	<b>Desk-top Environmental and Social Impact Assessment</b>	
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Title: **Desk-top Environmental and Social Impact Assessment for an Eskom Pilot Carbon Capture Project** Document Identifier: **ENV15R246**

Alternative Reference  
Number:

Area of Applicability: **Eskom Holdings SOC Ltd**

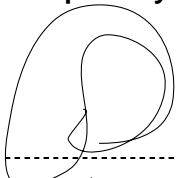
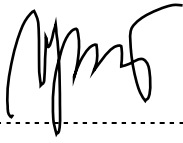


Functional Area: **Environmental  
Management**

Revision: **1**

Total Pages: **34**

Next Review Date: **TBC**

Disclosure  
Classification: **Controlled Disclosure**

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Date: 04/02/2016	Date: 02/02/2016	Date: 2/02/2016	Date: 04/02/2016

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## **1. Introduction**

The South African National Energy Development Institute (SANEDI) has been mandated by the South African Government and parties to the South African Centre for Carbon Capture and Storage (SACCCS) to investigate the potential for Carbon Capture and Storage (CCS) in South Africa through the implementation of the South Africa CCS Roadmap (Roadmap). The Roadmap comprises five key milestones and SACCCS's role in the Roadmap is as follows:

- 1) 2004: Assessment of the potential for CCS in South Africa;
- 2) 2010: Development of a South African Carbon Dioxide (CO<sub>2</sub>) Geological Storage Atlas;
- 3) 2017: Commencement of a Pilot CO<sub>2</sub> Storage Project (PCSP) (10,000 - 50,000 tonnes (t) CO<sub>2</sub> stored);
- 4) 2020: Facilitate the commencement of a CCS demonstration plant (in the order of 100,000 t CO<sub>2</sub> per year);
- 5) 2025+: Inform the implementation of commercial CCS deployment (over 1,000,000 t CO<sub>2</sub> per year);

With the first two milestones of the Roadmap completed, SACCCS's primary focus is now the third key milestone namely the PCSP that concentrates on aspects of CO<sub>2</sub> storage and monitoring.

It is however acknowledged that in order to prepare for the commencement of the fourth key milestone of an integrated CCS demonstration plant, further investigation is required into CO<sub>2</sub> capture, including the potential development of a CO<sub>2</sub> Capture Pilot Plant (CCPP) in South Africa.

This preparation work for the consideration of a CCPP is intended to be funded from the International Bank for Reconstruction and Development (IBRD) (World Bank) CCS Trust Fund, which is part of the World Bank's Programmatic Technical Assistance for Capacity Building for CCS in South Africa.

This desk-top Environmental and Social Impact Assessment (ESIA) is therefore a desk top study of the impact of a post-combustion CCPP project. For this pre-feasibility desk-top assessment the Eskom Kusile coal-fired Power Station (Kusile) which is currently under construction is being used as an example for this assessment in terms of a retrofit to the power station.

It is stressed that this is a pre-feasibility assessment of such a CCPP and that a decision to build a CCPP at Kusile has not been taken. This would be subject to governance approval through Eskom and its shareholder the Department of Public Enterprises (DPE) as well as the obtaining of the relevant environmental approvals. However, it is noted that the output of this pre-feasibility study will be instrumental in the decision whether to proceed with a CCPP or not.

It is noted that Kusile received its Environmental Authorisation (EA) from the Department of Environmental Affairs (DEA) on 17 March 2008. This allowed the commencement of the construction of the power station in the same year. It is noted that construction is underway and anticipated to be completed in 2022. One of the conditions of this EA (revised) was:

*“3.7.8 End of pipe measures need to be specific to address the sulphur dioxide and particulates emissions. These measures must include the following<sup>1</sup>:*

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<sup>1</sup> FGD – Flue Gas Desulphurization, ESP – Electrostatic Precipitator, DEAT - Department of Environmental Affairs and Tourism

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- *For sulphur dioxide – FGD unit*
- *For particulates – ESP or bag filters*
- *For carbon dioxide – carbon capture readiness (the Applicant is required to submit to DEAT a report detailing the preferred technology, for approval, before proceeding with construction)”*

## **2. Supporting Clauses**

### **2.1 Scope**

A desk-top ESIA for the pre-feasibility assessment of a concept 50 t/day CCPP at Kusile.

#### **2.1.1 Purpose**

The purpose of this document is to provide the outcome of a desk-top level assessment of the potential environmental and social impacts of a concept 50 t/day CCPP at Kusile. In addition, the document sets out the environmental and social legislative framework in South Africa that would be applicable to such a pilot project.

#### **2.1.2 Applicability**

This document shall apply to the SACCCS to investigate the potential for CCS in South Africa and in particular to the pre-feasibility assessment of a concept 50 t/day CCPP at Kusile.

#### **2.1.3 Effective Date**

This document is effective on date of authorisation.

## **2.2 Normative/Informative References**

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

### **2.2.1 Normative**

- [1] Final Kusile Environmental Impact Report<sup>2</sup>;
- [2] The South African Coal Roadmap, SANEDI 2013.

### **2.2.2 Informative**

- [1] Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996);
- [2] International Labour Office Occupational Health and Safety Conventions and Recommendations;
- [3] National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998);
- [4] The World Bank Policy on Disclosure of Information, 2002;
- [5] World Bank Performance Standards, 2013.

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<sup>2</sup>([http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/Pages/Kusile\\_Power\\_Station.aspx](http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/Pages/Kusile_Power_Station.aspx))

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## 2.3 Definitions

**Carbon capture and storage:** the capture and storage of CO<sub>2</sub>.

**Carbon capture and storage ready (CCSR):** A CCSR facility is a large-scale industrial or power source of CO<sub>2</sub> which could and is intended to be retrofitted with CCS technology when the necessary regulatory and economic drivers are in place. The aim of building new facilities or modifying existing facilities to be CCSR is to reduce the risk of carbon emission lock-in or of being unable to fully utilise the facilities in the future without CCS (stranded assets). CCSR is not a CO<sub>2</sub> mitigation option, but a way to facilitate CO<sub>2</sub> mitigation in the future. CCSR ceases to be applicable in jurisdictions where the necessary drivers are already in place, or once they come in place<sup>3</sup>.

**Carbon capture ready:** a CO<sub>2</sub> capture-ready power plant is a plant which can include CO<sub>2</sub> capture when the necessary regulatory or economic drivers are in place<sup>4</sup>.

**Environment:** The surroundings within which humans exist and that are made up of:

- i. the land, water, and atmosphere of the earth;
- ii. micro-organisms and plant and animal life;
- iii. any part or combination of (i) and (ii) and the interrelationships among and between them; and
- iv. the physical, chemical, aesthetic, and cultural properties and conditions of the foregoing that influence human health and well-being.

## 2.4 Abbreviations

Abbreviation	Explanation
%	Percent
°C	Degrees Celsius
AEL	Atmospheric Emission Licence
BA	Basic Assessment
CCPP	CO <sub>2</sub> Capture Pilot Plant
CCS	Carbon Capture and Storage
CCSR	Carbon Capture and Storage Ready
CEMP	Construction Environmental Management Plan
CO <sub>2</sub>	Carbon Dioxide
CoE	Centre of Excellence
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DPE	Department of Public Enterprises
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officers
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Regulations

<sup>3</sup> IEA/CSLF Report to the Muskoka 2010 G8 Summit. Carbon Capture and Storage: Progress and Next Steps – OECD/IEA 2010

<sup>4</sup> IEA, 2007

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Abbreviation	Explanation
ELM	Emalahleni Local Municipality
EMC	Environmental Monitoring Committee
EMPr	Environmental Management Programme
ESIA	Environmental and Social Impact Assessment
ESP	Electrostatic Precipitator
FGD	Flue Gas Desulphurisation
h	hour
IBRD	International Bank for Reconstruction and Development
ISO	International Organization for Standardization
KLM	Kungwini Local Municipality
km	kilometre
Kusile	Kusile coal-fired power station
m	meter
m <sup>3</sup>	cubic metre
MCC	Motor Control Centre
mm	millimetre
NDM	Nkangala District Municipality
NEM	National Environmental Management
NEMA	National Environmental Management Act
OEMP	Operational Environmental Management Plan
PCSP	Pilot CO <sub>2</sub> Storage Project
PS	Performance Standard
RT&D	Research, Testing and Development
S&EIR	Scoping & Environmental Impact Report
SACCCS	South African Centre for Carbon Capture and Storage
SANEDI	South African National Energy Development Institute
SHEQ	Safety, Health, Environment and Quality
SO <sub>2</sub>	Sulphur Dioxide
SO <sub>3</sub>	Sulphur Trioxide
t	tonne
TBD	To be determined
TLM	Thembisile Local Municipality
VKLM	Victor Khanye Local Municipality
w/w	by weight
WML	Waste Management Licence
WUL	Water Use Licence

## **2.5 Roles and Responsibilities**

**The IBRD (World Bank) CCS Trust Fund:** to finance this work, that is part of the World Bank's Programmatic Technical Assistance for Capacity Building for CCS in South Africa.

