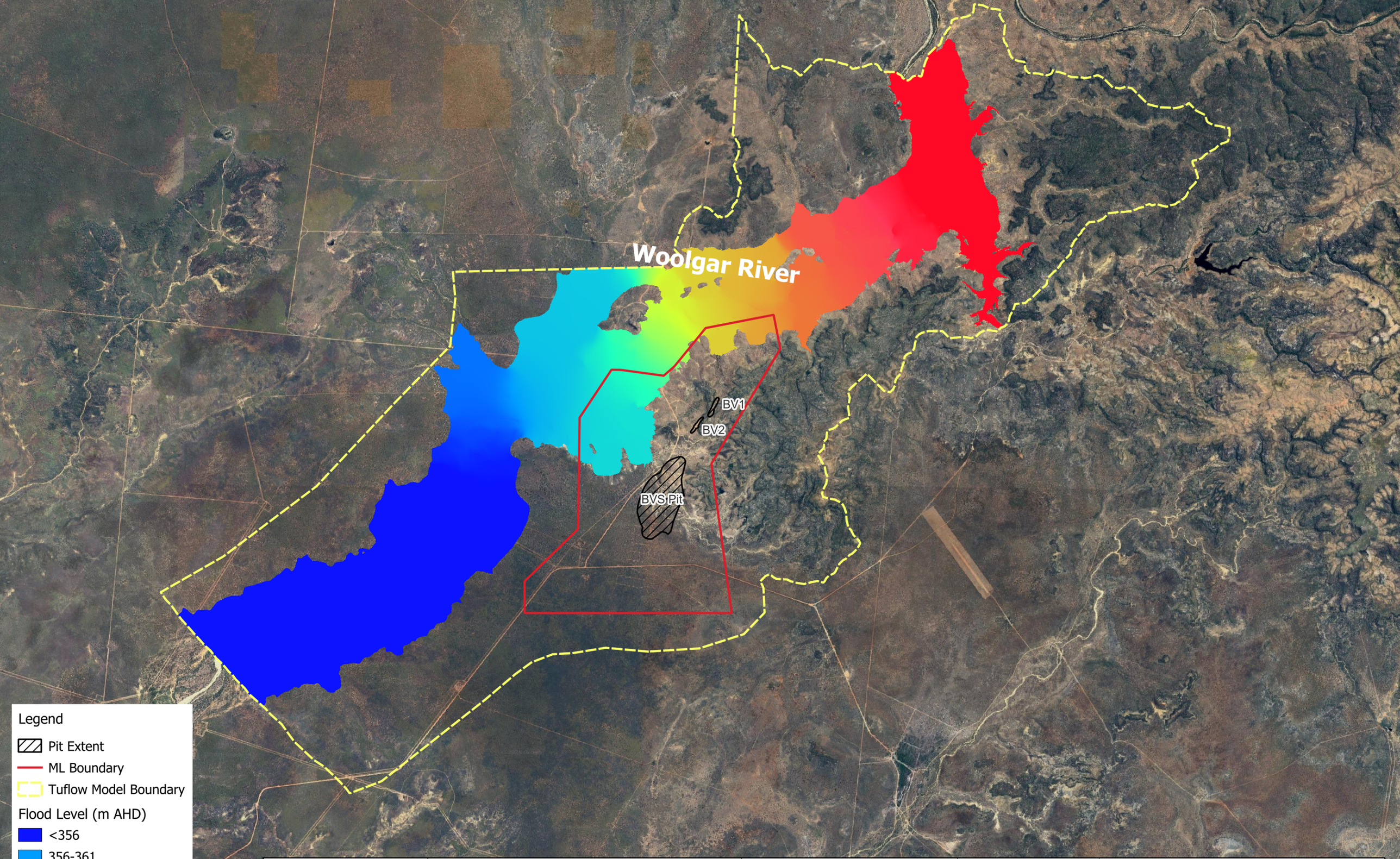


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0 1,900 3,800

Scale in metres (1:77,000 @ A3)

Map Projection: Tranverse Mercator
Horizontal Datum: Geocentric Datum of Australia
Vertical Datum: Australia Height Datum
Grid: Map Grid of Australia, Zone 54

		STRATEGIC MINERALS CORPORATION
DATE	28/5/2026	Big Vein South Gold Project Regional Flood Assessment
DRAWN	SS	PMF Flood Level
JOB NO.	BNE00504_0004	
A3	Figure 3.4	1

Woolgar River

BV1

BV2

BVS Pit

Legend

- Pit Extent
- ML Boundary
- Tuflow Model Boundary

Flood Depth (m)

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 3.0
- 3.0 - 5.0
- >5

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0 1,900 3,800

Scale in metres (1:77,000 @ A3)

Map Projection: Tranverse Mercator
Horizontal Datum: Geocentric Datum of Australia
Vertical Datum: Australia Height Datum
Grid: Map Grid of Australia, Zone 54

		STRATEGIC MINERALS CORPORATION
DATE	12/6/2026	Big Vein South Gold Project Regional Flood Assessment
DRAWN	SS	PMF Flood Depth
JOB NO.	BNE00504_0004	
A3	Figure 3.5	1

4. CONCLUSIONS

Baseline (pre-mining) flood modelling was undertaken for the Woolgar River adjacent to the proposed BVS Project in accordance with flood modelling methodologies detailed in Australian Rainfall and Runoff 2019. The Woolgar River is the only watercourse in the immediate vicinity of the Project (several smaller drainage features flow through the Project area towards the Woolgar River). The baseline flood modelling was performed for the 0.1% AEP and PMF flood events and included adjustments to represent the "Current and near term (2021 to 2040) – SSP3-7.0" climate scenario in accordance with Australian Rainfall and Runoff Version 4.2.

The baseline flood mapping indicates the three proposed open cut pits (BVS Pit, BV1 Pit and BV2 Pit) that will remain as voids post closure, will be located outside of the baseline (pre-mining) floodplain of the Woolgar River for the 0.1% AEP and PMF flood events.

5. REFERENCES

Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors), 2019. Australian Rainfall and Runoff: A Guide to Flood Estimation, Commonwealth of Australia.

Bureau of Meteorology (2003a). The Estimation of Probable Maximum Precipitation in Australia: Generalised Short-Duration Method, Bulletin 53.

Bureau of Meteorology (2003b). Guidebook of the Estimation of Probable Maximum Precipitation: Generalised Tropical Storm Method.

Department of Environment, Tourism, Science and Innovation (2026). Information sheet – Voids in floodplains. ESR/2019/4966, Version 1.03. 19 January 2026.

Department of Environment, Tourism, Science and Innovation (2024). Statutory Guideline – Progressive rehabilitation and closure plans (PRC Plans). ESR2019/4964. Version 3.01. 16 September 2024.

Engeny Australia Pty Ltd (2026). Final Landform Flood Assessment – Big Vein South Gold Project. June 2026.

Hausfather, Zeke and Peters, Glen P. (2020). "Emissions – the 'business as usual' story is misleading". Nature. 577 (618–620).

IPCC, 2023: Summary for Policymakers. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 1-34, doi: 10.59327/IPCC/AR6-9789291691647.001.

Queensland Government (2026). Information sheet – Voids in floodplains, ESR/2019/4966, Version 1.03.

6. QUALIFICATIONS

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(g) This Report does not provide legal advice.

APPENDIX A: FIGURE SHOWING FLOOD PLAIN EXTENT FOR DRAINAGE FEATURE 1

WOOLGAR RIVER

Drainage Line 3

Northern Waste Rock Dump

BV1 Pit

BV2 Pit

Drainage Line 3

Drainage Line 1

Drainage Line 2

Central Waste Rock Dump

Drainage Line 1

Southern Waste Rock Dump

LEGEND

- Levee Alignment
- Baseline Woolgar River Flood Extent
- Model Boundary

Peak Flood Depth (m)

- < 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- > 3.0

PRCP Final Landform
Elevation (m AHD)

- 390
- 360

R	DETAILS	DATE
1	Final Issue	10-06-2026

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This drawing is confidential and shall only be used for the purpose of this project.

DRAWN	ET	CHECKED	AV
APPROVED	AV	DATE	10-06-2026

NOTES:

N

0 100 200 m

SCALE - 1:14,500
GDA94 / MGA zone 54

DISCLAIMER
Engeny has endeavoured to ensure accuracy and completeness of the data. Engeny assumes no legal liability or responsibility for any decisions or actions resulting from the information contained within this map.

DATA SOURCE
QLD Government Open Data Source

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Figure A.5

Big Vein South Gold Project
0.1% AEP Flood Extents

Drg Ref.
BNE00504-0004-BVS-A5-01

S:\01_Projects\BNE\BNE00504 Strategic Minerals Corporation\BNE00504_0004 BVS DETSI IR Flooding\05 Design\QGIS\Workspaces\BNE00504_0004-WOR-001-A-BVS_Tuflow_Model.qgz

APPENDIX B: BASELINE WATER QUALITY RESULTS

BVS Water Quality Results

SampleID	Sample Date	pH Value	Electrical Conductivity @ 25°C	Suspended Solids (SS)	Total Dissolved Solids (SS)	Turbidity	Sulfate as SO4 - Turbidimetric	Aluminium	Arsenic	Cobalt	Copper	Manganese	Uranium	Zinc	Nitrate as N
SW3	9/04/2018	7.73	210		130	5.7	4.1	0.020	<0.001		<0.001	0.020		<0.004	<0.01
SW9	9/04/2018	6.69	206		140	56.0	<0.01	0.020	<0.001		<0.001	0.660		0.010	<0.01
SW2	10/04/2018	7.44	187		110	2.3	3.7	<0.005	<0.001		<0.001	<0.001		<0.004	<0.01
SW1	11/04/2018	7.54	185		120	2.9	3.6	0.010	<0.001		<0.001	0.050		<0.004	<0.01
SW1	11/04/2018	6.95	228		150	8.9	2.2	0.010	<0.001		<0.001	0.290		<0.004	<0.01
SW10	11/04/2018	7.62	115		120	150.0	<0.01	1.070	<0.001		<0.001	0.020		<0.004	<0.01
SW9	11/04/2018	6.67	217		140	64.0	<0.01	<0.005	<0.001		<0.001	1.830		<0.004	<0.01
SW3	24/04/2019	7.45	267	<5	174	1.7	7	<0.01	<0.001	<0.001	<0.001	0.299	<0.001	<0.005	<0.01
SW4	24/04/2019	6.85	277	<5	180	2.8	9	<0.01	0.001	0.003	<0.001	0.873	<0.001	0.005	<0.01
SW1	25/04/2019	7.08	218	14	142	7.9	5	0.010	0.001	0.001	<0.001	0.310	<0.001	<0.005	<0.01
SW5	25/04/2019	7.21	231	155	150	1690.0	<1	0.070	0.004	0.004	0.004	1.210	0.001	<0.005	<0.01
SW6	25/04/2019	6.85	78	55	51	40.4	<1	0.090	<0.001	<0.001	0.002	0.161	<0.001	<0.005	<0.01
SW12	26/04/2019	6.41	50	<5	32	0.8	<1	0.060	<0.001	<0.001	<0.001	0.002	<0.001	0.030	<0.01
SW1	27/04/2019	7.05	228		150	4.7	2.8	0.011	0.001		<0.0005	0.350		<0.004	<0.01
SW2	27/04/2019	7.10	178		120	1.5	5.4	<0.005	0.001		<0.0005	0.140		<0.004	<0.01
SW3	27/04/2019	7.13	280		170	2.7	8.4	<0.005	0.001		<0.0005	1.000		<0.004	<0.01
SW3	5/03/2020	7.45	167	12		6.5	6								0.02
SW3	5/03/2020	7.56	160	46		54.4	6								0.02
SW7	5/03/2020	6.85	91	156		194.0	<1								0.15
SW8	5/03/2020	7.45	144	16		65.5	2								0.21
SW3	14/03/2020	7.68	472	7		23.9	6								0.02
SW3	14/03/2020	7.23	83	17		108.0	2								0.05
SW3	14/03/2020	7.67	141	8		11.3	4								0.01
SW3	12/02/2021	6.62	127	24		42.8	4								0.68
SW3	12/02/2021	6.49	284	168		174	<1								<0.01
SW3	12/02/2021	6.76	92	616		1060	2								0.02
SW7	12/02/2021	6.32	32	12		61.7	<1								0.1
SW3	24/02/2021	6.81	102	98		88.4	<1								<0.01
SW3	24/02/2021	6.7	74	30		66	<1								0.24
SW3	24/02/2021	6.37	50	99		165	<1								0.18
SW3	24/02/2021	6.57	85	89		157	<1								<0.01
SW3	24/02/2021	6.6	115	117		86.5	<1								<0.01
SW3	24/02/2021	7.13	144	36		52.9	3								0.28
SW3	24/02/2021														
SW7	24/02/2021	7.37	47	60		205	<1								<0.01
SW3	28/04/2021	7.63	115	<5		58.1	2								0.02
SW3	28/04/2021	6.9	60	15		106	<1								0.08
SW3	28/04/2021	6.61	32	736		347	<1								0.02
SW3	28/04/2021	7.11	141	<5		6.8	2								0.06
SW2	30/04/2021														
SW3	2/02/2022	7.11	168	462	365	581	3	<0.01	0.002	0.006	<0.001	1.06	<0.001	<0.005	<0.01
SW3	2/02/2022	6.82	49	122	194	322	1	0.23	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	6.93
SW3	2/02/2022	6.9	102	1460	190	270	2	0.03	<0.001	<0.001	0.002	0.097	<0.001	<0.005	0.03
SW3	2/02/2022	7.4	121	24	325	57	2	0.04	<0.001	<0.001	0.001	0.004	<0.001	<0.005	0.08

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APPENDIX I

Mine Waste Storage Facilities Geotechnical Stability Report

STRATEGIC MINERALS CORPORATION

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Broadmeadow NSW 2292

nsw@atcwilliams.com

Our Ref: 261273-L01 Rev 1.6
12 August 2026

Strategic Minerals Corporation Pty Ltd

Level 15, 40 Creek Street

Brisbane QLD 4000

ATTENTION: CRAIG STREATFEILD

Dear Craig,

REASSESSMENT OF SLOPE STABILITY - MINE WASTE FINAL LANDFORMS

1 INTRODUCTION

1.1 Overview

Strategic Minerals Corporation Pty Limited (SMC) is developing the Big Vein South Gold Project (BVS), located 130 km north of Richmond and 380 km west of Townsville in north-west Queensland. A location plan of the Site is shown in Figure 1.

