

Report

24 March 2026

To	Bathurst Resources Limited	Contact No.	[REDACTED]
Copy to	[REDACTED]	Email	[REDACTED]
From	Dora Avaniidou	Project No.	12659028
Project Name	Buller Plateaux Continuation Project		
Subject	Peer Review Memo of Mt Frederick South (MFS) Groundwater Technical Report prepared by Mine Waste Management		

EXECUTIVE SUMMARY

1. This peer review memo provides an independent review of the hydrogeological components of the Buller Plateaux Continuation Project (Mt Frederick South). The review is based on Mine Waste Management's Mt Fred South Sub-Area – Groundwater Technical Report dated 18 August 2025 (document ID: JNZ0377004RRRevB) and subsequent updates issued on 28 November 2025 and 3 February 2026, together with the relevant supporting statements referenced in those documents.
2. Overall, the groundwater report identifies the key actual and potential adverse effects:
 - a. dewatering-related drawdown in the vicinity of the East and West pits (with an estimated groundwater table reduction of approximately 30 m anticipated in parts of the eastern section of the MFS sub-area),
 - b. reduced groundwater contribution to baseflows in Deep Creek during mining and the active closure phase, a material reduction in Bilo Stream flows during mining and post-closure (estimated at approximately 40–50% reduction, with associated flow redistribution to Deep Creek and the Waimangaroa River), and
 - c. localised water-quality impacts from acid mine drainage (AMD) seepage and potential pit-floor infiltration affecting groundwater quality and, via groundwater–surface water interaction, receiving environments.
3. The quantification of effects is high level given the limited site-specific hydrogeological dataset. Further hydrogeological characterisation and performance monitoring is recommended by MWM to confirm hydrogeological assumptions used in their assessment. MWM has provided a high-level groundwater monitoring plan and recommend the completion of a more detailed groundwater monitoring and trigger action response plan to refine effect magnitude and to support effective groundwater and water-quality management through construction, operations and closure. I agree with these recommendations.

INTRODUCTION

4. My full name is Dr Theodora Avaniadou, I am a Technical Director of hydrogeology within GHD's Environment Group based in Christchurch. I have held this role since 2020. Additionally, since 2022 I have been the Hydrogeology Service Line Leader for Asia Pacific.
5. This memo comment on the groundwater effects from the works proposed for the Buller Plateaux Continuation project and provides an independent review of the technical work undertaken by MWM to address the Hydrogeological aspects of the Project.

Qualifications and experience

6. I have the following qualifications and experience relevant to this assessment:
 - i. I hold a Bachelor and a Master in Civil and Environmental Engineering degree (1997) from the Aristotle University of Thessaloniki, Greece
 - ii. Master of Science (2000) from the University of South Carolina, USA and
 - iii. Doctor of Philosophy in Groundwater Hydrology from the University of South Carolina, USA (2003);
 - iv. Since 27 January 2020 I have been employed at GHD. Prior to that:
 - A. I held the roles of Senior and Associate Hydrogeologist at Beca Ltd between 2012 and 2020
 - B. Team Leader of the surface and groundwater hydrology design team in Egnatia Odos SA, a multi-disciplinary consultancy in Greece for eight years.
 - C. I specialise in groundwater hydrology and groundwater modelling have provided technical support on hydrogeological related projects. This work has included:
 - D. Review of the Groundwater technical report for Mt Fred South
7. I specialise in groundwater hydrology and groundwater modelling and have provided hydrogeological support on infrastructure projects including mining. I have been involved with the following projects which are of particular relevance to this consent application:
 - i. Cypress Coal Mine, Buller New Zealand - Technical expert on groundwater: Guided the analysis of hydrogeological data and groundwater flow modelling to assess the effects from open pit mining extensions and the increase of storage of tailings and waste rock stacks.
 - ii. Macraes Mine, New Zealand - Technical expert on groundwater: Guided the analysis of hydrogeological data and groundwater flow and contaminant transport modelling to assess the effects from open pit mining and underground working extensions as well as the increase of storage of tailings and waste rock stacks.

