

DECEMBER 2022

MARIKANA TAILINGS  
 STORAGE FACILITY (TSF)

DETAILS OF TAILINGS STORAGE FACILITY

Tailings Storage Facility (TSF) Name	Marikana
Operation	Kroondal - K2 Concentrator
Operational Status	Active
Operating Segment	RSA - PGM
Location	Approximately 15 km outside the town of Rustenburg in the North-West Province - please refer to Figure 1
Latitude, Longitude (decimals)	-25.732519, 27.40939
Ore Source	Underground
Type of Storage Facility	Impoundment (upstream development)
Deposition Methodology	Spigot
Year of Commissioning	2002
Consequence Classification (GISTM, 2020)	Very High
Operating Contractor	EnviroServ Waste Management (Pty) Ltd
Engineer of Record (EoR)	Knight Piesold (Pty) Ltd (KP)
Current Maximum Height (m)	27
Final Maximum Height (m)	41
Maximum Storage Capacity (tons/month)	200 000
Life of TSF (year)	2030 @2m/yr

TECHNICAL ASPECTS:

Adopted Factor of Safety Australian National Committee on Large Dams (ANCOLD) (July 2019)



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### Stability Assessment and Mitigation Measures (if applicable)

A stability assessment was conducted in December 2021, a summary of the findings and mitigation measures are detailed below. This assessment will be updated based on piezocone probing and laboratory testing results once they become available in Q2 2023.

(KP reference: SAND301-00851/07 Rev 0 , 31 March 2022)

Seepage was first identified on the eastern part of the TSF which resulted in Phase 1 buttressing. Thereafter, seepage on the north-west & west flanks were observed which resulted in an extension of the existing buttress (Phase 2). During the 3rd quarter inspection in 2021, seepage was noted on the north-east and south-east corner of the TSF. Another buttress extension (Phase 3) was carried out and completed in March 2022.

### Dam Breach Assessment

Assessment completed in 2022

(KP Reference: PR301-00851/05 DHR0077 Rev A, May 2022)

### Area of Inundation

Has been identified by EoRs – please refer to Figures 2 and 3

### Summary of Human Exposure

Consequence classification has been based on Population at Risk (PAR). Communities have been identified and are being engaged through various means including Community Engagement Forums (CEF)

## DOCUMENTATION:

### Site Specific OMS Manual

Version 2022 available

### Dam Safety Review (DSR)

Carried out by an independent third party in 2020. All recommendations at the time have been addressed in the last 3 years.

(KP Reference: RI301-00851/01 Rev B, August 2019)

### Design Basis Report (DBR)

Version 2022 available

(KP Reference: SAND301-00851/07 Rev A, 30 June 2022)

### Environmental Management Programme (EMPr)

In place

### Surveillance:

#### Surveillance Frequency

Daily by the Operator and monthly reports of critical controls submitted to and reviewed by the EoR

#### Surveillance Technology/System

K2Fly Decipher

Deformation Monitoring

Interferometric Synthetic Aperture Radar (InSAR)

Phreatic Surface Levels & Pore Pressure Measurements

Standpipe piezometers  
 AquaSense Retrofit piezometers (IoT device)

## RISK MANAGEMENT / EMERGENCY PREPAREDNESS:

Risk Assessment

Annual Risk Assessment (Bowtie and Fault Event Tree) completed with no untoward risk identified

Risk Management

Site specific OMS Manual in place  
 Site specific Trigger Action Response Plans (TARPs) in place  
 Critical controls established and implemented

Site Specific Emergency Preparedness & Response Plans (EPRP)

Version 2022 available

Annual emergency mock drill for a catastrophic TSF failure – undertaken on 6 December 2022 with SSW employees and contractors.

