

ESKOM GENERATION: DUVHA POWER STATION ("DPS")



Environmental Legal Compliance Audit Report

Final Report: 11 May 2016

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Table of Contents

- 1. Audit Objectives**
- 2. Audit Scope**
- 3. Audit Methodology**
- 4. Identification of the Audit Client**
- 5. Identification of the Auditor**
- 6. Date and Site of Audit**
- 7. Audit Criteria**
- 8. Abbreviations Used**
- 9. Executive Summary**
- 10. Audit Findings**
- 11. Conclusions**

1. Audit Objectives

The objective of this audit was to determine the extent of DPS's legal compliance with applicable national, provincial and local authority environmental legislation at the Duvha Power Station

2. Audit Scope

It was agreed that a baseline audit would be conducted, in terms of which the auditor would audit the entire site. An audit schedule was generated in consultation with a representative of DPS and the areas reflected in this audit schedule were audited.

Areas of compliance and non-compliance are reported on. Where appropriate (or if so requested), the auditor made suggestions on site and during the audit with regard to appropriate corrective actions.

3. Audit Methodology

The audit process followed was based on the requirements and guidelines of SANS 19011:2012 and entailed audit preparation, audit execution and the submission of an audit report.

It must be noted that the auditor relied on the information and documentation supplied to the auditor by DPS's representatives, as well as from information gathered during a site inspection.

The audit was conducted against relevant legislation as at 29 February 2016. As this was not a certification audit, the information supplied by DPS has been relied on and was, in appropriate circumstances, assumed without independent verification.

4. Identification of the Audit Client

The Audit Client is Eskom Generation: Duvha Power Station

5. Identification of the Auditor

The audit was conducted by a member of Eco Impact's qualified team of auditors. The audit was conducted by:

- a. Daniel Weber ("DW") - (Lawyer and Environmental Auditor).

6. Date and Site of Audit

The audit was conducted over 2 days, commencing on Wednesday 30 March 2016 and ending on Thursday 31 March. The activities at the Duvha Power Station, Old Bethel Road, Emalahleni were audited. Unfortunately the 2 audit days of were not sufficient and as such the ability to thoroughly audit all areas was severely restricted. It is suggested that future audits should make provision for at least 3 days of auditing in order that a more comprehensive audit can be completed.

7. Audit Criteria

The activities at DPS were audited against applicable national, provincial and local authority environmental legislation. The auditor also inspected the Air Emissions License 17/04/AEL/MP312/11/07, Registration in Terms of APPA 1025/3, Water Use Licenses 24013693 and 27/2/1/C211/1/1 and various specialist reports and documentation relevant to the scope of the audit. For the purposes of this report only the emissions related findings have been included.

8. Abbreviations Used

The following abbreviations (in alphabetical order) have been used below:

Atmospheric Emission Licence No: 17/04/AEL/MP312/11/07	AEL
Atmospheric Emission Management Plan	AEMP
Annual Emissions Report	AER
Emission Offset Programme	EOP
Emission Reduction Plan	ERP
Eskom Generation	EG
National Atmospheric Emissions Inventory System	NAEIS
National Atmospheric Emission Reporting Regulations	NAERR
National Environmental Management Act, 107 of 1998	NEMA
National Environmental Management: Air Quality Act, 39 of 2004	NEMAQA
National Environmental Management: Air Quality Act, 39 of 2004: Listed Activities and Associated Minimum Emission Standards Identified in Terms of Section 21 of the Act	GN 893
National Environmental Management: Air Quality Act, 39 of 2004: National Dust Control Regulations	NDCR
Oxides of Nitrogen	NO_x
Particulate Matter	PM
Particulate Matter Emissions	PME

9. Executive Summary

9.1. Air Quality Concerns

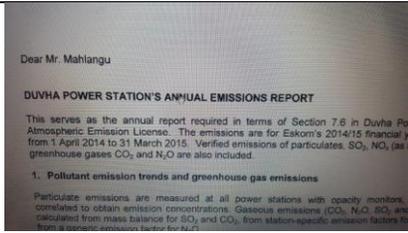
The auditor inspected the emissions trend for DPS. It was noted that the requirements of Conditions 7.3.2 – 7.3.3 of the AEL were exceeded. It must be noted that DPS completed and submitted s30 incident reports for each instance in which the limits were exceeded.

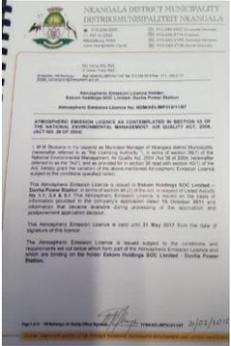
Dust fallout monitoring was commenced by DPS in 2014. They have not received any results due to a contractual dispute. The auditor was informed that Reton Engineering now conducts the monitoring. It must be noted that the monitoring was to commence in March 2013. It is therefore unknown whether DPS comply with the NDCR. DPS must ensure that they comply with the conditions of the AEL, and that monitoring is conducted and submitted as is required by the conditions of the AEL.

