

**SASOL MINING (PTY) LTD**  
**Twistdraai Colliery Thubelisha Shaft**

**Licence Number: Ref No. MP 30/5/1/2/3/2/1 (138) EM)**  
**dated 17/01/2018**

**EXTERNAL AUDIT: ENVIRONMENTAL AUTHORISATION  
& ENVIRONMENTAL MANAGEMENT PROGRAMME**



**DECEMBER 2022**



PREPARED FOR	PREPARED BY
<b>Name of Client:</b> Sasol Mining (Pty) Ltd	<b>Name of Consultant:</b> MDT Environmental (Pty) Ltd
<b>Address:</b> Twistdraai Colliery: Thubelisha Shaft Private Bag X1015, Secunda, 2302	<b>Address:</b> 673 Glosotti Street, Garsfontein, 0043
<b>Tel: +27</b> <b>Cell: +27 (0) 82 410 7280</b>	<b>Tel: +27 (0) 11 348 6931</b> <b>Cell: +27 (0) 82 445 1781</b>
<b>Contact Person:</b> Carol Hooghiemstra	<b>Contact Person:</b> Deon Esterhuizen
<b>Email:</b> <a href="mailto:carol.hooghiemstra@sasol.com">carol.hooghiemstra@sasol.com</a>	<b>Email:</b> <a href="mailto:Deon@mdte.co.za">Deon@mdte.co.za</a>



**SASOL MINING (PTY) LTD  
TWISTDRAAI COLLIERY THUBELISHA SHAFT**

**EXTERNAL ENVIRONMENTAL AUTHORISATION & ENVIRONMENTAL  
MANAGEMENT PROGRAMME AUDIT FOR TWISTDRAAI COLLIERY  
THUBELISHA SHAFT**

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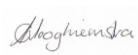
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TWISTDRAAI COLLIERY THUBELISHA SHAFT**

**EXTERNAL ENVIRONMENTAL AUTHORISATION &  
ENVIROMENTAL MANAGEMENT PROGRAMME AUDIT  
FOR TWISTDRAAI COLLIERY  
THUBELISHA SHAFT**

**DOCUMENT CONTROL SHEET**

<b>Report/Project Number:</b>	<b>Twistdraai Colliery: Thubelisha Shaft</b>
<b>Report/Project Title:</b>	External Environmental Authorisation & Environmental Management Programme audit for Twistdraai Colliery Thubelisha Shaft

Revision Number	Date of Issue	Status of Report	Originator		Checked		Approved	
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00	2023/06/28	1 <sup>st</sup> Draft	DE				CH	

## Executive Summary

MDT Environmental (Pty) Ltd (MDTE) was appointed by Sasol Mining (Pty) Ltd (Sasol) to conduct an External Environmental Authorisation & Environmental Management Programme audit of the Twistdraai Colliery Thubelisha Shaft.

The scope of the audit encompassed TCTS and in particular its surface and underground operations. The site audit and reconnaissance focused on the overall mining operations and all active sites.

The audit was conducted by Deon Esterhuizen on 19 - 20 December 2022.

The site audit and reconnaissance focused on the overall mining operations and all active sites.

The audit was successfully completed, and the commitment from the TCTS employees, specifically from Sasol senior management at the Mine, is commendable.

The overall EA compliance score is 100% and the EMPr compliance score is 97%.

Considering the risk categories, the following areas require attention / intervention by TCTS, specifically considering the EA and EMPr conditions:

- Fugitive dust monitoring results and reporting of incidents.
- Implement regular maintenance of all stormwater (clean and dirty) systems at all areas on the Mine, including seepage control at the coal emergency / throw out stockpile area.
- Management of Potential Groundwater / Seepage Impacts at Emergency Stockpile
- Underground Mining Plan & Water Management Strategy.

To ensure improved compliance with the requirements of the EMPr the Mine should:

- Continue to address fugitive dust exceedances and ensure compliance with NAEIS.
- Implement regular maintenance of all stormwater (clean and dirty) systems at all areas on the Mine, including seepage control at the coal emergency / throw out stockpile area.
- Update the underground mining planned model and the approach to address the requirements of the EMPr.
- Establish a functioning security group within surrounding farmers.
- Develop a Conservation Management Plan.
- Initiate public awareness programmes regarding subsidence.