The proposed development includes an open-cut mining operation that would extract up to 1.95 MT of gold bearing ore per annum, over an 11-year Life-Of-Mine (LOM). Oxide ores extracted during the first two (2) years of operations would be treated by heap leaching. Transition and primary ores would be treated in a Carbon-In-Leach (CIL) circuit from year three (3) through to the end of LOM.

1.2 Mining Operations

Mining operations at the Site would include development of up to three (3) open pits using conventional drill and blast, load and haul methods. BVS is expected to generate over 130 MT of waste rock over the LOM that would be emplaced in one of three (3) Waste Rock Dumps (WRD's) known as:

- Northern WRD (NWRD),
- Central WRD (CWRD), and
- Southern WRDs (SWRD).

SMC proposes to emplace approximately 110 MT of the waste rock inventory at the CWRD with the remainder emplaced at the NWRD and SWRD. In addition, SMC proposes to develop the CWRD as an Integrated Waste Landform (IWL) that includes a Co-Placement Cell (CPC). The CPC would be used to contain potentially acid forming waste rock and filtered process tailings.

Processing operations at the Site would include CIL treatment of transition and primary ores to extract gold doré. Process tailings would be thickened and managed pursuant to one of two tailings management strategies that would operate in parallel.

Approximately 80% of the thickened tailings inventory would be filtered to yield a low moisture cake which would be loaded onto trucks and hauled to the CPC for emplacement.

SMC proposes that the remaining 20% of the thickened tailings stream would be contained at a purpose-built Tailings Storage Cell (TSC). The TSC would be developed by construction of a ring-style embankment forming a central impoundment area. Tailings slurry would be chemically detoxified and discharged in a manner that facilitated deposition of solids and formation of a

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gently sloping beach. Bleed water and rainfall runoff would form a decant pond from which water would be reclaimed for reuse in the processing operation.

1.3 Concept Studies

1.3.1 Overview

SMC engaged KCB Australia Pty Limited (KCB) to prepare initial designs for the WRD's and TSC. The initial designs were documented as:

- KCB (June 2024): TSC & WRD Concept Design Report **[1]**

1.3.2 Site and Material Characterisation

KCB 2024 adopted a ground model for the Site that was common to all facilities.

The ground model adopted by KCB 2024 comprised a 4 m thick layer of residual soil overlaying bedrock comprising weathered to highly weathered sandstone of at least 10 m depth. The ground model included groundwater at 20 m below ground level.

KCB 2024 also selected and documented material parameters that informed their constitutive models. These parameters were presented in Tables 2.12 (Tailings) and 3.7 (Waste Rock). Documentation of the methodology and reasoning that informed parameter selection was reasonable and consistent with the level of study undertaken.

1.3.3 Assessment of the Waste Rock Dumps

Concept assessment of the initial designs of the WRD's included:

- Slope stability assessment,
- Settlement assessment, and
- Landform evolution and erosion assessment.

1.3.4 Assessment of Tailings Storage Cell

Concept assessment of the initial design of the TSC included initial consequence category assignment and was based on a zoned embankment with a 6 m wide crest with upstream slopes 2.5 H : 1 V and downstream slopes of 3.0 H : 1 V, founded on natural ground. Assessment of the TSC considered the final landform under operational and post operational (closure) conditions and included:

- Slope stability assessment,
- Seepage assessment,
- Deformation and settlement assessment, and
- Hydrologic assessment.

Assessment of the operational condition assumed that the tailings and foundations were fully saturated. Assessment of the closure condition included placement of an engineered cap over the tailings beach.

1.4 Revision of Final Landform Geometry

In April 2026, SMC revised the geometric configuration of the WRD's.

For the WRD's, the batter slopes were revised from a compound slope of 4.75 H : 1 V (overall) to a consistent slope of 5 H : 1 V. For the TSC, the upstream and downstream batter slopes under the closure condition remained unchanged at 2.5 H : 1 V and 3 H : 1 V respectively.

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SMC engaged ATC Williams Pty Limited (ATCW) to reassess the slope stability of the WRD's and TSC under the revised geometric arrangements and specifically, for the closure condition.

The objectives of this concept level assessment were to:

- Identify potential global and local slope instability mechanisms,
- Calculate the Factor of Safety (FoS) of the proposed WRD and TSC slopes against slope instability for post closure conditions using assumed material properties,
- Highlight key geotechnical risks and uncertainties,
- Provide recommendations for further investigation and analysis required to support detailed design.

2 METHODOLOGY

2.1 General

The slope stability assessment was completed using the limit equilibrium method (as implemented in SLOPE/W) and the Morgenstern-Price method, which satisfies both force and moment equilibrium.

Slope stability assessment of the WRD's did not incorporate piezometric conditions, as the development of a groundwater table within the proposed landforms was considered non-credible. The waste rock inventories are expected to remain free draining and the climatic conditions at the Site are insufficient to sustain a groundwater surface within the emplacements. Consequently, saturated conditions within the landforms are not anticipated, except for limited edge effects.

Industry guidance for the design criteria of WRDs is provided in Hawley and Cunning **[2]** while ANCOLD Guidelines on Tailings **[3]** provide criteria for tailings storage facilities. The two references are aligned in engineering philosophy, with both advocating a risk-based design methodology. The frameworks consider potential failure modes including slope stability (internal and foundation failure), groundwater-related instability, erosion, and failure runout impacts with operations to include monitoring, surveillance throughout the facility lifecycle. For this assessment, only the geotechnical stability criteria are assessed as summarised in **Table 1**. The post seismic scenario is relevant to the stability assessment of the TSC.

TABLE 1: GEOTECHNICAL STABILITY CRITERIA

Criteria	Factor of Safety
Static, long-term drained	≥1.5
Post-Seismic (TSC closure option)	≥1.2

2.2 Material Parameters

Site specific investigation of the geotechnical properties of the proposed foundations and waste rock materials that would be emplaced at the WRDs has not been completed. For the purposes of this Study, material parameters were based on the geotechnical information presented in KCB 2024 **[1]**:

- The waste rock is assumed to comprise blasted rock fragments ranging from gravel-sized to boulders, with limited clay content. The material is assumed to behave as a coarse-grained, free draining rockfill. Waste rock would be placed by end-tipping 10m loose lifts. For this preliminary assessment, the waste rock dumps are assumed to be unsaturated, with no persistent phreatic surface within the dump or foundation. The

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potential effects of infiltration, perched water tables, or extreme rainfall events have not been explicitly modelled.

- Foundation materials are assumed to be very stiff or dense residual soils with adequate bearing capacity and shear strength. No weak layers, fault zones, or adverse groundwater conditions have been assumed at this stage. Further geotechnical investigation is required at later design stages, and where poorer materials are encountered the design may need to be revised and/or foundation preparation completed.

Assessment of the TSC also included loading attributable to the Maximum Credible Earthquake (MCE) which is likely to occur under the post closure scenario. Materials such as residual soils and tailings are expected to exhibit undrained behaviour for such loading condition. Also, the tailings are assumed to be liquified following the earthquake while all the other geotechnical units (including the residual foundation) are expected to lose up to 20% of their peak strength due to strain softening. Accordingly, the post-seismic shear strength parameters of the TSC model were also considered as presented in **Table 2**.

The material parameters adopted for this Study are shown in **Table 2** and are consistent with published data and experience with similar foundation conditions and waste rock inventories. As discussed above, additional investigations including field mapping, sub-surface investigation and laboratory testing may be required to inform detailed design of the proposed final landforms.

TABLE 2: ADOPTED SHEAR STRENGTH PARAMETERS FOR SLOPE STABILITY ASSESSMENT

Material	Unit Weight (kN/m^3)	Post Seismic			Long Term / Drained	
		Minimum Strength (kPa)	Undrained Strength Ratio τ/σ'_v	Critical State Friction Angle, ϕ'$_{cs}$ (°)	Cohesion c' (kPa)	Peak Friction Angle, ϕ' (°)
Residual Clayey SAND Foundation	20	60	0.46	-	2	30
Waste Rock	21	-	-	30	0	35
Rockfill Embankment	21	-	-	34	0	40
Capping Layer	21	-	-	30	0	35
Low Permeability Liner	19	30	0.2	-	0	28
Tailings	14	5	0.05	-	0	25

3 RESULTS AND DISCUSSION

3.1 Slope Stability Assessment Revised WRD Geometry

Slope stability assessment of the revised WRD geometry adopted batter slopes of 5 H : 1 V and vertical heights ranging from 25 m to 90m. The assessment was completed using a 2-dimensional approach that considered the most critical slope for each landform. Four (4) cross-

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sections were selected for assessment with each cross-section was oriented perpendicular to the batter slope as shown in **Figure 1**.

Slope stability assessment of the revised WRD geometry was completed in SLOPE/W. Modelled results are summarised in **Table 3** and outputs are presented as **Figures 2** to **5**. The results indicate the required factor of safety (1.5) was exceeded by a significant margin for all cases. The modelled results ranged from 3.4 to 3.5.

TABLE 3: SLOPE STABILITY ASSESSMENT – REVISED WRD GEOMETRY

Section	Figure Reference	Factor of Safety
1 - NWRD	Figure 2	3.4
2 - CWRD	Figure 3	3.4
3 - CWRD	Figure 4	3.4
4 - SWRD	Figure 5	3.5

Assessment of the geotechnical stability of the IWL and the CPC included two (2) sections running along the primary axes of the CWRD (**Figures 4** and **5**). The modelling considered the geometric extents of the CPC as well as the material properties of the emplaced filtered tailings. As shown in **Figures 3** and **4**, the failure planes indicating the minimum FoS did not intersect with the CPC. Consequently, the minimum FoS for the IWL would exceed 3.4 which exceeds the design criteria by a considerable margin.

3.2 Slope Stability Assessment TSC Geometry

Decommissioning and rehabilitation of the TSC would include construction of an engineered barrier to limit water flux through the contained waste and support the establishment of vegetation.

Considering the low-permeability nature of the tailings and their likely contractive behaviour, undrained shear strength parameters were adopted for the tailings under rapid dynamic earthquake loading. The tailings are also considered susceptible to liquefaction during such an event. As such, the liquefied strength of the tailings was adopted for the closure scenario.

The residual clayey sand foundation is also likely to exhibit undrained behaviour during earthquake loading if it is nearly or entirely saturated. Accordingly, the foundation materials were modelled using an undrained shear strength ratio for this loading condition. The foundation materials are assumed to be non-liquefiable; however, this assumption should be verified during detailed design if the foundation materials are retained within the footprint of the proposed TSC.

The slope stability assessment of the TSC under the closure condition was completed in SLOPE/W. The modelled results are summarised in **Table 4**, and the outputs are presented as **Figures 6** and **7**. The results indicate that the required factors of safety of 1.5 and 1.2 were exceeded by a significant margin for the long-term and post-seismic loading conditions, respectively.

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TABLE 4: SLOPE STABILITY ASSESSMENT – REVISED TSC GEOMETRY (CLOSURE CONDITION)

Section	Loading Condition	Figure Reference	Factor of Safety
5 - TSC Case 1	Long Term (drained)	Figure 6	2.2
6 - TSC Case 2	Post Seismic	Figure 7	1.9

3.3 Discussion

Slope stability assessment of the revised WRD's and TSC was completed in SLOPE/W. The analysis did not identify any slopes that failed to satisfy the design criteria indicating that the WRD's and TSC would remain geotechnically stable under normal operating and post-closure conditions.

It should be noted that site-specific investigations have not yet been completed and the assessment is based largely on assumed parameters. Conservative values were adopted to account for uncertainty, which is considered appropriate for an early-stage study.

ATCW recommends that future stages of development are informed by site specific geotechnical investigations that include:

- Hydrogeological characterisation of the foundation conditions,
- Geotechnical characterisation of the foundations of the WRD's and TSC including:
  - Test-pitting and or rotary drilling to inform logging, in-situ testing, and collection of disturbed and undisturbed samples,
  - Laboratory testing of representative samples,
- Geotechnical and geochemical characterisation of materials proposed for use in construction.

Should you have any questions or comments regarding this letter, please do not hesitate to contact the undersigned or John Milsom.