**SANEDI:** to investigate the potential for CCS in South Africa through the implementation of the Roadmap.

**Eskom:** to undertake the desk-top ESIA for the pre-feasibility assessment of a concept 50 t/day CCPP at Kusile.

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### **3. Document Content**

This document sets out the preliminary desk-top ESIA for a concept CCPP. It covers:

- 1) Project description;
- 2) Environmental and social regulatory framework;
- 3) Environmental and social baseline;
- 4) Environmental and social impacts;
- 5) Analysis of alternatives (locations);
- 6) Environmental and social mitigation measures;
- 7) Environmental and social management plan;
- 8) Monitoring plan;
- 9) Capacity and institutions for implementation;
- 10) Evidence of consultation with key stakeholders (focusing on local stakeholders).

#### **3.1 Project Description**

An envisaged preliminary design is for a 50 t/day CCPP for location at Kusile. This Power Station is currently under construction in the Emalahleni district, Mpumalanga province of South Africa. It is anticipated that the current power station will be completed in 2022. The base description of the CCPP project is provided in the following sections.

##### **3.1.1 Footprint**

The plant footprint is expected to fit into an area of 50x50 meters (m) including gas cleaning area, CO<sub>2</sub> capture plant, cooling tower, boiler, coal / ash infrastructure, roads *etc.* It is assumed that in the design access to a nominal [50 millimetres (mm) nominal bore pipe] supply of instrument air for the entire facility included. The pilot plant will be operated from a containerized control room and a Motor Control Centre (MCC) which will also be located within the plant footprint. No overhead power line is required, as it is assumed that access to a 400 or 525 Volt supply would be from Kusile into the MCC for distribution to the CCPP.

##### **3.1.2 Associated Infrastructure**

It was determined that the estimated plant is based on a complete island requiring only power, steam and make-up water. Power and water requirements are detailed below. The other tie-in is the inlet gas pipe, which is assumed to be a 500 mm nominal bore diameter 3161 duct (thin walled pipe) conveying the gas to the capture plant.

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### 3.1.3 Process Description

Figure 1 shows a simplified block flow diagram. The off-gas from the FGD plant at Kusile would be ducted directly into a venturi scrubber<sup>5</sup> where particulates and some sulphur dioxide/sulphur trioxide ( $\text{SO}_2/\text{SO}_3$ ) are removed. It would then pass into a packed scrubber where the acid mist and remaining  $\text{SO}_2$  are scrubbed from the gas, with minimal co-removal of  $\text{CO}_2$ . This is achieved by allowing the scrubber to operate in the bicarbonate regime.

The gas is polished in a washing zone above the impurity gas absorber and then discharged from the top of the primary column. The cleaned, cooled and humid gas then passes through to the bottom zone of the  $\text{CO}_2$  absorber where it is contacted together with amine solution. Approximately 90 to 92.5 percent by weight (% w/w) of the  $\text{CO}_2$  is absorbed into the amine solution which is pumped directly to the steam stripper. The decarbonised flue gas is finally washed in a final zone in the absorber and then discharged to atmosphere. The  $\text{CO}_2$  rich amine discharges the absorber and is pumped through the rich/lean heat exchanger directly into the top of the steam stripper, where the  $\text{CO}_2$  desorbs and passes upwards through a washing zone, final condenser and then is let-down to atmospheric pressure and vented.

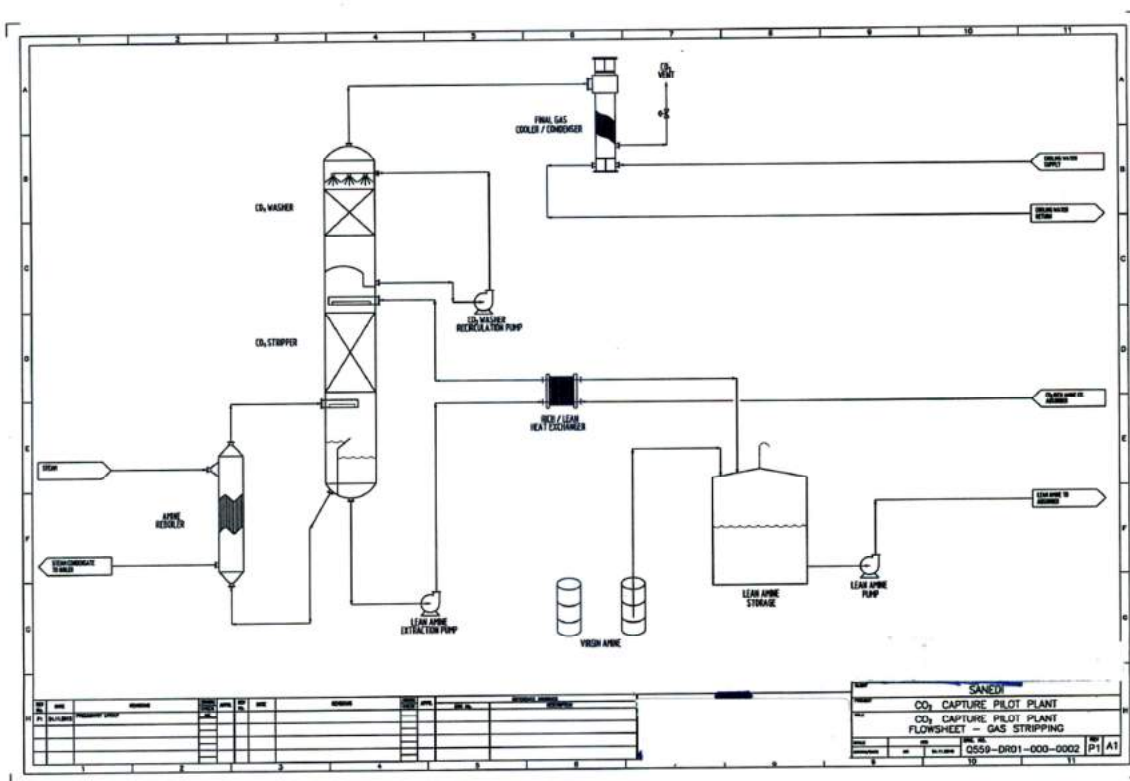


Figure 1: Simplified Block Flow Diagram

<sup>5</sup> A venturi scrubber is designed to effectively use the energy from the inlet gas stream to atomize the liquid being used to scrub the gas stream. This type of technology is a part of the group of air pollution controls collectively referred to as wet scrubbers.

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It is possible to hook up a compressor/cooler to this gas stream and produce a liquid CO<sub>2</sub> for sale. The lean amine (after stripping the CO<sub>2</sub>) discharges from the bottom of the column into a drum from where it is pumped through the rich/lean exchanger once more into lean amine storage from where it is pumped back to the absorber on demand.

The plant could include a small steam boiler to generate 10 gauge pressure [Bar(g)] steam and a cooling tower to process 300 cubic metres per hour (m<sup>3</sup>/h) water for various cooling/condensation duties on the plant, however this could be obtained from the power station.

A containerised MCC and control room will also be located within the plant. The plant footprint also allows for a small storage area for coal deliveries and for ash removal, only in the event of a boiler plant being required.



**Figure 2: Typical CO<sub>2</sub> Capture Plant**

### **3.2 Environmental and Social Regulatory Framework**

Information provided under this section gives a comparison between World Bank Performance Standards (PS) and the relevant South African legislation and some detail on the specific legislative requirements of South African legislation in terms of ESIA.

Table 1 sets out the link between the PS and the relevant South African legislation. In general, the 8 of the World Bank PCs (PS1-PS8) are in line with South African legislation as demonstrated in Table 1. It is noted that the Safeguards Diagnostic Report issued in 2010 for the Eskom Infrastructure Support Project (which included the Medupi coal-fired Power Station - similar to Kusile) concluded that South Africa's environmental and social safeguards systems, as implemented by Eskom, were equivalent to the World Bank's safeguards policies and acceptable in meeting the objectives of those policies.

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**Table 1: Link between PS and the Relevant South African Legislation**