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## LIST OF ACRONYMS & ABBREVIATIONS

BPG	Best Practice Guideline
CAR	Corrective Action Report
DWS	Department of Water and Sanitation
EC	Electrical Conductivity
EIAR	Environmental Impact Assessment Regulations, 2014, as amended
ELU	Existing Lawful Uses
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
IWUL	Integrated Water Use Licence
IWULA	Integrated Water Use Licence Application
IWWMP	Integrated Water and Waste Management Plan
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NWA	National Water Act, 1998 (Act 36 of 1998)
PCDs	Pollution Control Dams
ROM	Run of Mine
RSIP	Rehabilitation Strategy and Implementation Plan
SEMA	Specific Environmental Management Act
SS	Suspended solids
TCTS	Twistdraai Colliery: Thubelisha Shaft
TOC	Total organic carbon
TDS	Total dissolved solids
TSS	Total suspended solids

WCWDMP	Water Conservation and Water Demand Management Plan
WML	Waste Management Licence
WUA	Water Use Authorisation
WUL	Water Use Licence
WwTW	Wastewater Treatment Works



## 1. INTRODUCTION

MDT Environmental (Pty) Ltd (MDTE) was appointed by Sasol Mining (Pty) Ltd, Twistdraai Colliery: Thubelisha Shaft (TCTS) to conduct an external audit on compliance with the conditions set out in the Environmental Authorisation (EA) and Environmental Management Programme (EMPr). The EMPr and EA were approved in 2009, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) and the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The EMPr was amended in 2017 to incorporate two additional mining right areas as well as the construction of two ventilation shafts into its approved EMPr. The EMPr has been submitted to the DMRE for consideration and was approved on 29 July 2020. Therefore, the Environmental Audit was undertaken against the operational conditions within the existing and approved EMPr and EA dated 2020 for the TCTS operations. Additionally, a Regulation 29 Amendment application was submitted to include additionally properties into the EMPr boundary. This Regulation 29 has since been approved (Ref No. MP 30/5/1/2/3/2/1 (138) EM) dated 17/01/2018. The audit was conducted by Deon Esterhuizen on 19 December 2023.

### 1.1.1 Background

The TCTS was commissioned to replace Twistdraai Colliery's shafts as coal reserves of the latter were depleted:

- Central shaft decommissioned and shaft sealed in 2012;
- West Shaft decommissioned and shaft sealed in 2015; and
- East Shaft decommissioned in December 2017 and rehabilitated in June 2018.

The life of mine (LOM) for TCTS extended to 2050.

The project which includes the Trichardtsfontein Mine, Vaalkop and TCTS is located between the town of Trichardt and Bethal in the province of Mpumalanga. The town of Evander is 17 km to the West and Secunda is 10 km South West of the Trichardtsfontein and TCTS mining area. Vaalkop is located 5 km southeast of Bethal and 17 km southwest of Trichardt. The consolidation project area and coal reserve are located within the Bethal Magisterial District, the Gert Sibande District Municipality (GSDM) and the Govan Mbeki Local Municipality (GMLM).

The mining method includes both bord-and-pillar and high extraction mining (stooping) in selected areas. Primary access to the underground reserves is achieved via a vertical main and materials shaft, with secondary access via an incline shaft at TCTS.

### 1.1.2 Audit Objectives, Scope and Criteria

The objective of the audit was to verify whether the TCTS complies to the requirements of the EA and EMPr (where applicable).

The scope of the audit encompassed TCTS and in particular its surface underground operations. The site audit and reconnaissance focused on the overall mining operations and all active sites.

The audit was conducted by Deon Esterhuizen on 19 and 20 December 2022.

