





STORMWATER MANAGEMENT & ASSOCIATED INFRASTRUCTURE

BASIS OF DESIGN

Beeshoek Plant Optimisation Project – JIG Plant

JZADBR4951-CIV-REP-003 Rev A

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	Stormwater Management & Associated Infrastructure Basis Of Design <i>Beeshoek Low Grade Plant Optimisation Project – JIG Plant</i>		
	Rev. A	Date. 28 April 2021	

REVISION RECORD



Revision No	Date Issued	Description	Person
A	28.04.2021	Draft for Review	Fernando Mendes
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2			

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REFERENCES DOCUMENTS

Document Number	Document Description
526742	Beeshoek Lowgrade Ore Beneficiation Definitive Feasibility Study Preliminary Phase II Geotechnical Investigation Report
JZADBR4951-CIV-DC-003	Civil, Structural & Infrastructure Design Criteria
JZADBR4951-ME0SPC-001	Site Climatic Conditions
ETBEE-20-5804	Hydrogeological Impact Assessment for Beeshoek Mine” Report No. January 2021.

REFERENCE DRAWINGS

Document Number	Drawing Description
04951-IH-80-YR-1-00331	JIG Plant Stormwater Management General Arrangement
04951-IH-80-P-00322	Infrastructure Site Plan
04951-IH-80-P-00490	WHIMS & JIG Plant Infrastructure & Stormwater Catchment Block Plan

ABBREVIATIONS, TERMS AND DEFINITIONS

Abbreviations/Terms	Definition
DRA	DRA Projects SA (Pty) Ltd
JIG (term)	Jigging Separation Processing Plant
DFS	Definitive Feasibility Study
MAP	Mean Annual Precipitation
MAE	Mean Annual Evaporation
LoM	Life of Mine
NGL	Natural Ground Level
GRI	Geosynthetic Research Institute
NEMWA	National Environmental Management Waste Act
GN704	Regulations on Use of Water for Mining and Related Activities aimed at the Protection of Water Resources (GN 704 GG20119 1999)

SYSTEM OF UNITS

The international metric system of units (SI) will be used throughout the design in all documentation, specifications, drawings, reports and all other documents associated.





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1. INTRODUCTION

Assmang (Pty) Ltd. has embarked on an Environmental Authorisation process to allow for the development of a Low-Grade Ore Beneficiation Facility (LGOBF) at the Beeshoek Iron Ore Mine, located approximately 7km north-west of Postmasburg in the Northern Cape.

This Engineering Report provides the basis of design for the Stormwater Drainage Management and associated infrastructure at the JIG Plant, which forms part of the LGOBF. The report is also in support of the application for the Water Use License for the proposed Low Grade Ore Beneficiation Facility.



The proposed JIG Plant and associated infrastructure will cover a footprint area of approximately 7.23 hectares, including:

- Stormwater management infrastructure, including:
 - Clean water cut off drains upstream of the plant area, and
 - Plant polluted stormwater run-off.

2. DESIGN PARAMETERS

The following design parameters for the present environmental conditions have been obtained from Section 3.1 of Report No. JZADBR4951-ME-SPC-001 Rev.C Site Climatic Conditions (September 2020):

- MAP = 410 mm
- Highest Rainfall Month = January (98 mm)
- Design storm event = 1:50-year 24-hr (112mm)
- MAE = 2,026 mm (A-Pan)

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3. JIG PLANT

3.1 Stormwater Management

Stormwater runoff upstream of the process plant is considered as clean water and is therefore deflected around and allowed to daylight downstream of the plant. The deflection of the clean stormwater was achieved with the provision of a combined earth lined trapezoidal drain & compacted earth berm for low flow velocities. The drain then changes to a stone pitched lined drain to accommodate flow velocities greater than 1m/s.

Similarly, the stormwater runoff from the Contractor's laydown area is considered as clean water. The run-off is captured in earth lined drains along the terrace edges and discharged downstream. Erosion protection is provided where drains daylight with 300mm thick reno mattresses.

The runoff from the plant may be polluted due to the processing activities within the plant and therefore deemed as dirty stormwater runoff.

A dirty water drainage system including concrete lined drains, drifts and culvert crossings in line with regulation 7 of GN 704, was provided to ensure all dirty water from the plant is controlled and channeled towards the mine's existing polluted water drainage network.

The peak stormwater runoff was calculated using the Rational Method and the drainage system was sized to accommodate peak runoffs for the 1:50-year storm event from a total catchment area of 7.23Ha. This in compliance with regulation 6 of GN704.

Reference is made to drawing 04951-IH-80-YR-1-00331 for the JIG Plant Stormwater Management G.A. Drawing 04951-IH-80-P-00490 shows the stormwater run-off catchments in relation to the overall Mine Site and Low Grade Plant Optimization Project.