<b>PS Description</b>	<b>Relevance to South African Legislation (in General Terms)</b>
PS 1: Assessment and Management of Environmental and Social Risks and Impacts	<ul style="list-style-type: none"> <li>Constitution of the Republic of South Africa, 1996 (Section 24): sets out the right of all to an environment that is not harmful to their health or well-being and to have the environment protected for the benefit of present and future generations;</li> <li>NEMA, 1998 (Act No. 107 of 1998): Section 28 (duty of environmental care);</li> <li>National Environmental Impact Assessment Regulations (EIAR), 2014</li> <li>Promotion of Access to Information Act, 2000 (Act No. 2 of 2000).</li> </ul>
PS 2: Labour and Working Conditions	<ul style="list-style-type: none"> <li>Basic Conditions of Employment Act, 1997 (Act No. 75 of 1997);</li> <li>Labour Relations Act, 1995 (Act No. 66 of 1995);</li> <li>Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).</li> </ul>
PS 3: Resource Efficiency and Pollution Prevention	<ul style="list-style-type: none"> <li>NEMA, 1998 (Act No. 107 of 1998): Section 28 (in terms of duty of care and remediation of environmental damage);</li> <li>National Environment Management (NEM): Air Quality Act, 2004;</li> <li>NEM: Waste Act, 2008 (Act No. 59 of 2008);</li> <li>National Water Act, 1998 (Act No. 36 of 1998).</li> </ul>
PS 4: Community Health, Safety, and Security	<ul style="list-style-type: none"> <li>Constitution of the Republic of South Africa, 1996 (Section 27): Health care, food, water and social security;</li> <li>Occupational Health and Safety Act, 1993 (Act No. 85 of 1993);</li> <li>Promotion of Access to Information Act, 2000 (Act No. 2 of 2000).</li> </ul>
PS 5: Land Acquisition and Involuntary Resettlement	<ul style="list-style-type: none"> <li>Constitution of the Republic of South Africa, 1996 (Section 27): Property;</li> <li>Expropriation Act, 1975 (Act No. 63 of 1975);</li> <li>Restitution of Land Rights Act, 1994 (Act No. 22 of 1994)</li> <li>Land Reform (Labour Tenants) Act, 1996 (Act No. 3 of 1996);</li> <li>Extension of Security of Tenure Act, 1997 (Act No. 62 of 1997);</li> <li>Prevention of Illegal Eviction from and Unlawful Occupation of Land Act, 1998 (Act No. 19 of 1998);</li> <li>Interim Protection of Informal Land Rights Act, 1996 (Act No. 31 of 1996)</li> </ul>
PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	<ul style="list-style-type: none"> <li>NEM: Biodiversity Act, 2004 (Act No. 10 of 2004);</li> <li>NEM: Protected Areas Act, 2003 (Act No. 57 of 2003).</li> </ul>
PS 7: Indigenous Peoples	<ul style="list-style-type: none"> <li>Constitution of the Republic of South Africa, 1996 (Section 31): Cultural, religious and linguistic communities;</li> <li>NEMA, 1998 (Act No. 107 of 1998);</li> <li>National Heritage Resources Act, 1999 (Act No. 25 of 1999);</li> <li>Expropriation Act, 1975 (Act No. 63 of 1975);</li> <li>Restitution of Land Rights Act, 1994 (Act No. 22 of 1994);</li> <li>Land Reform (Labour Tenants) Act, 1996 (Act No. 3 of 1996);</li> <li>Extension of Security of Tenure Act, 1997 (Act No. 62 of 1997);</li> <li>Prevention of Illegal Eviction from and Unlawful Occupation of Land Act, 1998 (Act No. 19 of 1998);</li> <li>Interim Protection of Informal Land Rights Act, 1996 (Act No. 31 of 1996).</li> </ul>
PS 8: Cultural Heritage	<ul style="list-style-type: none"> <li>Constitution of the Republic of South Africa, 1996 (Section 31): Cultural, religious and linguistic communities;</li> <li>NEMA, 1998 (Act No. 107 of 1998);</li> <li>National Heritage Resources Act, 1999 (Act No. 25 of 1999).</li> </ul>

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### **3.2.1 National Environmental Management Act**

The framework act in South Africa for environmental management, including environmental permitting, is the NEMA (Act No. 107 of 1998). This enacts the Bill of Rights, Section 24 (Environment) of the Constitution of the Republic of South Africa (1996). This Section of the Bill sets out the right of all to an environment that is not harmful to their health or well-being and to have the environment protected for the benefit of present and future generations.

Chapter 5, Sections 23 and 24 of NEMA promotes the application of appropriate environmental management tools in order to ensure the integrated environmental management of activities. The objective of the integrated environmental management approach is to identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage. Mechanisms are established with NEMA for the promulgation of regulations which require a permitting process for certain identified activities and activities to be undertaken in specified geographical areas. Such regulations exist.

Section 28 of NEMA establishes a duty of care and remediation of environmental damage on every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.

### **3.2.2 Environmental Impact Assessment Regulations**

Chapter 5 of NEMA is promulgated through the EIAR, 2014 to regulate the procedures and criteria relating to the submission, processing and consideration of, and decision on, applications for EAs.

Chapter 3 of EIAR establishes two different types of assessments required for EA applications:

- Scoping & Environmental Impact Report (S&EIR) – activities requiring this level of assessment are prescribed under EIAR<sup>6</sup>, are projects within an environmental sensitive area (as defined within the legislation<sup>7</sup>) and/or as identified through the Basic Assessment (BA) process, as explained below. In terms of this project, there may be the need to have the existing power station's Atmospheric Emission Licence (AEL) amended and in doing so an EA will be required (Activity No. 6 of listing notice No. 2). This will be processed through the undertaking of an S&EIR.
- BA – activities requiring this level of assessment are also prescribed under EIAR<sup>8</sup>.

The DEA is the administering authority for NEMA and EIAR, and is the competent authority for issuing of EAs for activities under S&EIRs and BAs for State Owned Companies such as Eskom.

### **3.2.3 Additional Relevant Legislation**

Table 2 shows additional national environmental, planning and infrastructure legislation.

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<sup>6</sup> Listing Notice 2 (2014)

<sup>7</sup> Listing Notice 3 (2014)

<sup>8</sup> Listing Notice 1 (2014)

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**Table 2: Relevant EAs**

<b>National Legislation</b>	<b>Government Authority</b>	<b>Key Permits Granted under this Legislation</b>
<ul style="list-style-type: none"> <li>NEMA, 1998 (Act No. 107 of 1998);</li> <li>EIAR, 2014.</li> </ul>	<ul style="list-style-type: none"> <li>DEA.</li> </ul>	<ul style="list-style-type: none"> <li>EAs.</li> </ul>
<ul style="list-style-type: none"> <li>NEM: Air Quality Act, 2004 (Act No. 39 of 2004)</li> </ul>	<ul style="list-style-type: none"> <li>DEA;</li> <li>Provincial Authorities;</li> <li>Local Municipal Authorities.</li> </ul>	<ul style="list-style-type: none"> <li>AELs.</li> </ul>
<ul style="list-style-type: none"> <li>NEM: Waste Act, 2008 (Act No. 59 of 2008);</li> <li>NEM: Waste Amendment Act, 2014 (Act No. 26 of 2014).</li> </ul>	<ul style="list-style-type: none"> <li>DEA</li> </ul>	<ul style="list-style-type: none"> <li>Waste Management Licences (WMLs).</li> </ul>
<ul style="list-style-type: none"> <li>National Water Act, 1998 (Act No. 36 of 1998).</li> </ul>	<ul style="list-style-type: none"> <li>Department of Water and Sanitation (DWS)</li> </ul>	<ul style="list-style-type: none"> <li>Water Use Licence (WUL);</li> <li>Concurrence Record of Decisions (related to WMLs and EAs).</li> </ul>
<ul style="list-style-type: none"> <li>National Forests Act, 1998 (Act No. 84 of 1998).</li> </ul>	<ul style="list-style-type: none"> <li>Department of Agriculture, Forestry and Fisheries.</li> </ul>	<ul style="list-style-type: none"> <li>Licences for infrastructure affecting natural forests, protected trees or State forests.</li> </ul>
<ul style="list-style-type: none"> <li>National Heritage Resources Act, 1999 (Act No. 25 of 1999).</li> </ul>	<ul style="list-style-type: none"> <li>The South African Heritage Resources Agency.</li> </ul>	<ul style="list-style-type: none"> <li>Approvals associated with Heritage Impact Assessments.</li> </ul>

### **3.2.4 Environmental Authorisation Process**

Two levels of assessment may be undertaken for this project and require to secure an EA for the project:

- S&EIR** are required for high risk projects and typically take at least twelve months to process. The amendment of the AEL for Kusile is expected to be required and this will trigger the need for an S&EIR under NEMA / EIAR. The initial scoping study requires public consultation and preparation and approval of terms of reference for specialist studies, prior to a full impact assessment phase.
- BA** are prepared for less complex, lower impact projects, where the impacts and mitigations are generally considered to be predictable. The BA process typically takes up to 6 months to complete.

Other environmental permits that may be required by Eskom, in addition to the EA, include:

- Amendment of the AEL for Kusile in terms of the NEM: Air Quality Act, 2004 (Act No. 39 of 2004).
- WUL – required under the National Water Act, 1998 (Act No. 36 of 1998) from DWS where the project includes activities that will involve extraction of water, treatment and release of water, impeding or diverting the flow of water in a watercourse or altering the bed, banks, course or characteristics of a watercourse or wetland area.
- WML – required under the NEM: Waste Act, 2008 (Act No. 59 of 2008).

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### **3.2.5 Environmental Assessment Practitioner**

Under the EIAR, 2014 (Chapter 3 Section 17), an applicant for an Environmental Approval must appoint an Environmental Assessment Practitioner (EAP) before conducting a BA or S&EIR. The applicant has to take reasonable steps to verify that the EAP:

- is independent;
- has expertise in conducting environmental impact assessments, including knowledge of relevant legislation and guidelines;
- will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; and
- will disclose to the applicant and the competent authority all material information in the possession of the EAP that reasonably has or may have the potential of influencing any decision or the objectivity of any report, plan or document prepared by the EAP for submission.

The applicant or the EAP managing an application may appoint a person to carry out a specialist study; as with EAPs, specialists have to comply with the criteria listed above. Specialist studies which Eskom or their EAPs may commission as part of the BA preparation process include impact studies on visual amenity, biodiversity, avifauna, heritage, wetland/aquatic habitats, and fauna, socio-economic (where relocation is required) and agriculture/soil.