## CLOSURE & POST CLOSURE

Closure Planning

In place - report prepared by Golder Associates (Golder Reference: 20353611-341349-2, April 2021)

Closure Costing

Adequate financial capacity in place  
 Financials prepared by Golder Associates (Golder Reference: 21467925-349386-1, December 2021)

Asset Insurance Cover

In place – July 2022 to June 2023

## Independent Reviews:

Independent Tailings Review Board (ITRB)

13 July 2022 with no material concerns identified

Future ITRB Review

2024

Performance Reviews

Annual and quarterly reports and inspections completed by EoR (KP reference: SAND301-00851/07 Rev 0, 31 March 2022)



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Figure 1: Layout of Marikana TSF

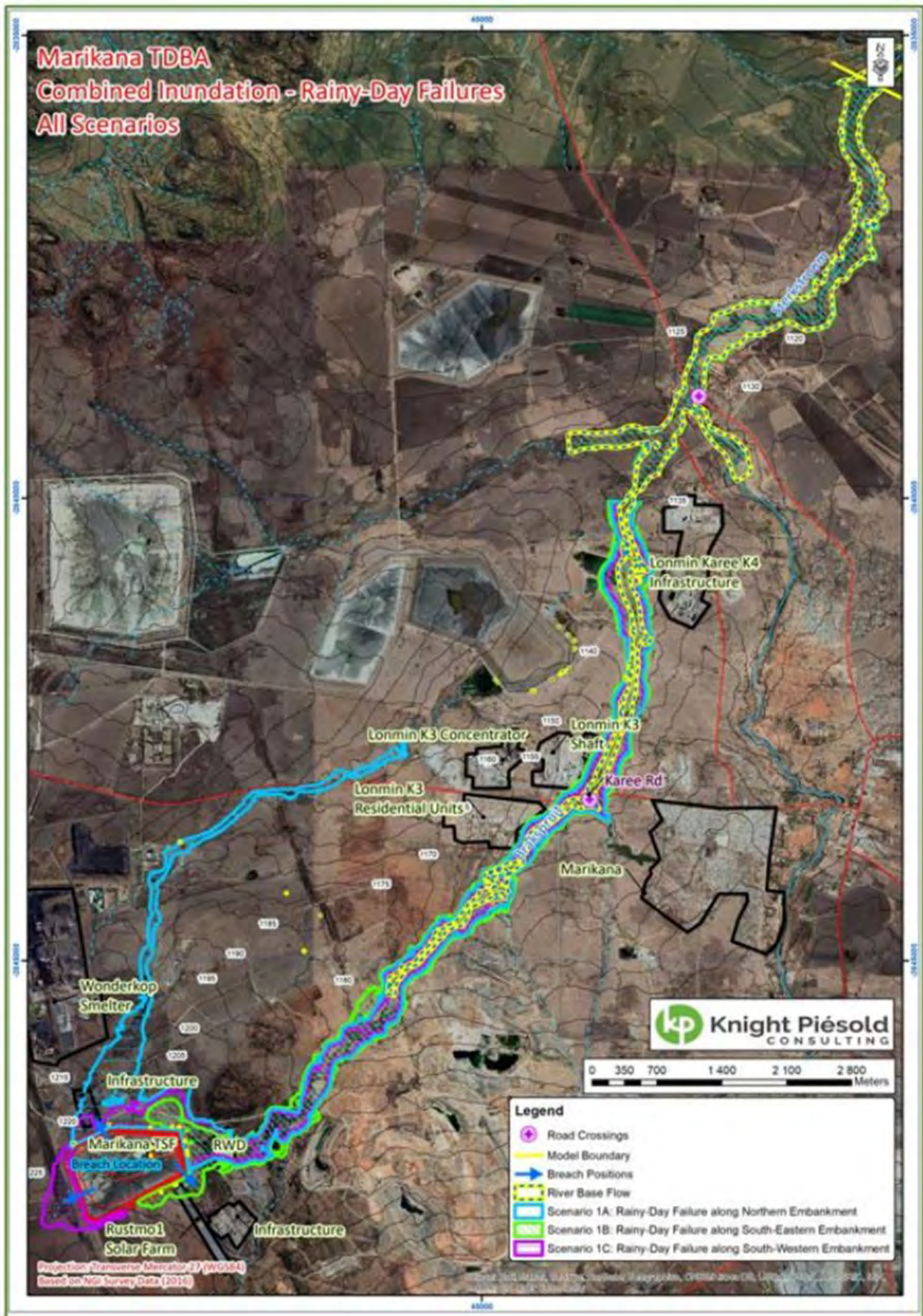


Figure 2: Consolidated view of the rainy-day failure scenario inundation boundaries