Upon inspection of the AERP for 2014/2015, it is evident that the PM levels at Units 4-6 exceeded the limits as required by Category 1.1 of GN 893 on a regular basis. The limit is 100 mg/Nm³ and this is regularly exceeded. It is understood that this was caused by the refurbishment of the SO₃ plant. DPS must ensure measures are put in place to take reasonable steps to mitigate such occurrences as soon as reasonably possible.

DPS must adhere to submission timeframes for any reports, documents or responses. There are numerous instances where it is either unknown when documents were submitted or they have not been submitted timeously.

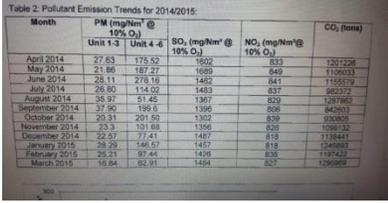
10. Audit Findings

Duvha Power Station			
Environmental Legal Compliance Audit Findings			
No.	Findings	Legal Reference	Photograph
DPS:EC1.	The complaints register for the AEL has been implemented and contains the required information. It is also included in the monthly emissions reports.	Condition 7.6 AEL	NPA
DPS:EC2.	A Fugitive Emission Plan has been developed and has been submitted to the local authority. It has been included in AEMP.	Condition 7.4 AEL	NPA
DPS:EC3.	The annual report for the AEL has been compiled and submitted. The report for the 2015/2016 period is yet to be submitted.	Condition 7.6 AEL	 <p>The photograph shows a document titled "DUVHA POWER STATION'S ANNUAL EMISSIONS REPORT". The text on the document includes: "Dear Mr. Mahiangu", "This serves as the annual report required in terms of Section 7.6 in Duvha Power Station's Atmospheric Emission License. The emissions are for Eskom's 2014/15 financial year from 1 April 2014 to 31 March 2015. Verified emissions of particulates, SO₂, NO_x and greenhouse gases CO₂ and N₂O are also included.", and "1. Pollutant emission trends and greenhouse gas emissions". Below this, it states: "Particulate emissions are measured at all power stations with opacity monitors, combined to obtain emission concentrations. Gaseous emissions (CO₂, N₂O, SO₂) are calculated from mass balance for SO₂ and CO₂, from station-specific emission factors or from a generic emission factor for N₂O."</p>
DPS:EC4.	DPS has registered on the NAEIS. Although they have not registered individually, EG has registered as an entity.	Regulation 5 NAERR	NPA

DPS:EC5.	A copy of the AEL was on site an available for inspection	Condition 4.4 and 7.2.3 AEL	
DPS:EC6.	Condition 7.3.3 was not complied with in September 2015. DPS investigated and reported the incident in terms of s30 of NEMA as required by Condition 7.3.4 of the AEL.	Condition 7.3.3 and 7.3.4 AEL	NPA

Duvha Power Station			
Environmental Legal Compliance Audit Findings			
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DPS:ENC1.	The EOP was to be submitted by 31 March 2016. The auditor was informed that this is being completed by head office and as such they have little control over when it will be submitted.	Condition 4.4 AEL	NPA
DPS:ENC2.	DSP has conducted an investigation into the “Maximum Release Rates Under Start-Up, Maintenance and Shut Down Operating Conditions”. It was required to be submitted immediately on receipt of the license which was 31/03/15. It was only submitted on 10 March 2016.	Condition 7.7 AEL	
DPS:ENC3.	The auditor observed the emissions trend for DPS. It was noted that the requirements of Conditions 7.3.2 – 7.3.3 of the AEL were exceeded.	Conditions 7.3.2 and 7.3.3 AEL	NPA

<p>DPS:ENC4.</p>	<p>Dust fallout monitoring was commenced by DPS in 2014 however they have not received any results due to a contractual dispute. The auditor was informed that Reton Engineering is now conducting the monitoring.</p> <p>It is therefore unknown whether DPS are complying with the NDCR. It must also be noted that the monitoring was to commence in March 2013.</p>	<p>Condition 7.5 AEL and Regulation 4 and 5 NDCR</p>	<p>NPA</p>
<p>DPS:ENC5.</p>	<p>A cold start-up of Unit 4 was conducted on 27 November 2015. The emissions results were included in the RSSD in order to comply with the requirements of the AEL.</p> <p>The PME was above the limits prescribed and did not normalize after 72 hours as required by Condition 7.3.3.</p> <p>SO₂ and NO_x levels were not measured as required. It is noted that DPS indicated that these <i>“results will be provided once the Gaseous CEMS is connected to the DCS.”</i></p>	<p>Condition 7.3.3 AEL</p>	<p>Dear Dr Mohli</p> <p>DUVHA POWER STATION - INVESTIGATION INTO EMISSIONS DURING START UP AND SHUT DOWN</p> <p>The Duvha Atmospheric Emission Licence (NDMA/EL/MP/12/11/07 dated 2015/03/31) requires that the licensee undertake an investigation to measure, monitor and report on gaseous emissions released during the start-up, maintenance and shut-down conditions (Section 7.3.3). The correspondence summarises the emissions during a representative start-up (and shutdown) condition in fulfillment of the AEL condition.</p> <p>Duvha Power Station utilizes two different particulate matter abatement technologies: units 1, 2 and 3 use Pulse Jet Fabric Filter Plant (PJFF) and units 4, 5 and 6 use Electrostatic Precipitator Plant (ESP) coupled with a Rotoclean Trioxide (SO₃) Sulphur conditioning system. Emissions quantification was performed on a unit that uses ESP, because particulate matter emissions are higher on units using this system than on units retained with PJFF. The situation is the reverse of the start-up conditions and, as a result, no additional physical measurements were taken for the shutdown period. During the maintenance and start conditions, the emissions are dependent on the nature of the problems being experienced and an attempt to quantify the emissions at the time will be made, if possible at all. However, the ESPs are in service at the time when the unit is shutdown and no further physical measurements.</p>