The site audit and reconnaissance focused on the overall mining operations and all active sites. The audit included the following:

- The independent external audit was initiated with an opening meeting on 19 December 2022, during which the audit approach was discussed, and the audit schedule and focus areas confirmed.
- A site walk and visits to active areas and especially water-related features.
- A collection and review of audit evidence in terms of documentation and records.
- The audit culminated in a close-out meeting on 20 December 2022.

### 1.1.3 Audit Scope and Approach

The audit was conducted by an experienced external lead auditor and the audit approach was independent and holistic. The compliance to audit criteria – in this case the EA and EMPr, were verified by sample site inspections, collection of applicable documentation, records and reports as well as interactive discussions with the organisation's environmental staff and on-site employees.

The audit was a systematic review of the records and data presented by the auditee team to the external auditor. In the absence of evidence not being found or provided confirming compliance to a condition, a non-compliance was raised.

### 1.1.4 EA and EMPr External Auditor and Declaration of Independence

The EA and EMPr external Auditor was Deon Esterhuizen who also prepared the audit report. Below is a summary of his relevant experience:

Deon Esterhuizen has a M.Sc. degree in Environmental Management with 29 years of experience in water related projects, which include water resource management, water quality management, water use registration and licencing of water users, including project management of multi-disciplinary studies. He also has extensive experience in a wide-range of environmentally related projects, processes and applications for private, commercial and industrial clients, in addition to local, provincial and national government departments.

#### *Water Resources*

Key experience gained through his involvement in a number of water resources related projects, including ensuring the protection, development, conservation, management, use and control of the water resources in the Gauteng Region's area of responsibility in a sustainable manner as well as co-ordinate the management of the quality of the water resources of a specific catchment on an ongoing basis to achieve water resource objectives

during his employment at the Department of Water Affairs and Forestry. Specific focus areas include:

- Catchment Management Strategies & Plans
- Water Quality Management Plans
- Registration and Licensing of water users
- Assessing water requirements for basic human needs and riverine ecology
- Determining stream-flow assimilative capacity for pollution loads
- Water quality guidelines
- Industrial wastewater treatment and disposal

#### *Environmental*

Key experience gained through environmental related projects as a consultant at BKS (Pty) Ltd and ILISO Consulting (Pty) Ltd in the fields listed

below:

- Integrated Environmental Management (IEM) in general
- Environmental Impact Assessments (EIAs)
- Environmental Management Plans (EMPs)
- Environmental monitoring and auditing

#### *Project Coordination & Management*

Key experienced gained as the project leader and coordinator on a number of large, strategically important and multi-disciplinary projects for various clients, including international (Africa) projects.

#### *External Reviewer*

Key experienced gained as external reviewer for the Department of Water and Sanitation as well as other consulting firms.

#### *Relevant Experience*

- Annual IWUL Audit for Sasol Synfuels.
- Glencor Lydenburg Operations: External Audit of Integrated Water Use Licence
- Annual IWUL Audit for Sasol Thubelisha Mine and Sasol Mooikraal
- Sasol Sasolburg General Authorisation application for Section 21 (c) and (i) water uses as required ito the National Water Act
- Sasol Mining General Authorisation application for Section 21 (c) and (i) water uses as required ito the National Water Act
- Project Leader and Coordinator for providing consulting engineering services to assist the City of Tshwane with various flood management activities on an “as-and-when” basis for a three-year period. November 2011 – October 2014.
- Project Lead of the Environmental Team that formed part of a bigger team managed by SRK to prepare environmental and water use applications for City of Tshwane Flood Management Activities. 2008 – 2012.
- Project Manager Environmental Impact Assessment (EIA) for the installation of Solar Photovoltaic Power Plant at Eskom Arnot and Duvha Power Stations. October 2014 – Current.

- Water Use Licence Application Task leader - for the Mzimvubu Water Project for the construction of the Ntabelanga and Lalini Dam and associated infrastructure.
- Project Leader - Basic EIA for the construction of flood remedial measures on the Doringkloof Spruit.
- Environmental and Social Lead of the Olifants River Water Resources Development Project - Sub- Phases 2C. Responsible and accountable for the management of all environmental and social related tasks performed by two Environmental Monitors, two Social Monitors, and a Land Acquisition Team. This team was responsible to ensure that the Contractor executes the project within the guidelines of legislation, the environmental authorisation, the environmental management plan, and project specifications. Trans Caledon Tunnel Authority. January 2011 – Current.

