The Independent Review Mechanism

SECOND MONITORING REPORT

On the Implementation of the Updated Management Action Plan for the - Medupi Power Project, South Africa

July 2017
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Annex 1: Seventh Update on the Progress in Implementing the Action Plan approved by the Boards on the Medupi Power Project for Independent Compliance Review, February 2017
LIST OF ABBREVIATIONS

AfDB  African Development Bank Group
CEMP  Construction Phase Environmental Management Plan
CRMA  Climate Risk Management and Adaptation Strategy
BCRM  Compliance Review and Mediation Unit
DEA   South African Department of Environmental Affairs
DMR   South African Department of Mineral Resources
DPE   South African Department of Public Enterprises
DWS   South African Department of Water and Sanitation
ECO   Environmental Control Officer
EIA   Environmental Impact Assessment
EMC   Environment Monitoring Committee
EUR   Euros
FGD   Flue Gas Desulphurization
IRM   Independent Review Mechanism
IWRMP Integrated Water Resource Management Policy
LEDET Limpopo Department of Economic Development, Environment and Tourism
MCIO  Medupi Central Information Office
MCWAP Mokolo-Crocodile Water Augmentation Project
OEMP  Operational Phase Environmental Management Plan
RESA  Regional Environmental and Social Assessment Report
SO2   Sulphur Dioxide
PM10  Particulate Matter including Dust
PM2.5  Fine Particulate Matter
UA    Unit of Accounts
ZAR   South African Rand
1. INTRODUCTION

This Second Monitoring Report on the implementation of the Updated Management Action Plan for the Medupi Power Project prepared by the Independent Review Mechanism (IRM) is submitted to the Boards of Directors of the African Development Bank Group (AfDB) for consideration and approval. The objective of the second monitoring exercise was to assess progress made in the implementation of the Management Action Plan of the Medupi Power Project which was approved by the Boards of Directors on 13 February 2013. The Management Action Plan was designed to bring the Medupi project into compliance with the applicable Bank policies and procedures, as a result of the IRM Compliance Review Report which was submitted to the Boards of Directors of the African Development Bank on 24 January 2012. The Compliance Review Report had noted a number of instances of non-compliance with Bank policies and the related harm caused on people and the environment. The Boards authorized the IRM to conduct annual monitoring of the Management Remedial Action Plan on 13 February 2013, including the scope of the annual monitoring by the IRM. The findings of the First IRM Monitoring Report were approved by the Board of Directors on 26 November 2015.

This Second Monitoring Report is based on the findings of the field visit, conducted by the IRM from 19 to 25 February 2017, to South Africa, by Mr. Sekou Toure, Director of BCRM and Mrs. Arntraud Hartmann, IRM Expert. It is further based on desk reviews of relevant documents provided by Management, including project supervision reports and comments made by selected staff during interviews.

The Project

The Medupi Power Project consists of the construction of a 4,764 MW coal fired power plant in Lephalale, Limpopo Province, South Africa. When fully operational, the plant will operate with 6 units of about 800 MW each. The plant is designed to use coal from a near-by coal mine. The plant operates with supercritical technology and a closed cooling system. The plant is not equipped with Flue Gas Desulphurization (FGD) equipment, but assurances have been given that FGD equipment will be retrofitted no later than six years after each unit has become fully operational. On 25 November 2009, the Board of Directors of the Africa Development Bank approved a loan not exceeding Euro 930 million for the supply and installation of six boilers and turbo-generators in the Medupi project. The project is also co-financed by the World Bank. At the time of the Board approval, the total project costs were estimated at Euro 11.2 billion.

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1 ADB/BD/WP/2012/12/Add.1/Rev.2, 13 February 2013
Currently, the project is in transition from the construction to the operational phase. Two units are presently under commercial operation while four units are either under construction or in the testing phase. After significant delays, the first unit came into commercial operation in August 2015. A second unit began commercial operation in March 2017. It is planned that all units will be fully operational by 2020. For the project to comply with National Air Quality Standards retrofitting of the units with FGD equipment will start in 2021, six years after the first unit became operational. In spite of delays in the units becoming operational, the project has not stopped receiving coal supply from the contractors ending up in large quantities being stored at the project site.

**The Complaint and Compliance Review**

The complaint relating to Medupi project was filed on 28 September 2010 by two South African nationals who asked the Director of the Compliance Review and Mediation Unit (CRMU) (now referred to as the BCRM) to keep their identities confidential. The IRM submitted the project Compliance Review Report to the Boards of Directors in January 2012. The Report established several instances of non-compliance with the applicable Bank policies and procedures and their related harm. These instances are summarized in the following paragraphs.

(i) **Climate Change and Related Environmental Issues:** The Requestors’ concern related to: (i) the Bank’s compliance with the promotion of a “clean sustainable energy sector”; (ii) the adequacy of social and environmental studies conducted regarding the assessment of cumulative impacts; and (iii) the linkage between this project and the Bank’s and the Borrower’s approaches to climate change. The Panel of the IRM Experts determined that the Bank’s policies on energy and environmental assessments were applicable. The Appraisal Report presented to the Boards of Directors of AfDB in November 2009 noted that South Africa was already the 11^th^ largest emitter of greenhouse gases in the world, and was likely to rise in this global ranking, as a result of Medupi and other planned coal fired power stations. Nonetheless, the appraisal report and its annexes did not describe any steps that the Bank had taken to ensure that this large coal-fired project was compliant with the full range of applicable Bank policies.

(ii) **Local Environmental Issues Related to Air and Water:** The Requestors complained that: “communities living near the Medupi plant will have negative impacts on their health from air pollution, elevated sulfur-dioxide (SO2) levels, and mercury residues in their water, air and land; constrained access to water; and negative impacts on livelihoods from degradation of land and water in their largely agrarian area.” Management noted that FGD equipment would be installed six years after each unit has become operational. The IRM Panel identified the uncertainties regarding installation of FGD due to the: (i) inadequacy of water supply for the water intensive FGD technology; and (ii) inadequate management of waste, primarily gypsum, produced by this technology.
In terms of water access, the concerns of the Requestors were about stresses from the construction and operation of the Medupi power plant in an area where demand for water is high and water supply inadequate. Land and water degradation can take many forms in such a project. While the waste ash is designed to be minimally liquid and a lining will be installed between the Medupi ash dump and the soil, there remains the risk that the ash dump could leak into the ground and contaminate the local ground water supply, and dry toxins on the surface could be carried away as air pollutants. The FGD technology, if installed, would generate two major waste streams: (i) it generates wastewater that can only be partially recycled; and (ii) it will produce massive quantities of gypsum.

Furthermore, the Compliance Review Report found non-compliance with AfDB environmental policies resulting from sand mining in the Mokolo River which was done without rehabilitation for sand utilized in the construction of the Medupi plant.

(iii) **Desecration of Graves and Land Claims:** The compliance review found non-compliance with the Bank Group’s Policy on Involuntary Resettlement Policy, 2003 as communities were inadequately consulted about the location of graves on the project site. The Requestors stated that “the Bank failed to consider community consultations and participation processes in the assessment of the project, and that local communities, who live close to the power plant were subjected to removals and desecration of ancestral graves.” The issue of inadequate consultation of the traditional population on location of graves was inflammatory for the community. The project developer identified only two “formal” grave sites, but the Requestors and community members insisted that unmarked graves were scattered throughout the project area. The Involuntary Resettlement Policy requires the Bank staff to pay careful attention to the needs of disadvantaged groups who may not have formal title to land but may have special sentimental attachment to particular pieces of land. There was no evidence to indicate that the borrower engaged in consultations with the local community about either the existence of unmarked or symbolic graves or land claims.

(iv) **Public Consultations:** The Compliance Review found non-compliance with the consultations requirements of the Bank Group’s Policy on Involuntary Resettlement.

2. **KEY FINDINGS AND RECOMMENDATIONS OF THE SECOND IRM MONITORING REPORT**

The IRM Monitoring Team recognizes that significant efforts have been made to implement Management Action Plan item 5.1 (Desecration of Graves and other Heritage Issues) and wants to congratulate Eskom and the AfDB staff for this effort. The IRM Monitoring Team also notes that Action Plan item 2 - Regional Environmental and Social Assessment (RESA) study has been completed. The IRM recognizes that Eskom has made efforts in improving communications with
communities and has started to support the communities with special projects. However, while relationships with the municipality appear to be good, outreach to the communities requires further efforts by Eskom. The IRM Monitoring Team notes the important efforts made by Eskom to monitor air quality and water quality impacts. In respect to air quality monitoring, the IRM welcomes the fact that Eskom has established an air quality monitoring station at a location where impacts by the plant can be measured but encourages Eskom to establish a second station as reliance on one data source might not be adequate to reach reliable conclusions. The IRM notes that AfDB has supervised the project in a six monthly basis with adequate attention given to the implementation of the Updated Management Action Plan.

The IRM Monitoring Team is very concerned about possible delays of the installation of the FGD equipment. Retrofitting of the first unit with FGD equipment is expected to take place in 2021, but there are significant delays in the preparation of the investment program and in ensuring the required financing which might endanger the timely installation. Without installation of the FGD equipment, the project will remain in non-compliance status with AfDB policies. In the opinion of the IRM Monitoring Team, the timely implementation of the FGD equipment is of highest priority as it is the only measure to mitigate negative impacts of the project on air quality and thus the health of the affected population. The IRM is concerned about possible increases in SO₂ emissions resulting from the burning of coal with higher than expected sulphur content which resulted in Eskom seeking a postponement of the application of the national SO₂ minimum emission standards for new plants.

Furthermore, despite progress reported on technical design, the IRM Monitoring Team is greatly concerned also by the delays in securing the full investment for the Mokolo-Crocodile Water Augmentation Project 2 (MCWAP-2), which should bring water to the Lephalale area for both the operation of all FDG units and for the population living in this area (see Action Plan item 3.1). As the Medupi project is located in a highly water constrained area, without the MCWAP-2, the water for the project would only be sufficient to operate the first three FGD units. The present schedule for the implementation of the MCWAP-2 project is extremely tight to meet the required deadlines. The MCWAP-2 is two years behind schedule, which means it will only provide water in June 2023. Any further delay in implementation of MCWAP-2 would delay installation of FGDs in units 4, 5 and 6 as sufficient water would not be available to operate all the six FGDs. This would perpetuate the non-compliance status Medupi Project.

The IRM notes that little progress has been made in the resolution of the sand-mining issues (Action Plan item no. 3 (iii)) since no independent assessments of damage caused to the Mokolo River and rehabilitation requirements of sand mining operations have been conducted, rather only an environmental assessment was conducted by a potential sand miner to fulfill the requirement to obtain a new sand mining license. The IRM Monitoring Team looks forward to an independent assessment of the damage made to the Mokolo River by the Limpopo Department of Economic
Development, Environment and Tourism (LEDET) and/or the Department of Environmental Affairs (DEA) and implementation of rehabilitation measures in the near future.

