	Kendal work instruction	Environmental management
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## **1. Introduction**

Environmental aspects and impacts of the activities, products and services at Kendal Power Station and areas over which the station exercises jurisdiction, need to be identified and assessed (in terms of significance) to enable the implementation of sound environmental management.

## **2. Supporting Clauses**

### **2.1 Scope**

#### **2.1.1 Purpose**

To establish, implement and maintain a method of identifying environmental aspects of Kendal Power Station activities, products and services that it can control and those that it can influence, within the defined scope of the Environmental Management System (EMS) and to determine those aspects that have, or can have, a significant impact on the environment and also to determine the risks and opportunities, related to Kendal Power Station's Environmental aspects, compliance obligations and other issues and requirements, identified in the context of the organization.

#### **2.1.2 Applicability**

This document is applicable to Kendal Power Station.

#### **2.1.3 Effective date**

The effective date for the implementation of this work instruction at Kendal power station will be date when the document is authorised.

## **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] ISO 9001 Quality Management Systems
- [2] ISO 14001 Environmental management system

### **2.2.2 Informative**

- [3] National Environmental Management Act, No.107 of 1998
- [4] \*1015695: Kendal document and records management work instruction
- [5] 240-53114002: Engineering change management work instruction

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[6] \*1015586: Kendal environmental scope and management system documentation work instruction

## 2.3 Definitions

Definitions	Explanation
<b>Abnormal Conditions</b>	Are irregular, non-permanent circumstances.
<b>Activity</b>	An action either planned, actual (existing) or historical, that occurs or is performed by employees on behalf of the company
<b>Compliance obligations</b>	Legal requirements that an organization has to comply with and other requirements that an organization has to or chooses to comply with.
<b>Emergency Conditions</b>	An unplanned and uncontrolled condition that might threaten or negatively influence the environment, human, life, assets and the continuous rendering of strategic and essential services or products.
<b>Employee</b>	An individual in the full-time or part-time / occasional employee of Kendal Power Station, including contracted workers as per the OHSAct.
<b>Environment</b>	The surroundings in which humans exist that is made up of the: <ul style="list-style-type: none"><li>- earth's land, water and atmosphere,</li><li>- micro-organisms, plant and animal life,</li><li>- any part or combination of (3.1.2.1) and (3.1.2.2) and the interrelationship among and between them and</li><li>- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well being</li></ul>
<b>Environmental aspect</b>	An element of an organisation's activity, product and service that can have a beneficial or adverse impact on the environment.
<b>Environmental impact</b>	The degree of change in the environment resulting from the effect of an activity on the environment, whether desirable or undesirable.
<b>Environmental Management Plan/Programme</b>	A documented plan or programme which captures short, medium and long term actions aimed at addressing environmental management at the Station.
<b>Environmental Objective</b>	Objective set by the organization consistent with its environmental policy.
<b>Frequency</b>	The intervals at which an environmental impact occurs.

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<b>Legal &amp; regulatory implications</b>	Legislative action taken against the Power Station or Eskom as a result of the environmental impact of the Station's activities, products or services.
<b>Life Cycle</b>	Consecutive and interlinked stages of a product (or service) system, from raw material acquisition or generation from natural resources to final disposal.
<b>Modified plant</b>	Any permanent or temporary change, deletion or addition to any system, equipment, structure including permanent changes to operating/protection/control set points, software and technical documentation which will result in any deviation from the established Design Base. This includes the replacement of SSC components with equivalent components of a different make or type.
<b>Normal Situations</b>	Refers to the situations during which a business is running normal as per the operational philosophy.
<b>Operational interference</b>	When an environmental impact affects the normal or optimal operation of the Power Station.
<b>Probability</b>	The possibility of an environmental impact occurring.
<b>Receiving environment</b>	The immediate natural surroundings which are affected (impacted) by an activity or environmental incident.
<b>Requirement</b>	Need or expectation that is stated, generally implied or obligatory.
<b>Risks and opportunities</b>	Potential adverse effects( Threats) and potential beneficial effects (opportunities)
<b>Severity</b>	The magnitude of the effect on the environment should an environmental impact be realized.
<b>Toxicity</b>	The degree to which a substance or activity is poisonous to the environment.

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## **2.4 Abbreviations**

<b>Abbreviation</b>	<b>Explanation</b>
<b>A&amp;I</b>	Aspects and Impacts
<b>EMP</b>	Environmental Management Plan/Programme
<b>EMS</b>	Environmental Management System
<b>NEMA</b>	National Environmental Management Act, No.107 of 1998
<b>OHSAct</b>	Occupational Health and Safety Act, No. 85 of 1993

## **2.5 Roles and Responsibilities**

2.5.1 Each Departmental Manager with the assistance from environmental department where necessary, is responsible for:

2.5.1.1 Identification of environmental aspects in their area of responsibility.

2.5.1.2 Determination of significance rating of the identified environmental aspects and impacts.

2.5.1.3 Review environmental aspects/impacts and the associated significance rating when required.

## **2.6 Process for Monitoring**

Implementation of this work instruction will be monitored during SHEQ file reviews and or during audits.