This report has been prepared according to the requirements of Section 34 of the Environmental Impact Assessments Regulations, 2014, as amended. I, Deon Esterhuizen, the undersigned, declare the findings of this report free from influence or prejudice.



**Deon Esterhuizen: Professional Natural Scientist (RN: 400154/09)**

**Director: MDT Environmental (Pty) Ltd**

### 1.1.5 Methodology

The audit was a systematic review of the records and data presented by the TCTS employees to the External Auditor. In the absence of evidence, a finding was raised.

To ensure consistency of findings and reporting, it was agreed that the Auditor would use the Sasol ISOMETRICS spreadsheet. This approach also allows for the active closeout of audit findings by the relevant and responsible parties.

The main result is that only compliant or non-compliant findings can be raised. This ensures a very conservative approach and was accepted by all.

The spreadsheet also makes provision for risk categories, with high risk findings summarised below:

- Competent Authority reporting requirements
- Stormwater management
- Water quality and quantity exceedances
- Design requirements of pollution prevention facilities
- Activities not authorised in terms of the NWA
- Pollution of surface and ground water resources, including the potential for pollution
- Impact on stakeholders / neighbours
- Closure financial liabilities
- Freeboard requirements for pollution control facilities
- Undermining activities within regulated zone of water resources

### **1.1.6 Disclaimer**

Although care is taken to audit as comprehensively as possible, auditing is done on a sample basis and based on conditions as they were found on the day of the audit. There could thus be other non-conformances not observed during the audit, or a finding could be a once off occurrence.

## 2. INDEPENDENT EXTERNAL AUDIT RESULTS

An excel based audit checklist was developed by Sasol and used to capture the results of the audit. The assessment criteria were discussed earlier. The criteria ensures that the assessment is objective and removes any bias.

Considering the risk categories discussed above, the following areas require attention / intervention by TCTS, specifically considering the EA and EMPr conditions:

- Fugitive dust monitoring results and reporting of incidents.
- Implement regular maintenance of all stormwater (clean and dirty) systems at all areas on the Mine, including seepage control at the coal emergency / throw out stockpile area.
- Management of Potential Groundwater / Seepage Impacts at Emergency Stockpile
- Underground Mining Plan & Water Management Strategy.

The details of each risk category are discussed below.

The audit checklists that were completed for the audit is attached as **Appendix A**.

### 2.1.1 Fugitive dust monitoring results and reporting of incidents

The Mine does monitor dust and reports against legal standards. The Mine complies fully with the set standards, but evidence (fugitive dust results) suggests that excessive fugitive dust is generated onsite.

It was reported that dust fall results at Thubelisha east exceeded the non-residential standards of 1 200 mg/m<sup>2</sup>/day. It appears that there is no incident management tool (procedure) to investigate, address the dust fallout exceedances from the Mine, and report the same to the Competent Authority.

National Dust Control Regulations were published on 1 November 2013 (Notice 827 of 2013). The purpose of the regulations is to prescribe general measures for the control of dust in all areas. Two exceedances per year, but not sequential months are allowed in terms of the standards. Any two consecutive exceedances within twelve months, must be reported to the Competent Authority, with a remediation plan included. The Auditor could not determine whether the Mine is compliant with the standards because one set of samples were provided.

The National Atmospheric Emission Reporting Regulations came into effect on the 2 April 2015 (Notice 283 of 2015). The purpose of the regulations is to regulate the reporting of data and information from an identified point, non-point and mobile source of atmospheric emissions to the internet based National Atmospheric Emissions Inventory System (NAEIS) as to compile atmospheric emission inventories. Any entity that holds a mining right or permit in terms of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002), must comply with these regulations. Entities must submit the required information for the preceding calendar year to the NAEIS by 31 March of each year. Records of data submitted must be kept for a period of 5 years and must be made available for inspection by the relevant authority. Again, the Auditor could not determine compliance with these regulations.



