6 DESCRIPTION OF THE BASELINE ENVIRONMENT

6.1 Introduction

According to section 28(e) of the NEMA Regulations, this section includes a description of the baseline environment that may be affected by the activity and the manner in which the biophysical, social, economic and cultural aspects of the environment may be affected by the proposed activity.

6.2 Study Area in Regional Context

6.2.1 Locality

Tutuka Power Station is located approximately 25 km north-north-east (NNE) of Standerton in the Mpumalanga Province (**Figure 6.1**). The power station falls within the Lekwa Local Municipality which falls within the Gert Sibande District Municipality (**Figure 6.2**).

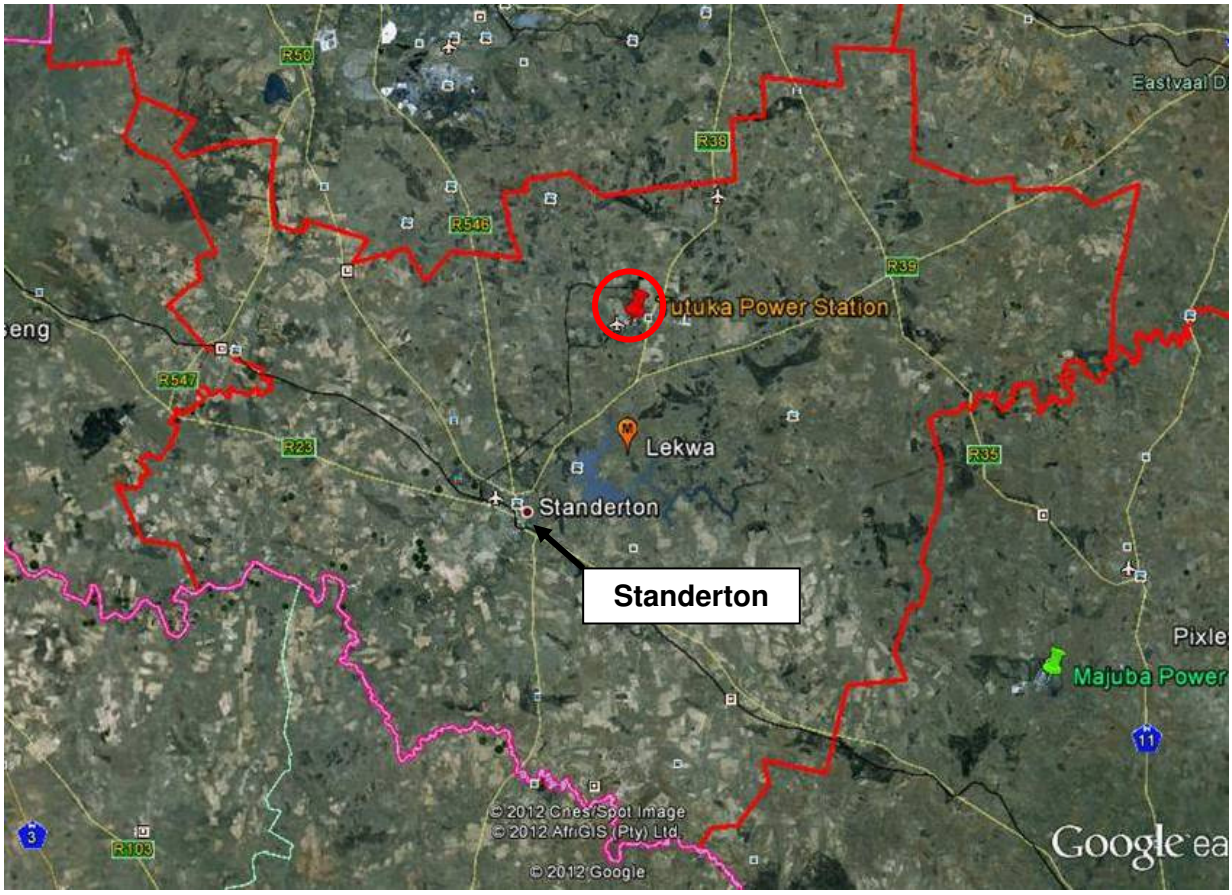

Figure 6.1: Location of Tutuka Power Station within the Lekwa Local Municipality

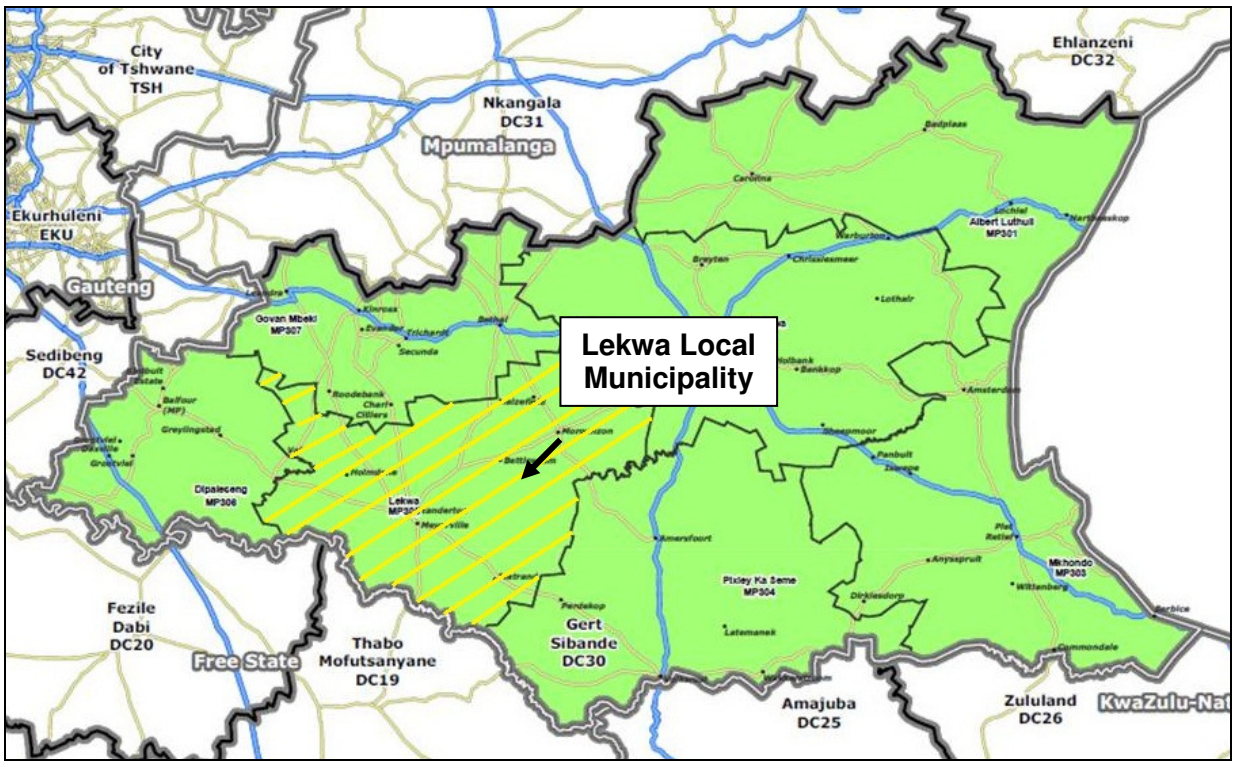

Figure 6.2: Location of Lekwa Local Municipality within the Gert Sibande District Municipality

6.2.2 Study Area

A particular area proposed by Eskom for the continuous ashing facility is approximately 759 ha, which is located on the eastern and southern portion of the existing Tutuka Power Station ash disposal facility. This area would form a continuation of the current ashing activities, which are in line with Eskom's historical plans for ashing. However, in order to allow for a robust environmental process, all land within a radius of 8 km was assessed in order to identify potential alternatives sites should sensitive environmental aspects limit the suitability of this particular portion of land. The 8km radius was deemed to be a feasible radius within which the ashing operations can take place. The Tutuka Continuous Ashing EIA study area is therefore located within the 8 km radius around a source of ash, within the Tutuka Power Station (**Figure 6.3**). The study area is approximately 200 square kilometres in size and includes a total of 24 different farms divided into 128 farm portions. A list of the farm portions are included in **Table 6.1**. **Figure 6.4** shows the location of the proposed continuous ashing site within the demarcated study area. **Table 6.2** outlines the farms associated with the proposed Tutuka Continuous Ashing Area