Code of conduct

8. I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023. This assessment has been prepared in compliance with that Code, as if it were evidence being given in Environment Court proceedings. In particular, unless I state otherwise, this assessment is within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

Purpose and scope of assessment

9. The purpose of this assessment is to provide an independent review of and comment on:
 - a. Mt Fred South Sub-Area – Groundwater Technical Report prepared by Mine Waste Management (MWM)

Assumptions and exclusions in this assessment

10. The supporting technical documents referred to in the Groundwater Technical Report have not been reviewed as part of my review.

THE BULLER PLATEAUX CONTINUATION PROJECT

11. The full description for the Project is provided in the AEE and I do not repeat it in my assessment.

METHODOLOGY

Introduction

12. My approach has been to review all relevant Project reports necessary to develop an understanding of the likely environmental effects of the project (construction, operation and closure), consider whether the extent and nature of the effects have been correctly and fully assessed, documented and addressed, and determine whether the proposed management (including if applicable offset/compensation measures) appropriately address the impacts of the construction, operation and closure of the project.
13. The report reviewed include the MFS Groundwater Technical Report prepared by Mine Waste Management (MWM).
14. I initially reviewed the Groundwater Technical Report for the Mt Frederick South Sub-area, dated 18 August 2025 (document ID: J-NZ0377-004-R-RevB), prepared by Mine Waste Management (MWM).
15. I provided high level comments and feedback on the groundwater technical report (dated 18 August 2025) which was subsequently updated by MWM. I reviewed the updated version of the report, dated 28 November 2025 with additional comments provided and responded to MWM with a third iteration of the report dated 3 February 2026 which was provided to me for final consideration.

COMMENT ON THE METHODOLOGY USED TO ASSESS THE SITE'S

HYDROGEOLOGY

16. The proposed Mt Frederick South (MFS) project is located approximately 1 km southwest of the Mount Frederick mining area at the Stockton Mine. The project involves the open cast mining of two pits (East and West Pits), the construction of Engineered Landforms (ELFs) to place waste rock, the construction of an active water treatment plant (WTP) and the construction of Mussel Shell Reactors (MSRs) and polishing ponds to passively treat ELF seepage water.
17. The MWM report presented a summary of data related to topography and land use, climate and hydrology, regional and site-specific geological and hydrogeological data to develop a conceptual hydrogeological model (CHM).
18. Limited site-specific hydrogeological investigations were undertaken and data collected (groundwater levels, groundwater quality, and hydraulic conductivity) were used to inform the CHM.
19. Groundwater flow was inferred using the limited available groundwater level data, stream elevations, topography and author's professional judgment. Groundwater was interpreted to broadly flow southwards with hydraulic gradients reflective of topographic relief. Groundwater is expected to discharge locally into Bilo Creek and Deep Creek.
20. Historical underground workings discharges into Deep Creek tributaries through adits. MWM notes that it is currently unknown the exact influence of workings on the groundwater flow regime as some are near surface above groundwater table and some below.

21. Four groundwater sampling rounds have been undertaken since 2023 at MFS and a summary of the results as well as the detailed data are presented by MWM in the technical report.
22. A conceptual hydrogeological model (CHM) representing the baseline (existing) groundwater conditions was developed using two cross-sectional profiles: one aligned in a south-to-north direction, and the other oriented southwest to northeast.
23. The CHM incorporates topography, geological conditions and hydrological features to represent the baseline groundwater flow regime.
24. A post closure CHM representing the post closure conditions was also developed at the same two cross-sectional profiles. The post closure conditions were then compared to the baseline conditions to assess effects on groundwater.
25. During MFS pit mining, dewatering will be required that will lower the groundwater levels in the vicinity of the pit. A simple high-level quantitative approach has been undertaken by MWM to estimate the lowering of the phreatic surface in the pit area.
26. Results from the Water Balance model (MWM 20225c) were used to describe the changes in low flow conditions for the Deep Creek and Bilo Stream by the authors of the hydrogeology assessment.
27. A qualitative approach has been followed to assess the effects on the groundwater quality.
28. Known groundwater users were identified as being over 4 Km away, located on the coastal flats and is considered unlikely to be impacted by the proposed project.
29. The approach to characterise the site's hydrogeology followed by MWM is reasonable given the limitation of data.