Table 1 below provides a summary of the key findings of the Second IRM Monitoring of the Implementation of the Management Remedial Actions for the Medupi Power Project

**Table 1**: Summary of the Key Findings of the Second IRM Monitoring

<table>
<thead>
<tr>
<th>No.</th>
<th>Issue</th>
<th>Updated Management Action Plan</th>
<th>Findings of the Monitoring Mission:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Risk to Public Health due to Emissions</td>
<td>Monitoring of the CEMP Implementation (Air Quality Monitoring)</td>
<td>Air quality monitoring is being conducted. The IRM recommends (i) data collection through an additional monitoring station established at another location where impacts can be measured; (ii) the CEMP has been approved but needs to be supplemented by further operational details during operational phase; (iii) health baseline data should be established and a monitoring system for PM 10 and PM2.5 related diseases should be established; (iv) timely operation of FGD equipment (starting 2021 for first unit) is a key concern and essential for ensuring control of air quality and compliance with AfDB policies and national law requirements.</td>
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<td></td>
<td>Action Plan 1.1: Continuous monitoring of Construction Phase Environmental Management Plan (CEMP) and compliance with the requirements of the various licenses to be issued under the CEMP.</td>
<td>Eskom submits regular quarterly progress reports to the Bank as well as to the Department of Environmental Affairs (DEA). Project supervision has been conducted on a six-monthly basis and should be continued.</td>
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<td>Action Plan 1.2: Reporting on the status of implementation of the project as follows: 1.2.1 Project Quarterly Progress Reports submitted to the Bank; 1.2.2. Frequency of Bank supervision missions; 1.2.3 Update of the Operational Phase Environmental Management Plan (OEMP).</td>
<td>The OEMP approved in 2016 represents general rather than specific environmental measures to be applied during operational phase. The IRM Monitoring Team was informed that further environmental measures will be specified as part of operational implementation guidelines. The IRM Monitoring Team is concerned that the OEMP, without supplementary environmental measures, does not seem to be an appropriate environmental plan for the operational phase.</td>
</tr>
<tr>
<td>No.</td>
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<td>Updated Management Action Plan</td>
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<td>2</td>
<td>No Regional Impact Assessment</td>
<td>Conduct further Regional Assessment of Coal Based Energy Projects between South Africa and Botswana to build on the work already done.</td>
<td>Regional Environmental and Social Assessment (RESA) study has been completed. Thus, the remedial action 2 in the Management Updated Action Plan has been complied with. The RESA findings are to inform the revision of the Integrated Resource Plan.</td>
</tr>
<tr>
<td>3</td>
<td>Compliance with the Integrated Water Resources Management Policy.</td>
<td>Action Plan 3.1: Follow up with DWA on status of the Mokolo-Crocodile Water Augmentation Project (MCWAP-2) and development of the effluent re-use and groundwater use.</td>
<td>Significant work has gone into the planning and the technical design for the MCWAP-2 project. However, the MCWAP-2 project is more than two years behind schedule, which means it would only provide water in June 2023. Timely implementation of MCWAP-2 project is now of utmost importance as operation of three (3) out of the six (6) units with FGD equipment will depend on water provided under MCWAP-2 project. Delayed implementation of MCWAP-2 would delay operation of three of the six FGD units, which would perpetuate non-compliance status of Medupi Project.</td>
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<td>Action Plan 3.2: Follow up on the DEA, DMR, DWA and DAFF Task Team decision on the sand mining issues.</td>
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<td>Key actions remain to be done. An environmental assessment as part of an application for a sand mining license has been conducted. The IRM is of the view that this environmental assessment conducted as part of an application for a license, cannot substitute for an independent assessment of the damage done to Mokolo River and the rehabilitation requirements by previous legal and illegal sand mining operations. Decisions need to be communicated to the stakeholders and rehabilitation measures need to be conducted.</td>
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<td>Action Plan 3.3: Develop a monitoring program of surface and ground water for the operation phase based on the conditions of the water use licenses and include it in the OEMP</td>
<td>Water quality appears not to have been affected by the construction of the Medupi plant. Water quality is adequately monitored by Eskom.</td>
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<tr>
<td>No.</td>
<td>Issue</td>
<td>Follow-up activities (Management Action Plan)</td>
<td>Findings of the Monitoring Mission:</td>
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<td>4</td>
<td>Inadequate Public Consultation with the Communities</td>
<td>Action Plan 4.1: Expand the functions of the Medupi Central Information Office (MCIO) to also serve as a center where grievances can be reported and where Eskom can gain feedback from communities on the project activities.</td>
<td>MCIO performs the function of grievance mechanism but the population seems reluctant to use it as a grievance center since its main function has become a labor recruitment center for Eskom. The functions of grievance mechanism and labor recruitment are incompatible. An additional and independent grievance redress process needs to be established. At present, environmental concerns are expressed through the Environment Monitoring Committee (EMC), and the EMC process should be maintained.</td>
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<td>Action Plan 4.2: Enhance participation of Ward Councilors in Environment Monitoring Committee (EMC) meetings by assisting them with transportation to the meetings.</td>
<td>The IRM recognizes efforts made by Eskom and the EMC to involved Ward Councilors, however, in spite of these efforts, Ward Councilors have not become engaged in EMC meetings.</td>
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<td>Action Plan 4.3: Develop a mechanism for Councilors to report back to communities and vice versa.</td>
<td>The original design of this measure has not been successful, but alternative approaches have been adopted by Eskom. For instance, it has invested significantly in improving relationship with the municipality and a corporate social responsibility program with communities has been launched – to improve relationships with communities. While such a program should help in building relationships with the communities, it cannot be a substitute for systematically communicating with communities on issues of interest with community members. Such a communication and consultation practice on the community level still needs to be established.</td>
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<td>Action Plan 4.4: The EMC to finalize and implement its Communications Strategy to create awareness about its functions and activities.</td>
<td>The EMC has improved it communication with the communities. However, it needs to continue its outreach among local communities. It should develop a better system for tracking information on how it has carried out its operations and plans to do so in the future.</td>
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<tr>
<td>No.</td>
<td>Issue</td>
<td>Follow-up activities (Management Action Plan)</td>
<td>Findings of the Monitoring Mission:</td>
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<td>5</td>
<td>Desecration of Graves and other Heritage Issues.</td>
<td>Action Plan 5.1: Engage Marapong community to reach an understanding and closure on the issue.</td>
<td>The IRM Monitoring Team wishes to commend Management and Eskom on their considerable efforts in developing the process for following up and in reaching an understanding with affected families on the issue of graves. The process included conducting a heritage assessment, identifying graves on the Medupi site, conducting cleansing and appeasement ceremonies with the affected families and for constructing a memorial site. The IRM Monitoring Team is of the view that further measures need to be taken to secure access of the families to the memorial site. The Team considers the follow-up of this action item in the remedial action plan as an example of best practice.</td>
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</table>

**The IRM recommends that:**

(i) The IRM will prepare a monitoring report on the progress of implementation of the Updated Management Action Plan every two years, instead of the annual monitoring authorized by the Board of Directors in February 2013. A biennial (two year-spaced) monitoring appears appropriate, as the key outstanding issues are the installation of the FGD equipment and the implementation of the MCWAP-2 projects, both of which are long-term exercises which will require monitoring for years to come.

(ii) The Bank Management will continue with its current semi-annual supervision missions of the Medupi project and send bi-annual supervision reports on the progress of implementation of the Updated Management Action Plan to BCRM. The IRM will review these reports.

(iii) The third IRM Monitoring Mission to South Africa on the implementation of the Updated Management Action Program for the Medupi Project will take place in 2019.
3. MANAGEMENT UPDATES ON IMPLEMENTATION OF THE REMEDIAL ACTION PLAN

A Management Action Plan was approved by the Boards in February 2013 to bring the project into compliance with the applicable Bank Group policies and procedures. Management supports the implementation of this Action Plan and submits regular reports to the IRM to report on the progress made in the implementation of agreed actions. Since completion of the First IRM Monitoring Report in 2015, Management has submitted three progress reports. In these reports Management notes “that it is satisfied that both Eskom and the relevant regulatory authorities of the Government of South Africa continue to play their part in monitoring and enforcing compliance with regulatory requirements and conditions of various aspects of air emissions, water quality, as well as Occupational Health and Safety.” Management is of the view that three action items are fully complied with. These actions are: (i) Finalization and approval of the Operations Phase Environmental Management Plan (OEMP); (ii) Finalization of the Regional Environmental and Social Assessment (RESA) Study, and (iii) Engagement with the affected communities to reach closure on the alleged desecration of graves. Management commended Eskom on the efforts made to ensure occupational health and safety of the workers. Management expressed concern about the execution schedule of the Mokolo-Crocodile water Augmentation Project (MCWAP-2), which if delayed, would affect the FGD installation in units 4, 5 and 6 as sufficient water would not be available to operate all the six FGDs. Management recognizes that installation of the FGD equipment into the six units requires careful monitoring and requested a more detailed schedule for the outstanding milestones so as to be able to track progress. Given delays in the preparation of the FGD investment program, there are serious concerns that FGD equipment cannot be completed within the committed deadlines.

4. FINDINGS OF THE IRM MONITORING TEAM

The IRM Monitoring Team spent five days in South Africa (February 19-24, 2017) with time, divided between consultations in Pretoria with government representatives and civil society, and in the Lephalale/Marapong area in Limpopo Province, where the Medupi Power Project is under construction. The visit in Lephalale involved extensive consultation with Eskom officials,

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community leaders and other local stakeholders. The Team reviewed implementation of the various remedial actions prepared by Management. The action items and the respective IRM assessments are presented below.

4.1 Monitoring of the CEMP Implementation

Air quality monitoring

<table>
<thead>
<tr>
<th>Key Issue: Risk to Public Health due to Emissions.</th>
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<tbody>
<tr>
<td><strong>Management Action Plan 1.1:</strong> Continuous monitoring of Construction Phase Environmental Management Plan (CEMP) and compliance with the requirements of the various licenses to be issued under the CEMP.</td>
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</tbody>
</table>

Findings of the Second IRM Monitoring Mission:

Meeting air quality standards requires the installation of FGD equipment to reduce emissions from the power plant and the careful ongoing monitoring with sufficient number of air quality monitoring stations. Eskom reaffirmed to the IRM Monitoring Team its commitment to install the FGD equipment. However, given delays in investment preparation, timely installation of FGD equipment in the generating units is a major concern. Without such FGD equipment, national air quality standards cannot be met and the Medupi Project will remain non-compliant with the applicable policies of the African Development Bank Group (AfDB)

As to air quality monitoring, the IRM Monitoring Team notes that Eskom is seeking postponements of application of SO2 emission standards due to higher than expected sulfur content of coal used in the plants. The IRM notes that there are currently two air monitoring stations, one downstream and the other upstream of the power station. Questions remain as whether reliable data could be generated from only two air monitoring stations – if only one can measure the impacts of the plant - sufficient to measure properly the impacts of the Medupi Plant on air quality.

Air quality Monitoring

Management relies on Eskom reports for the monitoring of emissions from the Medupi power plant. So far only two of the six units are in full commercial operation and the others are in the testing phase or under construction. The full impact of the plant on air quality can only be assessed once all the units are operational. Management reported that Eskom is monitoring the Construction Phase Environmental Management Plan (CEMP) and that the implementation of this Plan is in compliance with the requirements of the various licenses to be issued under the CEMP by the
Department of Environmental Affairs (DEA). Eskom submits regular quarterly progress reports to the Bank as well as to DEA. AfDB most recent update on implementing the action plan states:

“...updates provided show satisfactory compliance with ambient air quality standards with respect to dust and NO₂ emissions, although with intermittent diurnal spikes of non-compliances due to a variety of reasons. The ambient air quality monitoring data in the last six months indicated that PM2.5 concentrations and PM10 concentrations are high in the morning and evening... This has been attributed to influences by other low-level sources such as domestic combustion, vehicular movement on dust roads and agricultural farming activities. Sulphur dioxide (SO₂) emissions also continued to be generally within the 3500 mg/Nm³ limit, except on occasions when higher Sulphur coal was used.