Yours sincerely,

AHMAD HAKIMI

Engineer

AhmadH@atcwilliams.com.au

ATC Williams Pty Ltd

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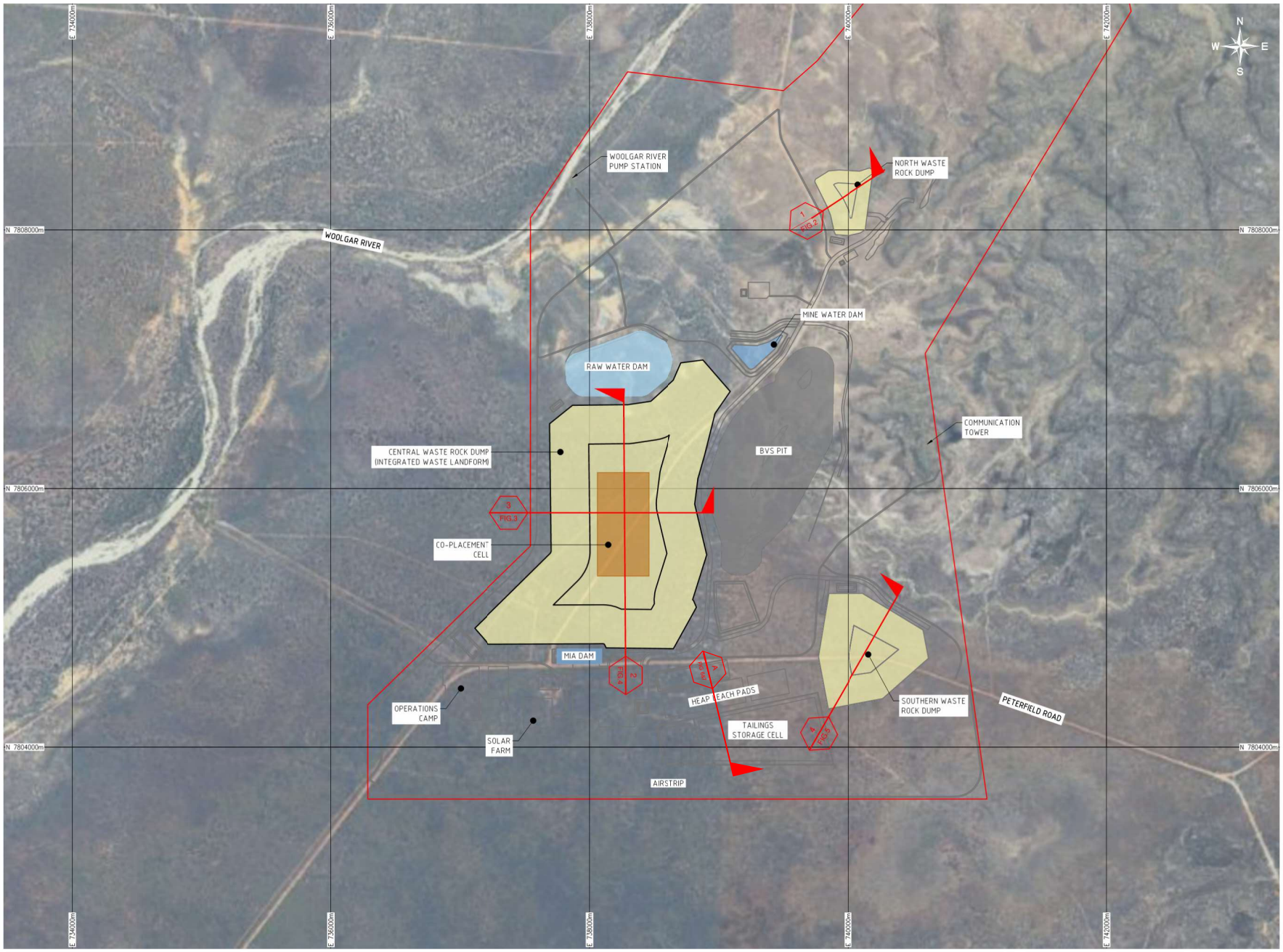
REFERENCES

[1] Klohn Crippen Berger (2024). "TSC & WRD Concept Design Report", DX70102A01.

[2] M. Hawley and J. Cunning (2017). *Guidelines for Mine Waste Dump and Stockpile Design*. CSIRO Publishing.

[3] ANCOLD (2019). "Guidelines on Tailings Dams - Planning, Design, Construction, Operation and Closure".

FIGURES



FOR INFORMATION ONLY
NOT FOR CONSTRUCTION

No.	DESCRIPTION	DATE	DRAWN	CHECK'D	APPR'D
A	FOR INFORMATION	10/06/26	MS	JM	JM

SCALE:	1:30,000
JOB No.	261273
DATE	10.06.2026
DESIGN	na
DRAWN	MS
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STRATEGIC MINERALS CORPORATION N.L.

BIG VEIN SOUTH
INTEGRATED WASTE LANDFORM CONCEPT

LAYOUT PLAN

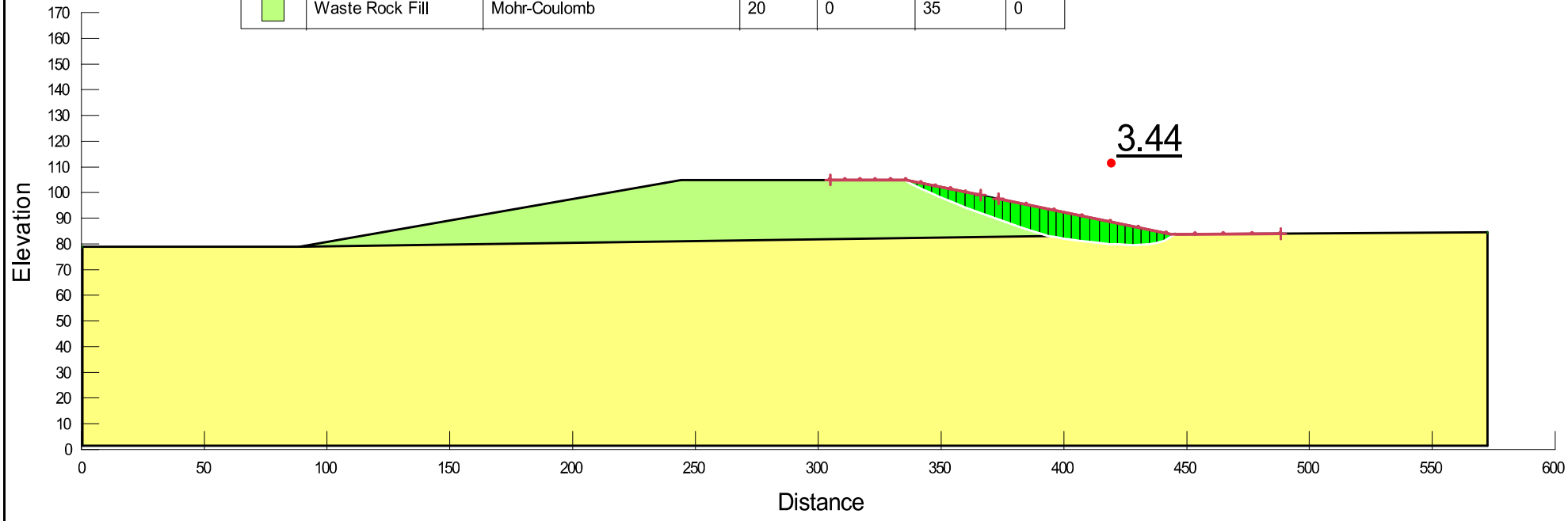
DWG. No. FIGURE 1

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SHEET 1 OF 1

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)
	Residual clayey sand	Mohr-Coulomb	20	2	30	0
	Waste Rock Fill	Mohr-Coulomb	20	0	35	0



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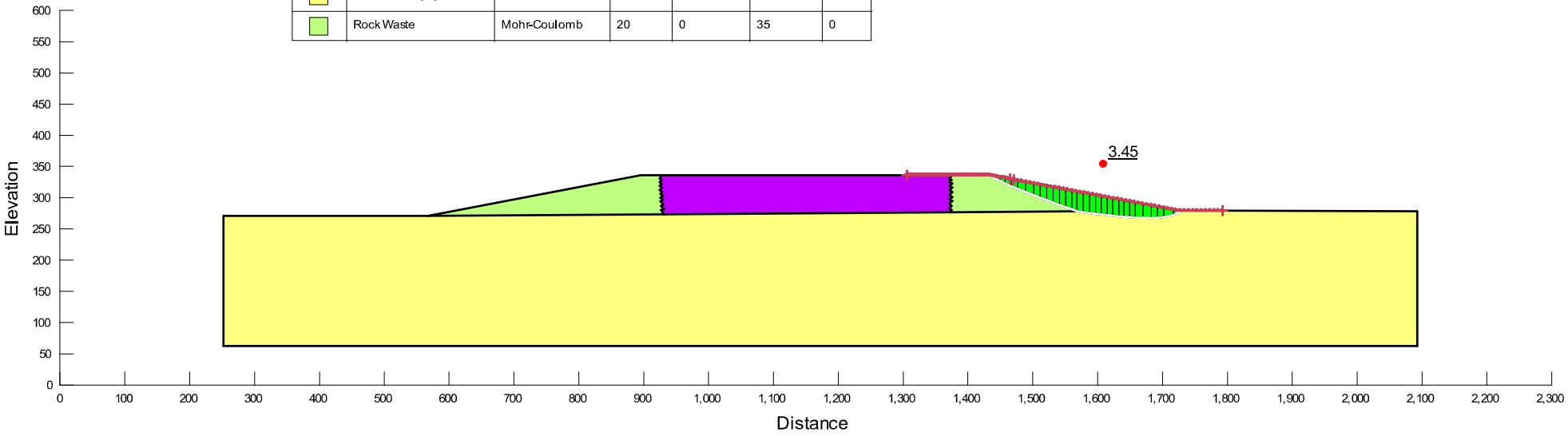
Northern Waste Rock Dump - Section 1

Date: 20/07/2026 **Job No:** 261273

FIGURE 2

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Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)
	Co - Placement Cell	Mohr-Coulomb	20	0	30	0
	Residual clayey sand	Mohr-Coulomb	20	2	30	0
	Rock Waste	Mohr-Coulomb	20	0	35	0



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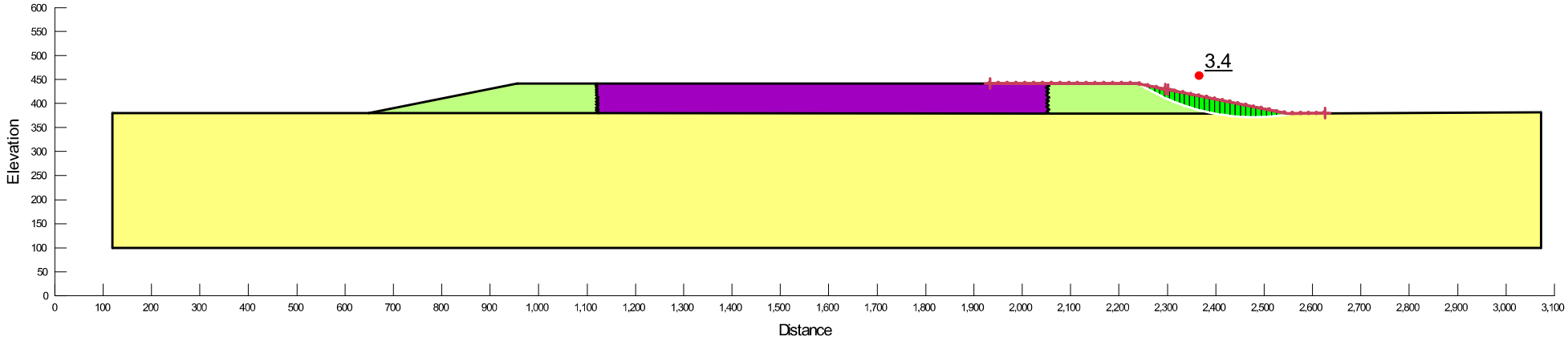
Central Waste Rock Dump - Secton 3

Date: 20/07/2026 **Job No:** 261273

FIGURE 3

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Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)
	Co - Placement Cell	Mohr-Coulomb	20	0	30	0
	Residual clayey sand	Mohr-Coulomb	20	2	30	0
	Rock Waste	Mohr-Coulomb	20	0	35	0



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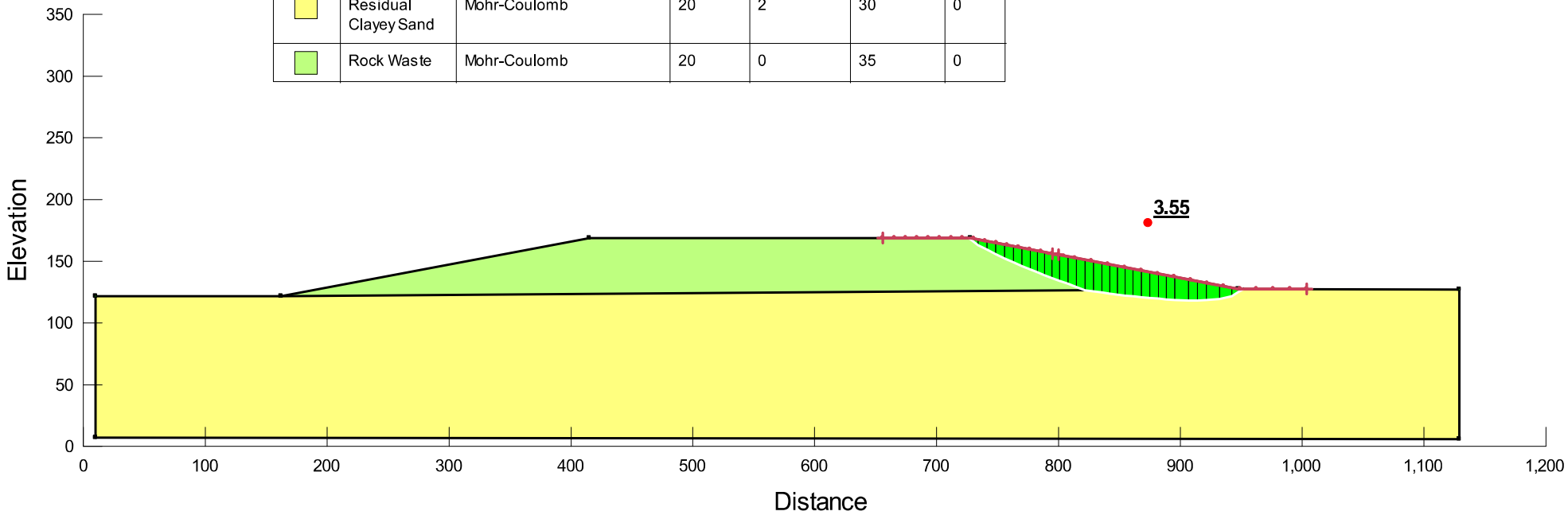
Central Waste Rock Dump - Section 2

Date: 20/07/2026 **Job No:** 261273

FIGURE 4

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Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)
	Residual Clayey Sand	Mohr-Coulomb	20	2	30	0
	Rock Waste	Mohr-Coulomb	20	0	35	0



