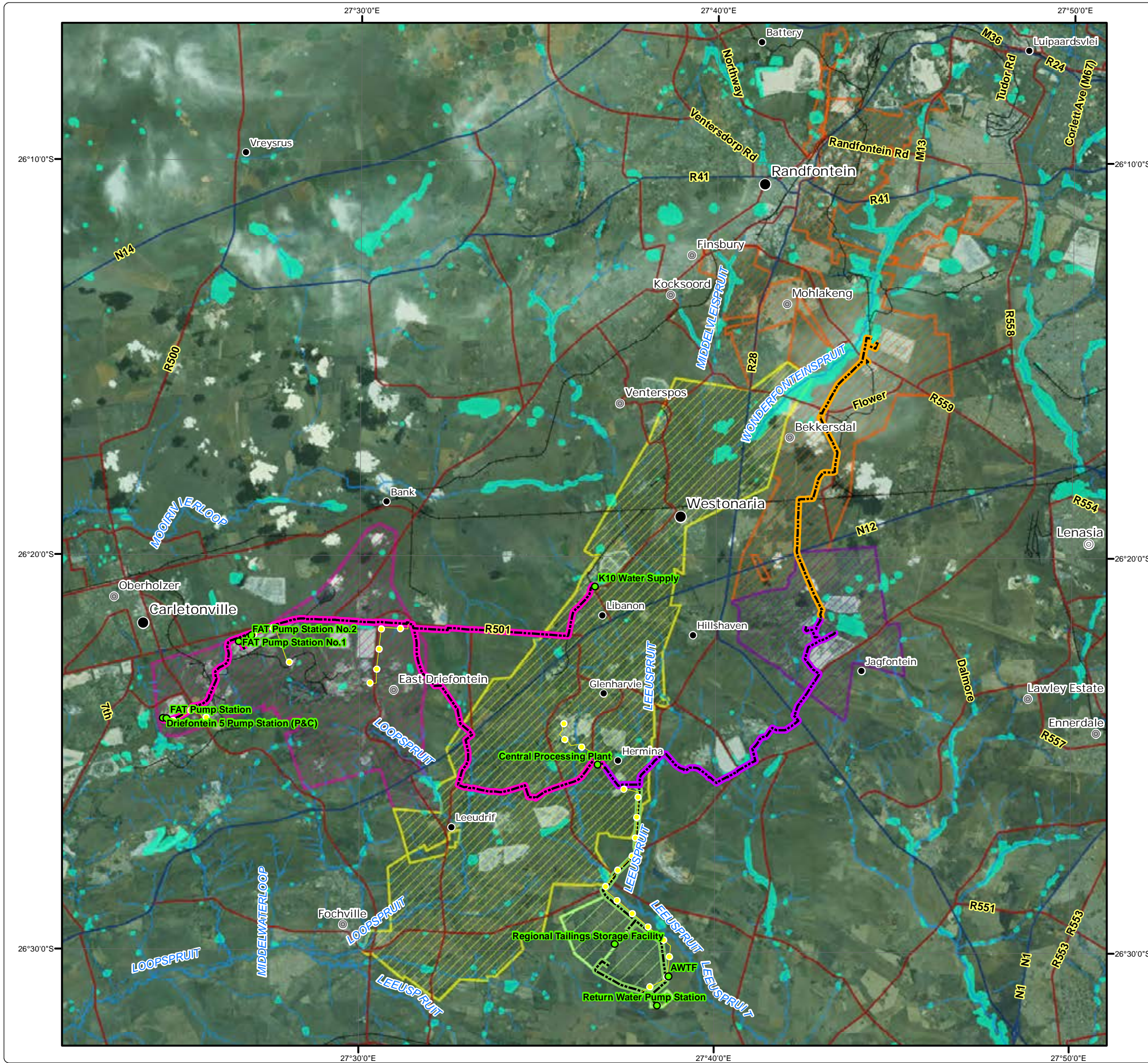


# Sibanye WRTRP EIA

## NFEPA Wetlands

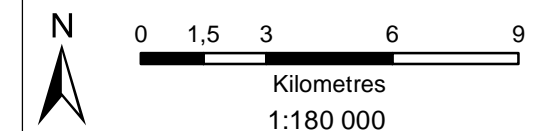
### Legend

- Major Town
- Secondary Town
- ⊙ Other Town
- Settlement
- Arterial / National Route
- Main Road
- +— Railway Line
- Non-Perennial Stream
- Perennial Stream
- NFEPA Wetlands
- Infrastructure**
- Infrastructure Points
- Powerlines
- Pipelines: Kloof Mining Right
- Pipelines: Driefontein Mining Right
- Pipelines: Cooke Mining Right
- Pipelines: Ezulwini Mining Right
- Regional Tailings Storage Facility
- Kloof Mining Right
- Driefontein Mining Right
- Cooke Mining Right
- Ezulwini Mining Right