COMMENT ON HYDROGEOLOGICAL EFFECTS AND EFFECTS MANAGEMENT MEASURES

GROUNDWATER EFFECTS

30. A detailed description of the expected and potential effects of the project construction, operation and closure is contained in the Applicant's groundwater reports and the technical statements prepared by Ryan Burgess.
31. In summary, the actual/potential adverse groundwater effects identified are:
 - i. Lowering of the groundwater level in the vicinity of the project.
 - ii. Reduction in the groundwater discharge to Deep Creek during mining and active closure phase.
 - iii. Reduction in the groundwater discharge to Bilo Stream during mining and post closure phase by 40 – 50%.
 - iv. Acid mine drainage (AMD) seepage will result in changes in groundwater quality discharged to surface water.
32. A reduction in the groundwater table ranging approximately 30 meters is anticipated in the eastern section of the project. This estimate is based on the pits floor elevation and the groundwater level recorded at a specific site. Groundwater levels in the western area of the project are also expected to be reduced in a lesser degree than the eastern side as groundwater levels are interpreted to be deeper, and the pits are shallower on the western side. This simplistic approach is reasonable to quantify the magnitude of the expected drawdown at the pit.
33. The drawdown extent from pit dewatering has not been quantified, but MWM expect this to be relatively limited due to the relatively low hydraulic conductivity of the geological units in the area. Post closure due to more permeable ELF material to be deposited in the pit voids and the basal drainage systems groundwater levels are expected to remain depressed. I conditionally agree with this assessment provided that the hydraulic property values of the surrounding rock are confirmed with further hydrogeological investigations and performance monitoring.

34. The technical report notes that the reduction in the baseflows contributed by groundwater to the streams has been assessed in the MFS Water and Load Balance Model (WLBm), (MWM, 2025c). I have not independently reviewed the WLBm report as I understand that this has been reviewed by others.
35. In summary, for Deep Creek the WLBm results indicate a small decrease in groundwater discharge to compliance points during mining and active closure phase, but the estimated reduction is expected to be offset in the post closure phase by the MSR's discharges.
36. A 40% -50 % of the pre-mining Bilo Stream flow would be routed to Deep Creek and the Waimangaroa River due to the disturbance of the contributing catchment.
37. Basal and perimeter drainage systems will promote AMD impacted water from ELF seepage to collection points for treatment. Monitoring is proposed to confirm that ELF seepage is not discharged to streams through groundwater. I agree with MWM's recommendation for additional monitoring during operation and post closure to confirm that the pit remains a sink.
38. Runoff from pit floors infiltrating to the ground also pose a risk to groundwater quality. Regional recharge is estimated to 5% of annual average rainfall. Monitoring is proposed to confirm any potential changes in groundwater quality. I agree with MWM's recommendation for additional monitoring during operation and post closure.

COMMENT ON THE PROPOSED GROUNDWATER MANAGEMENT MEASURES

Water management overview

39. Operational phase water management will include:
 - a. In-pit dewatering, will collect water in sumps within the pit, which will then be pumped to the Water Treatment Plant (WTP) (active treatment). Treated water will be discharged to the Waimangaroa River upstream of Smokestack.
 - b. Construction of sub-ELF basal and perimeter drains to direct ELF seepage to passive water treatment systems, each comprising a MSR and a polishing pond.
40. Post closure water management will comprise:
 - a. Continuation of active treatment and associated operational water management infrastructure until discharge water quality meets compliance criteria or passive treatment can be utilised.
 - b. Ongoing passive water treatment for ELF seepage.
 - c. Cessation of dewatering associated with active treatment, and subsequent filling of sumps.
41. The proposed water management measures are reasonable. Furthermore, I agree with MWM's recommendations for additional hydrogeological investigations, groundwater level and quality monitoring and the development of a trigger action response plan along with periodic seepage surveys to enable proactive management of unexpected seepage pathways

SUMMARY

42. I have reviewed the Groundwater assessment of effects reports, and the methodology used to assess likely effects on groundwater. Due to limitation of site specific hydrogeological data, the quantification of the potential effects is considered to be high level, relying on a conceptual hydrogeological model and results from the MFS Water and Load Balance Model. I consider this approach adequate given the proposed pre-mining monitoring and mitigation.
43. I agree with the author's recommendation of completing a hydrogeological characterisation program to confirm hydrogeological conditions and the installation of groundwater monitoring wells for groundwater level and quality monitoring long term.