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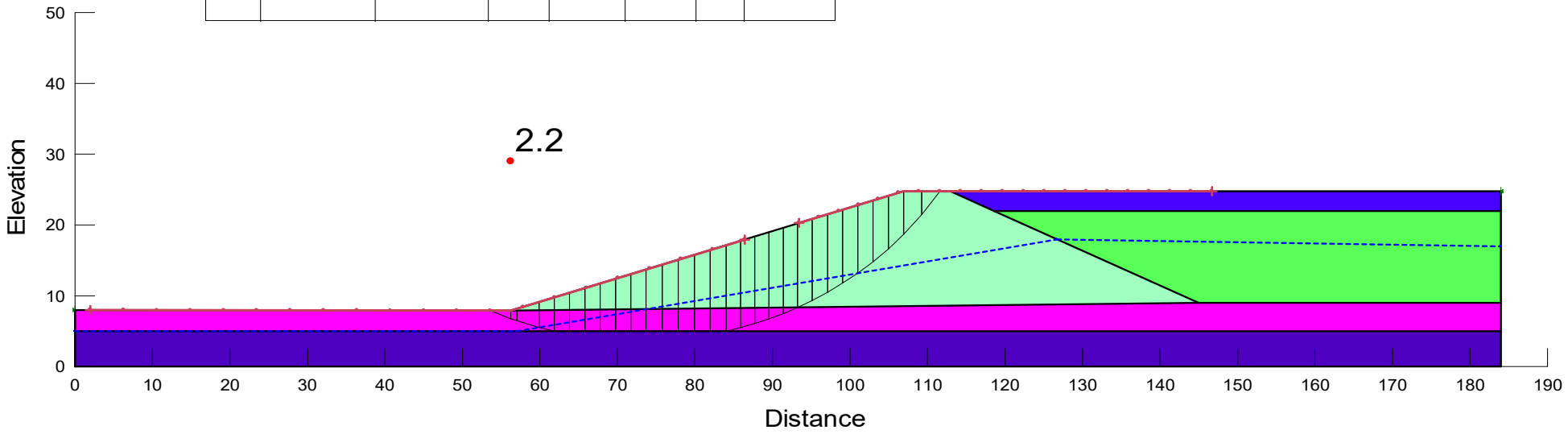
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Date: 20/07/2026 **Job No:** 261273

FIGURE 5

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Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)	Piezometric Surface
	Capping Layer	Mohr-Coulomb	21	0	35	0	1
	Residual Clayey SAND	Mohr-Coulomb	20	2	30	0	1
	Rock	Bedrock (Impenetrable)					1
	Rockfill Embankment	Mohr-Coulomb	21	0	40	0	1
	Tailings (Long-Term Conditions)	Mohr-Coulomb	14	0	25	0	1



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Big Vein South Gold Project

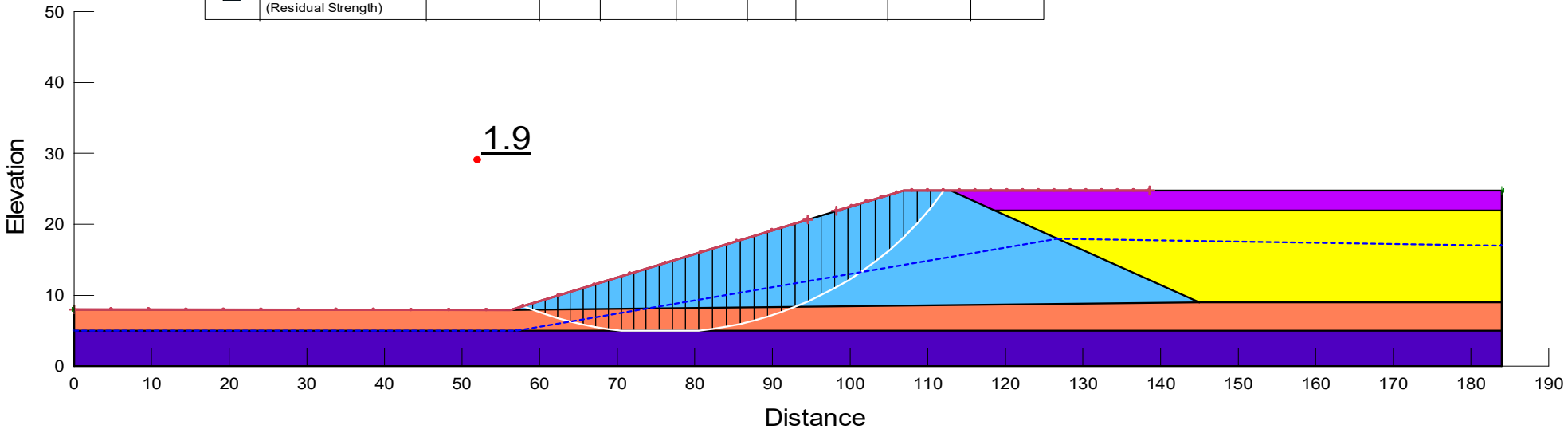
Tailings Storage Cell - Section A (Long-Term Stability)

Date: 10/08/2026 **Job No:** 261273

FIGURE 6

S:\BVS\261273 Respond DETSI RFI IWLF\Data and Calcs\SlopeW\Safety Factors Updated1 Long-Term Stability

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)	Piezometric Surface	Tau/Sigma Ratio	Minimum Shear Strength (kPa)
	Capping Layer (Residual Strength)	Mohr-Coulomb	21	0	30	0	1		
	Liquefied Tailings	SHANSEP	14				1	0.05	5
	Residual Clayey Sand (Residual Strength)	SHANSEP	20				1	0.46	60
	Rock	Bedrock (Impenetrable)					1		
	Rockfill Embankment (Residual Strength)	Mohr-Coulomb	21	0	34	0	1		



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Big Vein South Gold Project

Tailings Storage Cell - Section A (Post-Seismic Slope Stability)

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FIGURE 7

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APPENDIX J

Final Landform Flood Modelling Report

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Final Landform Flood Assessment

Big Vein South Gold Project

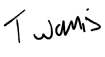
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6 JULY 2026

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Rev	Date	Description	Author	Reviewer	Project Mgr.	Approver
A	11/06/2026	Client Issue - Draft	Andrew Vitale	Aaron Baldwin	Andrew Vitale	Tim Wallis
0	6/07/2026	Client Issue	Andrew Vitale	Aaron Baldwin	Andrew Vitale	Tim Wallis
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CONTENTS

1. **Introduction** 1
2. **Background** 3
   - 2.1 Project Description 3
   - 2.2 Existing Surface Drainage 3
   - 2.3 Final Landforms 6
3. **Baseline Flood Modelling for the Woolgar River** 9
4. **Flood Modelling of Local Drainage Features** 11
   - 4.1 Overview 11
   - 4.2 Hydrology Modelling 11
     - 4.2.1 Hydrology Model Development 11
     - 4.2.2 Hydrology Model Validation 12
     - 4.2.3 Hydrology Model Results 14
   - 4.3 Hydraulic Modelling 14
   - 4.4 Flood Mapping for Local Drainage Features 15
5. **Flood Assessent for Final Landforms** 17
   - 5.1 Overview 17
   - 5.2 Location of Final Landform Domains in Relation to Potential Flood Levels 17
   - 5.3 Alteration of Flow Upstream and Downstream 18
   - 5.4 Model Flood Levels For a Range of Design Storm Events 19
   - 5.5 Develop a Flooding Risk Profile 19
6. **Conclusions** 20
7. **References** 21
8. **QUALIFICATIONS** 22

Appendix

Appendix A: Flood Modelling Results for Local Flooding 23

Tables

Table 3.1: Shared Socioeconomic Pathways in the IPCC Sixth Assessment Report (IPCC, 2021) 9
Table 4.1: WBNM Model Validation for 2% and 1% AEP Flood Events (No Climate Change) 14
Table 4.2: Peak Catchment Flows (With Climate Change) at Key Locations Relative to the Final Landforms 14

Figures

Figure 1.1: Project Location 2
Figure 2.1: Project Layout 4
Figure 2.2: Local Catchments and Drainage Plan 5
Figure 2.3: Conceptual Final Landform Plan 7
Figure 2.4: Operational Phase Site Drainage and Water Management Infrastructure Layout Plan 8
Figure 4.1: WBNM Model Sub-catchments and Layout 13
Figure 4.2: TUFLOW Model Layout 16
Figure 5.1: 0.1% AEP Flood Profile Along Drainage Feature 1 Upstream of the BVS Void Flood Protection Levee 19

1. INTRODUCTION

This report documents flood modelling of the final landforms for the Big Vein South Gold Project (the Project). The Project is a greenfield open cut gold mine in North Queensland (refer Figure 1.1) and is planned to be developed by Strategic Minerals Corporation Pty Ltd (SMC).

The Woolgar River is located along the northern boundary of the Project and is the only watercourse in the vicinity of the Project. Baseline flood modelling of the Woolgar River was performed by Engeny Australia Pty Ltd (Engeny, 2026).

A number of smaller drainage features flow through the Project area towards the Woolgar River. This report details flood modelling of the major drainage features that flow through the Project area to identify the susceptibility of the proposed final landforms (i.e. the rehabilitated mining facilities that will remain in the landform in perpetuity after closure of the mine) to flooding.

The report meets the requirements of Section 3.6.1 of the Department of Environment, Tourism, Science and Innovation (DETSI) *Statutory Guideline – Progressive rehabilitation and closure plans* (PRCP Guideline) (DETSI, 2024) for flood assessments for the rehabilitation planning and design of final landform mine domains. These requirements include:

- consider the location of domains in relation to potential flood levels (addressed in Section 5.2);
- consider alteration of flow upstream and downstream (addressed in Section 5.3);
- model flood levels (including probable maximum flood levels) for a range of design storm events (addressed in Section 5.4); and
- develop a flooding risk profile (addressed in Section 5.5).



Figure 1.1: Project Location

2. BACKGROUND

2.1 Project Description

The Project involves the construction and operation of an open cut gold mine on a greenfield site in North Queensland. The Project site covers an area of approximately 2,281 ha and is located approximately 100 km north of Richmond and 380 km west of Townsville (Figure 1.1).

Open cut mining will be conducted using excavators and trucks. Gold ore will be processed on site to produce gold dore (solid bars containing gold alloy). The mine's peak production rate will be up to 1.95 million tonnes per annum (Mtpa) of run of mine (ROM) gold ore, yielding up to approximately 100,000 ounces of gold dore per annum. The mine life will be approximately 11 years.

The following mining and ore processing activities will be undertaken as part of the Project:

- Developing three open cut pits, as follows:
  - The main Big Vein South Pit (BVS Pit) located in the centre of the Project site (Figure 2.1). Waste rock from this pit will be hauled by truck and stored in the Central and Southern Waste Rock Dumps (WRDs).
  - Two small satellite pits, BV1 Pit and BV2 Pit, located in the northern part of the Project site (Figure 2.1). Waste rock from these pits will be stored in the Northern WRD.
- Transporting mined ore in haul trucks from the open cut pits to the ROM area ore stockpiles located near the mine processing facilities at the southern end of the project site (Figure 2.1).
- Processing ore from the BV1 and BV2 Pits in the first 2 years of mining using Heap Leach Pads and gold elution.
- Processing ore mined from the BVS Pit in an on-site Carbon In-Leach (CIL) Plant from Year 3 onwards. The heap leaching process will generate spent heap leach residues. These residues will be reprocessed in the CIL Plant over the life of the mine. The CIL Plant will generate wet tailings and dewatered tailings. Wet tailings will be pumped to a Tailings Storage Cell. Dewatered tailings will be stored with waste rock in the Central WRD.
- Transporting dore bars from the site via plane to a refinery.

The majority of the mine infrastructure will be located at the southern end of the project site (Figure 2.1). Key mine infrastructure will include ore processing facilities, workshop, warehouse, administration buildings, haul roads and access roads, vehicle servicing, refuelling and wash down facilities, fuel storage facilities, diesel and solar power station, water supply and water management infrastructure. Workforce accommodation and a private airstrip will also be located at the southern end of the Project site.

2.2 Existing Surface Drainage

The Project is located in the headwaters of the Woolgar River catchment within the Flinders River Basin. The Woolgar River is a major tributary of the Stawell River which drains into the Flinders River downstream of the township of Richmond.

The drainage features in the vicinity of the Project are shown in Figure 2.2. The Woolgar River flows in a south-westerly direction through the north-western corner of the Project Mining Lease (ML) area. A number of un-named drainage features are located within the northern and central parts of the Project area. These drainage features generally flow in a westerly direction towards the Woolgar River and originate from a natural ridgeline to the east of the mining lease area that divides the Woolgar River and Patience Creek catchments. The topography in the southern parts of the Project area is flatter than the northern and central areas and there are no mapped drainage features in this part of the project area.

The Woolgar River is a 6th order stream at the project area with an upstream catchment area of approximately 1,079 km^2. The smaller drainage features (tributaries of the Woolgar River) within the Project area are mostly 1st and 2nd order streams. However, the primary drainage feature in the central part of the mining lease area becomes a 4th order stream immediately before discharging into the Woolgar River.

A watercourse determination for the project area was performed by the Department of Natural Resources, Mines and Energy in 2020 and determined that the Woolgar River is a watercourse as defined in the *Water Act 2000,* while the smaller drainage features within the mining lease area are all drainage features (i.e. not watercourses).