Unit 6 emissions showed particular matter not to exceed the minimum emission standards, largely on account of installation of high temperature fabric filter bags that have proved more effective.”

The IRM Monitoring Team was briefed about a request made by Eskom to obtain a postponement of the application of SO₂ minimum emissions standards for the existing plant’s SO₂ emission limits for Medupi and Matimba power stations. Eskom had already applied in 2014 for an exemption from applying the new SO₂ standards. The Minimum Emissions Standards in South Africa have two requirements. These are emission standards for existing plants, which came into effect in April 2015, and more stringent limits for new plants, which must be complied with by April 2020. The DEA rejected Eskom’s application for postponement of the 2015 existing plant SO₂ limit, but approved the request for postponement of the new plant SO₂ limit from 2020 to 2025 for both the Medupi and the Matimba power stations. Eskom is still intending to reapply for postponement of the existing plant SO₂ Minimum Emissions Standards for the Medupi and Matimba coal fired power stations. Eskom will apply for amendment of the Atmospheric Emission License for SO₂ minimum emission limit to be increased from 3500 mg/Nm³ to 4000 mg/Nm³.

Based on the present emission levels, there does not seem to be a justification for seeking an exemption of minimum emission standards as current emissions were largely conforming to the 3,500 mg/NM³ limit. Eskom explained that its application was driven by a concern that both Matimba and Medupi coal fired power stations receive their coal from the Grootegeluk Mine and over the last year there has been a variability and increase in the average sulphur content of the coal, which could likely increase the SO₂ emission levels from these units. While the power stations average monthly emissions are within limits, there are times when the daily limits for Medupi and Matimba have exceeded due to the high sulphur content of coal. Eskom informed the IRM Monitoring Team that the exceedances are well below 4000 mg/Nm³ and that unit 6 (the first unit which became commercially operational in August 2015) exceeds SO₂ daily emission limits of 3500 mg/Nm³ for more than 48 hours only on few days during the month.

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8 Eskom, Background Information Document (BID), January 2017.
The increasing sulphur content of the coal used in the Medupi power station is clearly a concern. If the present – very tight– implementation schedule can be adhered to, FGD equipment will be installed between 2021 and 2026. Mitigating effects of FGD equipment would only take place in several years, assuming that the FGD equipment will be implemented as scheduled -. In the meantime, higher than expected sulphur content in the coal could lead to continuous decline in the air quality. Air quality would deteriorate as more units become operational and could lead to negative health impacts if not mitigated. Eskom informed the IRM Monitoring Team that at this stage, the Medupi plant is unable to undertake blending of coal between higher and lower sulphur content at the stock yard, but that steps are being taken to finalize commissioning of the coal reclaimer so as to allow using the blend of high and low sulphur coal. Grootegeluk Mine – from which the Medupi plant receives its coal -has since adopted a blending strategy as a mitigation measure. It is worrying that Medupi plant might not be able to comply with the existing plant standard of 3,500 mg per NM³ in the short term. The higher than expected SO₂ emissions underlines the importance of timely installation of the FGD equipment.

The IRM Monitoring Team is concerned that air quality monitoring by Eskom is conducted only with two air quality monitoring stations of which only one, due to its location downstream from the plant, can adequately gauge the impact of the Medupi plant. Air quality data is also collected at the Marapong Monitoring Station. This station was required by DEA. The station is located in a densely settled area where ambient levels are influenced by numerous activities which are not related to plant activities. Moreover, the station is upwind where – given the typical wind directions – the impact of emissions from the plant would normally not be captured. Air quality impacts of the plant will primarily occur downstream. The Marapong monitoring station is thus not well suited to gauge the impacts of the plant on air quality. Eskom informed the IRM Monitoring Team that this monitoring station was established as a condition by DEA.

To gauge the downstream impacts, Eskom has established a new monitoring station to the south of the Medupi Power Station. This station was not required by DEA but was established by Eskom to have more reliable data to assess the impacts of the Medupi plant on air quality compared to that generated by the station required by DEA and located at Marapong. Data has been collected from Marapong station since November 2014. Based on typical wind direction, this downstream station should be primarily relevant for measuring air quality impacts of the plant. The IRM Monitoring Team was informed that DEA – in addition to these two stations – has air quality stations in which it monitors air quality but that these stations are not set up to measure the specific impacts of the Medupi plant.

The IRM Monitoring Team commends the decision of Eskom to set up an additional air quality station downstream which can capture the impacts of the Medupi plant. But the Team is concerned that relying only on one station to generate monitoring data is insufficient for reliable and accurate measurements of the impacts of the Medupi plant on air quality. One or two additional stations located in areas of influence where impacts of the plant can actually be measured, are necessary.
The IRM Monitoring Team also found little attention given to building stronger understanding of the connection between air monitoring and the health risks for potentially affected populations. Concerns are expressed by residents of the area about the impact of the construction of the Medupi plant on the health of vulnerable populations, especially young children and the elderly. The incidence of asthma and other respiratory diseases can be driven by many factors, and will likely become more controversial when Medupi becomes fully operational and emission levels increase rapidly. It would be in the interest of the local population, Eskom, the Government of South Africa, and the Bank to establish a sound baseline data for the sources of respiratory illnesses in the area of influence of the Medupi plant. Moreover, a system of ongoing health monitoring should be established immediately to collect data on respiratory diseases which could be associated with or caused by air quality deterioration. Based on ample evidence available, elevated levels of PM10 and PM 2.5 cause respiratory diseases, especially among the young and the elderly. The health status of the population could also be impacted by ash and coal dust pollution resulting from the open ash pit and the massive coal reserve pile, which the Medupi plant holds on its site. Emissions from coal-based power plants pose high risks to public health. The IRM Monitoring Team suggests
that AfDB assists the South African authorities and Eskom to establish a baseline and a health impact monitoring system to assess impacts of the Medupi plant on the health status of the population. Such monitoring systems are being established by other power plants of comparable size and technology, such as the Tata Mundra Power plant in India.

**Waterberg-Bojanala Priority Area Air Quality Management Plan (WBPA-AQMP)**

The objective of the WBPA-AQMP is to bring ambient air quality within the Waterberg Bojanala area into compliance with the National Air Quality Standards by 2020 taking into account the existing and planned investments in the region. Dispersion models for air emissions projected an increase of all the air quality parameters monitored (SO₂, NO₂, and particulates) within the region for 2015, 2020, 2025, and 2030. As models only take into account incremental planned investments and do not take into account other emission sources, the present results underestimate the impacts of industrial and related developments on air quality in the area. The results of the model demonstrate the importance of FGD equipment installation for the Medupi plant and other plants in the region.

**Flue Gas Desulphurization (FGD) Units Installation**

The IRM Monitoring Team was briefed by Eskom and by AfDB Management that Eskom remains committed to install the FGD equipment six years after operation of each unit. As unit 6 came into commercial operation in August 2015, the first retrofitting with FGD equipment would take place in 2021. However, there are serious concerns about delays in the preparation of the FGD investment program. Eskom has now firmed up the design and has included the funding in its development budget. However, sources of funds for this large investment remain to be identified. Securing adequate funding for this large investment will be a key priority. Even with the current schedule, construction of the first FGD unit would only start by April 2020. This would leave only one and a half year for final construction and commissioning which, by any means is an exceptionally tight schedule. It is essential that no further delays are incurred as without FGD units, air quality standards cannot be met. Only with FGD installation can the Medupi project be brought into compliance with applicable AfDB policies and national standards.

Public stakeholders continue to disagree with the strategy of a slow installation of FGDs. The contrast with the Kusile coal power plant, which is being constructed in parallel with the Medupi plant and where FGD units are being installed at the same time. Civil society, according to interviews with the IRM Monitoring Team, has frequently asked why the FGDs could not be installed at Medupi at the time the units were or are being constructed. The constraints to the installation of the FGD appear primarily financial. The cost quoted to the IRM Monitoring Team was ZAR 32 billion.

A key concern for the operation of the FGD equipment is the supply of adequate water. For all of the six units to operate with FGD equipment, additional water will be needed from the Mokolo-Crocodile Water Augmentation Project (MCWAP-2). This project (see section 4.4 below) has
experienced serious delay in implementation. Other issue to be addressed in relation to the installation of FGD equipment is the disposal of large amount of gypsum once the FGD equipment is used. Alternative gypsum disposal measures are being assessed as part of project preparation for FGD installation.

As long as adequate financing for FGD installation, water availability and related environmental mitigation measures, such as disposal of gypsum, have not been resolved, FGD installation remains at risk and the Medupi project will remain non-compliant with national ambient air quality standards and the AfDB environment policy. It is essential that the Bank remains engaged in the process to ensure completion of air and water quality measures as key elements of the Management Action Plan.

4.2 Project Supervision

**Management Action Plan 1.2: Reporting on the status of implementation of the project as follows:** 1.2.1 Project Quarterly Progress Reports submitted to the Bank; 1.2.2. Frequency of Bank supervision missions; 1.2.3 Update of the Operational Phase Environmental Management Plan (OEMP)

**Findings of the Second IRM Monitoring Mission:** The AfDB staff and Management appropriately supervised the project. The ongoing six-monthly supervision schedule should be continued as the project now has two units in the operational stage and adequate environmental measures during operations and construction phase need to be ensured and monitored. Moreover, critical milestones towards installation of the FGD equipment and development of adequate water resources is key for the project to become compliant with national law requirements and applicable AfDB policies. AfDB should continue to provide support to ensure these milestones are achieved.

As the project now has two units under commercial operation, the project partly operates under the Operational Phase Environmental Management Plan (OEMP). The OEMP requires further specificity on environmental measures. The IRM Team is concerned that, without supplementary environmental measures, the OEMP does not seem to be adequate for the operational phase.

The Bank Management receives the reports required by the project loan agreement, particularly on the Construction Phase Environmental Management Plan (CEMP). These reports are complemented by onsite monitoring of the CEMP activities by the independent environmental officer as required by the DEA license for construction of the project. This arrangement for onsite monitoring and Bank Management supervision missions will presumably continue to the end of the construction phase, expected to be completed by 2020.
The IRM Monitoring Team was provided with the Environmental Management Plan for Operation and Maintenance (OEMP), which was approved in 2016. As two units are now in full operations, the Medupi power plant is now guided by the OEMP for the units under operation and the Construction-phase Environment Management Plan (CEMP) for the other four units which are still under construction. The IRM Monitoring Team is concerned that the approved OEMP document is sketchy, and does not have detailed environmental measures to be applied during operations. The Team was informed that the OEMP – in its present form - is prepared in accordance with established practices in South Africa and that further environmental measures will be specified as part of operational implementation guidelines. Special attention will need to be paid to these specific environmental measures because without such supplementary measures, the OEMP will not be adequate for the operational phase.

Management informed the IRM that it receives quarterly progress reports on a regular basis and that monthly compliance reports are submitted by the Environmental Control Officer (ECO) for information. Supervision mission by AfDB staff have been conducted semi-annually. The last two supervision missions were conducted in June 2016 and January 2017. So far, supervision missions have been conducted jointly with the World Bank. The semi-annual supervision schedule should be continued, especially as progress towards implementation of the FGD equipment and related water developments under the MCWAP-2 are critical for Medupi project to comply with the applicable Bank Group’s policies. Moreover, as more units become operational, air quality impacts need to be carefully monitored. The full impacts on air quality will only come to bear as more or all units come into operation.