44. A high-level description of proposed monitoring locations (areas) and number of monitoring wells is discussed in the MWM technical report. They recommend a groundwater monitoring and trigger action plan to be developed to detail groundwater monitoring locations, screen depths, monitoring frequency, trigger levels and actions in the event of exceedances for groundwater level and quality monitoring to enable proactive management of unexpected seepage pathways. I agree with this recommendation.

Theodora Avaniidou

24 March 2026

Limitations

This report has been prepared by GHD Limited, in accordance with the agreed scope of work. It is intended to support the Bathurst Resources Limited application under the FTAA and may be relied upon by the Expert Panel and relevant administering agencies for the purposes of assessing the application.

While GHD Limited has exercised due care in preparing this report, it does not accept liability for any use of the report beyond its intended purpose. Where information has been supplied by the Client or obtained from external sources, it has been assumed to be accurate unless otherwise stated.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described throughout this report and particularly in this report (refer section(s) 10 and 11 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

Project name		Buller Plateaux Continuation Project					
Document title		Report Peer Review ESE Groundwater Technical Report					
Project number		12659028					
File name		Peer Review MFS Groundwater Technical Report_24_03_2026.docx					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4		Dora Avaniadou	Stephen Douglass	On File	Stephen Douglass	On File	19/03/2026
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Report

24 March 2026

To	Bathurst Resources Limited	Contact No.	[REDACTED]
Copy to	[REDACTED]	Email	[REDACTED]
From	Dora Avaniidou	Project No.	12659028
Project Name	Buller Plateaux Continuation Project		
Subject	Peer Review Memo of Escarpment Extension Groundwater Technical Report prepared by Mine Waste Management		

EXECUTIVE SUMMARY

1. This memo provides an independent peer review of the hydrogeological components of the Buller Plateaux Continuation Project (Escarpment Extension sub-area). The review is based on Mine Waste Management's Escarpment Extended Sub-Area – Groundwater Technical Report dated 7 August 2025 (J-NZ0433-002-R-RevC) and subsequent updates issued on 2 December 2025 and 3 February 2026, together with the relevant supporting statements referenced in those documents.
2. Overall, the groundwater report identifies the key actual and potential adverse effects:
 - a. dewatering-related drawdown in the vicinity of the proposed pit,
 - b. reduced groundwater contribution to baseflows in the Whareatea River catchment during mining,
 - c. changes to long-term low flows due to discharge of treated water,
 - d. reduced groundwater discharge to Cascade Creek associated with partial removal of historic workings, and
 - e. localised water-quality impacts from acid mine drainage (AMD) seepage.
3. The quantification of effects is high level given the limited site-specific groundwater-level dataset (particularly in the western pit area) and the absence of site-specific hydraulic testing.
4. Further hydrogeological characterisation and performance monitoring is recommended by MWM to confirm hydrogeological assumptions used in their assessment. I agree with this recommendation as it will also provide data for a more detailed assessment. MWM has provided a high-level groundwater monitoring plan and recommend the completion of a more detailed groundwater monitoring and trigger action response plan to refine effect magnitude and to support effective groundwater and water-quality management through construction, operations and closure. I agree with these recommendations.

INTRODUCTION

5. My full name is Dr Theodora Avaniidou. I am a Technical Director of Hydrogeology within GHD's Environment Group based in Christchurch. I have held this role since 2020. Additionally, since 2022 I have been the Hydrogeology Service Line Leader for Asia Pacific.

6. This memo comments on the groundwater effects from the proposed works for the Buller Plateaux Continuation project and provides an independent review of the technical work undertaken by MWM on the Hydrogeological aspects of the Project.