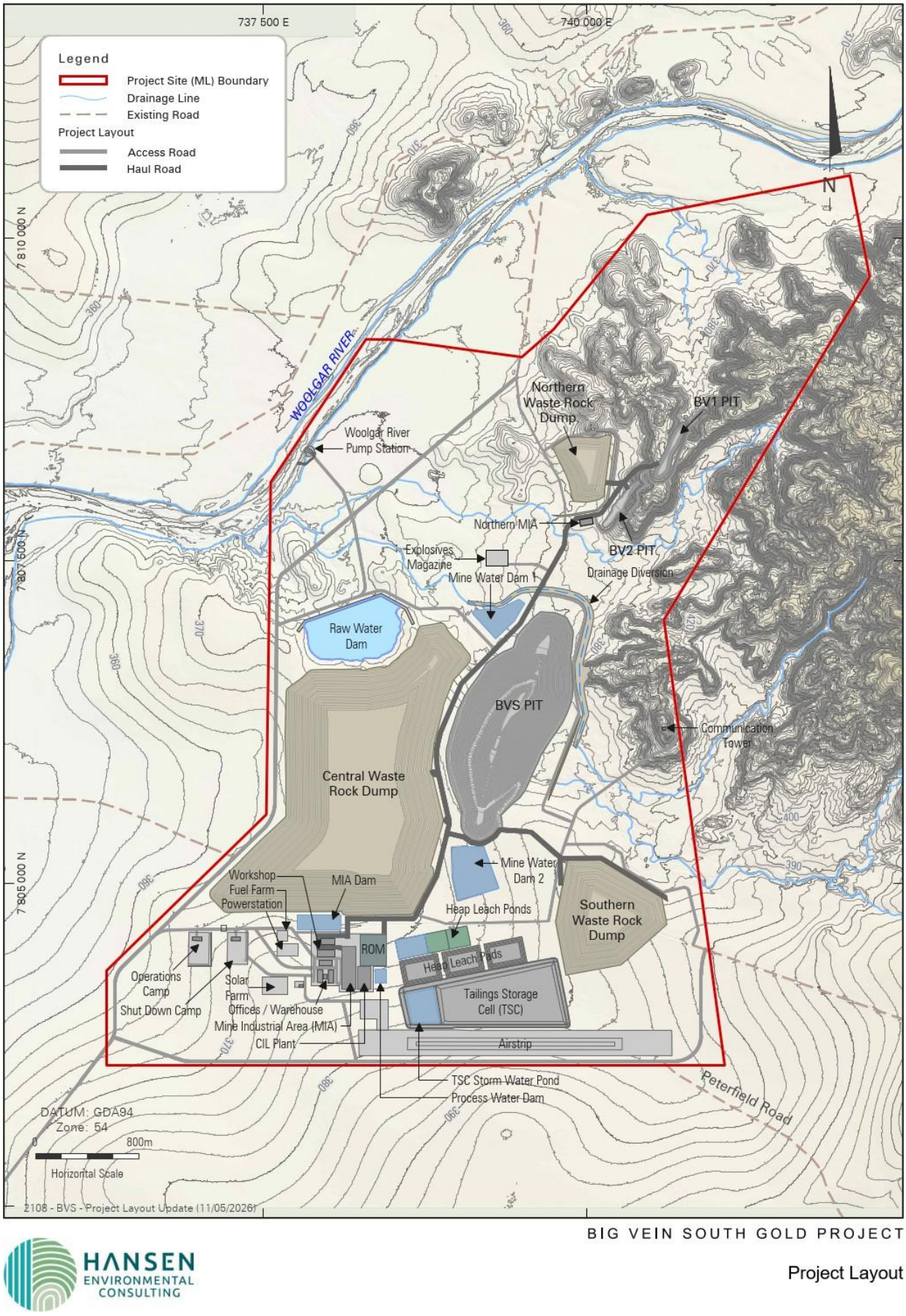


Figure 2.1: Project Layout

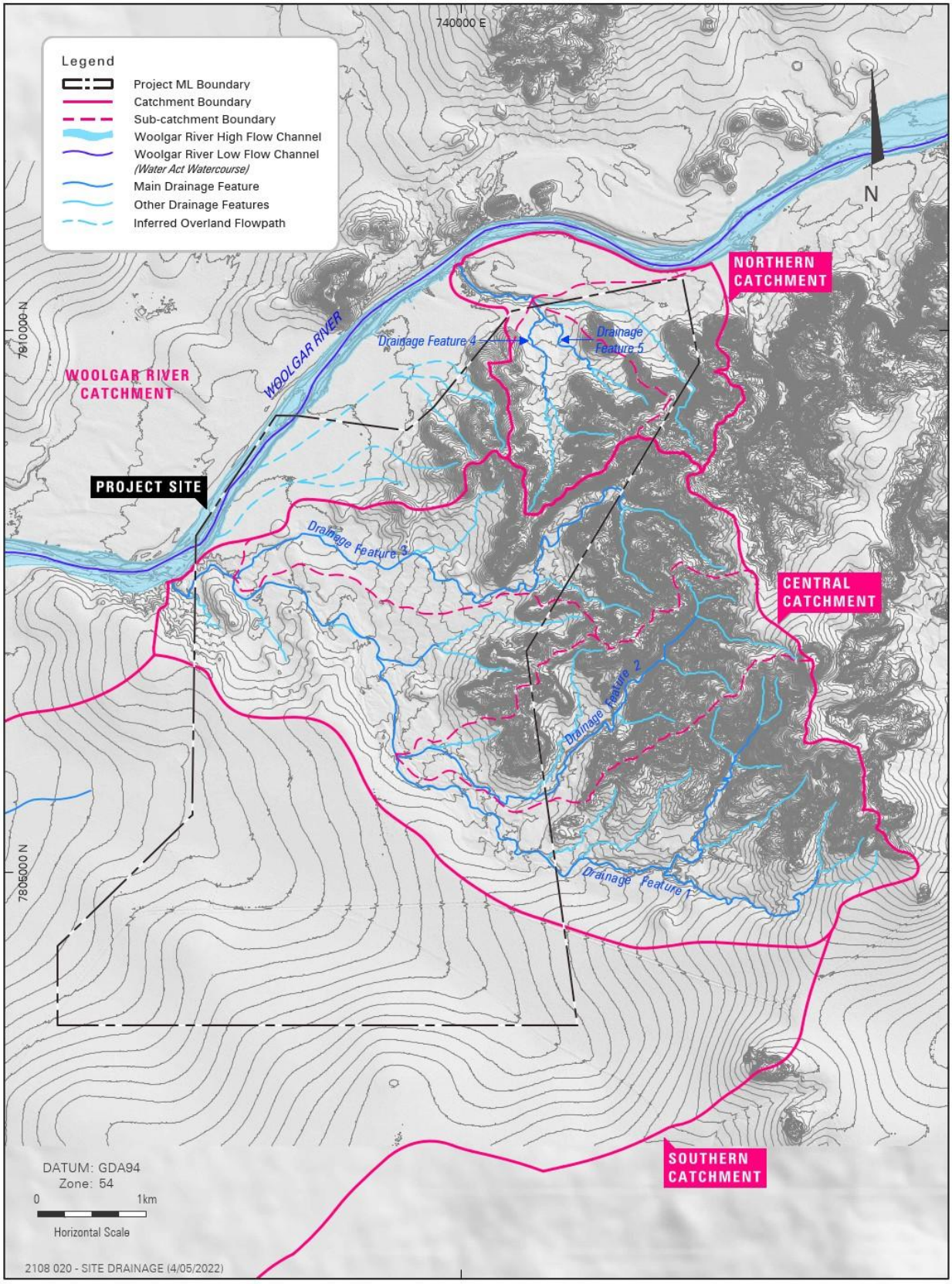


Figure 2.2: Local Catchments and Drainage Plan

2.3 Final Landforms

At the end of the operational phase of the Project, the mine infrastructure will be decommissioned and all disturbance areas will be rehabilitated (including the three waste rock dumps and Tailings Storage Cell), with the exception of the three open cut pits which will remain as residual voids.

The mining facilities that will remain in the final landform after mine closure will be (refer Figure 2.3):

- The BVS, BV1 and BV2 pits residual voids.
- The rehabilitated Northern, Central and Southern Waste Rock Dumps (WRDs).
- The rehabilitated Tailings Storage Cell (TSC).
- The BVS Pit drainage diversion.

The rehabilitated WRDs and TSC will be free-draining, above-ground landforms.

The BVS, BV1 and BV2 pit voids will be excavated voids with abandonment bunds positioned around the perimeter of the pit crests.

The BVS void diversion is required during the operational phase of the project and will include a diversion levee across two drainage features on the eastern (upslope) side of the BVS Pit (Drainage Features 1 and 2 in Figure 2.2) and an excavated diversion channel around the eastern and northern sides of the pit that ties back into the natural (existing) channel of Drainage Feature 1 downstream of the north-western corner of the BVS Pit. The drainage diversion has been designed for the 0.1% (1:1,000) Annual Exceedance Probability (AEP) flood event, with a maximum flood protection levee height of 4 m, and a diversion channel base width of 25 m and longitudinal gradient of 0.4% which is similar to the natural gradient of Drainage Feature 1 in the vicinity of the BVS Pit location.

During the operational phase of the Project, constructed drains will be utilised around the mine facilities to segregate and manage clean water, sediment affected water and mine affected water (refer Figure 2.4). After the closure of the mine, these drains will be rehabilitated or modified/upgraded, as necessary, to ensure that stormwater runoff from local catchments is directed around the final landforms in a way that does not compromise the stability of the final landforms or result in the unnecessary capture of stormwater runoff from local catchments in the residual pit voids. Any remaining final landform drainage will be conveying clean water as all of the operational mine disturbance areas will be rehabilitated to achieve the post-mining land use outcomes (the proposed post-mining land use for the majority of the Project is native vegetation with low intensity grazing).

The final landform clean water drains that will be required after closure to protect the final landforms against local catchment stormwater flows (Figure 2.3) are:

- Drains on the eastern side of the BV1 and BV2 Pits residual voids to prevent stormwater flows from the small upslope catchment areas to the east of the voids from entering the voids.
- Drain between the Central Waste Rock Dump and the BVS Pit void to prevent stormwater from the rehabilitated Central Waste Rock Dump from entering the BVS Pit void.
- Drains around the perimeter of the rehabilitated Northern Waste Rock Dump, Central Waste Rock Dump and Southern Waste Rock Dump.
- Drain around the perimeter of the rehabilitated Tailings Storage Cell.

These final landform clean water drains will be designed to manage 0.1% Annual Exceedance Probability (AEP) flows from the local catchments.

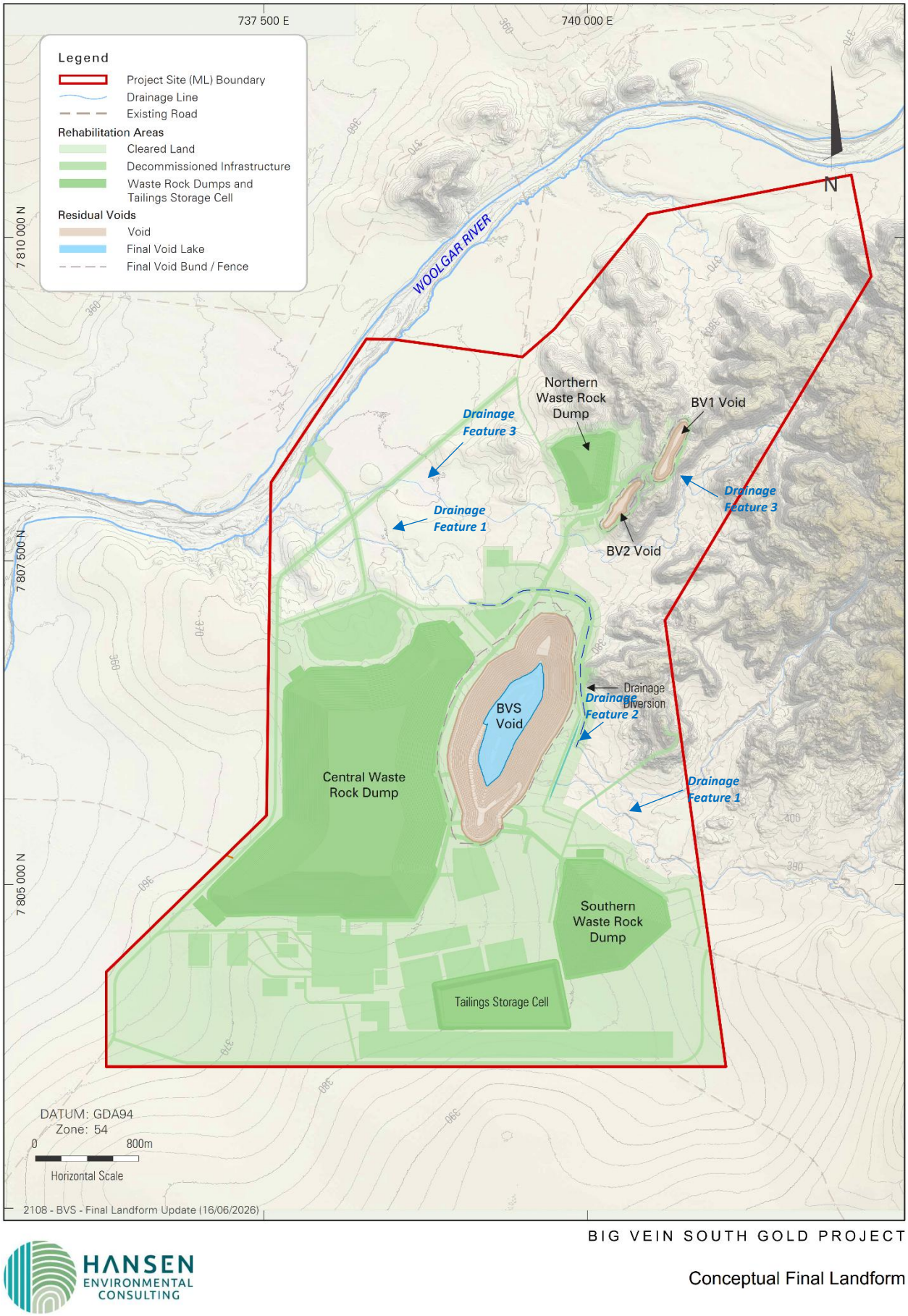
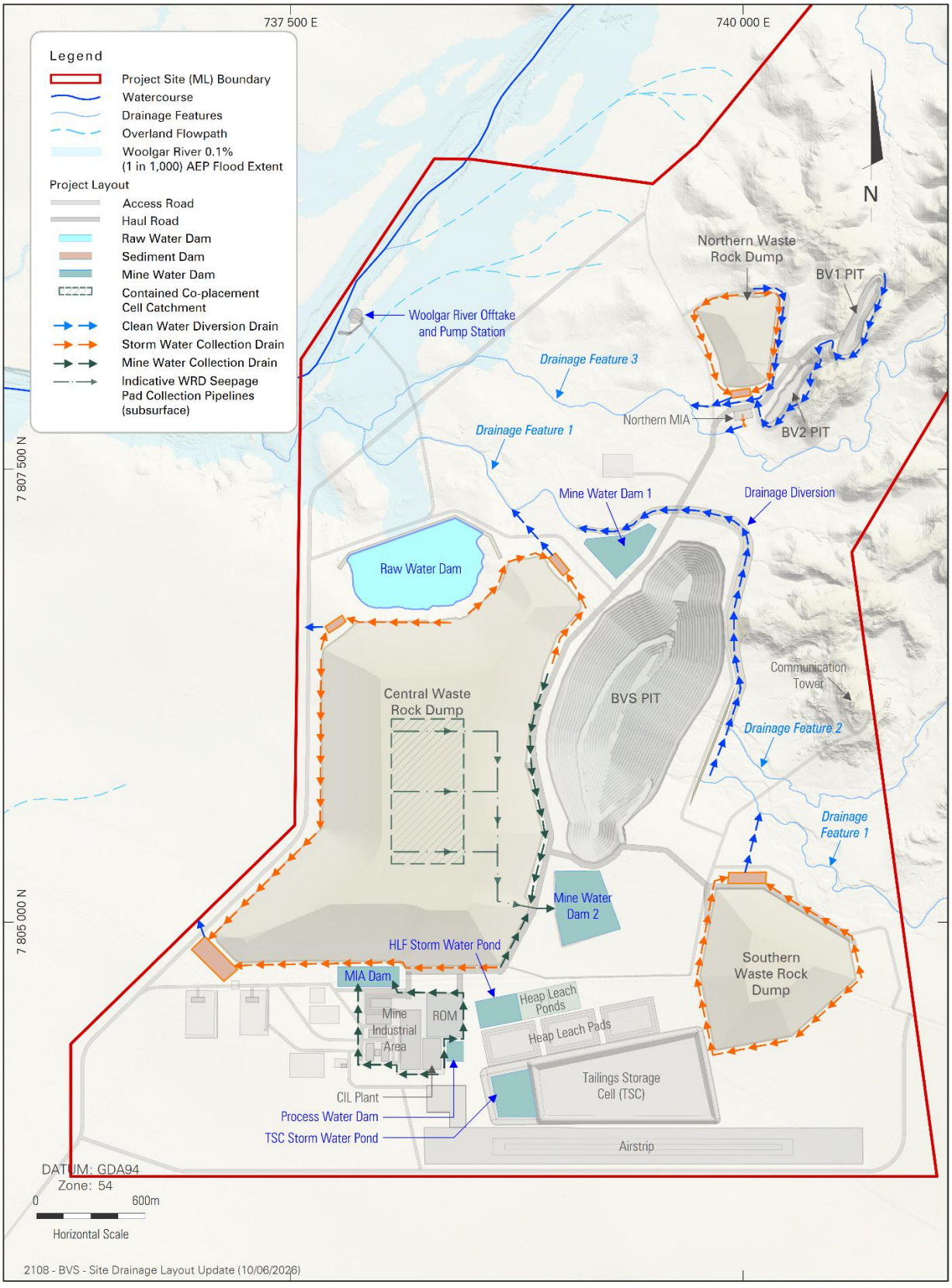