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator      Ref #: sdp.GOL2376.201508.209  
 Datum: WGS 1984      Revision Number: 1  
 Central Meridian: 27°E      Date: 25/08/2015



# Sibanye WRTRP EIA

## RTSF Wetlands

### Legend

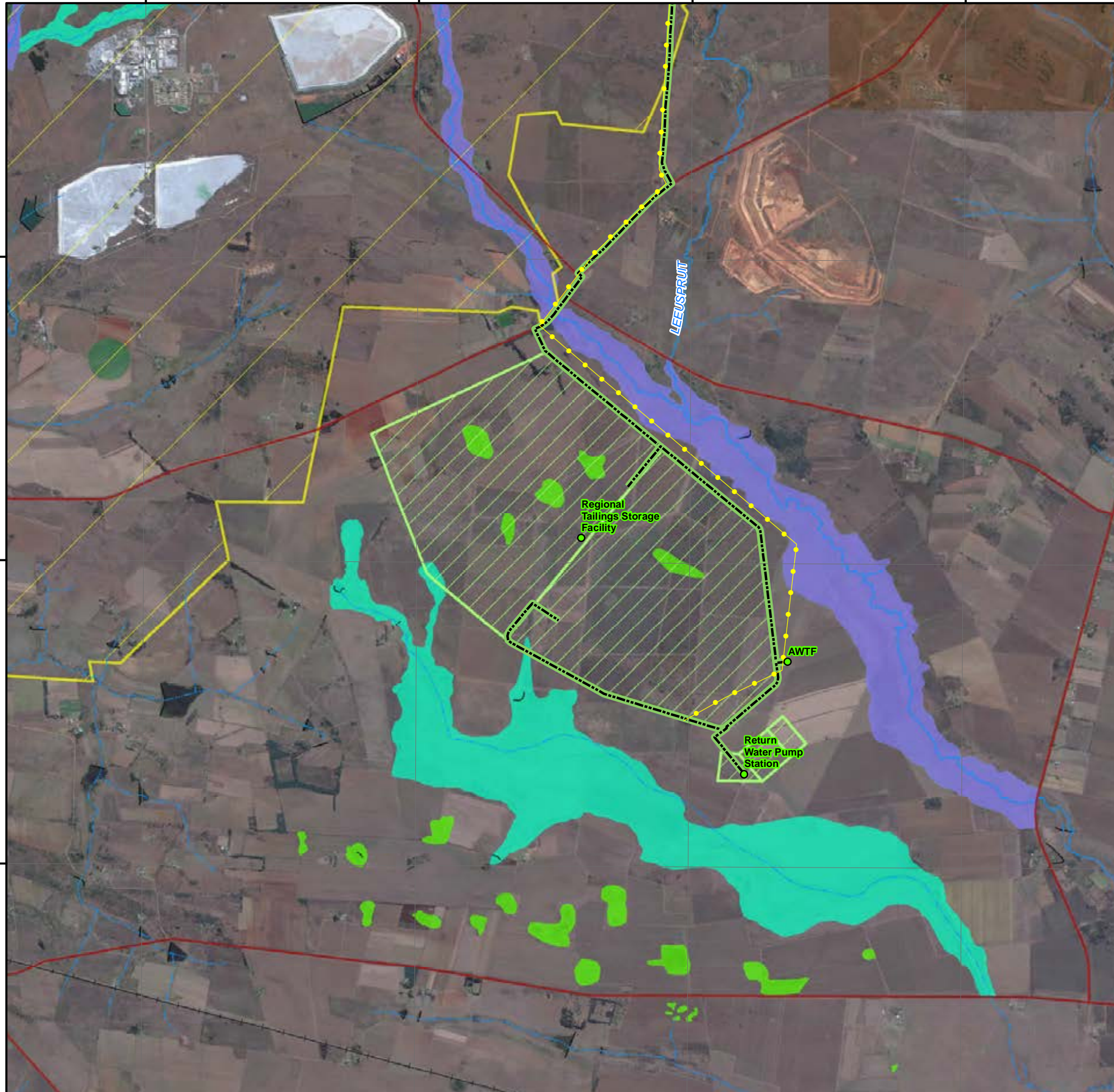
- Major Town
- ⊙ Secondary Town
- ⊙ Other Town
- Settlement
- Arterial / National Route
- Main Road
- +— Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall

### Infrastructure

- Infrastructure Points
- Powerlines
- Pipelines: Kloof Mining Right
- Regional Tailings Storage Facility
- Kloof Mining Right

### Wetland Delineation

- Channelled Valley Bottom
- Pan
- Valley Bottom



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator      Ref #: sdp.GOL2376.201508.210  
 Datum: WGS 1984                              Revision Number: 1  
 Central Meridian: 27°E                        Date: 25/08/2015