Qualifications and experience

7. I have the following qualifications and experience relevant to this assessment:
 - i. I hold a Bachelor and a Master in Civil and Environmental Engineering degree (1997) from the Aristotle University of Thessaloniki, Greece
 - ii. Master of Science (2000) from the University of South Carolina, USA and
 - iii. Doctor of Philosophy in Groundwater Hydrology from the University of South Carolina, USA (2003).
 - iv. Since 27 January 2020 I have been employed at GHD. Prior to that:
 - A. I held the roles of Senior and Associate Hydrogeologist at Beca Ltd between 2012 and 2020
 - B. Team Leader of the surface and groundwater team in Egnatia Odos SA, a multi-disciplinary consultancy in Greece for eight years.
8. I specialise in groundwater hydrology and groundwater modelling and have provided hydrogeological support on infrastructure projects including mining. I have been involved with the following projects which are of particular relevance to this consent application:
 - i. Cypress Coal Mine, Buller New Zealand - Technical expert on groundwater: Guided the analysis of hydrogeological data and groundwater flow modelling to assess the effects from open pit mining extensions and the increase of storage of tailings and waste rock stacks.
 - ii. Macraes Mine, New Zealand - Technical expert on groundwater: Guided the analysis of hydrogeological data and groundwater flow and contaminant transport modelling to assess the effects from open pit mining and underground working extensions as well as the increase of storage of tailings and waste rock stacks.

Code of conduct

9. I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023. This assessment has been prepared in compliance with that Code, as if it were evidence being given in Environment Court proceedings. In particular, unless I state otherwise, this assessment is within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

Purpose and scope of assessment

10. The purpose of this assessment is to provide an independent review of and comment on:
 - A. Escarpment Extended Mine Project – Groundwater Technical Report prepared by Mine Waste Management (MWM)

Assumptions and exclusions in this assessment

11. The supporting technical documents referred to in the Groundwater Technical Report have not been reviewed as part of my review.

THE BULLER PLATEAUX CONTINUATION PROJECT

12. The full description for the Project is provided in the AEE and I do not repeat it in my assessment.

METHODOLOGY

Introduction

13. My approach has been to review relevant Project reports necessary to develop an understanding of the likely environmental effects of the project (construction, operation and closure), consider whether the extent and nature of the effects have been correctly and fully assessed, documented and addressed, and determine whether the proposed management (including if applicable offset/compensation measures) appropriately address the impacts of the construction, operation and closure of the project.
14. I initially reviewed the Groundwater Technical Report for the Escarpment Extended Sub-Area, dated 7 August 2025 (document ID: J-NZ0433-002-R-RevC), prepared by Mine Waste Management (MWM).
15. I provided high level comments and feedback on the groundwater technical report (dated 7 August 2025) which was subsequently updated by MWM. I reviewed the updated version of the report, dated 2 December 2025, with additional review comments provided and responded to by MWM with a third iteration of the report dated 3 February 2026, which was provided to me for final consideration.

COMMENT ON THE METHODOLOGY USED TO ASSESS THE SITE'S

HYDROGEOLOGY

16. The proposed Escarpment Extension Sub-area (ESE) will comprise of one large opencast pit with two small auxiliary pits designed to facilitate stormwater management and supply aggregates for onsite road and infrastructure construction. During mining operations, an ex-pit Engineered Landform (ELF) along with multiple in-pit ELF's will be systematically developed to establish a rehabilitated final landform upon project completion.
17. The MWM report presented a summary of data related to historic underground mine workings, topography, climate and hydrology, regional and site-specific geological data and the groundwater level data to develop a conceptual hydrogeological model.
18. There are very limited groundwater level data available for the site especially for the western parts of the proposed pit.
19. There are no site-specific hydraulic testing data available. MWM reviewed and presented in this assessment hydraulic data from nearby sites from across the Buller Plateaux.
20. Groundwater flow was inferred using available groundwater level data and was extrapolated westwards over the ESE area where no data are available using the surface elevation of streams.
21. The historical underground workings beneath SE footprint were mapped on plans provided by BRL (2025a) and their influence on the groundwater flow and measured flows were discussed in the MWM report.
22. A conceptual hydrogeological model (CHM) representing the baseline (existing) groundwater conditions was developed using two cross-sectional profiles: one aligned in a south-to-north direction, and the other oriented west to east.
23. The CHM incorporates topography, geological conditions, hydrological features and mining features (e.g. historical underground mine workings).