The EIAR, 2014 makes allowance for the competent authority to suspend an application and investigate an EAP or person compiling a specialist report where the authority has reason to believe that the requirements for an EAP, set out above, are not being met.

## **3.3 Environmental and Social Baseline**

Kusile is a six-unit, Greenfield, coal-fired Power Station, generating approximately 4,800 Megawatt. Supercritical steam technology will be incorporated to improve the overall efficiency. Wet FGD will be utilized to reduce SO<sub>2</sub> emissions (see Table 6 for residual emissions).

Kusile is a dry-cooled Power Station with FGD to remove SO<sub>2</sub> emissions and designed to be carbon capture ready. It will have fabric bag filters to remove particulate emissions. Each supercritical boiler will be about 115 m high. Each air-cooled condenser will be constructed on and support by twenty 50 m high columns. Each chimney will be about 220 m high and contain three flues.

Kusile is situated under the jurisdiction of the Victor Khanye Local Municipality which falls under the jurisdiction of the Nkangala District Municipality (NDM) in the Mpumalanga province, South Africa.

The commercial operation of the 1<sup>st</sup> unit is expected in 2018 and completion of construction anticipated in 2022.

Kusile (the dawn has come) is an Ndebele and Siswati word meaning “goodning”. Kusile is the second most advanced coal-fired power plant project in Eskom after Medupi Power Station in Lephalale where construction commenced in 2007.

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### 3.3.1 Social Baseline Information

Kusile is situated in the Victor Khanye Local Municipality, which falls under the jurisdiction of the NDM in the Mpumalanga Province. The neighbouring local municipalities include Kungwini (to the West), Emalahleni (to the East) and Thembisile (to the North). The surrounding towns and villages include: Phola [15 kilometres (km)]; Ogies (19 km); Bronkhorstspuit (22 km); Emalahleni (30 km); Delmas (35 km); Rietspruit (38 km); KwaMhlanga (60 km); and Kwaggafontein (75 km).

The population of Mpumalanga for 2010 was estimated to be around 3,617,600 (StatsSA, 2010), compared to the estimated 3,122,990 in 2001 (StatsSA, 2001), and 3,643,435 in 2007 according to the South African community survey. Initially the population seemed to have increased significantly, however it stabilised (StatsSA, 2001 & 2007). The population accounts for roughly 7.2 % of the country's total population (StatsSA, 2010).

Table 3<sup>9</sup> provides comparative socio-economic statistics (as at 2001) for the four local municipalities; Thembisile Local Municipality (TLM), Emalahleni Local Municipality (ELM), Victor Khanye Local Municipality (VKLM) and Kungwini Local Municipality (KLM).

The pictures below (Figure 3) provided insight into the scale and magnitude of Kusile.

**Table 3: Key Characteristic Baseline Socio-economic Data for Kusile's Host Communities**

Key Variables	TLM	ELM	VKLM	KLM
<b>Description</b>	Semi-urban local municipality, rural in nature and consisting of 57 villages. The municipal seat is in Kwaggafontein.	Industrial zone, originally known for coal mining and for its power stations such as Kendal, Matla, Duvha and Ga-Nalae. eMalahleni City is the main urban centre.	Located in western Highveld and comprise of large areas covered by commercial farms and coal mining operations. Delmas is the main economic hub.	Part of Gauteng Province. It is a vast open space that is mainly natural in the north eastern part, with the economic Centres being Bronkhorstspuit and Ekandustria to the north.
<b>Towns / Villages near Kusile</b>	KwaMhlanga (60 km) Kwaggafontein (75 km)	Phola (15 km) Ogies (19 km) Emalahleni (30 km) Rietspruit (38 km)	Delmas (35 km)	Bronkhorstspuit (22 km)
<b>Population, %</b>	258,876	276,416	56,211	107,307
Age (below 20 years)	50	38	42	37
Age (65 years old and above)	5	3	4	4

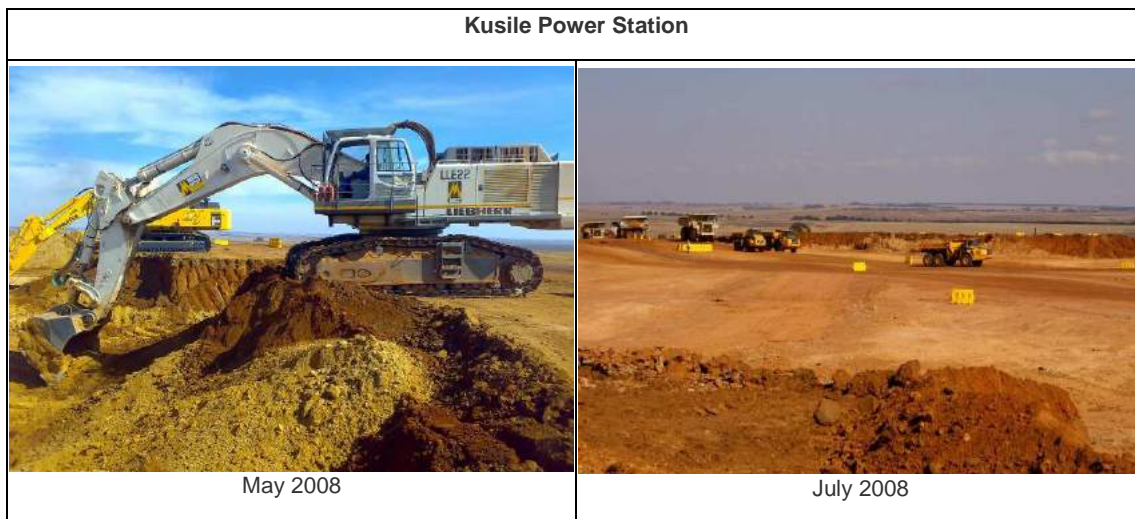
<sup>9</sup> Eskom Socio-Economic Development Assessment for Kusile, 2012/13

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Education (no schooling)	25	14	22	17
Literate (Grade 9)	47	61	42	57
Matric	18	30	18	31
<b>Unemployment Rate, %</b>	51	38	43	29
<b>Key Industries, %</b>				
Agriculture	3	3	23	14
Mining and quarrying	1	23	7	1
Manufacturing	8	11	11	18
Community, social	18	13	9	13
Private households	23	8	15	15
<b>Income Level, %</b>				
No income (age 15 - 65)	57	51	52	40
<b>Electricity Access</b> (lighting), %	20	21	64	54
<b>Water Access</b> (piped water), %	72	73	71	76
<b>Sanitation</b> (flush toilet), %	7	73	67	60