Figure 2.3: Conceptual Final Landform Plan



BIG VEIN SOUTH GOLD PROJECT

Site Drainage and Water Management Infrastructure Layout

HANSEN ENVIRONMENTAL CONSULTING

Figure 2.4: Operational Phase Site Drainage and Water Management Infrastructure Layout Plan

3. BASELINE FLOOD MODELLING FOR THE WOOLGAR RIVER

Baseline (pre-mining) flood modelling for the Woolgar River in the vicinity of the Project was undertaken by Engeny to provide delineation of the flood plain, relevant to the Project area, in accordance with Section 3.4 of the PRCP Guideline and the DETSI *Information Sheet – Voids in Flood Plains* (ESR/2019/4966). The baseline flood modelling of the Woolgar River is detailed in the Baseline Flood Assessment – Big Vein South Gold Project report (Engeny, 2026).

The baseline flood modelling was undertaken for the 0.1% AEP and Probable Maximum Flood (PMF) design flood events. The 0.1% AEP event is the relevant flood event for the delineation of flood plains specified in the DETSI Voids in Flood Plains Information Sheet. The 0.1% AEP flood event has a 0.1% probability of being exceeded in any year and would be expected to occur on average once in a 1,000 year period. The PMF is an upper limiting flood event that represents the largest flood event that could feasibly occur at a given location. In theory, the PMF event has a 0% exceedance probability (i.e. it can't be exceeded) but in practice the exceedance probability of the PMF event is related to the accuracy of the design rainfalls (Probable Maximum Precipitation) for the PMF event. The Australia Rainfall and Runoff publication (Ball, et al., 2019) identifies the AEP of the PMF event as approximately 1:1,000,000 to 1:10,000,000 (i.e. close to 0% annual exceedance probability).

The baseline flood modelling for the Woolgar River was undertaken for the "Current and near term (2021 to 2040) – SSP3-7.0" climate scenario in accordance with Australian Rainfall and Runoff Version 4.2. This climate scenario factors in historical climate change during the period of historical rainfall records and expected future climate change over the period 2021 to 2040 and is relevant to the current (i.e. baseline) assessment. The Shared Socioeconomic Pathway (SSP) SSP3-7.0 represents a high future greenhouse gas emissions scenario as indicated in Table 3.1 and is a conservative climate change scenario to use for a flood assessment since design rainfall intensities are expected to increase with increasing greenhouse gas emissions and corresponding global warming. An assessment of the emissions scenarios by Hausfather and Peters (2020) described the SSP5–8.5 scenario as highly unlikely, SSP3–7.0 as unlikely, and SSP2–4.5 as likely.

TABLE 3.1: SHARED SOCIOECONOMIC PATHWAYS IN THE IPCC SIXTH ASSESSMENT REPORT (IPCC, 2021)

SSP	Scenario Description	Estimated changes in global surface temperature relative to 1850–1900		
		Near term (2021-2040)	Mid-term (2041– 2060)	Long term (2081– 2100)
SSP1-1.9	Very low GHG emissions: CO_2 emissions cut to net zero around 2050	1.5°C	1.6°C	1.4°C
SSP1-2.6	Low GHG emissions: CO_2 emissions cut to net zero around 2075	1.5°C	1.7°C	1.8°C
SSP2-4.5	Intermediate GHG emissions: CO_2 emissions around current levels until 2050, then falling but not reaching net zero by 2100	1.5°C	2.0°C	2.7°C
SSP3-7.0	High GHG emissions: CO_2 emissions double by 2100	1.5°C	2.1°C	3.6°C
SSP5-8.5	Very high GHG emissions: CO_2 emissions triple by 2075	1.6°C	2.4°C	4.4°C

The baseline flood modelling results have been used to assess the susceptibility of the Project's final landforms to flooding in the Woolgar River, in addition to local flooding conditions from the major drainage features that flow through the Project area towards the Woolgar River (modelling of local flooding conditions is detailed in Section 4). The modelled 0.1% AEP and PMF event baseline flood extents for the Woolgar River are shown on the corresponding 0.1% AEP and PMF event local flooding figures in Appendix A (refer Figures A.5 and A.7).

The Woolgar River and local drainage catchments have been modelled using separate hydrologic events (i.e. not the same flood event) due to the significant difference in the contributing catchment area of the Woolgar River at the Project location (approximately 1,000 km^2) and

the catchment of the drainage features that flow through the Project area (approximately 10 km^2). Accordingly peak flooding conditions in the Woolgar River will occur at a different time (later) to the peak flooding conditions for the local drainage features. The critical storm duration (storm duration that results in the peak flooding conditions) for the Woolgar River catchment is 12 hours while the critical storm duration for the local drainage feature catchments is 1.5 hours. In addition to this, Woolgar River flooding does not extend far up the drainage features that flow through the site and will have negligible impact on flood levels in the local drainage features near the proposed final landform features. Appendix A presents The Woolgar River 1:1000 AEP peak flood extent relative to flooding in the local drainage features which shows minimal interaction near the proposed final landform features.

4. FLOOD MODELLING OF LOCAL DRAINAGE FEATURES

4.1 Overview

Flood modelling was undertaken for the significant local drainage features that flow through the Project area and have potential for flood interactions with the final landforms. The local drainage features that were modelled are the Drainage Features 1, 2 and 3 that are shown in Figure 2.2, Figure 2.3 and Figure 2.4. These are the only drainage features within the Project area with catchments of sufficient size to generate stream flow conditions that are characteristic of creek flooding. These drainage features have the potential to cause flood interactions with the following final landforms:

- Drainage Feature 1: BVS void, BVS void diversion, Southern WRD and Central WRD.
- Drainage Feature 2: BVS void, BVS void diversion.
- Drainage Feature 3: BV2 void and Northern WRD.

Drainage Features 1 and 2 will both be diverted around the BVS void via the BVS Pit drainage diversion. Drainage Feature 3 flows to the south of the BV2 void and the Northern WRD and flows into Drainage Feature 1 just upstream of the western Mining Lease boundary.

There are smaller localised upslope catchments in the vicinity of the final landforms that will result in stormwater flows towards the final landforms. The stormwater flows from local catchments in the vicinity of the final landforms will be managed with clean water drains to prevent flow concentration against the edges of the WRDs and TSC final landforms and the capture of stormwater runoff from external areas into the pit voids as discussed in Section 2.3. The stormwater flows from these smaller localised catchments in the vicinity of the final landforms have not been modelled as they are not considered flooding and the final landforms can be protected against these stormwater flows with appropriately engineered drainage controls.

The flood modelling of Drainage Features 1, 2 and 3 has been undertaken in accordance with the procedures described in the 2019 version of Australian Rainfall and Runoff: A Guide to Flood Estimation (ARR19) (Ball, et al., 2019). The assessment has also been guided by Section 3.6.1 (Flooding) of the DETSI PRCP Guideline.

Hydrology modelling for the catchments of Drainage Features 1, 2 and 3 was undertaken using the WBNM rainfall runoff modelling software, while hydraulic modelling of the drainage features was undertaken using the TUFLOW two-dimensional hydraulic modelling software.

The flood modelling was performed for the 2% (1:50), 1% (1:100), 0.1% (1:1,000) AEP and PMF design flood events and incorporated the latest industry guidance on climate change (Australian Rainfall and Runoff Version 4.2), with the design flood hydrology adjusted to allow for future climate change. The “Long-term (2081 to 2100) – SSP3-7.0” climate change scenario was used for the assessment. The long-term horizon is appropriate for the flood assessment of final landforms, while the SSP3-7.0 is a highly conservative greenhouse gas emissions pathway and is unlikely to occur as detailed in Section 3.

4.2 Hydrology Modelling

4.2.1 Hydrology Model Development

Hydrologic modelling for the catchments of Drainage Features 1, 2 and 3 was undertaken using the WBNM rainfall runoff modelling software. The catchments of Drainage Features 1, 2 and 3 were sub-divided into 56 sub-catchment areas based on the 1 second SRTM Derived Digital Elevation Model upstream of the Project area and a 2017 LiDAR topographic survey within the Project area. The sub-catchments within the Project area were based on the final landform configuration and excluded the area within the BVS void which won’t contribute to the stream flow in Drainage Feature 1. The BV1 and BV2 voids are small and the catchment areas of the sub-catchments containing these voids were not adjusted to exclude the void areas (this is a conservative approach).

The WBNM model layout and sub-catchments for the local drainage features is shown in Figure 4.1. The total combined catchment area of the three drainage features at the western Project boundary is 21 km^2.

The WBNM model parameters utilised for the hydrologic modelling of the major drainage features were:

- Routing parameter = 1.
- Routing exponent of 0.77 (default model value).

- Pervious lag parameter = 1.6 (within the suggested range of 1.3–1.8).
- Impervious lag parameter = 0.1.
- Impervious fraction = 0%.

Design rainfall data for the local catchments was obtained from the following sources:

- 2%, 1% and 0.1% AEP design events: Bureau of Meteorology Intensity-Frequency-Duration (IFD) data (http://www.bom.gov.au/water/designRainfalls/revised-ifd/):
- Probable Maximum Precipitation (PMP) rainfall for PMF event: Generalised Short Duration Method, GSDM (Bureau of Meteorology, 2003).
- Areal reduction factors (ARFs) were applied to the point design rainfalls for the 2%, 1% and 0.1% AEP design events using a typical catchment area of 10 km^2 (this is the combined catchment area of Drainage Features 1 and 2 at the upstream end of the BVS void diversion. The ARFs were obtained from the ARR19 Data Hub (https://data.arr-software.org/). The PMP rainfall estimates are areal values and do not require ARFs to be applied (the PMP rainfall estimates were also scaled for a 10 km^2 catchment area).
- Design rainfall intensities were adjusted to represent the "Long-term (2081 to 2100) – SSP3-7.0" climate change scenario in accordance with Australian Rainfall and Runoff Version 4.2. The climate change uplift factors for the design rainfalls range from 59% for 1 hour duration storms to 29% for storm duration of 24 hours and longer. The design rainfall climate change uplift factor was 53% for the 1.5 hour critical storm duration for the local catchments.

Design storm rainfall losses and temporal patterns for the 2%, 1% and 0.1% AEP design events were obtained from the ARR19 Data Hub (https://data.arr-software.org/). The rainfall losses for these events were 22 mm initial loss and 7 mm/hr continuing loss.

The storm temporal patterns for the PMF event were obtained from the "Growth curves and temporal patterns of short duration design storms for extreme events" technical paper (Jordan et al., 2005). The rainfall losses for the PMF event were were 0 mm initial loss and 1 mm/hr continuing loss.

The rainfall losses were adjusted for the "Long-term (2081 to 2100) – SSP3-7.0" climate change scenario in accordance with Australian Rainfall and Runoff Version 4.2. The rainfall loss adjustment (increase) factors for the design rainfalls were 8% for the initial loss and 15% for the continuing loss.

4.2.2 Hydrology Model Validation

The WBNM hydrology model for the local flooding catchments was validated by comparing the predicted 2% and 1% AEP peak flows (no climate change adjustment) at key catchment locations against the following flood estimation methods (these methods were developed without consideration of climate change):

- Regional Flood Frequency Estimation (RFFE) model as specified in Australian Rainfall and Runoff – flood estimation model for ungauged catchments in Australia.
- Quantile Regression Technique (QRT) – flood estimation model for ungauged catchments in Queensland developed by the Queensland Department of Transport and Main Roads.