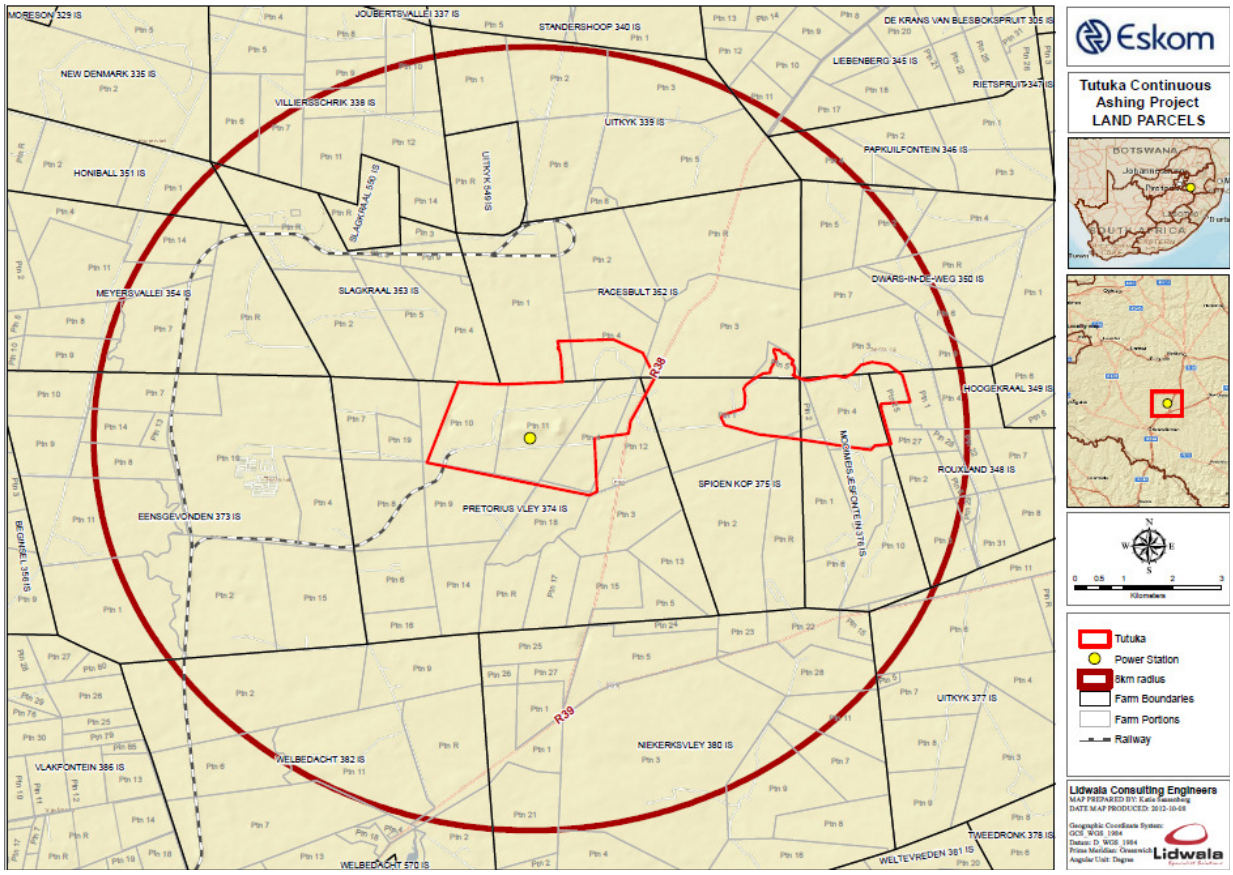

Figure 6.3: Tutuka Continuous Ashing EIA Study Area (indicating both the power station and the existing ashing area)

Table 6.1: Farm Portions situated within the Tutuka Continuous Ashing EIA Study Area

SG Code	Farm No.	Portion No.	Farm Name
T0IS00000000033900005	339	5	UITKYK 339 IS
T0IS00000000033900006	339	6	UITKYK 339 IS
T0IS00000000033900008	339	8	UITKYK 339 IS
T0IS00000000033900009	339	9	UITKYK 339 IS
T0IS00000000034500011	345	11	LIEBENBERG 345 IS
T0IS00000000038200000	382	R	WELBEDACHT 382 IS
T0IS00000000038200002	382	2	WELBEDACHT 382 IS
T0IS00000000038200002	382	2	WELBEDACHT 382 IS
T0IS00000000038200006	382	6	WELBEDACHT 382 IS
T0IS00000000038200009	382	9	WELBEDACHT 382 IS
T0IS00000000038200011	382	11	WELBEDACHT 382 IS
T0IS00000000034600004	346	4	PAPKUILFONTEIN 346 IS
T0IS00000000034800002	348	2	ROUXLAND 348 IS
T0IS00000000034800003	348	3	ROUXLAND 348 IS
T0IS00000000034800004	348	4	ROUXLAND 348 IS
T0IS00000000034800005	348	5	ROUXLAND 348 IS
T0IS00000000037300002	373	2	EENSGEVONDEN 373 IS
T0IS00000000037300004	373	4	EENSGEVONDEN 373 IS
T0IS00000000037300007	373	7	EENSGEVONDEN 373 IS

SG Code	Farm No.	Portion No.	Farm Name
T0IS00000000037300008	373	8	EENSGEVONDEN 373 IS
T0IS00000000037300011	373	11	EENSGEVONDEN 373 IS
T0IS00000000037300011	373	11	EENSGEVONDEN 373 IS
T0IS00000000037300013	373	13	EENSGEVONDEN 373 IS
T0IS00000000035400007	354	7	MEYERSVALLEI 354 IS
T0IS00000000035400008	354	8	MEYERSVALLEI 354 IS
T0IS00000000033800006	338	6	VILLIERSSCHRIK 338 IS
T0IS00000000033800007	338	7	VILLIERSSCHRIK 338 IS
T0IS00000000033800009	338	9	VILLIERSSCHRIK 338 IS
T0IS00000000033800010	338	10	VILLIERSSCHRIK 338 IS