4.3 Regional Impact Assessments

| Management Action Plan 2: Conduct further Regional Assessment of Coal Based Energy Projects between South Africa and Botswana to build on the work already done. |

Findings of the Second IRM Monitoring Mission: This action was delayed by several years, but it has now been completed. Thus, the remedial action 2 in the Updated Management Action Plan has been complied with. It is important that the findings of the Regional Environmental and Social Assessment (RESA) study be used by the Governments of South Africa and Botswana in subsequent energy planning in the border region.

A Regional Environmental and Social Assessment (RESA) study of Coal-Based Energy Projects between South Africa and Botswana has been completed. The overall conclusion is that – based on currently available data and reasonable assumptions – the cumulative effects of the proposed coal-based energy generation programs in the border region would lead to significant exceedances
of permissible environmental standards. It is thus important that the findings of the RESA Report will be considered in the energy investment planning for the region and in the design of mitigation measures. Management informed the IRM Monitoring Team that Eskom had informed them that the findings of the RESA study would be incorporated into the Integrated Resource Plan which the Department of Energy has embarked upon. The IRM Team takes note of the fact that the RESA study has been completed and the remedial action 2 has thus been complied with. However, it is now important that the findings of the RESA study will be used in subsequent planning. The joint World Bank and AfDB donor supervision missions have already drawn attention to this fact. The AfDB should use its different country relationship instruments as well as future investment decisions to reinforce the need to adjust energy investments in the region and to insist on appropriate environmental mitigation measures to ensure that the border region remains within national and internationally recognized standards.

4.4 Compliance with the Integrated Water Resources Management Policy

Management Action Plan 3.1: Follow up with DWA on the status of the Mokolo-Crocodile Water Augmentation Project (MCWAP-2) and development of the effluent re-use and groundwater use.

Findings of the Second IRM Monitoring Mission: An update on the MCWAP-2 project was given to the IRM Monitoring Team. The project has seen significant delays when its timely implementation is critical as operation of three (3) of the six (6) units with FGD equipment will depend on water provided under MCWAP-2 project. The water to be provided under MCWAP-2 is also crucial to meet other water demand in the area, which will be strained by increasing industrial development. As the MCWAP-2 project is more than two years behind schedule, it would only provide water in June 2023. Given these delays, the float between water availability for the fourth unit and the latest time for its operation is reduced to eight months. Further delays in implementation of MCWAP-2 would thus affect FGD operation which would perpetuate the non-compliance status of the Medupi project.

The MCWAP consists of several phases10. Phase 1 (MCWAP-1) was designed to meet the growing water requirements of the Lephalale area, and also to supply more water until a transfer pipeline from

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10 Summary of the status presented at the IRM meeting at Treasury by the representative of the Department of Water Affairs
the Crocodile river (West) is implemented. Phase 2 (MCWAP-2) proposes to transfer water from Vlieëpoort, near Thabazimbi, on the Crocodile River (West) to the Steenbokpan and Lephale areas. The engineering services started in September 2009. Construction of MCWAP-1 was scheduled to start in July 2011 to enable water delivery by July 2013. The initial estimated completion date for MCWAP-2 was 2016. Phase 3 and phase 4 of the project were to be completed between 2017 and 2018. However, there has been delays caused by, among others, severe flooding in the project area in 2014 and slow progress in pipe-laying, owing to the contractors and labour issues. The first phase of the MCWAP was initially expected to start operating in September 2013 but was finally ready in October 2016.

Phase 1 of the Mokolo Crocodile Water Augmentation Project is now fully operational to deliver 30.5 m3/year, which is sufficient to meet the requirements of at least three of Medupi’s FGD units. For the upcoming three units, MCWA-2 is required. There are serious concerns about continuous delays in the implementation of the MCWAP-2 phase which is by now more than 2 years behind schedule and would deliver water only in June 2023. Importantly, funding for the project still needs to be firmed up. The revised schedule for implementation, if adhered to, would still allow for provision of water to operate the FGD equipment. However, further delays will jeopardize timely operation of the last three units with FGD. Given the importance of water availability for FGD operation and for the supply of water to the population in this area with constrained water access, the timely implementation of MCWAP-2 is of high importance.

Management also confirmed that the Department of Water and Sanitation (DWS) plans to meet the water requirements for future social and economic development in the area, including new coal mines, future coal power plants in the Lephale area as well as existing power plants in the Mpumalanga Province, other commercial users and urban developments in Lephale. MCWAP-2 is thus crucial for the supply of water to the area in light of the many competing demands and the planned further industrial developments.

Management Action Plan 3.2: Follow up on the DEA, DMR, DWA and DAFF Task Team decision on the sand mining issues.

Findings of the Second IRM Monitoring Mission: The IRM Monitoring Team considers the resolution of the outstanding sand mining issue as a key priority. The Mokolo River is clearly in a critical condition which compromises the normal flow of the river and this must be addressed. The suspension of sand mining in the Mokolo River has been a positive step, but the community is impatient about receiving answers with regard to the rehabilitation of damaged areas of the river. Past damage of legal and illegal sand miners who provided sand for the construction of the Medupi plant needs therefore to be assessed and the damaged sites need to be properly
rehabilitated. The IRM Team notes that an environmental assessment was carried out, but this was done as part of an application for a new sand mining license. This assessment concluded that past sand mining did not have an impact on the river. The IRM Monitoring Team is of the view that – in addition to this assessment-carried out as part of an application – an independent assessment needs to be carried out and damaged sites rehabilitated. This is especially relevant because Eskom will need more sand for construction work and it is important that this pending issue is adequately addressed. It is also essential that stakeholders be included in the assessment process and that decisions on the rehabilitation are communicated to the affected population.

The DEA has suspended sand mining in the Mokolo River and has not issued any new licenses. The IRM Monitoring Team went on site to examine ongoing damage to the Mokolo River. There did not appear to be any major sand mining underway, but there were signs of some minor informal mining activities. The IRM Monitoring Team was not able to have a meeting with DEA to discuss sand mining issue. Eskom informed the Monitoring Team that an environmental impact assessment was prepared by a potential sand miner as part of an application for a license for sand mining operation. The environmental assessment was prepared by an Independent Environmental Assessment Practitioner. Based on the records received, this environmental assessment was conducted with adequate consultation with the stakeholders. A decision on the application has not yet been taken. Management informed the IRM Monitoring Team “that the Limpopo Local authorities have imposed a fine on the principal sand miner. The payment of the penalty will pave the way for the rectification application to obtain an environmental authorization to resume legally authorized sand mining operations.”

The environmental assessment supporting this application concluded that there is heavy sedimentation and very significant growth of reeds which reduces water availability of the river. The reed infestation is a major concern as reeds consume large volumes of water, lead to a stabilization of sand which then provides a suitable environment for further growth of reeds. The reed infested areas restrict the flow of the river through narrow encroached channels, with 46% of the total area assessed infected by reeds. The report does not attribute the growth of reeds and the strong sedimentation to sand mining but to the construction of the Mokolo Dam and the subsequent management thereof which has significantly altered the downstream of the river. The assessment argued, based on interviews and photographs examined, that reed infestation started after the operation of the Mokolo Dam and is caused by the low energy environmental resulting from the controlled release of water from the dam as flood peaks are dampened. Sedimentation occurs as the deposition rate is higher than the transportation rate.

The assessment argues that the hydrological regime of the lower Mokolo River has been severely altered by the construction of the Mokolo Dam in the 1980. Today, the river system downstream of the dam can be described as mostly a non-perennial river system where the channel is a largely artificial system due to sedimentation, reed encroachments, with upstream and downstream bridges and irrigated land adjacent to the river, with associated water abstraction infrastructure in the river. The report recognizes that there is river bank erosion but the report does not attribute this erosion to sand mining arguing that in areas where there was no sand mining, river bank erosion was also observed. The assessment is of the view that bank erosion is more likely the result of river mismanagement and bank disturbances by farmers digging abstraction wells and also as part of a natural process occurring within the river as a result of the movement of water.\(^4\)

The environmental assessment recognizes that the river has serious ecological problems in its present form affecting its balance. But the assessment does not ascribe any of these effects to sand mining but to the impacts of the controlled water releases of the Mokolo Dam and the impacts of irrigation water by farmers. On the contrary, the assessment argues that impacts of sand mining have been and will be negligible and could even have some beneficial impacts if sand mining is conducted as an orderly process.

The IRM Monitoring Team is of the view that this environmental assessment can provide a relevant input into a report on the damage resulting from sand mining during the construction of the Medupi plant. But this environmental assessment, conducted for the sole purposes of making an application for a new sand mining license cannot substitute for an independent assessment report of damage done to the river by numerous – legal and illegal – sand mining operations during the construction of the Medupi power plant where sand from the river was used by contractors of Eskom. The report shows a readiness to attribute almost all alterations to the river to the Mokolo Dam and to some degree to water withdrawal for irrigation. It is essential that DEA and the Limpopo Department of Economic Development, Environment and Tourism (LEDET) assess the damage to the river and specify which damage has been caused by previous sand mining operations. Relying solely on such an environmental assessment conducted as part of an application for a new mining license is not credible. A more independent view is required which focuses solely on an assessment of damage done to the river by specific sand mining operations in order to ensure that proper rehabilitation measures will be carried out by those found responsible for the damage.

The river is clearly in an endangered state and environmental rehabilitation should be a priority. The IRM Monitoring Team is disheartened about this lack of progress and considers it essential that the DEA and LEDET (i) address past damage caused by sand mining in the Mokolo River, (ii) ensure that rehabilitation measures are taken to mitigate past damage; and (iii) proactively

prevent further damage in the future to communities and farmers who have already been hurt by the past sand mining practices in the area.

The solution to the pending sand mining issues is also necessary for further constructions at the Medupi plant. AfDB staff in its recent supervision mission highlighted that Eskom still needs 31,000 tons of river sand, out of which 13,000 tons is stockpiled, while the balance 18,000 tons is to be sourced for the balance of construction work. AfDB signaled to Eskom that (i) Eskom needs to ensure that any future sand requirements of the project will be obtained from only licensed sand miners, (ii) Facilitate Limpopo Department of Economic Development, Environment and Tourism (LEDET), and the Environment Monitoring Committee (EMC) to communicate LEDET’s decisions to various affected parties. Eskom assured AfDB that it would pay attention to ensure that sub-contractors engaged to provide sand in the future are licensed and would follow national regulations.

Management Action Plan 3.3: Develop a monitoring program of surface and groundwater for the operation phase based on the conditions of the water use licenses and include it in the OEMP.

Findings of the Second IRM Monitoring Mission: Water quality appears not to have been affected by the construction of the Medupi plant. Water quality is adequately monitored by Eskom.

Water management and water quality monitoring remains a key concern which is regularly discussed during EMC meetings as the Medupi project is located in a water-stress area and the construction and operation of the Medupi project (and other upcoming investments) are putting significant stress on the water level. An extensive system of ground water monitoring has been set up at the Medupi plant. Management reported that a number of the old monitoring boreholes were rehabilitated in April 2015 due to blockages or obstructions in the boreholes. With the nine additional ground water monitoring wells drilled early in 2015, the Medupi plant now has a ground water monitoring network shown in the area photograph below.