24. A post closure CHM representing the post closure conditions was then developed at the same two cross-sectional profiles. The post closure conditions were then compared to the baseline conditions to assess effects on groundwater.
25. During ESE pit mining dewatering will be required that will lower the groundwater levels in the vicinity of the pit. A simple high-level quantitative approach has been undertaken to estimate the lowering of the phreatic surface in the pit area.
26. Results from the Water and Load Balance model (WLBm) (MWM,2025c) are used to describe the changes in low flow conditions for the Whareatea River Catchment. I have not independently reviewed the WLBm report as I understand that this has been reviewed by others.
27. A high-level estimate of the reduction of groundwater discharge to the Cascade Creek Catchment due to the removal of a portion of the historic underground workings is also presented.
28. A qualitative approach has been followed to assess the effects on the groundwater quality.
29. Known groundwater users are over 4 Km away, located on the coastal flats and it is considered unlikely to be impacted by the proposed project.
30. The approach to characterise the site's hydrogeology followed by MWM is reasonable given the limitation of data.

COMMENT ON GROUNDWATER EFFECTS AND EFFECTS MANAGEMENT MEASURES

GROUNDWATER EFFECTS

31. A detailed description of the expected and potential effects of the project construction, operation and closure is contained in the Applicant's groundwater reports and the technical statements prepared by Ryan Burgess.
32. In summary, the actual/potential adverse groundwater effects identified are:
 - i. Lowering of the groundwater level in the vicinity of the project.
 - ii. Reduction in in the groundwater discharge to the Whareatea River catchment during mining.
 - iii. Long-term increase of low flows to the Whareatea River catchment due to discharge of treated water.
 - iv. Reduction of groundwater discharge to Cascade Creek by approximately 40%.
 - v. Acid and Metaliferous Drainage (AMD) seepage will result in changes in groundwater quality discharged to surface water from three areas: Ex-Pit Seal, WWH Sump and Sub-ELF Pooling Zone.
33. A reduction in the groundwater table ranging from 50 to 70 meters is anticipated in the western section of the project. Groundwater levels in the eastern area of the project are also expected to be reduced in the order of 6m as the pit void depth is proposed to be at similar elevation as the historical working that have influenced and "controls" the groundwater levels in that area. These estimates are based on the pit floor elevations and the groundwater level recorded at a specific site. This simplistic approach is reasonable to quantify the magnitude of the expected drawdown at the pit. Although the drawdown extend is not quantified the relatively low hydraulic conductivities of the surrounding rock should limit the extend of the drawdown near the pit area.
34. A reduction in the baseflows contributed by groundwater to the Whareatea River catchment is expected during mining. Although the reduction of the baseflows have not been quantified with numerical modelling or analytical methods in the groundwater technical report, the authors reference the ESE Water and Load Balance Modelling (Mine Waste Management, 2025c) that have taken in to account the reduction on the base flow component based on the portion of the undisturbed area that is mined. Furthermore, the WLBm results estimate a long-term increase of low flow discharge to the Whareatea River catchment due to the steady discharge of treated water.