## **2.7 Related/Supporting Documents**

[1] \*1028939: Kendal identification of aspects and impacts form

[2] \*1028937: Kendal quantification of aspects and impacts significance rating form

[3] \*1028938: Kendal explanation for the quantification of aspects and impact/s significance rating

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### **3. Environmental aspect and impacts, risks and opportunities identification, rating and management process work instruction: General ISO 14001 requirements**

Kendal power station has considered clauses 4.1& 4.2 of the ISO 14001:2015 requirements when planning for environmental management systems in clause 6.1.1 to 6.1.4.

#### **3.1 Determining of Kendal Power Station's risks and opportunities**

3.1.1 Environmental Department, will identify all the station risks and opportunities using the Kendal power station's Risks and Opportunities Register (\*1036669) template.

3.1.3 The responsible manager from each department, with the assistance from the Environmental Department, will identify all the departments risks and opportunities using the Kendal power station's Risks and Opportunities Register (\*1036669) template.

#### **3.1.4 The risks and opportunities shall be identified based on the following.**

3.1.4.1 Kendal power station's significant aspects and impacts, compliance obligations and the internal and external issues.

#### **3.2 Identification of environmental aspects**

3.2.1 The responsible manager from each department, with the assistance from the Environmental Department, will identify all the department's activities, products and services and capture this information as per the Identification of aspects and impacts form (Appendix A), either electronically or manually.

3.2.2 The environmental aspects are identified based on:

3.2.2.1 A description of the activities that take place in the area/operations.

3.2.2.2 Other environmental impacts of the activities

3.2.2.3 Any changes in the department's activities, products or services, new developments, and new or modified activities.

3.2.3 Identified aspects must be assigned applicable controls such as elimination, substitution, engineering, administrative etc.

3.2.4 Identified aspects must be assigned applicable controls such as elimination, substitution, engineering, administrative etc.

#### **3.2.5 When determining environmental aspects and associated impacts, the following must be taken into account:**

3.2.5.1 Potential and actual impacts

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3.2.5.2 Positive and negative impacts

3.2.5.3 Direct and indirect impacts (resource use such as electricity consumption is an example of an indirect impact.) inputs and outputs associated with current, past and planned activities, products and services

3.2.5.4 Normal, abnormal and reasonable foreseeable emergency situations

3.2.5.6 Potential secondary and cumulative impacts

3.2.5.7 All elements of the environment as defined in 2.3 above

3.2.5.8 The extent to which Kendal power station has influence over its activities, products and services

3.2.5.9 Emissions to air, releases to water, releases to land, use of raw materials and natural resources, waste and by-products.

3.2.5.10 Consideration of life cycle perspective in all Kendal Power Station's activities, products and services

3.2.6 Environmental aspects are categorised into four categories according to the circumference over which an impact can occur and spread.

The four categories are:

3.2.6.1 Category A=Global

3.2.6.2 Category B=National

3.2.6.3 Category C=Provincial

3.2.6.4 Category D=Local

### **3.3 Rating of environmental aspects and impacts**

3.3.1. The environmental aspects relating to department's activities, products and services are rated using the quantification of aspects and impacts significance rating (Appendix B) and assigning values to each negative impact according to each criterion detailed in Annexure B.

3.3.2 Appendix B quantification rating methodology uses an exponential growth curve where it multiplies on a regular interval. i.e.  $1 \times 1 = 1$ ;  $2 \times 2 = 4$ ;  $4 \times 4 = 16$  and  $16 \times 16 = 256$ .

3.3.3 Should an aspect and its associated impact/s appear not to trigger a particular rating criterion, the lowest score must be allocated to the specific criterion being rated (i.e. the value received for that criterion will be one).

3.3.4 When rating negative impacts, the current situation is assessed taking the worst case scenario into account i.e. a precautionary principle must be adopted, therefore, actual and even potential environmental impacts under the current controls or circumstances must be rated accordingly.

3.3.5 Positive impacts are not rated for significance, although effort should be made to maintain or increase the good effect of the positive impact and they should be highlighted in green colour on the aspect and impact register.

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3.3.6 The rating can be done electronically by completing the excel spread sheet attached to the aspects & impact register or by completing Appendix B significant rating form.

3.3.7 Significant aspects and impacts are those with a significant rating score of half of the highest rated score and above on the station aspects & impacts register.