T0IS00000000033800011	338	11	VILLIERSSCHRIK 338 IS
T0IS00000000033800012	338	12	VILLIERSSCHRIK 338 IS
T0IS00000000033800013	338	13	VILLIERSSCHRIK 338 IS
T0IS00000000033800014	338	14	VILLIERSSCHRIK 338 IS
T0IS00000000033900001	339	1	UITKYK 339 IS
T0IS00000000033900002	339	2	UITKYK 339 IS
T0IS00000000033900003	339	3	UITKYK 339 IS
T0IS00000000034500017	345	17	LIEBENBERG 345 IS
T0IS00000000034500032	345	32	LIEBENBERG 345 IS
T0IS00000000034800001	348	1	ROUXLAND 348 IS
T0IS00000000034800022	348	22	ROUXLAND 348 IS
T0IS00000000034800025	348	25	ROUXLAND 348 IS
T0IS00000000034800027	348	27	ROUXLAND 348 IS
T0IS00000000034800028	348	28	ROUXLAND 348 IS
T0IS00000000034800029	348	29	ROUXLAND 348 IS
T0IS00000000035000000	350	R	DWARS-IN-DE-WEG 350 IS
T0IS00000000035000002	350	2	DWARS-IN-DE-WEG 350 IS
T0IS00000000035000003	350	3	DWARS-IN-DE-WEG 350 IS
T0IS00000000035000004	350	4	DWARS-IN-DE-WEG 350 IS
T0IS00000000035000005	350	5	DWARS-IN-DE-WEG 350 IS
T0IS00000000035000006	350	6	DWARS-IN-DE-WEG 350 IS
T0IS00000000035000007	350	7	DWARS-IN-DE-WEG 350 IS
T0IS00000000035000009	350	9	DWARS-IN-DE-WEG 350 IS
T0IS00000000035100001	351	1	HONIBALL 351 IS
T0IS00000000035200000	352	R	RACESBULT 352 IS
T0IS00000000035200001	352	1	RACESBULT 352 IS
T0IS00000000035200002	352	2	RACESBULT 352 IS
T0IS00000000035200003	352	3	RACESBULT 352 IS
T0IS00000000035200004	352	4	RACESBULT 352 IS
T0IS00000000035200005	352	5	RACESBULT 352 IS
T0IS00000000035300000	353	R	SLAGKRAAL 353 IS
T0IS00000000035300002	353	2	SLAGKRAAL 353 IS
T0IS00000000035300003	353	3	SLAGKRAAL 353 IS
T0IS00000000035300004	353	4	SLAGKRAAL 353 IS
T0IS00000000035300005	353	5	SLAGKRAAL 353 IS