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August 2008



August 2008



August 2009



Air cooled condenser columns - Unit 1 January 2010



Auxiliary Bay construction - January 2010

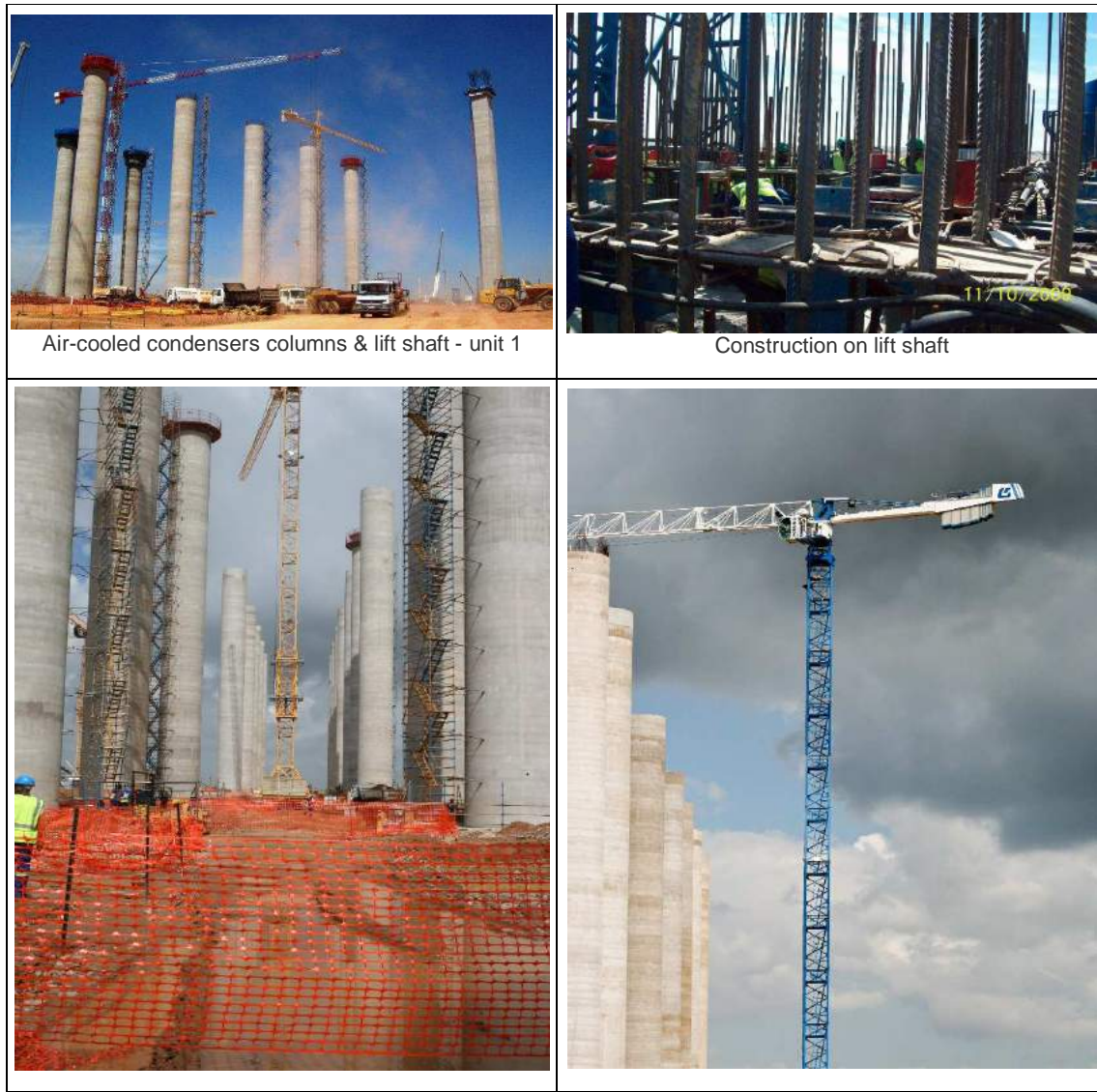


Turbine Generator Area - Unit 1 January 2010

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**Figure 3: Pictures of Construction Activities at Kusile**

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Figure 4: Google Image of Kusile Site Pre-construction (2004)



Figure 5: Google Image of Kusile Site during Construction (2011)

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**Figure 6: Google Image of Kusile Site during Construction (2015)**

The social and environmental baseline information from the ESIA that was undertaken for the Kusile site provides the base. In addition, Eskom had undertaken a Socio-Economic Development Assessment for Kusile in 2012/13<sup>10</sup>. This baseline information would be updated based on the actual ESIA that would be undertaken in the event that this project obtains governance approval to move to the phase of development.

This pre-feasibility study is based on its location being the existing Kusile Power Station currently under construction. It is noted that this is therefore a brown-fields site, and therefore its footprint will be within the existing footprint of the station. The footprint of the CCPP would therefore be a fraction of the Kusile site and would therefore be contained within the existing footprint.

### **3.4 Environmental and Social Impacts**

Based on this phase of the pilot project, an estimate of the CCPP input requirements and outputs have been determined. Based on these figures, in the context of Kusile, the anticipated environmental and social risk and impacts are not seen as material and therefore not significant in terms of the existing environmental and social footprint of Kusile.

The actual assessment of the environmental and social impacts would be determined through the legislative ESIA that would be undertaken as part of the environmental authorising process.

<sup>10</sup>[http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/Pages/Kusile\\_Power\\_Station.aspx](http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/Pages/Kusile_Power_Station.aspx)

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### 3.4.1 Plant Inputs

The plant will require are the following inputs (Table 4<sup>11</sup>):

**Table 4: CCPP Inputs**

Utility / Reagent	Units	Design	Operating	Source
Process Water	m <sup>3</sup> /h	10.0	4.0	Power station
Instrument Air	Nm <sup>3</sup> /h	20.0	15.0	TBD
Potable Water	m <sup>3</sup> /h	3.0	0.05	Power station
Caustic Soda (45 %)	kg/h	10.0	5.0	TBD
Coal (18 MJ peas)	kg/h	750	450 - 500	Not required as plant will obtain steam from power station
Amine (100 % reagent)	kg	Initial Inventory	22,000	TBD
Amine (100 % reagent)	kg/a	Annual makeup	3,500	TBD
Electricity	kW	250 (installed)	180 (absorbed)	Power station
Steam (1,000 kPa)	kg/h	5,000	3,500	Power station
Cooling Water	m <sup>3</sup> /h	300	250	Power station
Labour during Construction		At peak of construction, approximately 220 people.	Not anticipated to be any additional operation staff to that of the Kusile power station.	TBD

### 3.4.2 Plant Outputs

There are a few waste products requiring removal from the plant as shown in Table 5.

**Table 5: Carbon Capture Plant Outputs**

Waste Stream	Description	Form / Containerisation	Quantity	Disposal
Scrubber purge solution	The scrubber will remove ash and SO <sub>2</sub> /SO <sub>3</sub> from the raw gas (ex FGD) and generate a 20 % solution of sodium sulphate/sulphite.	Will be stored in a purge tank for disposal into the power station ash system, once per week.	35 litres/h max purge stream at 40 °C maximum may be stored in a 10,000 litre tank for pumping and removal once per week.	Power station ash disposal site
Waste Amine sludge	The decomposition products from the amine will be separated as a sludge for disposal. Note that some decomposition components in the amine are toxic	The sludge will be collected in a conical tank for disposal/incineration.	The volume of sludge generated will be approximately 1	Local hazardous disposal site, Holfontein

<sup>11</sup>Nm<sup>3</sup> – normal cubic meter, kg – kilogram, a – annum, kW – kilowatt, kPa – kilopascal, TBD – to be determined, MJ – megajoule.

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	and must be incinerated or disposed onto a hazardous site.		m <sup>3</sup> /month.	
Coal Ash	Ash generated from burning coal in the small steam boiler. However, it is anticipated that steam would be obtained from the power station at approximately 10Bar and de-superheated.	Dry clinker ash, in banded area.	100 – 150 kg/h, depending on the coal quality.	Power station ash disposal site

### 3.4.3 Generated Product Streams

In addition to the waste products above, the plant will generate the product streams as indicated in Table 6.

**Table 6: Generated Product Streams**

Stream	Description	Composition
Flue Gas Discharge	Cleaned flue gas containing mainly non-reactive components and water saturated at between 35 and 40 °C. Will be discharged to atmosphere.	Nitrogen, Oxygen, Argon etc. remaining in the feed gas to the CO <sub>2</sub> capture plant
CO <sub>2</sub> Product	Humid CO <sub>2</sub> product at 45 °C. Will be discharged directly to atmosphere, with an option to compress and sell off the CO <sub>2</sub> . Note that this gas will most likely be of a sufficient quality to be used as a food grade product for resale.	>99.5 % w/w CO <sub>2</sub> guaranteed >99.8 % w/w CO <sub>2</sub> expected

### 3.4.4 Concluding Statement on the Anticipated Environmental and Social Impacts

The proposed CCPP will be entirely within the footprint of the existing Kusile Power Station. This therefore means that:

- 1) No new land acquisition, no relocation and no new land impacted upon;
- 2) Relative to Kusile, a small piece of infrastructure to be constructed within a very large construction project;
- 3) There will no material/significant increase in current construction impacts and will not add any new impacts to what is already associated with the Kusile power station project;
- 4) The resource inputs during operation (other than small quantities of amine) are small in relation to that of Kusile with most supplied from Kusile;
- 5) Solid and liquid wastes generated will be in small quantities during operation to that of Kusile and would be managed along with the other waste streams of Kusile and, with the exception of approximately 1 m<sup>3</sup> of hazardous waste per month to be disposed of at a local area licenced hazardous waste disposal facility, will be disposed of in the Kusile disposal facilities;
- 6) The gaseous waste will be additionally cleaned flue gas in which the concentrations of air pollutants will be lower than in the main flue gas discharge from Kusile, resulting in a small positive contribution to the emissions from the site; and

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- 7) The CO<sub>2</sub> will be vented until either the carbon storage system is established or the CO<sub>2</sub> can be used in a secondary market. It is noted that the venting of the CO<sub>2</sub> will cause no net addition to the greenhouse gas emissions from Kusile. When storage or other use begins, there will be a small reduction in the CO<sub>2</sub> emissions from Kusile.

### **3.5 Analysis of Alternatives (Locations)**

Kusile is the only such power station in Eskom's fleet that has a condition in its environmental approval for carbon capture readiness (see Section 1). The ESIA undertaken for Kusile resulted in an authorisation from DEA identifying the site suitable for such technology. From a site alternative point of view there is therefore no alternative Eskom site that has received such an approval.

In the event that a CCPP was to be developed at Kusile, its operation would be integrated into existing operational processes and practices. The ESIA that would be undertaken in terms of environmental approvals, under EIAR, to include an assessment of "alternatives" in relation to a proposed activity, where different means of meeting the general purpose and requirements of the activity can be considered in relation to:

- a. The location where it is proposed CCPP will take place is the exiting Kusile site, which was already designed to be CCR.
- b. The type of activity to be undertaken – there is generally no feasible or reasonable alternatives to a CCPP. It is noted that the purpose of this proposed CCPP is to contribute to the implementation of the Roadmap.
- c. The design or layout of the activity – particular consideration would be given to these alternatives in terms of design within the Kusile footprint.
- d. The technology to be used in the activity – none as the purpose if this CCPP is to undertake the necessary research and piloting of the technology as part of the implementation of the Roadmap.
- e. The operational aspects of the activity – particular consideration would be given to optimisation of the plant into existing operations and processes within the Kusile footprint.
- f. The option of not implementing the activity – the “no-go” alternative is generally not a practical or feasible project alternative in terms of such a pilot project. The decision to pursue a pilot project could be contingent on South Africa's future expected electricity generation mix.