**2.1.1 Implement regular maintenance of all stormwater (clean and dirty) systems at all areas on the Mine, including seepage control at the coal emergency / throw out stockpile area.**



Storm water management and drainage planning are critical components of integrated water and waste management at mining sites.

As part of the final EMP for Thubilisha, it was committed by the Mine that clean water will be diverted away from the dirty water areas and permitted to discharge into the Debeerspruit and natural environment. The mine also committed to cleaning the stormwater canals regularly to prevent blockages and allow the water to naturally flow away from the mine.

It was noted during the audit that sections of the water management canals have dense reed growth and vegetation (grass). The vegetation restricts the flow of water and encourage siltation, decreasing the capacity of the canal and increasing the risk of uncontrolled spills.

The sediment cleaning areas encroaches into the clean water canal running past this facility. During cleaning events contaminated runoff enters the clean storm water system, as shown in the photographic evidence below.

	
<p>Silted stormwater canal system</p>	<p>Silted stormwater canal systems</p>

	
<p>Sedimentation ponds storage area that encroaches onto clean stormwater canal system</p>	<p>Coal spillages into clean stormwater canal system</p>

### 2.1.2 Management of Potential Groundwater / Seepage Impacts at Emergency Stockpile

The approved EMPr of Thubilisha Mine requires that the emergency stockpile should be managed to minimise infiltration of contaminants to the groundwater.

The Mine has initiated the construction of a cutoff stormwater canal and has shared the design drawings previously with the auditor. A design report that confirms that this cutoff trench is designed for the 1:50 year flood was shared with the auditor, but it specifically does not include; addressing super critical stormwater flows; creating a level platform, effective diversion of upstream clean stormwater and flow attenuation. The new canal will divert contaminated stormwater to the existing contaminated runoff facilities and Pollution Control Dams (PCDs).

Although surface water has largely been addressed, the Mine has to confirm how seepage infiltration will be arrested at this facility, or initiate an investigation that confirms no infiltration occurs.

### 2.1.3 Underground Mining Plan & Water Management Strategy

In terms of the EMPr the mine must limit the extent of pillar extraction to target only areas with a low potential for water ingress. This implies excluding all floodplain areas and areas within the 1:100 flood line, all areas with a **thin soil cover** that have a significant catchment draining to them, and as far as is practical, the mine must avoid **rocky outcrops**. It was also noted that the mine areas currently designated for pillar extraction do contain some percentage of thin cover and rocky outcrop.



These areas, as highlighted above, are currently not part of the underground mining planned model and the approach as described above is also not incorporated in the mine plan for Thubilisha.

#### **2.1.4 Other Findings Raised**

Other findings raised by the Auditor are listed below:

- No public awareness programmes regarding subsidence provided to the Auditor.
- No evidence provided of a functioning security group within surrounding farmers. This is a repeat finding and it was reported that it was found onsite that neighbouring farmers lock access gates to vent shafts and other mine infrastructure, which demonstrates that no working relationship exists with neighboring farmers.
- No Conservation Management Plan was provided to the Auditor. An action has been included in the IWWMP to develop one.

### 3. CONCLUSION & RECOMMENDATIONS

The audit was successfully completed, and the commitment from the TCTS employees, specifically from Sasol senior management at the Mine, is commendable.

The overall EA compliance score is 100% and the EMPr compliance score is 97%.

To ensure improved compliance with the requirements of the EMPr the Mine should:

- Continue to address fugitive dust exceedances and ensure compliance with NAEIS.
- Implement regular maintenance of all stormwater (clean and dirty) systems at all areas on the Mine, including seepage control at the coal emergency / throw out stockpile area.
- Update the underground mining planned model and the approach to address the requirements of the EMPr.
- Establish a functioning security group within surrounding farmers.
- Develop a Conservation Management Plan.
- Initiate public awareness programmes regarding subsidence.



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## APPENDIX A: AUDIT CHECKLISTS