# Sibanye WRTRP EIA

## Heritage Sensitivity

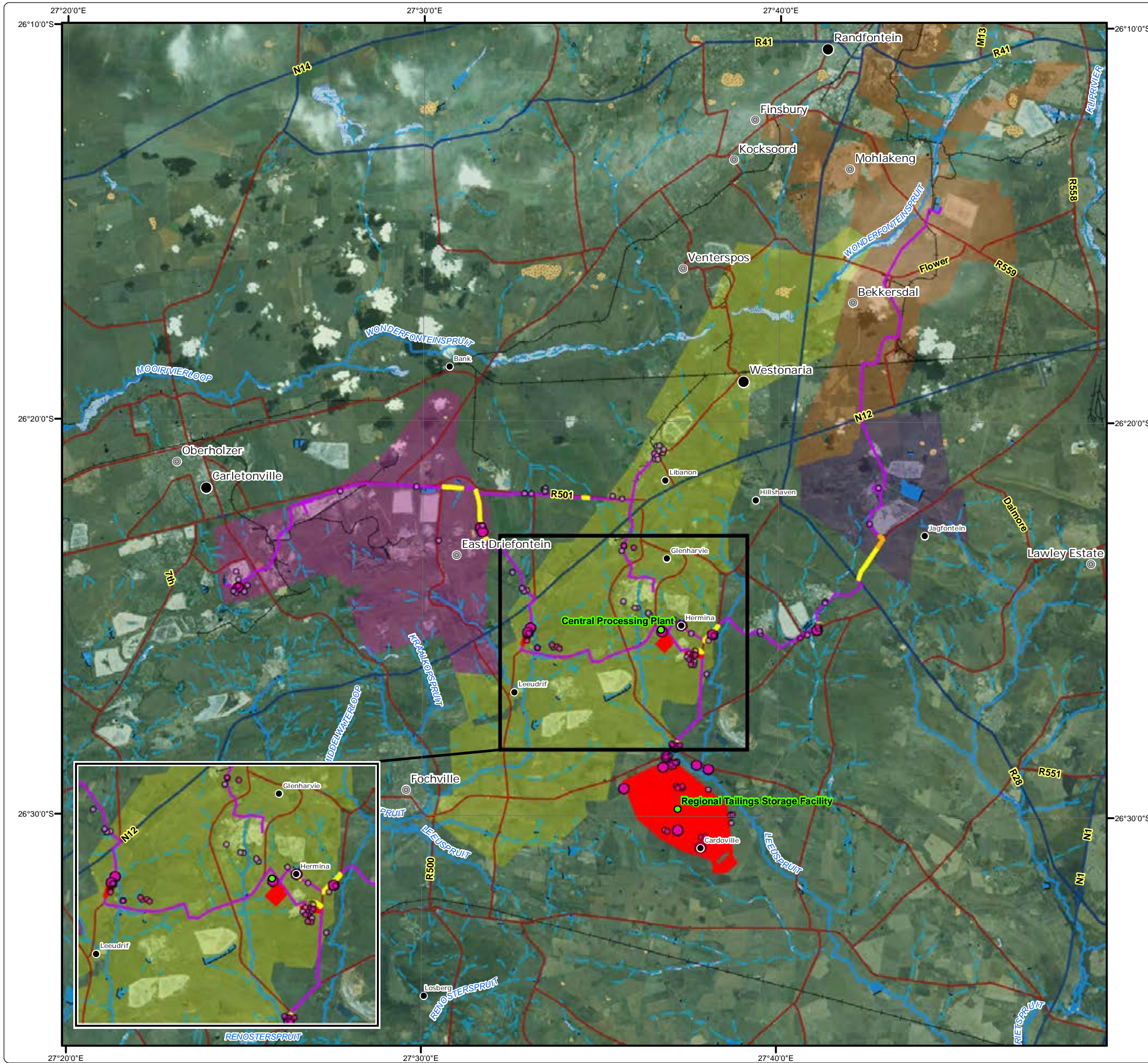
### Legend

- Infrastructure Points
- Identified Heritage Sites
- Historical Layering Points (1938)
- Historical Layering Points (1952)
- Major Town
- Other Town
- Settlement

- Pipeline Routing
- National / Arterial Route
- Main Road
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Non-Perennial Pan
- Wetland
- Kloof Mining Right
- Driefontein Mining Right
- Cooke Mining Right
- Ezulwini Mining Right

### Heritage Sensitivity

- High
- Medium - High
- Medium



  
**DIGBY WELLS**  
 ENVIRONMENTAL

• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator      Ref #: sdp.GOL2376.201508.211  
 Datum: WGS 1984                              Revision Number: 1  
 Central Meridian: 27°E                        Date: 25/08/2015