### **3.6 Environmental and Social Mitigation Measures**

In 2006 Eskom initiated an Environmental Impact Assessment (EIA)<sup>12</sup>, undertaken by independent environmental consultants Ninham Shand (Pty) Ltd, for the construction of Kusile and associated infrastructure in the Emalahleni area. The Power Station covers approximately 2,500 hectare of land on the Farm Hartebeesfontein 537 JR and the Farm Klipfontein 566 JR. The Power Station precinct includes the Power Station building, administration buildings (administrative, medical, maintenance, services) and the high voltage yard.

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<sup>12</sup>[http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/Pages/Kusile\\_Power\\_Station.aspx](http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/Pages/Kusile_Power_Station.aspx)

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The associated infrastructure applied for during the EIA included all associated infrastructure such as a water treatment works, a wastewater treatment works, access roads, railway line, water supply pipelines, a coal stockyard, an ash disposal facility, a coal and ash conveyor system and water storage facilities.

Kusile was issued with an EA at the time known as Record of Decisions (Reference 12/12/20/807) on 17 March 2008 which included the associated infra-structure including that for the water and waste water treatment facilities. Kusile began construction in April 2008. The authorised Standard Environmental Specification an annexure of the Environmental Management Plan was included as part of the authorisation.

This process ensured the identification and implementation of mitigation of environmental and social issues.

This CCPP project would be undertaken within the context of the existing occupational health and safety, environmental and social controls in place at Kusile. It would fall within the power stations scope of operations and therefore the scope of its management systems [e.g. Kusile's certified International Organization for Standardization (ISO) 14001 environmental management system] and controls (in terms of Eskom operating procedures and standards].

The CCPP would be constructed and operated subject to the outcome of the environmental approval processes that would be required in the similar way in which the power station obtained its environmental approvals.

### **3.7 Environmental and Social Management Plan**

Kusile has an existing Construction Environmental Management Plan (CEMP) as approved by the DEA. In the event that a CCPP was to be developed at Kusile, its operation would be integrated into existing operational processes and practices including the CEMP and later when operational, the Operational Environmental Management Plan (OEMP).

Compliance to the various environmental approvals is a key to Kusile hence various methodologies to ensure compliance are implemented. Independent Environmental Control Officers (ECOs) are appointed as per the EA conditions and their key role is to ensure project compliance to authorisations through site inspections, audits, review of method statements, *etc.* and reporting of compliance reports to the DEA. The DEA are also present to the Environmental Monitoring Committee (EMC) which comprises of DEA and DWS representatives. The project is also audited by external environmental companies on authorisation conditions to identify compliance gaps.

Kusile is ISO 14001 certified which means there are additional controls and more tools in place to ensure that the project activities do not impact on environment. Internal and external ISO 14001 audits are also undertaken by Eskom and external certification bodies which ensure that the project comply with ISO 14001 standards as well as regulatory requirements including DEA authorisations.

It is noted that the environmental approval process through a BA and/or a S&EIR an Environmental Management Programme (EMPr) is required to be submitted under NEMA and EIAR. The contents of the EMPr are set out in EIAR, 2014, Section 33 and include:

- Details of the project components and activities;

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- Roles, responsibilities and personnel involved in the construction phase with respect to environmental management. These parties typically include Eskom management, an ECO, contractor/sub-contractors and project manager/resident engineer;
- Details of the environmental specifications / mitigation measures to be implemented during the planning and design of the project, pre-construction and construction activities, and operation and maintenance.

Eskom maintains a set of environmental and social policies, standards and procedures which are applied as part of the process and in defining EMP's for design, construction, operation and maintenance of assets. Policy documents (e.g. *"Integrated Socio-economic Development Policy for Eskom"* and *"Land and Diversity Policy"*) set out Eskom's high level commitments. Associated standard(s) (e.g. *"Land and Biodiversity Standard"*) are to set general rules, position statements and control mechanisms consistent with legislative requirements and in support of Government policies / initiatives related to the topic. Procedure documents (e.g. *"Land and Biodiversity Procedure: Management of Wildlife Interaction"*) then set out the key practices that need to be performed during the planning of new infrastructure as well the process that must be adhered to during the construction, operating and maintenance of Eskom's infrastructure in terms of the management (including control and mitigation) of the topic/risk.

These policies, standards and procedures are listed in Table 7.

**Table 7: Eskom Environmental and Social Governance Documents**

<b>Eskom Code</b>	<b>Title of Eskom Policy, Directive, Procedure Document</b>
32-95	Incident Management Environmental, Health and Social Procedure
240-69723512	Integrated Socio-economic Development Policy for Eskom
464-0603	Land Acquisition and Disposal Environmental and Social Due Diligence Procedure
32-736	Land and Biodiversity Policy
32-829	Land and Biodiversity Procedure: Management of Wildlife Interaction
32-815	Land and Biodiversity Standard
36-355	Procedure for the Involuntary Resettlement of Legal and Illegal Occupants on or from Eskom Procured Land
32-727	Safety, Health, Environment and Quality (SHEQ) Policy
32-247	Vegetation Management and Maintenance within Eskom Land, Servitudes and Rights of Way
32-245	Waste Management Standard

### **3.7.1 Environmental Control Officer**

An ECO is required to be appointed at commencement of the construction phase of projects. This requirement is set out as a condition of the EA issued for the project by DEA. Where the environmental impact is significant then an independent ECO is required, but for lower impact projects (e.g. refurbishment) then an internal member of Eskom staff can be used. An ECO is seen as an extension of the Compliance Monitoring function at DEA.

The ECO has the following general responsibilities:

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- To audit the contractor and sub-contractors on implementation of the specifications of the EMPr. A monthly audit shall be undertaken and the audit reports should be distributed to The Proponent (Eskom), Project Manager, and to DEA (reporting period will be dependent on authorisation conditions and length of construction phase);
- To advise the Project Manager on the interpretation and enforcement of the Environmental Specifications;
- To supply environmental information;
- To be knowledgeable of the pre-construction state of the environment in order to inform rehabilitation measures stipulated in the EMPr;
- To provide on-site environmental guidance;
- To demarcate particular sensitive areas and pass instructions on work in these particular areas; and
- To inform contractors of environmental sensitivities associated with the site (and provide training input where required or necessary).

### **3.7.2 DEA Compliance Oversight**

The monthly audit report prepared by the ECO is forwarded directly to the Compliance team within the DEA. These audit reports are reviewed, on a sample basis, for any non-compliance and followed up with the appropriate regulatory action and a requirement for the ECO to report on whether the issues have been addressed / resolved. DEA issues administrative directives, but where a criminal proceeding is necessary then the DEA gathers information and refers this to the National Prosecution Authority.

The DEA Compliance team also draws on these monthly audit reports to assess the overall risk of particular companies/sectors in considering its prioritisation / approach to planning (i) strategic compliance reviews (e.g. across a particular sector) which will include other regulators (e.g. DWS), and (ii) campaigns targeting a specific company on specific topics / risks.

## **3.8 Monitoring Plan**

In the event that a CCPP was to be developed at Kusile, its operation would be integrated into existing operational processes and practices of the power station. It is not anticipated that any additional monitoring requirements would be needed and that the existing monitoring mechanism at Kusile would be used and be adequate to cover CCPP.

As Kusile has a number of EAs and associated CEMP, WML and WULs, a number of key environmental and social monitoring plans are in place. These include: pint source air emissions, ambient air quality in the area and surface and ground water.

### **3.8.1 Internal Audits**

Kusile is conducting internal audits as per the condition of the EAs, WMLs and WULs. Internal audits to determine compliance are conducted by the Independent ECO on site. The WUL internal audits are conducted by Eskom's Waste Management Centre of Excellence (CoE) as required by the WUL. The audit reports are communicated to the Authorities (DEA and DWS) and the Kusile EMC.

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### **3.8.2 External Audits**

In addition to the requirement of the EA to conduct internal audits, Eskom also appointed an external service provider (this is currently Envirolution Consulting) to conduct compliance audits on the EAs, EMP and WMLs. These reports are also submitted to the DEA.

WUL compliance audits are conducted quarterly by an external service provider (this is currently Sivest) as per the requirements of the WUL. The reports are submitted to DWS and discussed in the EMC and the ECO's reports.

### **3.8.3 Inspections**

Daily and weekly inspections are conducted by the ECO's, Eskom Environmental Officers and contractors to ensure compliance of the conditions of the EAs, CEMP, WMLs and WULs. The ECO compile monthly and bimonthly compliance reports that are submitted to DEA and also discussed in the EMC.

An Integrated Water and Waste Management Plan was also initiated and developed by the project in August 2015 to manage any waste that originates from the power station activities. The plan outlines the prevention, management and rehabilitation of environmental impacts.

Kusile has been conducting monitoring since the inception of the project. Jeffares & Green environmental and engineering consulting was appointed from February 2014 to date to undertake monthly surface and ground sampling as per the various WULs and the EA for Kusile. The surface and ground water monitoring programme is contextualised and interpreted relative to Kusile's location in the catchment (Figure 7, Figure 8 and Figure 9).