SG Code	Farm No.	Portion No.	Farm Name
T0IS00000000035300006	353	6	SLAGKRAAL 353 IS
T0IS00000000035300007	353	7	SLAGKRAAL 353 IS
T0IS00000000035300008	353	8	SLAGKRAAL 353 IS
T0IS00000000035300009	353	9	SLAGKRAAL 353 IS
T0IS00000000035400000	354	R	MEYERSVALLEI 354 IS
T0IS00000000035400009	354	9	MEYERSVALLEI 354 IS
T0IS00000000035400011	354	11	MEYERSVALLEI 354 IS
T0IS00000000035400014	354	14	MEYERSVALLEI 354 IS
T0IS00000000038000003	380	3	NIEKERKSVLEY 380 IS
T0IS00000000038000005	380	5	NIEKERKSVLEY 380 IS
T0IS00000000038000007	380	7	NIEKERKSVLEY 380 IS
T0IS00000000038000009	380	9	NIEKERKSVLEY 380 IS
T0IS00000000038000011	380	11	NIEKERKSVLEY 380 IS
T0IS00000000038000015	380	15	NIEKERKSVLEY 380 IS
T0IS00000000038000018	380	18	NIEKERKSVLEY 380 IS
T0IS00000000038000021	380	21	NIEKERKSVLEY 380 IS
T0IS00000000038000022	380	22	NIEKERKSVLEY 380 IS
T0IS00000000038000023	380	23	NIEKERKSVLEY 380 IS
T0IS00000000038000024	380	24	NIEKERKSVLEY 380 IS
T0IS00000000038000025	380	25	NIEKERKSVLEY 380 IS
T0IS00000000038000026	380	26	NIEKERKSVLEY 380 IS
T0IS00000000038000027	380	27	NIEKERKSVLEY 380 IS
T0IS00000000037300001	373	1	EENSGEVONDEN 373 IS
T0IS00000000037300014	373	14	EENSGEVONDEN 373 IS
T0IS00000000037300015	373	15	EENSGEVONDEN 373 IS
T0IS00000000037300019	373	19	EENSGEVONDEN 373 IS
T0IS00000000037400000	374	R	PRETORIUS VLEY 374 IS
T0IS00000000037400003	374	3	PRETORIUS VLEY 374 IS
T0IS00000000037400004	374	4	PRETORIUS VLEY 374 IS
T0IS00000000037400005	374	5	PRETORIUS VLEY 374 IS
T0IS00000000037400006	374	6	PRETORIUS VLEY 374 IS
T0IS00000000037400007	374	7	PRETORIUS VLEY 374 IS
T0IS00000000037400008	374	8	PRETORIUS VLEY 374 IS
T0IS00000000037400009	374	9	PRETORIUS VLEY 374 IS
T0IS00000000037400010	374	10	PRETORIUS VLEY 374 IS
T0IS00000000037400011	374	11	PRETORIUS VLEY 374 IS
T0IS00000000037400012	374	12	PRETORIUS VLEY 374 IS
T0IS00000000037400013	374	13	PRETORIUS VLEY 374 IS
T0IS00000000037400014	374	14	PRETORIUS VLEY 374 IS
T0IS00000000037400015	374	15	PRETORIUS VLEY 374 IS
T0IS00000000037400016	374	16	PRETORIUS VLEY 374 IS
T0IS00000000037400017	374	17	PRETORIUS VLEY 374 IS
T0IS00000000037400018	374	18	PRETORIUS VLEY 374 IS
T0IS00000000037400019	374	19	PRETORIUS VLEY 374 IS
T0IS00000000037500000	375	R	SPIOEN KOP 375 IS