Monitoring data collected to-date in most monitoring boreholes is considered to reflect ambient/baseline conditions and will play an important role for comparison of future groundwater quality characteristics into the operational phase of the Medupi plant. Whereas the reason(s) for the high overall salinity, high acidity and elevated heavy metal content in MBH04S is still uncertain, historical monitoring data shows that borehole MBH05D was affected by sulphate type contamination shortly after monitoring began in 2008 and does not therefore reflect ambient/unaffected baseline conditions.
Data from the majority of the ground water monitoring wells continued to indicate that the water quality is within allowable limits. However, some monitoring wells posted data that was above the allowable standards, although the reason for higher levels is not yet fully known. Management assured the IRM Monitoring Team that causes for these standards deviations are being examined.

An additional risk for water quality is the large stockpile of coal which resulted from the “take or pay” provision in the supply contract with Exxaro. Eskom stored large amount of coal in Medupi stock yard even though commercial operation of its first generating units was delayed. As two units are now in operation, the coal stored will be reduced although the stock piles are larger than the monthly supply of coal provided for in the design of the project. The large amount of coal stocked at the Medupi site poses a risk to the ground water quality. Eskom has started to line some of the coal storage area to mitigate negative impacts on ground water. Management states that:

“Data from the majority of the ground water monitoring wells continued to indicate water quality within allowable limits. A number of old monitoring boreholes were rehabilitated in April 2015
due to blockages or obstruction in the boreholes. Special attention was paid to one borehole, which was flushed with clean water and cleaned out with compressed air to see if it has any influence on the water quality. The rehabilitation of the boreholes did not have a marked effect on the water qualities. Even after cleaning to the respective borehole, there was little or no change in the water quality. Point source pollution has therefore been ruled out. The Ground Water assessment monitoring concluded that groundwater quality conditions varied significantly within relatively short distances, as a result of compartmentalization caused by groundwater flow barriers (geological structures) as well as varying aquifer host rock. Eskom continues to investigate this cause.

4.5 Public Consultation with the Communities

Management Action Plan 4.1: Expand the functions of the Medupi Central Information Office (MCIO) to also serve as a center where grievances can be reported and where Eskom can gain feedback from communities on the project activities.

Findings of the Second IRM Monitoring Mission: Eskom has made efforts to establish MCIOs as grievance redress centers where grievances can be filed. However, the population has accepted to use these centers for filing grievances related to employment and contract issues only as the centers are seen as an outreach of Eskom for employment and supply contract engagements. No grievances on, for example, environmental issues are filed at MCIO. As the population clearly has grievances in respect to environmental and health impacts, Eskom might consider complementary avenues for grievance redress mechanisms.

There is one Medupi Central Information Office (MCIO) near Lephalale Mall, which serves as a first point of contact to disseminate project information and process enquiries from various stakeholders including local communities and suppliers, media and the general public. In addition, there are six satellite Information Centers spread across Lephalale municipality. The MCIOs are used primarily as centers where people can apply for jobs related to the Medupi power plant and interested contractors can obtain information and submit documents. At the MCIOs, the population can also file complaints. The MCIOs have logs where complaints can be filed. The IRM Monitoring Team visited several centers and reviewed the logs. There are a few complaints filed and they relate to job search. The population apparently views the MCIOs primarily as employment centers. Given the high unemployment rate in the area, the population is obviously concerned about job opportunities and might perceive the filing of complaints as compromising their prospects of gainful employment. While environmental concerns – such as air pollution and related health impacts – might not be at the forefront of concerns of the population, the IRM Monitoring Team was briefed about concerns on environmental impacts by the population but these are not brought in the form of complaints to the MCIOs.
The IRM Monitoring Team recognizes that Eskom has made significant efforts to equip the MCIOs to serve as grievance redress centers and that an adequate infrastructure has been established. It is also clear that the MCIOs are perceived by population as employment centers and are reluctant to express grievances unrelated to employment or supply contracts. Filing of grievances do not seem compatible with searching for employment and people might be reluctant to express grievances if they see their employment prospects compromised. Eskom should explore other avenues where the population can file grievances relating to negative impacts of Medupi project. For environmental concerns, the EMC has received a number of complaints from people. Contact information for the EMC and updates on EMC meetings should be posted in the MCIOs. The present practice of maintaining a log where grievances can be recorded should be continued at the MCIOs. Nevertheless, additional avenues for grievance redress need to be established and publicized at MCIOs. As relationships between communities and Eskom continue to remain strained, it is essential that an adequate grievance process is established and made know to the population. The EMC could be one of the avenues, but as the future of the EMC remains unclear while the Medupi plant enters the operational phase, an ombudsperson function could be considered.

Management Action Plan 4.2: Enhance participation of Ward Councilors in Environment Monitoring Committee (EMC) meetings by assisting them with transportation to the meetings.

Management Action Plan 4.3: Develop a mechanism for Councilors to report back to communities and vice versa.

Findings of the Second IRM Monitoring Mission: The Environment Monitoring Committee (EMC) is playing a useful role and the leadership of the EMC has made special efforts to engage Ward Councilors in its meetings. In spite of these efforts, ward councilors have rarely participated in meetings and thus are not performing as a link to the communities. The IRM Monitoring Team recognizes that the EMC has made genuine efforts to seek the engagement of ward councilors and is of the view that other avenues should be pursued to supplement the ongoing dialogue with communities.

The Environmental Monitoring Committee is playing an active environmental monitoring role for the Medupi plant. The EMC exists as a mechanism where environmental concerns can be raised, addressed and where feedback can be provided. It addresses key environmental concerns of the community particularly air and water quality. It is highly desirable that the EMC will be maintained during the operational phase under independent leadership. The OEMP, in principle, provides for an EMC but it does not outline its composition and leadership. An independent
leadership, as is presently the case, appears essential. The competency and the independent 
leadership has provided credibility to the EMC. In the absence of a functioning grievance 
mechanism – for other matters than labour related issues (see Management Action Plan 4.1 above) - 
the EMC is an avenue for communities where their environmental concerns can be addressed. 
The IRM Monitoring Team recommends that this system should be maintained especially as 
environmental impacts and concerns on air and water quality will increase with more generating 
units entering into commercial operation. Moreover, with the planned installation of the FGD 
equipment, new environmental concerns will arise, including increased demand for water and 
possible negative impacts from gypsum.

The EMC has been designed to act as a liaison to the communities on environmental matters. The 
statutes of the EMC provide that the EMC shall consist of, amongst others, two representatives of 
the public, one community member from Marapong and one from Lephalale. Unfortunately, ward 
councilors of the two communities have not been forthcoming and rarely attend the EMC meetings. 
The only community representation which exercises its function at the EMC is the Lephalale 
Development Forum. The EMC is pursuing other avenues in securing community representation 
but has not so far succeeded in finding other active community engagement representatives. The 
EMC provides transport for community representatives to the meetings. Moreover, EMC meetings 
have in the past been held within communities, such as in the library of Marapong. As there has 
been civil unrest during one of the meetings which required evacuation of EMC members during 
the meeting, the practice of holding EMC meetings directly in the communities has presently been 
discontinued but the EMC does hold periodic site visits and regularly conducts stakeholder 
feedback sessions to brief the public on issues discussed during EMC meetings. The issue of 
seeking stronger engagement of communities remains to be resolved.

Finally, the IRM Monitoring Team was informed by Eskom about educational outreach conducted 
by Medupi staff in schools and various forums in the nearby towns to increase interest in and 
improved practices for the environment. The Team was also briefed on the different programs 
conducted by the Medupi plant under its corporate responsibility program. The work should be 
commended and continued as it will help to support communities, raise environmental awareness 
and could help to establish closer relationships between Eskom and the communities.

Management Action Plan 4.4: The EMC to finalize and implement its Communications 
Strategy to create awareness about its functions and activities.

Findings of the Second IRM Monitoring Mission: The EMC has improved it communication 
with the communities. However, it needs to continue its outreach efforts through various 
channels that can reach the local communities. It should develop a better system for tracking 
information on how it has carried out its operations and plans to do so in the future.
The EMC will need to continue its outreach efforts into the communities. As no systematic representation structure has been developed, continuous communications from the EMC through various channels are essential. The construction of FGD operations will require large-scale civil works which will create renewed demand for labor and more collaborative relations with the community. One estimate provided to the IRM Monitoring Team was that FGD construction would increase the labor force by 4000 in all grades. These new construction works will provide new opportunities for the communities through employment opportunities, but also pose new challenges. The communities will welcome the new employment opportunities but will also be affected by the presence of such a national-scale infrastructure project, and will continue to experience major impacts during completion of construction, start-up and operational phases. Eskom, through its community relations program, is already trying to strengthen its community relations. A systematic communications strategy with the community would be useful once decisions on FGD implementation schedules have been taken.

The IRM Monitoring Team was informed that significant progress has been made to improve relationships between Eskom and the municipal government. The Team visited the municipality representatives who praised the outreach efforts by the leadership of the Medupi plant but also noted that relationships on the community level continue to remain strained and thus require further outreach and improvement.

4.6 Desecration of Graves and other Heritage Issues

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<th>Management Action Plan 6.1: Engage Marapong community to reach an understanding and closure on the issue.</th>
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Findings of the Second IRM Monitoring Mission: The IRM Monitoring Team commends Eskom and the Bank Management on the progress made in conducting a heritage assessment, identifying graves on the Medupi site, conducting cleansing and appeasement ceremonies with the affected families and constructing a memorial site. The Team is of the view that further measures need to be taken to secure access of the families to the memorial site. The IRM Monitoring Team considers the follow-up of this action item in the remedial action plan as an example of good practice on how cultural heritage issues can be addressed.

Management and Eskom over the last year were actively engaged and committed in rectifying the shortcomings identified in the compliance review report. A Phase II heritage assessment was conducted in which consultation efforts were made to identify those families which had graves of family members on the project site. As part of this process six (6) families came forward and identified graves in the project site. The Phase II heritage assessment articulated recommendations which are implemented under a Phase III program. Among others, these included the moving of some of the identified graves in accordance with legal requirements and ritual, customs and
spiritual practices were performed. A protective palisade was erected for a grave not moved and a memorial plaque was erected in memory of all those affected. The names of all buried people are inscribed on the memorial wall. In addition, individual family sites have been established behind the memorial wall. For each of the graves, family appeasement ceremonies were performed. The spirits of the deceased were relocated to the memorial site. The IRM Monitoring Team met with the aggrieved families who recognized the importance of the appeasement ceremonies and welcomed the erection of the memorial site. There were concerns expressed about difficulty in accessing the memorial site, which requires ex-ante permission of Eskom security. Moreover, some issues remain to be addressed. The healing process of one of the affected family members still needs to be supported. Moreover, aggrieved families complained about inadequate job opportunities for their children within the Eskom plan and outstanding bursary issues.

Eskom informed the IRM Monitoring Team that the process for identification of graves and performance of related spiritual activities will remain open as there might be more graves not yet identified. There are some indications that new claimants for graves might come up and foreign nationals may identify themselves with graves on the site. Eskom has agreed with the consultants who were responsible for Phase II and Phase III of the cultural heritage assessment and implementation that they will also prepare an Integrated Management Plan for the maintenance of the memorial site and a handbook for managing community relationships in view of the graves and related issues. These plans will incorporate lessons learned of the completed program.