<p>DPS:ENC6.</p>	<p>Upon inspection of the AERP for 2014/2015 it is evident that the PM at Units 4-6 exceeded the limits as required by Category 1.1 of GN 893 on regular occasions. For example:</p> <ul style="list-style-type: none"> • April 2014 – 175.52 mg/Nm³ • May 2014 – 187.27 mg/Nm³ • June 2014 – 278.16 mg/Nm³ <p>The limit is 100 mg/Nm³ and was thus being greatly exceeded. It is noted that this was mainly caused by the refurbishment of the SO₂ plant.</p>	<p>Section 21 NEMAQA, Category 1.1 GN 893 and Condition 7.2 AEL</p>	 <table border="1"> <caption>Table 2: Pollutant Emission Trends for 2014/2015</caption> <thead> <tr> <th rowspan="2">Month</th> <th colspan="2">PM (mgNm³ @ 10% O₂)</th> <th rowspan="2">SO₂ (mgNm³ @ 10% O₂)</th> <th rowspan="2">NO_x (mgNm³@ 10% O₂)</th> <th rowspan="2">CO₂ (tms)</th> </tr> <tr> <th>Unit 1.3</th> <th>Unit 4.4</th> </tr> </thead> <tbody> <tr> <td>April 2014</td> <td>27.63</td> <td>175.52</td> <td>1932</td> <td>833</td> <td>1201228</td> </tr> <tr> <td>May 2014</td> <td>21.86</td> <td>187.27</td> <td>1889</td> <td>849</td> <td>1199033</td> </tr> <tr> <td>June 2014</td> <td>28.11</td> <td>278.16</td> <td>1462</td> <td>841</td> <td>1156373</td> </tr> <tr> <td>July 2014</td> <td>26.80</td> <td>114.02</td> <td>1483</td> <td>837</td> <td>862372</td> </tr> <tr> <td>August 2014</td> <td>35.97</td> <td>51.46</td> <td>1307</td> <td>859</td> <td>1287861</td> </tr> <tr> <td>September 2014</td> <td>37.50</td> <td>199.6</td> <td>1365</td> <td>866</td> <td>842012</td> </tr> <tr> <td>October 2014</td> <td>20.31</td> <td>201.50</td> <td>1302</td> <td>839</td> <td>830805</td> </tr> <tr> <td>November 2014</td> <td>33.3</td> <td>121.68</td> <td>1366</td> <td>826</td> <td>1088132</td> </tr> <tr> <td>December 2014</td> <td>22.57</td> <td>77.41</td> <td>1487</td> <td>818</td> <td>1138441</td> </tr> <tr> <td>January 2015</td> <td>39.28</td> <td>146.52</td> <td>1457</td> <td>819</td> <td>1248802</td> </tr> <tr> <td>February 2015</td> <td>25.21</td> <td>97.44</td> <td>1458</td> <td>826</td> <td>1187422</td> </tr> <tr> <td>March 2015</td> <td>18.84</td> <td>92.91</td> <td>1484</td> <td>827</td> <td>1266889</td> </tr> </tbody> </table>	Month	PM (mgNm ³ @ 10% O ₂)		SO ₂ (mgNm ³ @ 10% O ₂)	NO _x (mgNm ³ @ 10% O ₂)	CO ₂ (tms)	Unit 1.3	Unit 4.4	April 2014	27.63	175.52	1932	833	1201228	May 2014	21.86	187.27	1889	849	1199033	June 2014	28.11	278.16	1462	841	1156373	July 2014	26.80	114.02	1483	837	862372	August 2014	35.97	51.46	1307	859	1287861	September 2014	37.50	199.6	1365	866	842012	October 2014	20.31	201.50	1302	839	830805	November 2014	33.3	121.68	1366	826	1088132	December 2014	22.57	77.41	1487	818	1138441	January 2015	39.28	146.52	1457	819	1248802	February 2015	25.21	97.44	1458	826	1187422	March 2015	18.84	92.91	1484	827	1266889
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11. Conclusions

The auditor would like to thank DPS's representatives for their input during the audit.

There are certain issues that must be addressed. Measures must be implemented to rectify the areas of non-compliance. With careful planning and execution, the auditor is confident that the DPS can improve legal compliance on site.



Daniel Weber
11 May 2016