### **3.8.4 Air Quality Monitoring**

Eskom has established and maintains air quality monitoring data from the following ambient air quality monitoring sites in the Mpumalanga area (in which Kusile is located). Pollution parameters monitored at the sites include nitrogen oxide, nitrogen dioxide, oxides of nitrogen, SO<sub>2</sub>, ozone and fine particulate matter (PM10). The concentrations of these parameters have been appropriately averaged and assessed according to the National Ambient Air Quality Standards set by DEA. Ambient air quality monitoring provides Eskom as well as the DEA a means of evaluating the impacts of emissions from tall stack emitters and low level sources on ambient air quality.

The Eskom monitoring network sites are categorised based on the objectives for which they were set up. Some sites are a requirement by DEA as part of the power station AEL conditions, others as per EAs for construction of power station and some are located in populated areas like townships and/or residential areas that could be affected and others few kilometres from the power station to determine impacts downwind of sources. Other sites are for environmental research purposes.

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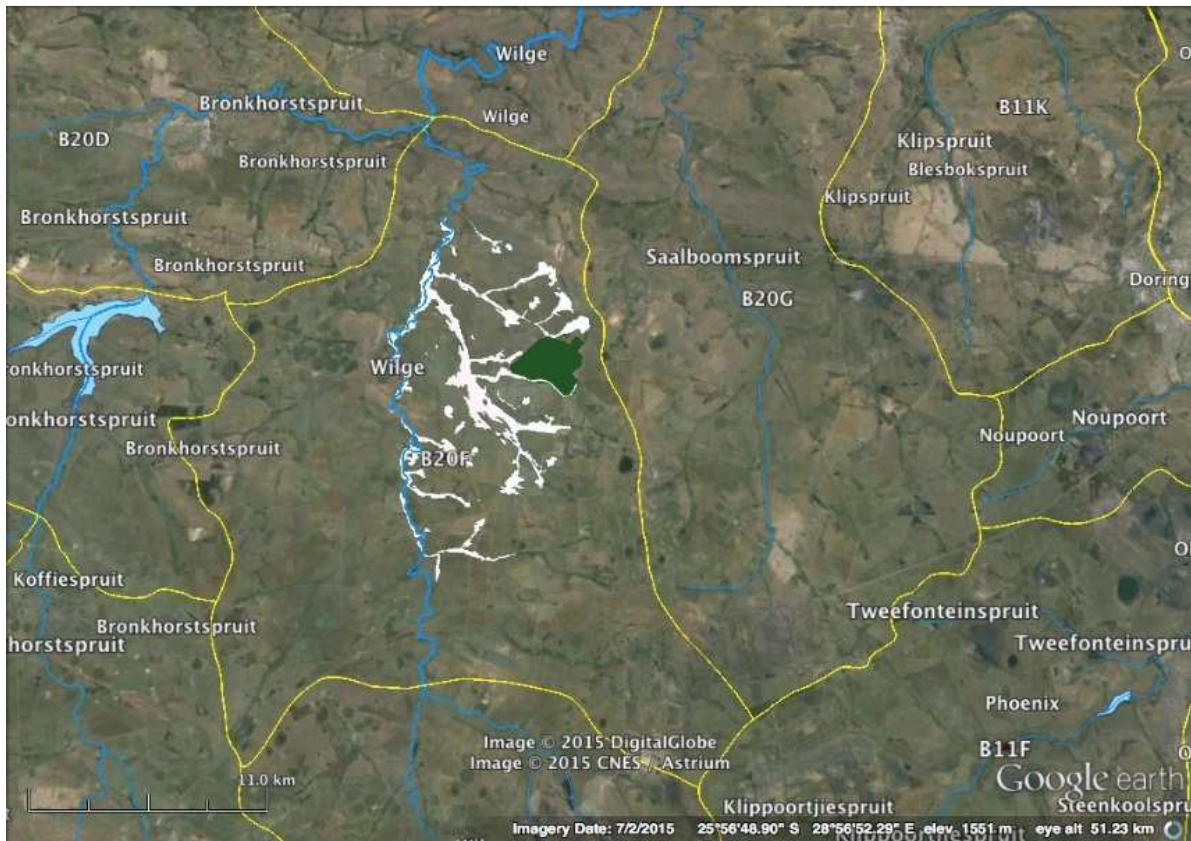


Figure 7: Quaternary B20F Catchment Image

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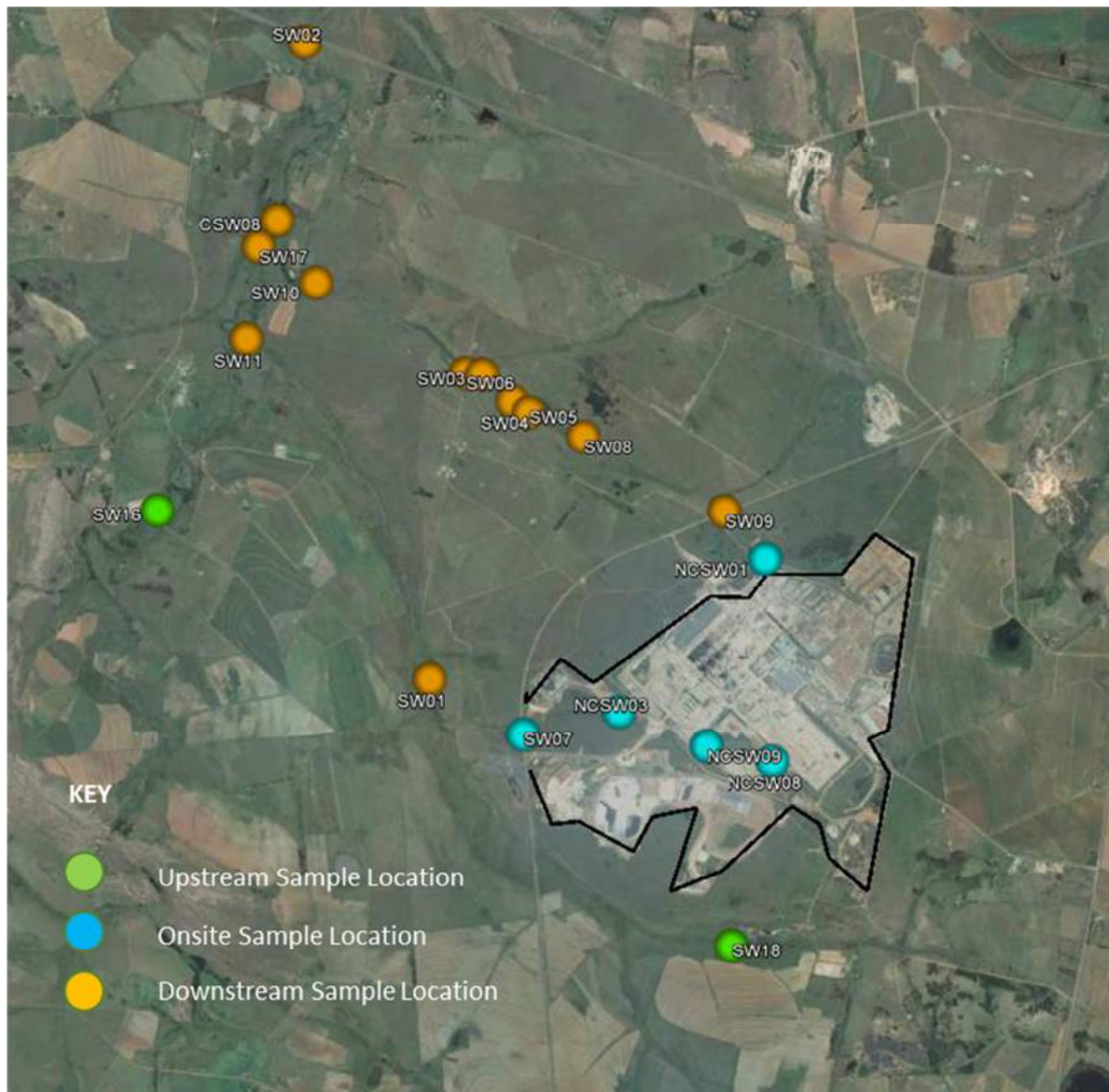
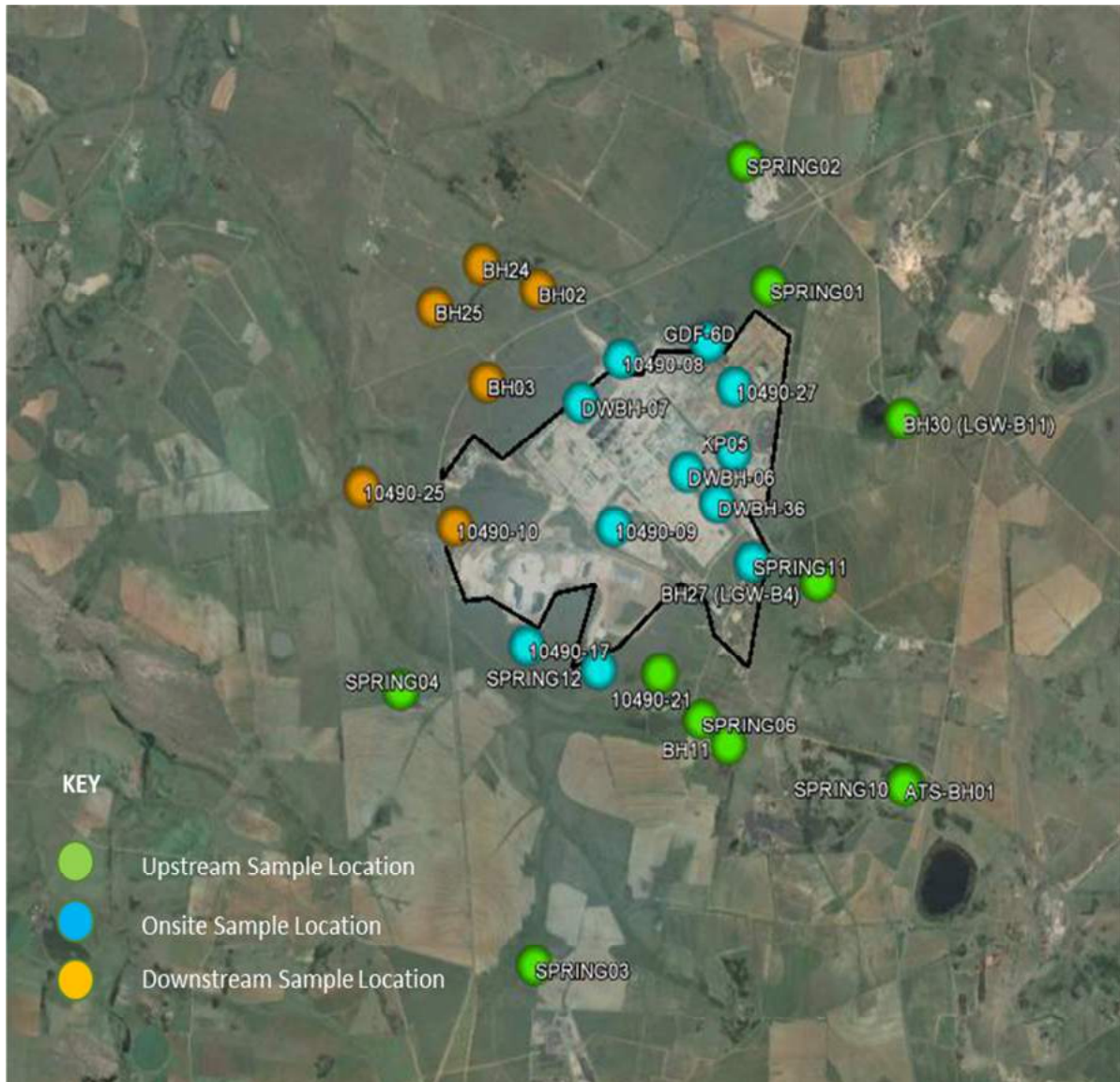