The IRM Monitoring Team commends Eskom and AfDB Management on how the process has been handled. Genuine efforts were made to reach out to the community, to listen to aggrieved families, to identify additional graves, to perform rituals and to commemorate the deceased through a memorial site. The IRM Monitoring Team is very pleased that an ongoing process will be maintained to address further claims. The Team encourages AfDB Management to work towards resolving outstanding issues. Easy access to the memorial site is clearly an issue which still needs to be resolved.

The IRM Monitoring Team recognizes that the preparation and implementation of the Cultural Heritage Plan constitutes a “an example of good practice” which AfDB Management might wish to use in demonstrating approaches for addressing cultural heritage concerns in future investment projects.

5. SUMMARY OF FINDINGS

The IRM Monitoring Team noted that important progress has been made on several action items, especially on action item 5.1 regarding the desecration of graves and other heritage issues. The Team congratulates Eskom – and AfDB for its support – in addressing these cultural heritage issues. A participatory process has been conducted which the IRM Monitoring Team considers a good practice. The process established will allow to accommodate any further concerns of possible
additional graves which might be brought to the attention of Eskom. The Team is very pleased with the genuine and professional efforts made on this action point. The IRM Monitoring Team understands that the OEMP and the RESA study have been completed and that these action items have been complied with. However, the Team encourages Eskom to supplement the approved OEMP with concrete environmental measures as the present OEMP is a guideline document with few specific measures.

The IRM Monitoring Team is concerned about lack of progress in assessing damage caused to Mokolo River by sand mining activities related to the construction of the Medupi plant. The IRM Monitoring Team – as well as AfDB Management – is particularly concerned about continued delays in the preparation of installation of FGD equipment and the preparation of the WCWAP-2 water project. IRM Monitoring Team has been assured by AfDB Management and Eskom that there is continued commitment by Eskom to install FGD equipment six years after each unit has become fully operational but notes that little progress has so far been made in putting together a financing plan for this very large investment. The Team notes that a decision has been taken to implement the Phase 2 of the Mokolo-Crocodile Water Augmentation Project (MCWAP-2). Timely implementation of MCWAP-2 will be critical for the operation of FGD equipment as water resources presently available would be insufficient to provide for all FGD units. The installation of FGD equipment to enable Medupi project to comply with national air quality standards and the environment policy of the AfDB, the related water constraints and waste issues, as well as adequately monitoring the impacts of the plant operation on air and water quality, are matters of utmost concern which require continuous attention by Eskom and AfDB Management. Without operation of FGD equipment, the Medupi project will remain in non-compliance status with relevant AfDB Policies. The findings of the Second IRM Monitoring Mission on each action item of the Management Action Plan are summarized in Table 1 which is presented as the Executive Summary of this Report.

6. CONCLUSION AND RECOMMENDATIONS

This Second IRM Monitoring Report is being submitted to the Board of Directors of the African Development Bank for consideration. As provided for in the Operating Rules and Procedures of the IRM, monitoring the progress made in the implementation of the Updated Management Action Plan is essential in ensuring that the Medupi Power Project complies with the applicable policies and procedures of the Bank Group, and providing the affected stakeholders with the assurance that the Bank takes seriously its social and environmental commitments.

The decision of the Boards of Directors in February 2013 stated that “The IRM Monitoring mission to South Africa will take place within 12 months following Management’s submission of the Report on the implementation of the Updated Management Action Plan to the Boards.” The IRM considers the monitoring mission a useful practice which should be continued, especially as the
project remains in non-compliance status until the FGD units are installed and become operational. As operations of the first FGD equipment is planned for 2021, the IRM Monitoring Team recommends that the next IRM monitoring mission be shifted from an annual to a biennial (every two years) schedule. Thus, the next IRM monitoring mission should be conducted in 2019. By this time, preparation of the program for FGD installation and implementation of the Phase 2 of the Mokolo-Crocodile Water Augmentation Project (WCWAP-2) should have advanced significantly so that progress can be monitored and an assessment can be made whether installation of FGD units will be done on time and whether investment preparation of the MCWAP-2 project have sufficiently advanced to allow for operation of all FGD units. However, during the discussion of the report, the Boards of Directors explicitly requested that the next IRM monitoring mission be carried out in 2018.

While the IRM proposes a 24 months monitoring schedule for the remaining period of the implementation of the Management Remedial Action Plan, it is essential that AfDB Management continue to supervise implementation of the remaining action items on a six-monthly basis and that progress reports be submitted to BCRM. The IRM will continue to review the progress reports and may seek additional clarifications from Management. The IRM Monitoring Team requests that Management continues to provide updates, which the IRM will review. The IRM Monitoring Team requests for a detailed progress report on the sand mining issue which it hopes can be resolved in the near future.

The IRM Monitoring Team looks forward to assisting the Bank to ensure that the Medupi Power Project becomes compliant with the applicable Bank Group policies and procedures to enable the Medupi Project to become a model for responsible power development in Africa.

The Boards of the Directors of the African Development Bank approved the following:

i. The findings contained in this Report.
ii. The third annual monitoring of the Medupi Power Project to be undertaken by the IRM in 2018; and.
iii. The Bank Management to send bi-annual supervision reports on progress made in the implementation of the Updated Management Action Plan for review by the IRM.
ANNEX 1: SEVENTH UPDATE ON THE PROGRESS IN IMPLEMENTING THE ACTION PLAN APPROVED BY THE BOARD ON THE MEDUPI POWER PROJECT FOR INDEPENDENT COMPLIANCE REVIEW, FEBRUARY 2017.

AFRICAN DEVELOPMENT BANK GROUP

SEVENTH UPDATE ON THE PROGRESS IN IMPLEMENTING THE ACTION PLAN APPROVED BY THE BOARD ON THE MEDUPI POWER PROJECT FOR INDEPENDENT COMPLIANCE REVIEW

February 2017
### LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AfDB</td>
<td>African Development Bank</td>
</tr>
<tr>
<td>AQMP</td>
<td>Area Air Quality Management Plan</td>
</tr>
<tr>
<td>CEMP</td>
<td>Construction-Phase Environmental Management Plan</td>
</tr>
<tr>
<td>CRMU</td>
<td>Compliance Review and Mediation Unit</td>
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<tr>
<td>CSOs</td>
<td>Civil Society organizations</td>
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<tr>
<td>DEA</td>
<td>Department of Environmental Affairs</td>
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<tr>
<td>DPE</td>
<td>Department of Public Enterprises</td>
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<td>DWS</td>
<td>Department of Water and Sanitation</td>
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<td>ECO</td>
<td>Environmental Control Officer</td>
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<td>EHS</td>
<td>Environment, Health and Safety</td>
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<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<tr>
<td>EMC</td>
<td>Environment Monitoring Committee</td>
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<tr>
<td>FGD</td>
<td>Flue Gas Desulphurization</td>
</tr>
<tr>
<td>GFA</td>
<td>Guarantee Framework Agreement</td>
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<tr>
<td>GoRSA</td>
<td>Government of the Republic of South Africa</td>
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<tr>
<td>HAP</td>
<td>Heritage Action Plan</td>
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<tr>
<td>HIA</td>
<td>Heritage Impact Assessment</td>
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<td>HMP</td>
<td>Heritage Management Plan</td>
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<td>IA</td>
<td>Implementation Agreement</td>
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<td>IRM</td>
<td>Independent Review Mechanism</td>
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<td>IRP</td>
<td>Integrated Resource Plan</td>
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<tr>
<td>LTIs</td>
<td>Lost Time Incidents</td>
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<tr>
<td>MCIO</td>
<td>Medupi Central Information Office</td>
</tr>
<tr>
<td>MCWAP</td>
<td>Mokolo and Crocodile River Water Augmentation Project</td>
</tr>
<tr>
<td>MES</td>
<td>Minimum Emission Standards</td>
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<tr>
<td>NAAQS</td>
<td>National Air Quality Standards</td>
</tr>
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<td>NT</td>
<td>National Treasury</td>
</tr>
<tr>
<td>OEMP</td>
<td>Operations Phase Environmental Management Plan</td>
</tr>
<tr>
<td>OHS</td>
<td>Occupational Health and Safety</td>
</tr>
<tr>
<td>RESA</td>
<td>Regional Environmental and Social Assessment</td>
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<tr>
<td>RoD</td>
<td>Record of Decision</td>
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<tr>
<td>SO₂</td>
<td>Sulphur dioxide</td>
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<tr>
<td>WBPA</td>
<td>Waterberg-Bojanala Priority Area</td>
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<tr>
<td>WSA</td>
<td>Water Supply Agreement</td>
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<tr>
<td>WUL</td>
<td>Water Use License</td>
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Summary

This seventh update on the progress in implementation of the Independent Review Mechanism (IRM) Action Plan for the Medupi Power Project follows the supervision mission conducted from 22-31st January 2017. During the mission, Management received updates which continued to indicate significant progress in implementation of the project Construction- phase Environmental Management Plan (CEMP) in general and the IRM Action Plan in particular. Overall, Management is satisfied that both Eskom and the relevant regulatory authorities of the Government of South Africa (GoRSA) continue to play their part in monitoring and enforcing compliance with the regulatory requirements and conditions of authorization on various aspects of air emissions, water quality, as well as Occupational Health and Safety (OHS).

It will be recalled that in the 5th and 6th Updates, Management, on the basis of satisfactory progress on some of the IRM Action Plan items, recommended that at-least 3 of the items which had largely been achieved, could be considered achieved and could be removed from further progress reporting. These items include; the requirement for Eskom to engage with the affected communities to reach closure on their concerns on the issue of graves, finalization of the Operations Phase Environmental Management Plan (OEMP) and finalization of the Regional Environmental and Social Assessment (RESA) Study. In this seventh update, any progress reported on these particular items should thus be viewed as being over and above the attainment of the specific action plan items as was phrased in the Board approval. For instance, inspite of the fact that Eskom successfully engaged with communities to reach an understanding on the issue of graves, facilitated in part by the comprehensive Heritage Impact Assessment (HIA) and traditional rituals conducted to the satisfaction of the affected families, Eskom continues to engage with the affected families/communities and other relevant agencies of the GoRSA on any other outstanding issues in the Heritage Action Plan (HAP) and reports on these engagement to the Bank through the normal project reporting channels.

It is also Management’s opinion that a fourth item requiring “development of a monitoring program on surface and groundwater for the operation phase based on the conditions of the water use licenses and include it in the OEMP” has been achieved as previously reported in updates 5 and 6.