SG Code	Farm No.	Portion No.	Farm Name
T0IS00000000037500001	375	1	SPIOEN KOP 375 IS
T0IS00000000037500002	375	2	SPIOEN KOP 375 IS
T0IS00000000037600001	376	1	MOOIMEISJESFONTEIN 376 IS
T0IS00000000037600002	376	2	MOOIMEISJESFONTEIN 376 IS
T0IS00000000037600003	376	3	MOOIMEISJESFONTEIN 376 IS
T0IS00000000037600004	376	4	MOOIMEISJESFONTEIN 376 IS
T0IS00000000037600005	376	5	MOOIMEISJESFONTEIN 376 IS
T0IS00000000037600006	376	6	MOOIMEISJESFONTEIN 376 IS
T0IS00000000037600006	376	6	MOOIMEISJESFONTEIN 376 IS
T0IS00000000037600007	376	7	MOOIMEISJESFONTEIN 376 IS
T0IS00000000037600010	376	10	MOOIMEISJESFONTEIN 376 IS
T0IS00000000037700005	377	5	UITKYK 377 IS
T0IS00000000037700006	377	6	UITKYK 377 IS
T0IS00000000037700012	377	12	UITKYK 377 IS
T0IS00000000038000001	380	1	NIEKERKSVLEY 380 IS
T0IS00000000038000001	380	1	NIEKERKSVLEY 380 IS
T0IS00000000038000028	380	28	NIEKERKSVLEY 380 IS
T0IS00000000055000000	550	R	SLAGKRAAL 550 IS
T0IS00000000054900000	549	R	UITKYK 549 IS

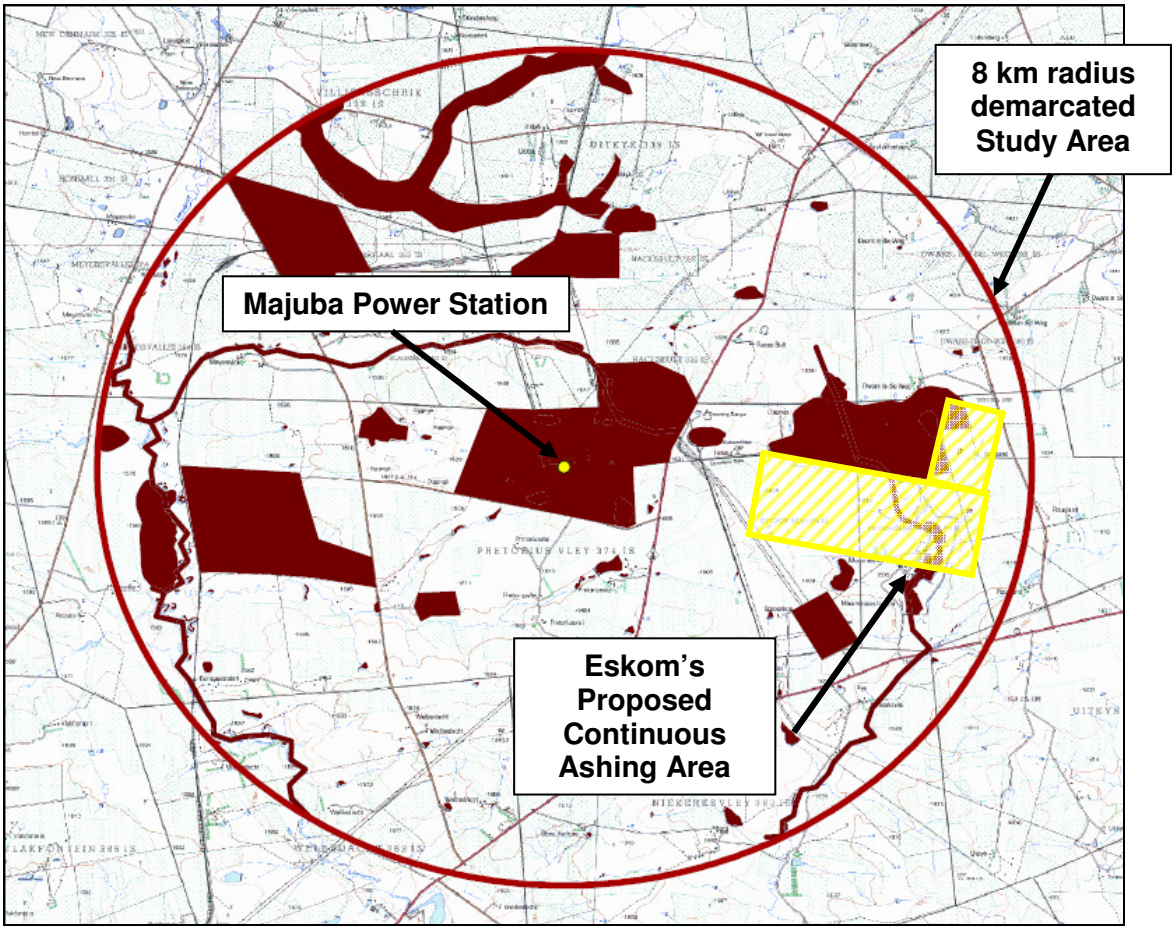

Figure 6.4: The location of Eskom's proposed continuous ashing site within the demarcated study area

Table 6.2: Farm Portions associated with the Eskom's proposed Continuous Ashing Area