3.3.8 EMPs must be developed for significant environmental aspects and impacts.

3.3.9 Additional legal & other requirements sheets to describe how these legal and other requirements impacts on KPS activities, products and services was added as a minimum to forms part of the aspects & impacts register.

#### **3.4 The environmental aspects and impacts register, EMP and planning actions**

3.4.1 The Identification of aspects and impacts (Appendix A) and the quantification of aspects and impacts significance rating using Appendix B, form the basis of Kendal power station's aspect and impact register. An electronic version of the combination of these forms is available under the file 'current environmental aspect and impacts register' on the G drive.

3.4.2 Station significant impacts are highlighted in red on the electronic version of current environmental aspect and impacts register.

3.4.3 The significant aspects and impacts must be reviewed annually as a minimum, or earlier (but not limited to) when there is a planned or actual change in the plant (new/modified plant installed or old plant decommissioned), or an emergency situation evaluation reveals the need for inclusion of new aspects/ratings or there is a change in legal and other requirements related to an aspect.

3.4.4 Aspects that are not significant must be reviewed (but not limited to) when there is a planned or actual change in the plant (new/modified plant installed or old plant decommissioned), or an emergency situation evaluation reveals the need for inclusion of new aspects/ratings or there is a change in legal and other requirements related to an aspect or every third year.

3.4.5 Aspects and impacts which have had a change in rating score from significance to non-significance during the review process must be listed on the explanation for the re-quantification of aspects and impacts significance rating (Appendix C ) to ensure that the reasons for changing a particular score during the review of the environmental aspect and impacts register, has been captured.

3.4.6 Once a new revision of the environmental aspect and impacts register is finalised, it is placed on the G drive as the 'current environmental aspect and impacts register' and any previous version of the register must be archived as per work instruction \*1015695 (Kendal document and records management work instruction).

3.4.7 Actions to address Kendal power station's significant environmental aspects, compliance obligations and risks and opportunities shall be identified in the Station's EMP.

3.4.8 The Station EMP must, at a minimum, contain:

3.4.8.1 Monitoring frequency

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3.4.7.2 Reference to significant aspects

3.4.7.3 Area of activity

3.4.7.4 Quantitative or qualitative targets

3.4.7.5 Specific actions addressing aspects and impacts

3.4.7.6 Target dates for completion of actions

3.4.7.7 Resources required (including responsible person/s; financial allocations; equipment; training and awareness)

3.4.7.8 Progress on actions addressed

3.4.8 All the revisions and updates or changes made to the environmental aspects and impacts registers and EMP documents must be captured on the environmental aspects and impacts registers and EMP documents on the sheet called review. The information to be captured shall include the following: Date of review, applicable department, details of updates, names of who was part of the review and the revision numbers. Attendance registers must also be signed off and be kept as proof of the review team.

#### 4. Acceptance

This document has been seen and accepted by:

Name	Designation
Yangaphe Ngcashi	Acting General Manager
Lomile Ngqendesha	Acting Outage Manager
Emeldah Madike	Environmental Manager
Karlheinz Von Bentheim	Acting Integrated Risk Manager
Mandla Dube	Human Resource Manager
Thapelo Mokoena	Finance Manager
Maditaba Kubheka	Training manager
Bonga Mashazi	Engineering Manager
Sello Kgantsi	Acting Maintenance Manager
Bafana Radebe	Acting Operating Manager
Boipelo Molema	Programme Manager
Johan Van Niekerk	BU Compliance Manager
Phumelele Thanjekwayo	Coal & Ash Manager
Nomsa Tshabalala	Senior Production Manager
Mildrad Mahlaba	Chemical Services Manager
Nonhlanhla Khumalo	Performance and Testing Manager
Carol Ngobeni	Materials Management Manager
Buyelwa Basholo	Safety Manager
Alice Mtshweni	Acting Ops Services Manager

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Name	Designation
Yangaphe Ngcashi	Acting General Manager
Lomile Ngqendesha	Acting Outage Manager
Emeldah Madike	Environmental Manager
Karlheinz Von Bentheim	Acting Integrated Risk Manager
Mandla Dube	Human Resource Manager
Thapelo Mokoena	Finance Manager
Maditaba Kubheka	Training manager
Bonga Mashazi	Engineering Manager
Sello Kgantsi	Acting Maintenance Manager
Malibongwe Mabizela	Boiler Engineering Manager
Mapule Madingoane	C&I Maintenance Manager
Mbali Molefe	C&I Engineering Manager
Biko Dzhalagome	Acting Boiler Maintenance Manager
Queen Ramalepe	Acting Civil Maintenance Manager
Johan Swanepoel	Process Engineering Manager