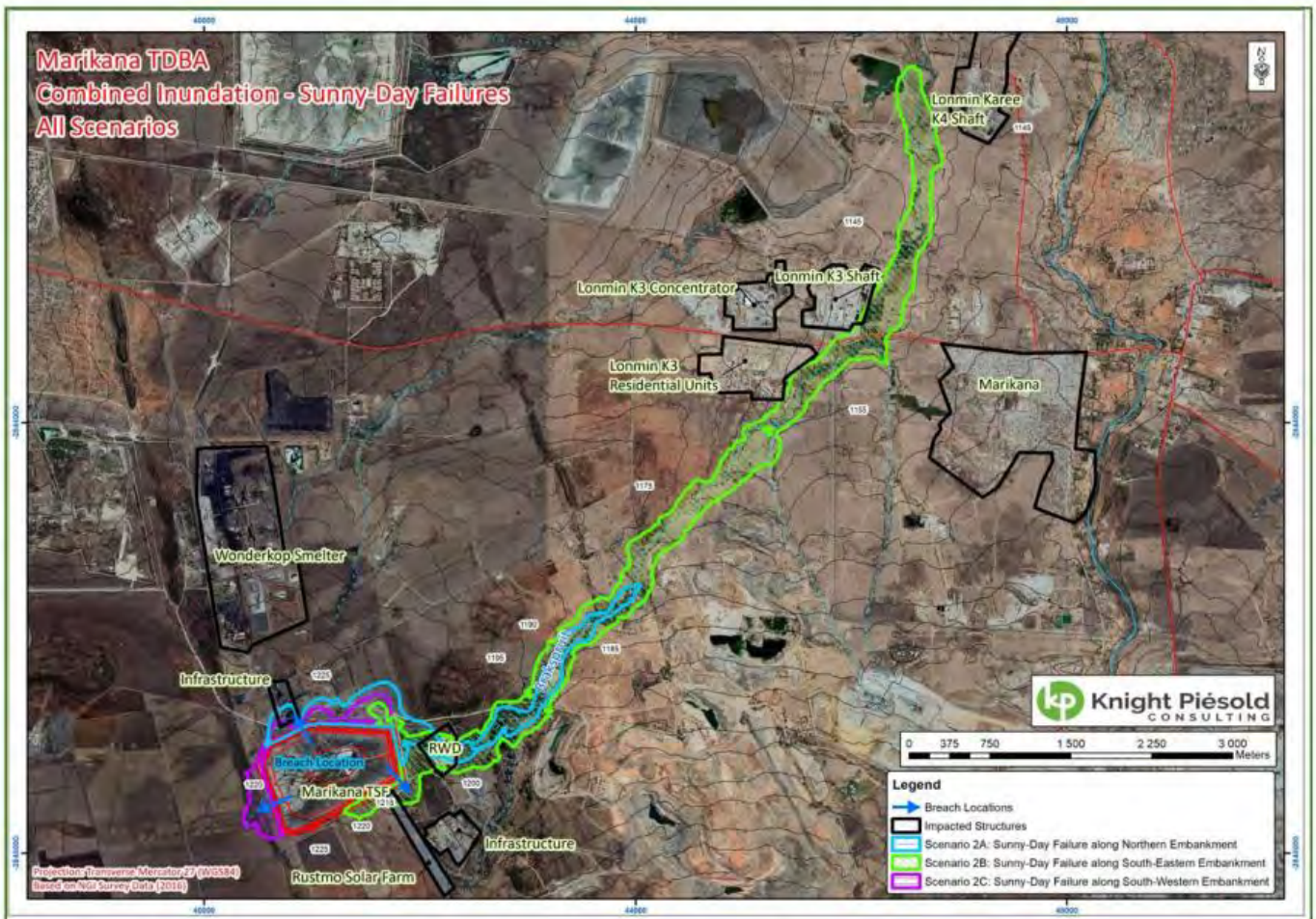


Figure 3: Consolidated view of the sunny-day failure scenario inundation boundaries