SG_CODE	FARM_NO	PORTION	FARM NAME
T0IS00000000037400000	374	Rem	Pretorius Vley 374 IS Remainder
T0IS00000000037400002	374	2	Pretorius Vley 374 IS Portion 2
T0IS00000000037400004	374	4	Pretorius Vley 374 IS Portion 4
T0IS00000000037400010	374	10	Pretorius Vley 374 IS Portion 10
T0IS00000000037400011	374	11	Pretorius Vley 374 IS Portion 11
T0IS00000000037600000	376	Rem	Mooimeisjesfontein 376 IS Remainder
T0IS00000000037600002	376	2	Mooimeisjesfontein 376 IS Portion 2
T0IS00000000037600004	376	4	Mooimeisjesfontein 376 IS Portion 4
T0IS00000000034800000	348	Rem	Rouxland 348 IS Remainder
T0IS00000000034800001	348	1	Rouxland 348 IS Portions1,
T0IS00000000034800025	348	25	Rouxland 348 IS Portion 25
T0IS00000000034800027	348	27	Rouxland 348 IS Portion 27
T0IS00000000034800028	348	28	Rouxland 348 IS Portion 28
T0IS00000000035000000	350	Rem	Dwars in de weg 350 IS Remainder
T0IS00000000035000002	350	2	Dwars in de weg 350 IS Portion 2
T0IS00000000035000005	350	5	Dwars in de weg 350 IS Portion 5
T0IS00000000035000006	350	6	Dwars in de weg 350 IS Portion 6
T0IS00000000035000008	350	8	Dwars in de weg 350 IS Portion 8)
T0IS00000000037500000	375	Rem	Spioen Kop 375 IS Remainder
T0IS00000000037500001	375	1	Spioen Kop 375 IS Portion 1
T0IS00000000037500002	375	2	Spioen Kop 375 IS Portions 2

6.3 Description of the Baseline Environment

6.3.1 Topography

The study area is characterised by the strong undulating character typical of the Mpumalanga province with low ridges east of the study area. The natural topography of the area has been disturbed as a result of various agricultural and power generation activities.

6.3.2 Climate

The climate in the study area can be described as typical highveld conditions with summers that are moderate and wet, while winters are cold and dry. Severe frost and snow are sometimes experienced. The area also falls within the mist belt.

The mean annual precipitation is approximately 580 mm/year, with rain experienced predominantly in the summer months (October to April). **Figure 6.5** shows the monthly rainfall for the study area experienced during the period August 2011 to July 2012 (as measured at the Grootdraaidam monitoring site).

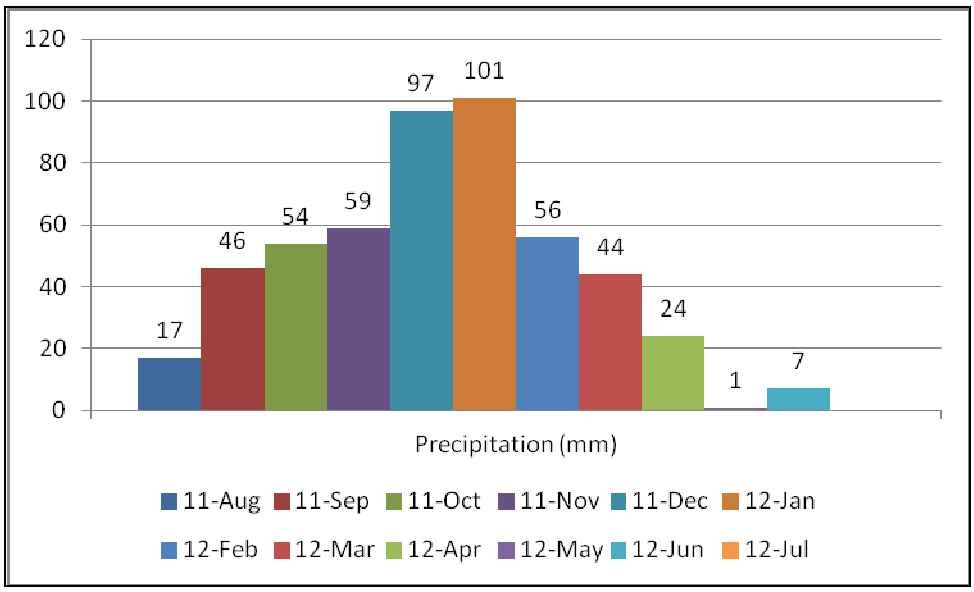

Figure 6.5: The monthly rainfall as measured at the Grootdraaidam monitoring site during the period August 2011 to July 2012

Annual average maximum, minimum and mean temperatures for the study area are given as 31.5°C, 0.9°C and 15.3°C, respectively, based on the measured data at the Eskom Grootdraaidam monitoring site for the period 2009-2011. Average daily maximum temperatures range from 35.7°C in October to 24.5°C in July, with daily minima ranging from 11.7°C in January to -9.8°C in June (**Figure 6.6**)..