The comparison of the WBNM model peak flows for the 2% and 1% AEP flood events (no climate change adjustment) to the alternative flood estimation methods is detailed in Table 4.1. The peak flows predicted by the WBNM model fall between the two alternative flood estimation methods.

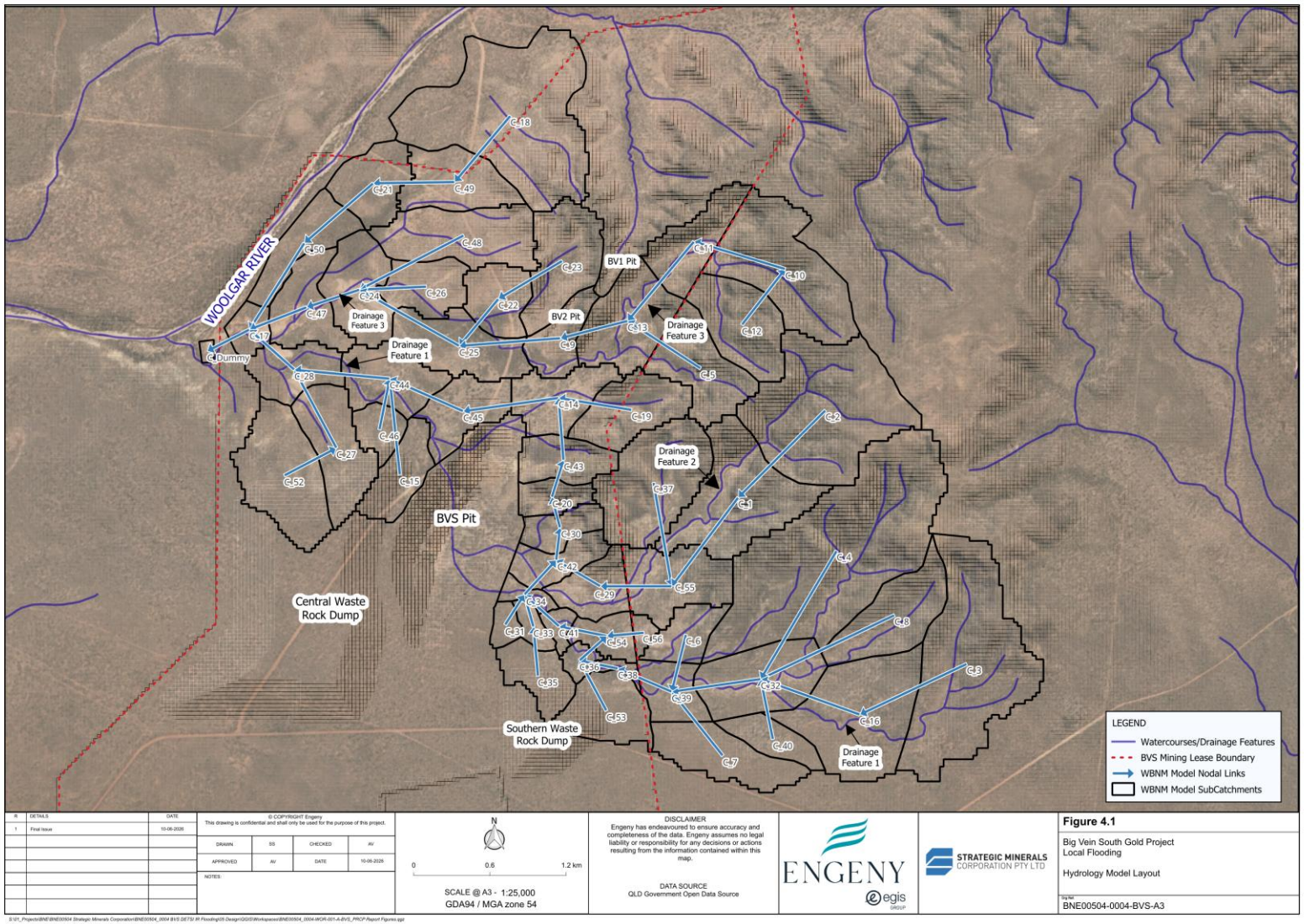


Figure 4.1: WBNM Model Sub-catchments and Layout

TABLE 4.1: WBNM MODEL VALIDATION FOR 2% AND 1% AEP FLOOD EVENTS (NO CLIMATE CHANGE)

Catchment Location	Catchment Area (km²)	Event AEP	Peak Flow (m³/s) – WBNM Model	Peak Flow (m³/s) – RFFE	Peak Flow (m³/s) – QRT
Junction of Drainage Features 1 and 2 at upstream end of BVS void drainage diversion	10	2%	68	40	80
		1%	80	49	105
Drainage Feature 1 at western Project area boundary (i.e. all WBNM sub-catchments)	21	2%	103	71	130
		1%	120	87	169

4.2.3 Hydrology Model Results

The design event flood hydrographs from the WBNM model for the Long-term (2081 to 2100) – SSP3-7.0 climate change scenario were used in the hydraulic modelling of the Drainage Features 1, 2 and 3 (refer Section 4.3).

The peak flows (with climate change) predicted by the WBNM hydrology model at the upstream end of the BVS void drainage diversion (i.e. confluence of Drainage Features 1 and 2) and in Drainage Feature 3 adjacent to the BV2 void and Northern WRD are summarised in Table 4.2.

TABLE 4.2: PEAK CATCHMENT FLOWS (WITH CLIMATE CHANGE) AT KEY LOCATIONS RELATIVE TO THE FINAL LANDFORMS

Flood Event	Critical Storm Duration (hours)	Peak Flow (m³/s)	
		Confluence of Drainage Features 1 and 2 at Upstream End of BVS Void Diversion (WBNM Model Node C_30)	Drainage Feature 3 Adjacent to BV2 Void and Northern WRD (WBNM Model Node C_9)
2% AEP	1.5	129	36
1% AEP	1.5	148	41
0.1% AEP	1.5	243	67
PMF	1.5	967	258

4.3 Hydraulic Modelling

Hydraulic modelling of Drainage Features 1, 2 and 3 within the Project area was undertaken using the TUFLOW two-dimensional hydraulic modelling software.

Key details of the hydraulic modelling of the drainage features are as follows:

- The hydraulic model covered the full extent of the Project area (i.e. the area within the Project's Mining Lease boundary).
- A two-dimensional modelling approach was used with a cell size of 2 m.
- Model bathymetry was obtained from a LiDAR aerial topographic survey of the Project area in 2017. The conceptual design information for the final landforms (WRDs, TSC, pit voids and the BVS void drainage diversion) was superimposed on top of the pre-mining LiDAR survey to represent the geometry of the final landforms. For the PMF flood event, the levee structure for the BVS void drainage diversion

was artificially extended and raised to prevent modelling of overtopping the BVS pit void diversion/levee (the diversion/levee will be designed to provide flood protection for the 0.1% AEP flood event). Levees were also modelled around the crests of the pit voids to represent the pit abandonment bunds that will be installed at closure.

- A uniform Manning's roughness value of n = 0.05 was assigned to all parts of the hydraulic model domain based on site inspections and inspection of aerial imagery.
- The 2%, 1% and 0.1% AEP and PMF design flood events were simulated for the Long-term (2081 to 2100) SSP3-7.0 climate scenario.
- Flood inflow hydrographs for the critical duration rainfall event for each design flood event AEP were obtained from the WBNM hydrologic model. Flood inflow hydrographs were applied at the following locations in the TUFLOW model (inflow locations are shown in Figure 4.2):
  - Drainage Features 1, 2 and 3 at the upstream model boundary (these inflows represent the flood flows from the catchment areas of the drainage features upstream of the Project area).
  - Local catchment inflows to Drainage Features 1, 2 and 3 at multiple locations within the model domain (these inflows represent the inflows to the three drainage features from the local catchments within the Project area).
- No coincident flood flows in the Woolgar River were adopted for the hydraulic modelling of the local flooding conditions within the Project area. The Woolgar River and local catchment flood events have been modelled as separate flood events (not the same flood event) because of the significant differences between the flood response times of the Woolgar River catchment (large catchment) and the local drainage feature catchments (small catchments) as discussed in Section 3. The 1:1000 AEP flood mapping in Appendix A also shows the Woolgar River peak flood extent relative to the local drainage features which shows no interaction near the final landform features. This indicates there would be negligible impact on flooding near the final landform features if peak flooding in the systems aligned.
- A normal depth boundary condition was applied for the downstream model boundary.

4.4 Flood Mapping for Local Drainage Features

Peak flood depth and velocity maps for Drainage Features 1, 2 and 3 within the Project area were created from the TUFLOW model results and are provided in Appendix A. The flood modelling results are provided for the 2%, 1% and 0.1% AEP and PMF design flood events (Long-term (2081 to 2100) SSP3-7.0 climate scenario).

The peak baseline flood extents for the Woolgar River are shown on the corresponding 0.1% AEP and PMF event local flooding figures in Appendix A (refer Figures A.5 and A.7).

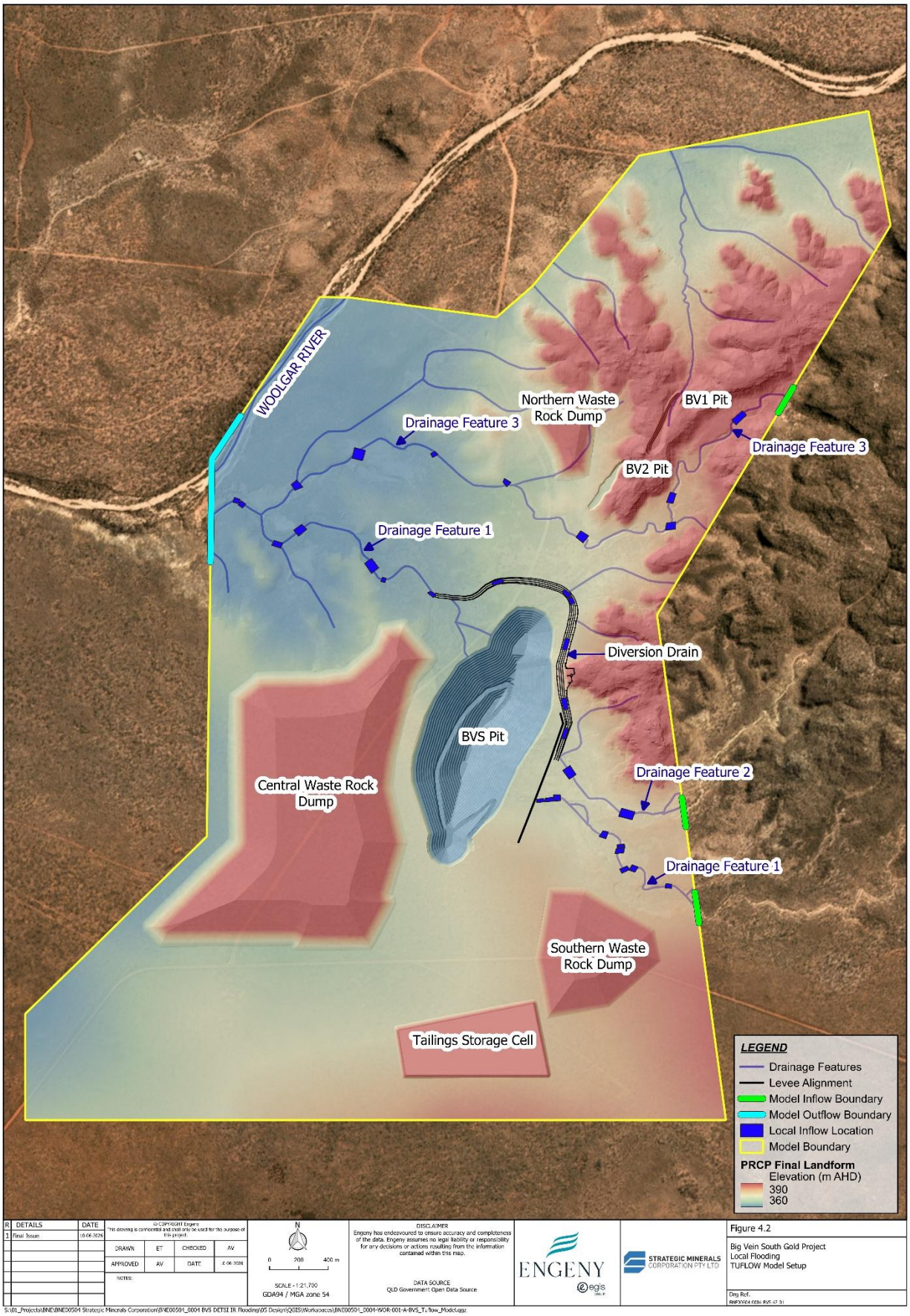


Figure 4.2: TUFLOW Model Layout

5. FLOOD ASSESSENT FOR FINAL LANDFORMS

5.1 Overview

The final landforms have been assessed against the flood assessment criteria for the rehabilitation planning and design of final landform mine domains detailed in Section 3.6.1 of the DETSI PRCP Guideline. These criteria comprise:

- consider the location of domains in relation to potential flood levels;
- consider alteration of flow upstream and downstream;
- model flood levels (including probable maximum flood levels) for a range of design storm events; and
- develop a flooding risk profile.

The final landform flood assessment has considered both the Woolgar River regional flooding and the local catchment flooding.

The flood assessment has considered the 2%, 1% and 0.1% AEP and PMF local catchment flood events and the 0.1% AEP and PMF Woolgar River flood events (these are all large to extreme flood events). The PMF event has been included in the final landform flood assessment to meet the requirements of the PRCP Guideline but is not considered an appropriate flood event for the design of final landforms because of the exceptionally low probability of this upper limiting flood event (1:1,000,000 to 1:10,000,000 AEP). Natural landforms would be expected to experience significant erosion if they are ever subjected to a PMF flood event.

It is noted that the SSP3-7.0 climate scenario adopted for the flood assessment is a highly conservative greenhouse gas emissions pathway and is unlikely to occur as detailed in Section 3. Accordingly, the flooding conditions predicted in this assessment are expected to be more severe than what will feasibly occur after closure of the mine.