Figure 8: Surface Water Sample Locations

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**Figure 9: Site Plan showing Groundwater Sample Locations**

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### **3.9 Capacity and Institutions for Implementation**

Eskom's corporate purpose is to *"to provide sustainable electricity solutions to grow the economy and improve the quality of life of people in South Africa and the region"*. One of its eight strategic imperatives is *"reducing Eskom's environmental footprint and pursuing low-carbon growth opportunities"*, with one of its six values being zero harm (in terms of both environmental duty of care and safety).

Eskom has six environmental objectives set out in its corporate plan. These are as follows:

1. Informed decision-making to avoid harm to the natural environment;
2. Legal compliance;
3. Reduced air emissions with target defined;
4. Reduced water usage and discharge with target defined;
5. Waste reduction, reuse and discharge focused on ash, gypsum and PCB phase out;
6. Enhance ecosystem services.

Eskom has a SHEQ Policy (32-727) which sets out its commitments to and principles on safety, health, environment and quality. It has a management system comprising a number of subject specific policy, directive and guideline documents. In line with Eskom's commitment in its policy, the Kusile power station is ISO 14001 certified.

Sustainability is one of two Strategic Functions which reports to the Group Chief Executive. It provides a centre-led approach to management of environmental and social issues across the Group. Thirty two people make up the central Environmental Management Department within the Sustainability Function, with a total of approximately 180 environmental professionals across the business and a further 34 specialists focused on occupational health and safety. The central Environmental Management Department is structured to include:

- Subject Matter CoE - on air quality, water management, waste management and biodiversity, reporting and assurance, and impact assessment; and
- Business partners to the different operating units - including Generation, Transmission, Technology & Commercial, Distribution, Customer Services, Finance & Group Capital and Enterprise Development.

Eskom operates an established governance framework with an Environmental Steering Committee at its centre, reporting to the Executive and Management Committees and to the relevant Board committees. This Committee is supported by various subject focused sub-committees.

Eskom has a Research, Testing and Development (RT&D) department in Eskom's Sustainability Division. The RT&D department has the mandate to perform applied technical research, provide specialized technical services and perform specialized technical testing services for the electricity utility. They would provide the technical support to this CCPP project.

The RT&D department provides a variety of services to the Eskom organisation, including: scientific and technical advice, research and consulting, analysis, detailed design as well as strategic technical planning services and direction. The focus is predominantly on applied, not pure research and the research outputs are focused on the strategic and operational needs of Eskom.

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The department consists of over 400 innovators, scientists, environmentalists, engineers and researchers. The team is focused on solving and seeking the best solutions. The RT&D department comprises the following departments:

- Technology Strategy & Research Management;
- Plant Performance & Optimisation;
- Sustainability;
- Power Delivery & Utilisation;
- Human Performance.

Under the Plant Performance & Optimisation department is the Clean Coal & Fuel Resources CoE area, which has been formed to provide support to Eskom relating to Clean Coal Technologies. This CoE will provide the support to the CCPP project<sup>13</sup>.

### **3.10 Evidence of Consultation with Key Stakeholders**

No consultation or public participation has taken place at this stage of the CCPP due to its being at the concept phase and being at a desk-top assessment.

It is noted that should the project move further along the project life cycle and applications be made for the necessary environmental approvals, public participation and stakeholder engagement will take place.

It is anticipated that an amendment to the Kusile AEL would be required for the CCPP. In order to have the AEL amended an EIA would be required and in terms of South African legislation, public participation would be required to be undertaken through independent consultants.

In addition, it is noted that Kusile has an existing and well established independent EMC that is represented by relevant stakeholders, including adjacent communities, DEA, DWS and Eskom. This would be the platform for initial stakeholder engagement with regard to this project in the event that it progresses to the next phases of the project life cycle.

Chapter 6 of EIAR set out the public participation process, as part of the EA process. Further guidelines are also set out in "*Integrated Environmental Management Guideline Series (Guideline 7), Public Participation in the Environmental Impact Assessment Process*" (10 October 2012), made under NEMA.

EAPs manage the consultation process on behalf of Eskom, which requires giving notice to all potential interested and affected parties of the application for EA through:

- 1) fixing a notice board at a place conspicuous to the public at the boundary or on the fence of
  - a) the site where the activity to which the application relates is or is to be undertaken; and
  - b) any alternative site mentioned in the application;
- 2) giving written notice to:

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<sup>13</sup> Further information on Eskom's approach to sustainability can be found at:  
[http://www.eskom.co.za/OurCompany/SustainableDevelopment/Pages/Sustainable\\_Development.aspx](http://www.eskom.co.za/OurCompany/SustainableDevelopment/Pages/Sustainable_Development.aspx)  
Eskom publishes an annual Integrated Report, which can be accessed at:  
[http://www.eskom.co.za/OurCompany/Investors/IntegratedReports/Pages/Annual\\_Statements.aspx](http://www.eskom.co.za/OurCompany/Investors/IntegratedReports/Pages/Annual_Statements.aspx)

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- a) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  - b) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - c) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - d) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  - e) the municipality which has jurisdiction in the area;
  - f) any organ of state having jurisdiction in respect of any aspect of the activity; and
  - g) any other party as required by the competent authority;
- 3) placing an advertisement in:
- a) one local newspaper; or
  - b) any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of the EIAR;
- 4) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken;
- 5) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to:
- a) illiteracy;
  - b) disability; or
  - c) any other disadvantage.

The EAP managing an application must open and maintain a register which contains the names, contact details and addresses of all persons who have submitted written comments or attended meetings with the applicant or EAP, and all organs of state which have jurisdiction in respect of the activity to which the application relates.

Interested and affected parties are given opportunity to comment on draft report before finalisation as well as to appeal any decision made by the DEA.

The EAP is required to address all concerns of project affected and interested parties prior to submission of the final BA. Whilst public meetings are not a formal requirement, often the EAP will use open days and public meetings in seeking to address concerns.

The EAP managing an application for an EA must ensure that the comments of interested and affected parties are recorded in reports and that written comments, including records of meetings, are attached to the BA report submitted to the DEA.

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#### **4. Acceptance**

This document has been seen and accepted by:

<b>Name</b>	<b>Designation</b>
Noel Kamrajh	PCSP Manager: SANEDI

#### **5. Revisions**

<b>Date</b>	<b>Rev.</b>	<b>Compiler</b>	<b>Remarks</b>
December 2015	0	DD Lucas	Input to the World Bank appraisal of the CCPP

#### **6. Development Team**

The following organisations were involved in the development of this document:

- Eskom;
- SANEDI.

#### **7. Acknowledgements**

Process Plant Technology (PPTech);  
SANEDI.

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