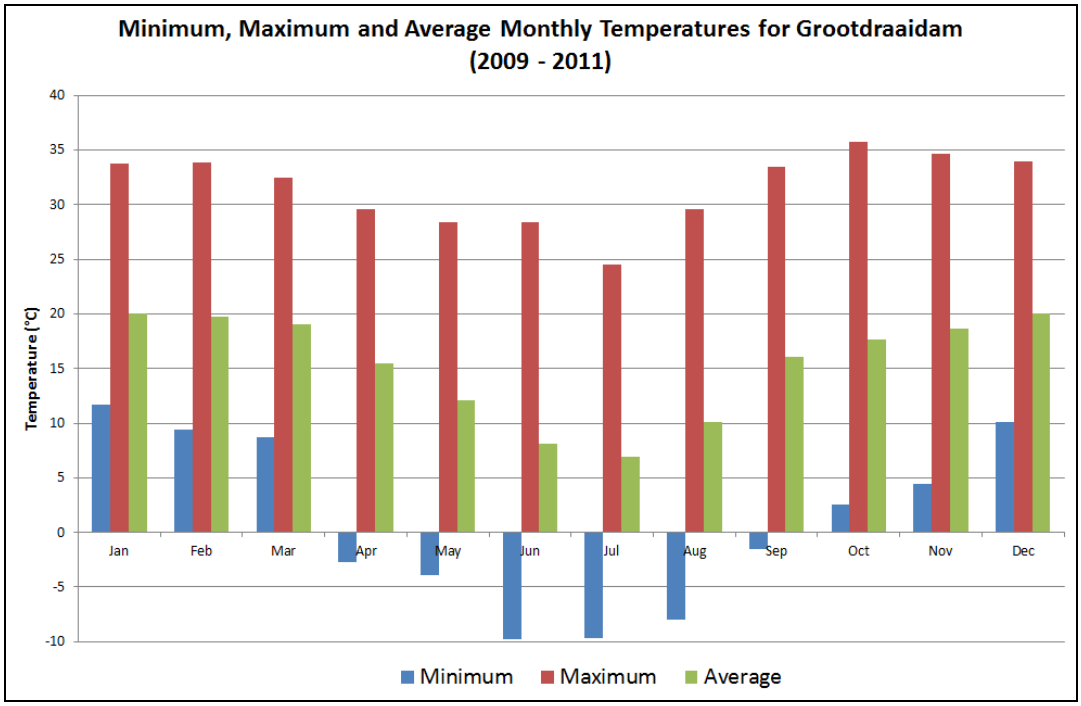

Figure 6.6: Average monthly maximum, minimum and mean temperatures measured at the Grootdraaidam monitoring site

The prevailing wind direction is recorded as being east-south-easerly winds. **Figure 6.7** shows the period, day-time and night-time wind roses for the Tutuka Power Station.

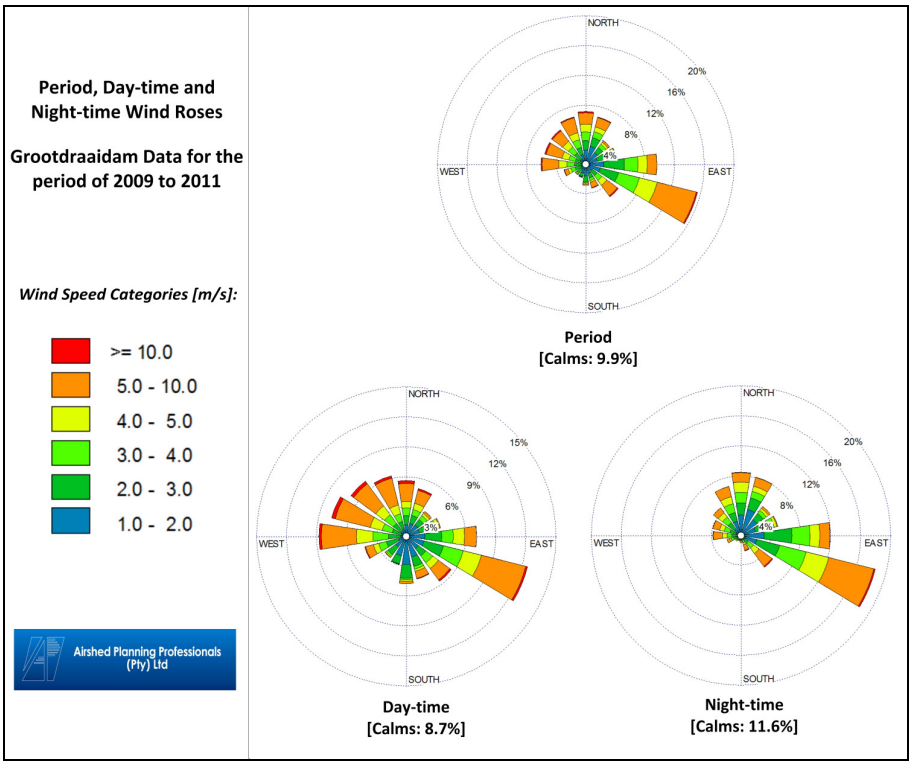

Figure 6.7: Period, day-time and night-time wind roses for the Tutuka Power Station

6.3.3 Geology

Tutuka Power Station and surrounding area (8 km radius) is underlain by rocks of Permian to Jurassic age. More specifically:

- Permian Ecca Group - Vryheid Formation;
- Karoo Supergroup – Karoo Dolerite.