5.2 Location of Final Landform Domains in Relation to Potential Flood Levels

The flood mapping provided in Appendix A shows the location of the final landforms in relation to the regional (Woolgar River) and local (Drainage Features 1, 2 and 3) flood extents. The following flood interactions with the final landforms are predicted:

- BVS void:
  - No interactions between the local flooding and the BVS void are expected for local flood events up to the 0.1% AEP flood event (Figure A.6) (the BVS void drainage diversion will be designed to safely convey the 0.1% AEP flood flows from the Drainage Feature 1 and Drainage Feature 2 catchments around the BVS void).
  - Flood ingress to the BVS void from Drainage Features 1 and 2 would occur in the PMF event (Figure A.7) unless the BVS void drainage diversion flood protection levee is raised to accommodate the higher flood levels from the PMF event (the flood modelling has simulated the raised levee scenario). The required levee raise height for the PMF event is approximately 3 m. If the flood protection levee is raised to contain the PMF event then flood water will flow against the pit abandonment bund around the northern end of the BVS void to a maximum depth of approximately 1 m because the diversion channel will not be wide enough to fully contain the PMF flow.
  - No interactions between the Woolgar River flooding and the BVS void are expected for all flood events up to the PMF event (Figure A.7).
- BV1 and BV2 voids:
  - No interactions between the local flooding and the BV1 and BV2 voids are expected for all flood events up to the PMF event (Figure A.7).
  - No interactions between the Woolgar River flooding and the BV1 and BV2 voids are expected for all flood events up to the PMF event (Figure A.7).

- Northern WRD:
  - No interactions between the local flooding and the Northern WRD are expected for all flood events up to the PMF event (Figure A.7).
  - No interactions between the Woolgar River flooding and the Northern WRD are expected for all flood events up to the PMF event (Figure A.7).
- Southern WRD:
  - No interactions between the local flooding and the Southern WRD are expected for local flood events up to the 0.1% AEP flood event. The 0.1% AEP flood level in Drainage Feature 1 just reaches the lowest elevation of the Southern WRD landform along the northern side of the landform (Figure A.5).
  - PMF flood flows from Drainage Feature 1 will interact with the northern edge of the Southern WRD, with a maximum depth of flooding at the toe of the Southern WRD landform of approximately 0.75 m (Figure A.7).
  - No interactions between the Woolgar River flooding and the Southern WRD are expected for all flood events up to the PMF event.
- Central WRD:
  - No interactions between the local flooding and the Central WRD are expected for local flood events up to the 0.1% AEP flood event.
  - PMF flood flows from Drainage Feature 1 will interact with the north-eastern corner of the Central WRD, with a maximum depth of flooding at the toe of the Central WRD landform of approximately 1.0 m (Figure A.7).
  - No interactions between the Woolgar River flooding and the Central WRD are expected for all flood events up to the PMF event. The Woolgar River PMF flood level just reaches the lowest elevation of the Central WRD landform at the north-eastern corner of the landform (Figure A.7). The 0.1% AEP Woolgar River flood level is 6 m lower than the lowest elevation of the Central WRD landform.
- TSC:
  - No interactions between the local flooding and the TSC are expected for all flood events up to the PMF event.
  - No interactions between the Woolgar River flooding and the TSC are expected for all flood events up to the PMF event.
- BVS void drainage diversion:
  - The BVS Pit drainage diversion has been designed to safely convey the 0.1% AEP flood flows from the Drainage Feature 1 and Drainage Feature 2 catchments around the BVS void. The diversion levee would need to be raised after closure to provide flood immunity from the PMF to the BVS void. The required levee raise height for the PMF event is approximately 3 m.
  - The predicted flow velocities in the BVS void drainage diversion in the 0.1% AEP local flood event are mostly below 2.5 m/s with the exception of the downstream end of the diversion where the flow velocity increases slightly above 3 m/s in the area where the excavated diversion channel ties back into the natural (pre-mining) Drainage Feature 1 alignment (Figure A.6). These flow velocities are not unusual for very large flood events of this magnitude. The diversion channel design will be optimised during detailed design.
  - No interactions between the Woolgar River flooding and the BVS void drainage diversion are expected for all flood events up to the PMF event. The Woolgar River PMF flood level just reaches the downstream limit of the drainage diversion (Figure A.7).

5.3 Alteration of Flow Upstream and Downstream

The only location where there is potential for the final landforms to alter flooding conditions upstream of the Project area is along Drainage Features 1 and 2 upstream of the BVS void drainage diversion, where the flood protection levee will cause upstream flood afflux (i.e. increased flood levels). The flood mapping in Appendix A indicates that the influence of the BVS void flood protection levee only extends a short distance (several hundred metres) upstream of the levee and is contained within the Project area boundary. This is illustrated in Figure 5.1 which shows the 0.1% AEP flood profile along Drainage Feature 1 between the flood protection levee and the eastern (upstream) Project area boundary. The area of influence of the flood protection levee only extends 400 m upstream of the levee and is more than 1 km away from the eastern (upstream) Project area boundary.

The final landforms will all be free-draining landforms with the exception of the three pit voids which will capture incident rainfall/runoff from within the direct footprint of the void landforms. Because there will only be minor/negligible flood interactions with the final landforms, the only potential for the Project to impact downstream flows after closure will be through the reduction in catchment area that will occur as a result of incident rainfall/runoff capture in the void landforms. The total combined direct catchment area of the three pit voids is 1.4 km^2 which only represents 6% of the total combined natural (pre-mining) catchment area of Drainage Features 1, 2 and 3 (22 km^2) and only 0.1% of the Woolgar River catchment area at the Project location (1,079 km^2). The three pit voids will cause a small reduction in flood flows along

Drainage Features 1 and 3 in the western part of the Project area and a negligible reduction in flood flows in the Woolgar River downstream of the Project.

The BVS void will have a larger impact on flood flows in Drainage Feature 1 during local flood events larger than the 0.1% AEP flood event. Reduced flood flows in extreme flood events are not typically of concern since this generally does not result in any adverse impacts to water users or sensitive receptors.

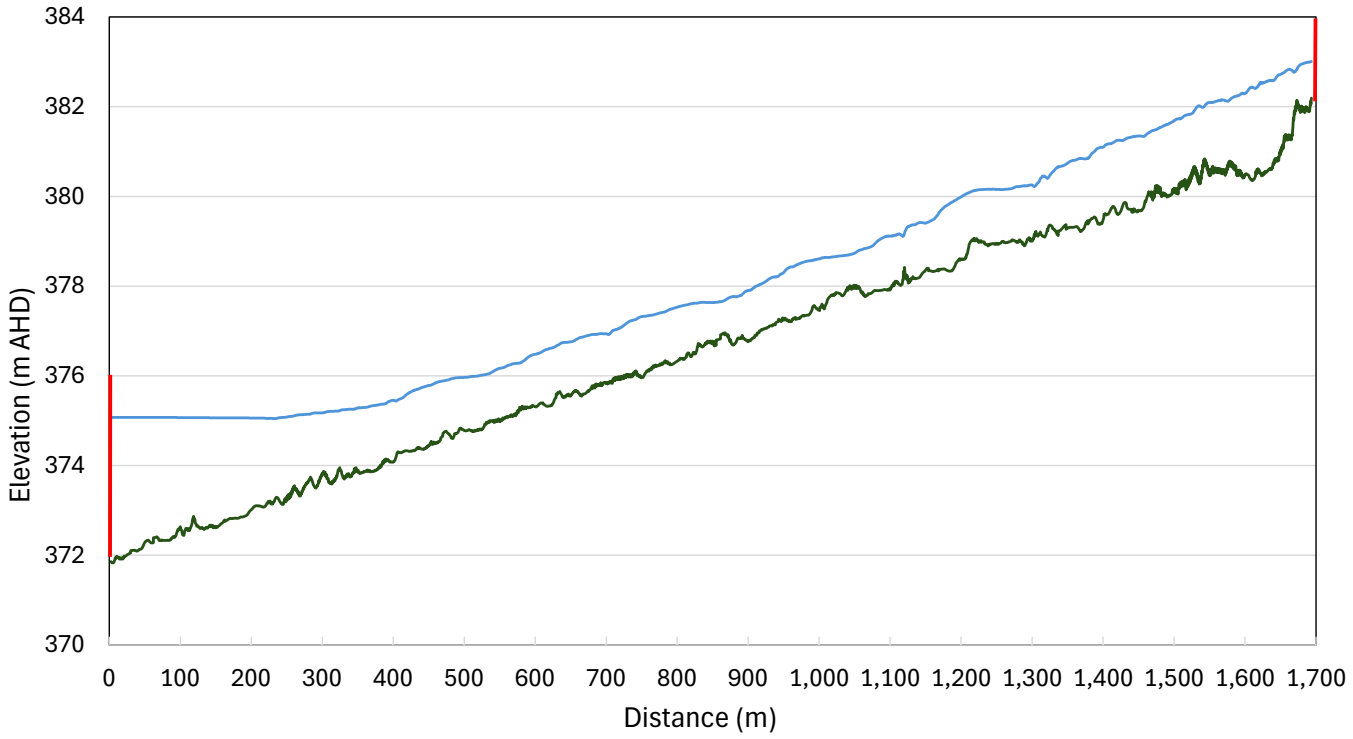


Figure 5.1: 0.1% AEP Flood Profile Along Drainage Feature 1 Upstream of the BVS Void Flood Protection Levee

5.4 Model Flood Levels For a Range of Design Storm Events

This flood assessment has considered the 2%, 1% and 0.1% AEP and PMF local catchment flood events and the 0.1% AEP and PMF Woolgar River flood events (these are all large to extreme flood events). Modelled flood extents, depths and velocities for the local catchment flood events are provided in Appendix A (these also show the modelled Woolgar River flood extents for the 0.1% AEP and PMF events).

The baseline flood modelling results for the Woolgar River are provided in the Baseline Flood Assessment – Big Vein South Gold Project report (Engeny, 2026).

5.5 Develop a Flooding Risk Profile

The susceptibility of the final landforms to local and regional (i.e. Woolgar River) flooding is detailed in 5.2.

The final landforms are not susceptible to either local or regional flooding for flood events up to the 0.1% AEP flood event. The BVS void drainage diversion (including the flood protection levee) is required to provide flood protection to the BVS flood from the local Drainage Features 1 and 2. The drainage diversion will be designed to safely convey the 0.1% AEP flood flows from Drainage Features 1 and 2 around the BVS void.

The northern side of the Southern WRD and north-east corner of the Central WRD landforms will be at risk of minor flood interactions during the local catchment PMF event. The maximum depth of PMF flooding at these locations is only expected to be 0.75 to 1 m which is a relatively shallow flow depth of flooding. The PMF event is not considered an appropriate flood event for the design of final landforms because of the exceptionally low probability of this upper limiting flood event (1:1,000,000 to 1:10,000,000 AEP).

6. CONCLUSIONS

This report documents flood modelling of the proposed final landforms for the BVS Project to meet the requirements of Section 3.6.1 of the DETSI PRCP Guideline for flood assessments for the rehabilitation planning and design of final landform mine domains.

Flood modelling was undertaken for the significant local drainage features that flow through the Project area and have potential for flood interactions with the final landforms. The flood modelling of the local catchments was performed for the 2% (1:50), 1% (1:100), 0.1% (1:1,000) AEP and PMF design flood events and incorporated the latest industry guidance on climate change, with the "Long-term (2081 to 2100) – SSP3-7.0" climate change scenario used for the assessment. The long-term horizon is appropriate for the flood assessment of final landforms, while the SSP3-7.0 is a highly conservative greenhouse gas emissions pathway (i.e. unlikely to occur).

The flood assessment of the final landforms has also considered the potential for flood interactions with Woolgar River flooding using the results of baseline flood modelling for the Woolgar River. The baseline flood modelling for the Woolgar River was undertaken for the "Current and near term (2021 to 2040) – SSP3-7.0" climate scenario. This scenario has a reduced climate change impact compared to the Long-term climate scenario adopted for the local flooding but is still suitable to assess the susceptibility of the final landforms to Woolgar River flooding.

The flood assessment demonstrates that the proposed final landforms for the BVS Project are not susceptible to either local or regional flooding for flood events up to the 0.1% AEP flood event. The BVS void drainage diversion (including the flood protection levee) is required to provide flood protection to the BVS flood from the local Drainage Features 1 and 2. The drainage diversion will be designed to safely convey the 0.1% AEP flood flows from Drainage Features 1 and 2 around the BVS void.

The northern side of the Southern WRD and north-east corner of the Central WRD landforms will be at risk of minor flood interactions during the local catchment PMF event. The maximum depth of PMF flooding at these locations is only expected to be 0.75 to 1 m which is a relatively shallow flow depth of flooding. The PMF event is not considered an appropriate flood event for the design of final landforms because of the exceptionally low probability of this upper limiting flood event (1:1,000,000 to 1:10,000,000 AEP).

7. REFERENCES

Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors), 2019. Australian Rainfall and Runoff: A Guide to Flood Estimation, Commonwealth of Australia.

Bureau of Meteorology (2003). The Estimation of Probable Maximum Precipitation in Australia: Generalised Short-Duration Method, Bulletin 53.

Department of Environment, Tourism, Science and Innovation (2026). Information sheet – Voids in floodplains. ESR/2019/4966, Version 1.03. 19 January 2026.

Department of Environment, Tourism, Science and Innovation (2024). Statutory Guideline – Progressive rehabilitation and closure plans (PRC Plans). ESR2019/4964. Version 3.01. 16 September 2024.

Engeny Australia Pty Ltd (2026). Baseline Flood Assessment – Big Vein South Gold Project. June 2026.

Hausfather, Zeke and Peters, Glen P. (2020). "Emissions – the 'business as usual' story is misleading". Nature. 577 (618–620).

IPCC, 2023: Summary for Policymakers. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 1-34, doi: 10.59327/IPCC/AR6-9789291691647.001.

Jordan, P., Nathan, R., Mittiga, L., & Taylor, B. (2005). Growth curves and temporal patterns of short duration design storms for extreme events. Melbourne: Institution of Engineers.

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