Since the beginning of the monitoring program on the progress in implementing the Action Plan, the status of the various Action Plan items is as summarized in the table below.
<table>
<thead>
<tr>
<th>Action Plan item</th>
<th>Status</th>
<th>Comment</th>
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<tbody>
<tr>
<td>Continuous monitoring of Construction Phase Environmental Management Plan (CEMP) and compliance with the requirements of the various licenses to be issued under the CEMP.</td>
<td>Significant progress continues to be made with monitoring stations for ground water quality, air quality, dust emission and noise installed and data collected and analyzed on a regular basis. Data collected is also regularly shared with stakeholders through the Environment Monitoring Committee (EMC).</td>
<td>This is a continuous activity that will go well into the operations phase, with current monitoring intended to establish the baseline conditions against which the impact of the project will be measured during the operations phase.</td>
</tr>
<tr>
<td>Occupational Health and Safety (OHS)</td>
<td>Monitoring of all OHS incidents as captured and reflected in Lost Time Incidents (LTIs) continues to be an integral part of the monitoring program to ensure the project takes note and follows up on all incidents and accidents at work. A record of LTIs is taken on a daily basis and remedial action taken accordingly.</td>
<td>As an indication that Medupi Project Management takes OHS issues very seriously, Eskom plans to conduct training for all its Supervisors and those of Contractors on safety during the month of February 2017. In addition, recent data on actual Lost Time Incidents (LTIs) is on average lower than the projected target rates ie; LT1 of 0.19 compared to target of 0.2, which is an indication of effort the project puts on safety issues.</td>
</tr>
<tr>
<td>FGD Installation</td>
<td>Eskom reaffirms its commitment to sequentially install FGD systems for abatement of SO2 emissions for all the six generation units. It is understood that the development funding for FGD installation has been approved by Eskom Treasury and Ministry of Finance and project development and the conceptual design work is underway.</td>
<td>Further progress on this activity to be reported in next supervision mission. In the meantime Management has requested for a more detailed schedule for the outstanding milestones so as to be able to track progress.</td>
</tr>
<tr>
<td>Reporting on the status of implementation of the project, including (i) Project Quarterly Progress Reporting to the Bank and (ii) Frequency of Bank supervision missions.</td>
<td>The project has submitted all due quarterly progress reports, and management has continued to provide oversight through regular supervision missions, including the just concluded supervision mission in January 2017 which followed the last mission in July 2016. Management also continues to receive monthly monitoring reports from the Independent Environmental Control Officer (EEO) who represents the Department of Environmental Affairs (DEA) project monitoring and oversight.</td>
<td>Implementation of this activity continues to be satisfactory with the project providing regular updates to management on one hand, and Management providing regular and timely oversight to the project on the other hand.</td>
</tr>
<tr>
<td>Conduct further Regional Assessment of Coal Based Energy Projects between South Africa and Botswana to build on the work already done.</td>
<td>Study fully completed. Currently the Department of Energy is conducting an analysis to determine if the scenarios under which the study was undertaken are still valid and relevant under the country’s current and medium term energy planning strategy. The study is also expected to inform the revision of the Integrated Resource Plan and well as inform energy planning in South Africa and Botswana.</td>
<td>Further status updates on the integration of RESA findings in IRP review to be received in next supervision mission.</td>
</tr>
<tr>
<td>Follow up with DWS on status of the Mokolo-Crocodile Water Augmentation Project (MCWAP-2) and development of the effluent re-use and groundwater use.</td>
<td>MCWAP 1 already delivering water (30.5 million m3/year) sufficient for the initial 3 FGD units. Further preparatory work ongoing on key outstanding milestones for MCWAP 2, with the current schedule for key activities including securing of project financing, application to register EIA with DEA – by April 2017 and securing environmental authorization by December 2017. Commencement of construction is planned for – June 2019 and water delivery by June 2023.</td>
<td>Management continues to express its concern regarding the MCWAP 2 execution schedule which could affect the FGD installation for Medupi Unit 4 onwards. To this effect, Management requested for a more detailed schedule for the outstanding milestones so as to be able to track progress. Further updates to be received in next supervision mission.</td>
</tr>
<tr>
<td>Follow up with DWS on status of the Mokolo-Crocodile Water Augmentation Project (MCWAP-2) and development of the effluent re-use and groundwater use.</td>
<td>Sand study complete and further enforcement action awaiting decision of regulatory authorities.</td>
<td>Need to communicate back the findings and outcomes of the Specialist sand study to the farmers who had lodged complaints to the authorities regarding the impact of sand mining activities on their farming operations. Ground water monitoring to be continuous into the operations phase.</td>
</tr>
<tr>
<td>Develop a monitoring program of surface and groundwater for the operation phase based on the conditions of the water use licenses and include it in the OEMP.</td>
<td>Ground water monitoring program developed and under implementation with ground water monitoring stations at all key potential pollution sources such as the coal stockyard, workshops and ash dump/excess coal stockyard.</td>
<td>Ground water monitoring to be continuous into the operations phase.</td>
</tr>
<tr>
<td>Engage Marapong community to reach an understanding and closure on the issue</td>
<td>The requirement for Eskom to “Engage Marapong community to reach an understanding and closure on the issue” has been achieved following the consultative process that culminated in the preparation of a Heritage Action Plan (HAP) and the subsequent conduct of the traditional rituals that met the expectations of the families/communities affected.</td>
<td>Activity fully achieved although Eskom is still committed to further engagement with affected families on other outstanding activities in the HAP.</td>
</tr>
</tbody>
</table>

Detailed updates on the more recent progress are detailed out in section 2 below.
1.0 Introduction

The supervision mission conducted from 22nd-31st January 2017 was the seventh in a series of supervision missions that Management has carried out to assess progress on the Medupi Power Project in general and on the implementation of the Independent Review Mechanism (IRM) Action Plan in particular. This seventh progress update therefore outlines the progress reported during that mission and has been prepared in compliance with the IRM rules of procedure, which among others, provide that Management shall submit to the Compliance Review and Mediation Unit (CRMU) copies of reports on the progress of implementation of any Management Action Plan submitted to the Boards and any monitoring reports on such implementation to the Boards or the President, as the case may be, for consideration, as often as required and in any event not less than once a year.

As in previous missions, Management engaged and consulted with the relevant departments of the Government of the Republic of South Africa (GoRSA), and with other relevant authorities and stakeholders, on various issues relevant to IRM Action Plan. These included meetings with officials of the National Treasury (NT), Department of Public Enterprises (DPE), Department of Environmental Affairs (DEA), Department of Water and Sanitation (DWS) and Eskom. Site visits to the project site were also conducted, during which discussions were held with senior project managers and the Environment, Health and Safety (EHS) team of the Medupi Power Project. This progress update has also been informed by meetings and presentations made by Eskom.

Following below is an update on further progress realized in implementing the various components of the Action Plan as informed by reports received during the January 2017 mission.
2.0 **Key issue: Risk to Public Health due to Emissions**

2.1 **Required Action (A): Continuous monitoring of Construction Phase Environmental Management Plan (CEMP) and compliance with the requirements of the various licenses to be issued under the CEMP.**

2.1.1 **Monitoring of the CEMP implementation**

Management received updates on the ongoing project monitoring activities by Eskom and the independent Environment Control Officer (ECO) on behalf of the Department of Environmental Affairs (DEA). Management continues to receive monthly environment monitoring reports submitted by the ECO providing updates on various compliance issues.

Data presented during the mission indicated compliance on key compliance items of the Record of Decision (RoD) and the CEMP, including ambient air quality, ground and portable water quality, noise and dust fallout. Updates on major monitoring parameters included the following:

2.1.1.2 **Noise:**

All the nine monitoring stations, as well as contractors own monitoring, showed no exceedance of noise limits in the recent months, resulting in no recent complaints received regarding violation of permissible ambient noise levels.

2.1.1.3 **Air emissions monitoring, including dust and particulate matter emissions**

**Medupi site emission monitoring**

At the project site, updates provided continued to show satisfactory compliance with ambient air quality standards with respect to dust and NO₂ emissions, although with intermittent diurnal spikes of non-compliances due to a variety of reasons. The ambient air quality monitoring data in last six months indicated that PM2.5 concentrations (against a limit of 40 µg/m³) and the PM10 concentrations (measured against a standard of 75 µg/m³) are high in the morning and evening with peaks observed at 03:00 hours and 05:00 hours and between 20:00 hours and 22:00 hours. This has been attributed to influences by other low-level sources such as domestic combustion, vehicular movement on dust roads and agricultural farming activities.
Sulphur dioxide (SO₂) emissions also continued to be generally within the 3500 mg/Nm³ limit, except on occasions when higher Sulphur coal was used. Unit 6 emissions showed particulate matter not to exceed the emission standards, largely on account of installation of high temperature fabric filter bags that have proved more effective.

The Lenders also received a brief about Eskom’s proposed postponement application for compliance to the Minimum Emission Standard (MES) for the existing plant’s SO₂ emission limits for Medupi and Matimba Power Stations. On the grounds that current emissions largely complied with the 3500 mg/Nm³ limit, the Lenders sought clarification on the rational for the postponement application since there did not appear to be an immediate breach of the SO₂ emission standards. Eskom explained that its application was driven by a concern that both Matimba and Medupi coal fired power stations receive their coal from the Grootegeluk Mine and over the last year, there has been a variability and an increase in the average sulphur content of the coal, which could likely increase their respective SO₂ emission levels. Thus, while the power stations’ average monthly emissions are within the MES limits, there are times when the daily limits for Medupi and Matimba are being exceeded due to the high sulphur content of coal. However, in view of the importance of country systems approach in safeguards management, Management believes that this matter will be satisfactorily handled by the relevant Departments of GoRSA.
Considering Eskom’s concern about coal of higher sulphur as the cause of spikes in SO$_2$ emissions, the Lenders suggested that Eskom could, in the interim, consider the option of direct lime injection to control SOx emissions for the next six years before installation of the FDG to help realize the desired emission levels. Such an approach was noted to have been tested in the USA and in Europe and shown to reduce SOx emissions by up to 50%. Eskom explained that at the moment, the Medupi plant is unable to undertake blending at the stock yard but steps are being taken to finalize commissioning of the coal reclaimer to enable coal blending. Eskom further informed the Mission that the Grootegeluk Mine has since adopted a blending strategy to try and mitigate the peaks.

**Waterberg-Bojanala Priority Area Air Quality Management Plan (WBPA- AQMP).**

The DEA presented progress on the implementation of the Waterberg-Bojanala Priority Area Air Quality Management Plan (WBPA- AQMP). The overall objective of the WBPA- AQMP is to bring ambient air quality within the Waterberg Bojanala Priority area into full compliance with the National Air Quality Standards (NAAQS) by 2020 in the face of other planned strategic infrastructural developments within the region. Against a baseline obtained from air emissions monitoring inventory up to 2012, dispersion modeling of air emissions projected an increase of all the key elements being monitored (ie; SO$_2$, NO$_2$ and particulates) within the region for 2015, 2020, 2025 and 2030. DEA, however, clarified that the model simulation only included documented planned infrastructure developments within the region and will need to be updated to include other potential emission sources which are yet to be documented as of the time of the model simulation. Considering that industry was responsible for a greater proportion of the emissions, there is good reason to ensure all industrial sources (documented and not) are captured as input into the AQMP implementation and that knowledge and understanding of air quality amongst stakeholders in the WBPA is enhanced.

![Graph of emission levels](image)

**Fig. 1:** Current and projected emission levels for various parameters

*Source: DEA*
Management requested to be availed with the most recent AQMP implementation report.

2.1.1.4 Occupational Health and Safety (OHS)

The project continues to maintain up-to-date OHS records with data presented to the mission for Medupi showing the actual Lost Time Incidents (LTIs) to be on average lower than the projected target rates, although Eskom was still concerned that the highest monthly incidence rate (LTI of 0.19 compared to target of 0.2) was still significantly high than it would have desired. The figure below presents the 12 month trend of LTI for 2016.

![Graph showing LTI trend]

Similar to the previous data, spillages still accounted for the highest number of lost time incidents.

Eskom also reported on the recent fatalities at the plant and the transmission line that cost the lives of two workers, and noted that these incidents triggered a number of actions by Management to ensure that similar incidents can be prevented in the future. Planned actions include, among others, training of all supervisors of Eskom and Contractors on safety during the month of February 2017.