- ***Vryheid Formation***
  The Vryheid Formation is made up of various lithofacies arranged in up-ward coarsening cycles which are essentially deltaic in origin. The formation can generally be divided into a lower fluvial dominated deltaic interval, a middle fluvial interval and an upper fluvial-dominated deltaic interval which are associated with 'lower sandstone unit, 'coal zone' and 'upper sandstone unit' (Johnson et al, 2006). In the vicinity of Tutuka the geology is mainly arenaceous sandstone.

- ***Karoo Dolerite***
  The area in the vicinity of Tutuka (and on a wider scale) is intruded by a network of dykes, sills and discordant sheets that are well developed in the sedimentary sequences (Johnson et al, 2006). The intrusions predominately consist of ultramafic / mafic rocks consisting of dolerite, diabase, gabbro, norite, carbonatite, anorthosite and pyroxenite.

The geology of the study area is shown in **Figure 6.8**.

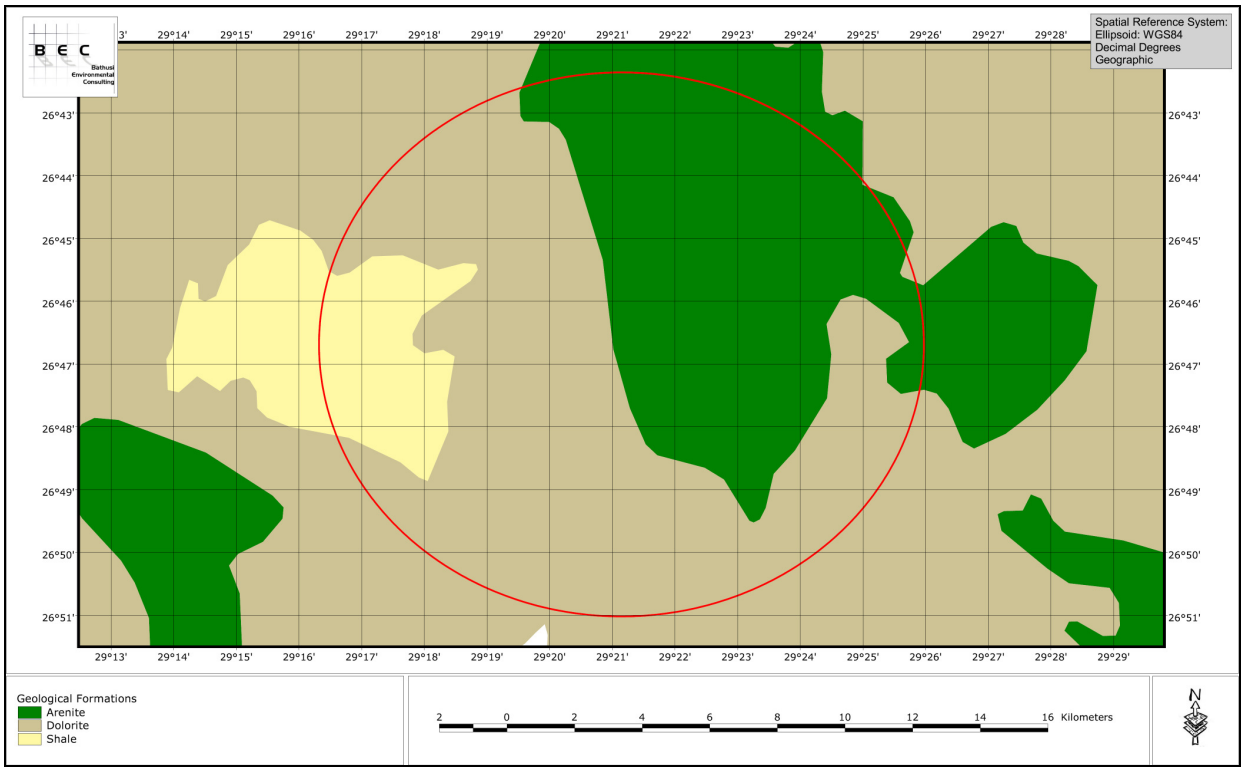

Figure 6.8: Geology of the Study area

6.3.4 Land Cover and Land Use

Land cover categories are presented in **Figure 6.9**. For the purpose of this assessment, land cover are loosely categorised into classes that represent natural habitat and categories that contribute to habitat degradation and transformation on a local or regional scale. In terms of the importance for biodiversity, the assumption is that landscapes exhibiting high transformation levels are normally occupied by plant communities and faunal assemblages that do not necessarily reflect the original or pristine status. This is particularly important in the case of conservation important taxa as these plants and animals generally exhibit extremely low tolerances levels towards disturbances. This is one of the main reasons for the threatened status of these species. Changes in the natural environment available to these species are therefore likely to result in severe impacts on these species and, subsequently, their conservation status.

Three important aspects are associated with habitat changes that accompany certain land uses. Permanent transformation of natural habitat by land uses such as agriculture, mining and urbanisation results in the permanent decimation of available habitat as these areas will not recover to the original pristine status. A second aspect of habitat transformation or degradation is that it affects species directly, namely changes in species presence/ absence and –composition. This result from the exodus of species for which habitat conditions have become unfavourable, the decrease in abundance of certain species because of decreased habitat size, or an influx of species that are better adapted to the altered environment. While some, or most, of the new species that occupy an area might be indigenous, they are not necessarily endemic to the affected area. Lastly, a