## 5. Revisions

Date	Rev.	Compiler	Remarks
May 2020	06	T. Vilane	3.2.2 Was added, explanation of significant rating methodology as per the EMS internal audit opportunity for improvement.
June 2019	05	K Mahlangu	Appendix A was updated with a column on Life Cycle. Work instruction was amended to match the ISO 14001 transition standard. Clauses were changed under section 6.1.1 as per the new ISO 14001 Standard. Under <b>section 3.1 risk and opportunities</b> ,

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			compliance obligations, internal and external issues were added as per the ISO 14001 2015 standard. <b>Under 3.1.5.10 The activities, products and services lifecycle perspective were added.</b>
February 2017	04	T. Vilane	Work Instruction on how to capture changes and updates made to the Aspects and Impacts registers and EMP documents under section 3.3.8
August 2015	03	T. Rabedzwa	Form on page 11 (Appendix B) was revised and additional information (Definitions) under section 2.3 added.
March 2015	02	T. Rabedzwa	Procedure due for review. New and additional information added under sections: 2.5; 2.6; 2.7; 3.1 and appendix A; B & C
April 2012	01	T. Rabedzwa	Additional clarification added to point 4.3.3; Addition of point 3.1.14
March 2012	00	T. Rabedzwa	Entire procedure re-written and procedure reference numbering changed to sequential SAP numbering (revision reverts to 00 due to new sequential numbering system)

## 6. Development Team

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

- Tshilidzi Vilane
- Tsakani Holeni
- Klaas Mahlangu
- Irene Motswenyane

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## 7. Acknowledgements


None

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## Appendix A – identification of aspects and impacts form

	<b>Kendal Power Station</b> <b>Identification of Aspects and Impacts Form</b>	Unique Identifier	*1028939
		Document Type	Form
		Revision	00
		Authorisation Date	June 2019
		Review Date	June 2022
		Environmental Management	

Area / Activity/ Operations	Aspects	Condition	Impacts	A & I Ref. No.	Life cycle (Yes / No)	Category	Controls and Operational Document Reference (if applicable)	Final Significance Rating Score <sup>#</sup>	Significant (Indicated with "YES")	EMP Ref.	Legal & other requirements	Other Requirement/s Reference	Monitoring Measurement Required/monitoring systems

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A&I Ref. No.	Significance Rating Criteria								Final score	Significant (indicated with "YES")
	Probability	Severity	Frequency	Receiving environment	Toxicity	Legal & regulatory implications	Public reactions & complaints	Operational interference		

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**Appendix B- quantification of aspects and impacts significance rating form**

	<b>Kendal Power Station Aspects and Impacts Significance Rating</b>	Unique Identifier	*1028937
		Document Type	Template
		Revision	01
		Authorisation Date	June 2019
		Review Date	June 2022
		Environmental Management	

Significance Criteria	Value					Score
	256	16	4	2	1	
<b>Probability</b>	Impact will definitely occur	Impact may occur once annually	Impact may occur less than once annually but at least twice every five years	Impact may occur one to two times (maximum) in Station's life	Very unlikely for impact to occur / Impact will not occur	
<b>Severity</b>	Impact potentially reaches beyond national boundaries	Impact will potentially affect neighbouring provinces	Impact confined to local province	Impact confined to local region but not province wide	Impact confined to Eskom property / site	
<b>Frequency</b>	Continual or weekly occurrence	Impact will occur once a month	Impact will occur once a year	Impact will occur once every ten years	Possible that impact will never occur in Station's life	
<b>Receiving environment</b>	Very sensitive, pristine area – protected site	Undisturbed area containing indigenous species	Disturbed area rehabilitated and recovering from prior impacts	Disturbed area in need of rehabilitation	Semi-disturbed	

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<b>Toxicity</b>	Impact poisonous to natural environment and is not contained – no rehabilitation possible	Impact potentially poisonous to natural environment and is partially contained – some rehabilitation possible	Impact potentially poisonous to natural environment and is partially contained & can be completely rehabilitated	Impact is potentially poisonous to natural environment but is completely contained	Impact is not poisonous to natural environment	
<b>Legal &amp; regulatory implications</b>	Strict regulations, require permits & licences	Legislated with no permit/licence requirements	Potential for regulatory action	Possibly no	No	
<b>Public reactions &amp; complaints</b>	Complaints from international	Complaints from local	Complaints from national, provincial	Internal complaints (employees & service providers)	No	
<b>Operational interference</b>	Yes	Possible	Potentially possible	No - unless under abnormal / emergency conditions	No	
<b>TOTAL SIGNIFICANCE RATING SCORE</b>						

Aspect: \_\_\_\_\_

Related Impact: \_\_\_\_\_

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