On account of these fatalities, the Lenders requested Eskom to in future communicate and report any fatalities when they occur and not wait until an implementation support mission.
2.1.1.5 FGD Installation

Eskom reaffirmed its commitment to sequentially install the FGD system for abatement of SO$_2$ emissions from the six generation units and informed the Lenders that the development funding has been approved by Eskom Treasury and Ministry of Finance and project development and the conceptual design work are underway. Eskom indicated further that the project is in the approved budget, although the funds had not been allocated yet. Eskom has now firmed up the design and a revision on the development budget approved in November 2016. However, the Lenders expressed continued concern over a slipping schedule to installation of the first operational FGD for Unit 6 by 2021, with the current schedule having Unit 6 FGD construction planned to start by April, 2020, which would leave an impractical 1.5 years for final construction and commissioning, by August 2021. It was agreed that Eskom would have internal discussions regarding availability of financing (required by May 2018) and commencement.

Eskom indicated that it will continue to refine and improve the FGD schedules to allow the normal minimum of 24-30 months between the first unit’s completion and its Commercial Operation. Detailed designs of buildings and civil works are scheduled for 2017, while all EIA approvals need to be obtained by 2018. Budget confirmation for the actual works should be achieved by end 2018.

For the FGD installation program, the key next milestones include:

a. Detailed designs of process package (absorber island) – October 2017
b. Detailed designs buildings and civil works – October 2017
c. Environmental Authorization – April 2018
d. Commencement of Construction – April 2020

2.1.1.6 Ground water monitoring

Data from the majority of the ground water monitoring wells continued to indicate water quality within allowable limits. A number of the old monitoring boreholes were rehabilitated in April 2015 due to blockages or obstructions in the boreholes. Special attention was paid to borehole MBH04S, which was flushed with clean water and cleaned out with compressed air to see if it has any influence on the water quality. The rehabilitation of the boreholes did not have a marked effect on the water qualities. Even in MBH04S that was cleaned, there was little or no change in the water quality. Point source pollution has therefore been ruled out. The Ground Water assessment monitoring concluded that groundwater quality conditions varied significantly within relatively short distances, as a result of compartmentalization caused by groundwater flow barriers (geological structures) as well as varying aquifer host rock. Eskom continues to investigate this to ascertain cause.
2.2 **Required Action (B). Reporting on the status of implementation of the project:**

2.2.1 **Project Quarterly Progress Reports submitted to the Bank.**

The project continues to submit quarterly progress reports on schedule, with the quarterly progress reports for the first, second and third quarters of 2016 received, while the one for quarter four is expected. In addition, the ECO has continued to submit monthly Environmental Compliance Reports detailing compliance actions taken and issues for follow up by respective Contractors on the project. All the ECO monthly monitoring reports for the period January – December 2016 were submitted to Management for information.

2.2.2 **Frequency of Bank supervision missions**

Following postponement of the 2016 end of year supervision mission, Management conducted the just concluded Mission in January 2017 which was not a significant departure from the regular schedule.

3.0 **Key issue:** No Regional Impact Assessment

3.1 **Required Action:** Conduct further Regional Assessment of Coal Based Energy Projects between South Africa and Botswana to build on the work already done.

With the Regional Environmental and Social Assessment (RESA) study already finalized, and the overall conclusion being that with currently available data and using reasonable assumptions, the level of the proposed coal-based energy generation programme in the border region would lead to significant exceedances of prescribed environmental standards in many cases, it is still the expectation of Management that these findings should find their way to inform and influence energy planning in the two countries. In the just concluded supervision mission, it was Eskom’s and Management’s shared understanding that the review of the Integrated Resource Plan (IRP), which the Department of Energy has embarked on, would provide the best opportunity for the RESA findings and recommendations to be used to inform the process and thereby assist decision-makers in making the case for alternative technologies, programmes and location of future coal-fired power plants in the longer term.

Management was further informed that the Department of Energy has embarked on a process to subject the scenarios upon which the study was undertaken to a further analysis to determine if the scenarios are still valid and relevant under the country’s current and medium term energy planning strategy.

4.0 **Key issue:** Compliance with the Integrated Water Resources Management Policy

4.1 **Required Action i):** Follow up with DWS on status of the Mokolo-Crocodile Water Augmentation Project (MCWAP-2) and development of the effluent re-use and groundwater use.
While Phase 1 of the Mokolo Crocodile Water Augmentation Project (MCWAP Phase 1) has made 30.5 million m³/year of water available, the Lenders noted with concern the continued delays in finalizing the financing and construction plan for the MCWAP Phase 2 which is now more than two years behind schedule. With the remaining three FGD units to be supplied with water from MCWAP 2 planned to be operational by March 2024, the implication is that the remaining lead time was now only eight months, and any further delays would jeopardize timely operation of the last three units with Flue Gas Desulfurization (FGD).

In view of this concern for the FGD schedules between when water from MCWAP 2 is required for Medupi Unit 4 onwards, the Lenders requested for more detailed milestones so as to be able to track progress. The DWA informed the Mission that it will be able to confirm the milestones once the borrowing limit is confirmed. The key next milestones were outlined to include:

i. Provision of detailed milestones of the project - March 31, 2017

ii. Finalization of planning reports based on transfer capacity of 75 million m³/annum and on revised borrowing limit approval – April 2017

iii. Obtaining of concurrence from Minister of Finance for approval of borrowing limit – March 2017

iv. Securing of project financing – April 2018

v. Application to register EIA with DEA – April 2017

vi. Environmental authorization completed – December 2017

vii. Commencement of construction – June 2019

viii. Water delivery – June 2023

With respect to water supply capacity for MCWAP 2, updates received from DEA indicated that in November 2016, the Minister of Water and Sanitation approved a revised borrowing limit for a project of 75 million m³/a, taking cognizance of a Cabinet resolution in September 2016 of reducing the capacity to 75 million m³/a (from 100 m³/a). Accordingly the Environmental Impact Assessment (EIA) for the approved project scope has been initiated. The Lenders were informed that a draft Guarantee Framework Agreement (GFA), Water Supply Agreement (WSA) and Implementation Agreement (IA) are ready. However, confirmation of availability of fiscal funding is required for the social component before disbursement from financing for the commercial component can commence.
4.2 **Required Action ii):** Follow up on the DEA, DMR, DWS and DAFF Task Team decision on the sand mining issues.

4.2.1 **Sand mining in the Mokolo River**

During the just concluded mission, updates were received on the status of the legislative actions that have been undertaken following suspension of the sand mining operations in the Mokolo River. Following completion of the Specialist Study on the environment and social impacts due to the past sand mining activities that preceded the ban, the Limpopo Local authorities have imposed a fine on the principal sand miner. The payment of the penalty will pave the way for issuance of a permit to resume legally authorized sand mining operations. The permit conditions will be informed by the findings of the specialist studies and part of the permitting process is expected to include public consultation with the affected communities and other interested parties. However, Management was concerned with the continued delays in communicating back the findings and outcomes of the Specialist Study to the farmers who had lodged complaints to the authorities regarding the impact of sand mining activities on their farming operations. Eskom observed that it had no direct control of the ongoing legislative process on the issue but noted that it will continue to urge the Regulators to communicate back the findings to the complainants. It was also reported that the ECO still monitors this process on behalf of the DEA, including monitoring of any current complaints that try to link Eskom to the sand mining activities. Management, suggested that the Environment Monitoring Committee (EMC) could be a useful avenue for communicating back the findings to the concerned farmers since the Regulators also participate in the EMC meetings.

Eskom was requested to provide further information on the “Sand Balance” for the project, including how much sand is still needed by the project, where this will be sourced from as well as how much is available on site in stockpiles. Eskom shared information regarding Sand Availability and Sources as at 25 January 2017 whose details were:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Amount of sand still required</td>
</tr>
<tr>
<td>2</td>
<td>Amount of sand available</td>
</tr>
<tr>
<td>3</td>
<td>Balance to be sourced</td>
</tr>
<tr>
<td>4</td>
<td>Where will the balance be sourced from</td>
</tr>
</tbody>
</table>

Management also emphasized that the status of further complaints, if any, received regarding sand used at Medupi was critical information for the Lenders and Eskom needed to manage any such complaints with the utmost urgency to prevent reputational risks to all the project development partners.
4.3 **Required Action iii):** Develop a monitoring program of surface and groundwater for the operation phase based on the conditions of the water use licenses and include it in the OEMP.

As reported during the previous Action Plan updates, the project does have a monitoring matrix as part of its ISO 14001 EMS that includes parameters and frequency of testing required to monitor ground and surface water quality. This surface and ground water monitoring program, which is expected to continue once Generation takes over, includes key monitoring points at potential pollution sources such as the coal stockyard, workshops and ash dump/excess coal stockyard.

5.0 **Key issue: Inadequate Public Consultation with Communities**

5.1 **Required Action (i):** Expand the functions of the Medupi Central Information Office (MCIO) to also serve as a center where grievances can be reported and where ESKOM can gain feedback from communities on the project activities.

Whereas no specific update was provided during the recent supervision mission regarding the activities of the MCIO, the account given on the MCIO activities in update 6 still provides an up-to-date description addressing this action point.

5.2 **Required Action (ii):** Enhance participation of Ward Councilors in Environment Monitoring Committee (EMC) meetings by assisting them with transportation to the meetings.

5.3 **Required Action (iii):** Develop a mechanism for Councilors to report back to communities and vice versa.

The Lenders received an update on the last three EMC meetings which discussed important issues relevant to the project, including feedback on heritage matters at Medupi, air and water quality monitoring. Through these meetings the EMC continues to be a platform for giving feedback to and from the communities in the project area. The 40th Medupi Environmental Monitoring Committee Site Visit and Meeting took place on 13 October 2016, which was attended by EMC Members, Project and Contractor staff and delegates from the DEA and DWS. The 41st EMC meeting held on 28 November 2016, attended by members discussed various issues such as comments from the Environmental Control Officer (ECO); water management; and animal mortalities. EMC members continue to actively discuss topics of interest to the community, including their own observations made during the site visits, ECO observations, water quality monitoring and air quality/emissions performance. The EMC requested Eskom to further investigate and report during the next meeting, control of ash dust, as well as progress on outstanding actions for construction of wash bay, service bay, hazardous waste and associated infrastructure.
6.0 **Key issue:** Desecration of Graves and Land Claims

6.1 **Required Action:** Engage Marapong community to reach an understanding and closure on the issue

This being an important issue still being monitored under the Independent Review Mechanism of the AfDB, the Mission requested Eskom to provide an update on the implementation of any outstanding activities of the Heritage Action Plan (HAP) since the conclusion of the traditional rituals last year.

7.0 **Conclusion**

Management commends Eskom and all the various departments of the GoRSA that continue to oversee various aspects of implementation of the CEMP, conditions of authorization and the IRM Action Plan for the Medupi Power Project. Ongoing actions to follow up on the recommendations of the two important studies on sand mining and the RESA are commended.

Management commends and acknowledges Eskom’s efforts to continue working with project affected communities on issues of interest to them, such as the efforts to follow up on the outstanding action areas on the Heritage Action Plan. Eskom’s community programs which are part of its socio-economic development initiatives are equally commended as they have extended the benefits of the project to many beneficiaries in the project impact zone in line with the Bank’s gender and inclusive growth strategies.