35. Mining of a portion of the historic underground workings (~40%) that are interpreted to discharge to Cascade Creek are expected to reduce the current groundwater discharge to Cascade Creek. Available flow data from the Escarpment and Cascade Adits are in the order of ~ 230 L/s, therefore a reduction of flows in the order of 90 L/s is estimated assuming a spatially uniform flow generation rate. This simplistic approach is reasonable since MWM reports that the direct discharge locations are not available to refine this estimate.
36. The Ex-pit Seal purpose is to seal off the historic underground workings to prevent ELF seepage from the Project reporting to Cascade Creek. The void will be used as a surge sump receiving AMD impacted water during active water treatment. The base of the void and fracture network along the void walls are planned to be sealed. A high-level estimate of a leakage rate of ~0.5 L/s from each side of the Ex-Pit Seal void has been estimated using Darcy's law that is significantly lower than the estimated underground workings discharge to Cascade Creek (140 L/s). The remaining underground workings (west of the Ex-pit Seal) will still discharge AMD affected water. MWM reports that this load is accounted in the ESE Water and Load Balance Model. Design details for dimensions and the proposed seals will be defined at the detailed design stage.
37. The West Whareatea (WWH) Sump will collect both mine affected surface water and AMD impacted water while active treatment occurs. The operational sump level is anticipated to be lower than the Whareatea River level to minimise leakage to the river through groundwater. During passive treatment the sump will fill with water and receive Mussel Shell Reactor (MSR) effluent and spill to the Whareatea River. Long term the effluent is anticipated to improve water quality and groundwater discharges would be small relative to surface spilling flow.
38. AMD affected water will pool up to a level of ~610 m RL in the Sub-Elf Pooling Zone. Above this elevation seepage would be diverted to the WWH Sump. A high-level estimate of the leakage rate to the Whareatea River is in the order of 0.025 L/s that is very small compared to the simulated 7 day mean annual low flow in the Whareatea River of 100 L/s suggesting a big dilution factor.

COMMENT ON THE PROPOSED GROUNDWATER MANAGEMENT MEASURES

Water management overview

39. MWM report that the operational phase water management will include:
 - a. In-pit dewatering, will collect water in sumps within the pit, which will then be pumped to the Ex-Pit Seal prior to treatment at the Water Treatment Plant (WTP) (active treatment). Runoff and seepage from ex-pit ELF's will be collected in sumps and transferred to the WTP. Treated water will be discharged to the Whareatea River and Cascade Creek.
 - b. Construction of sub-ELF basal and perimeter drains to direct ELF seepage to passive water treatment systems, each comprising a MSR and a polishing pond. Current water management plans include four MSRs associated with the ELF, and one for the Sullivan NAF ELF.
 - c. Dewatering of the Escarpment Borrow Pit, with water pumped to the Ex-Pit Seal.
40. Post closure water management will comprise:
 - a. Continuation of active treatment and associated operational water management infrastructure until discharge water quality meets compliance criteria or passive treatment can be utilised.
 - b. Ongoing passive water treatment for ELF seepage and associated water management infrastructure to separate ELF runoff and ELF seepage (for treatment).
 - c. Cessation of dewatering associated with active treatment, and subsequent filling with water of in-pit sumps, Ex-Pit Seal, and ESE Borrow Pit.

SUMMARY

41. I have reviewed the Groundwater assessment of effects reports, and the methodology used to assess likely effects on groundwater. Due to limitations of site specific hydrogeological data the quantification of the effects is high level using a conceptual hydrogeological model and results from the ESE Water and Load Balance Model. I consider this approach adequate given the proposed pre-mining monitoring and mitigation.
42. I agree with the author's recommendation of completing a hydrogeological characterisation program to confirm hydraulic properties, groundwater levels (especially on the western side of the pit) and baseline groundwater quality.
43. A high-level description of proposed monitoring locations (areas) and number of monitoring wells is discussed in the MWM technical report. They recommend a groundwater monitoring and trigger action plan to be developed to detail groundwater monitoring locations, screen depths, monitoring frequency, trigger levels and actions in the event of exceedances for groundwater level and quality monitoring to enable proactive management of unexpected seepage pathways. I agree with this recommendation.

Theodora Avaniidou

24 March 2026

Limitations

This report has been prepared by GHD Limited, in accordance with the agreed scope of work. It is intended to support the Bathurst Resources Limited application under the FTAA and may be relied upon by the Expert Panel and relevant administering agencies for the purposes of assessing the application.

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The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described throughout this report and particularly in this report (refer section(s) 10 and 11 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

Project name		Buller Plateaux Continuation Project					
Document title		Report Peer Review ESE Groundwater Technical Report					
Project number		12659028					
File name		Peer Review ESE Groundwater Technical Report_24_03_2026.docx					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4		Dora Avaniidou	Stephen Douglass	On file	Stephen Douglass	On file	19/03/2026
S4		Dora Avaniidou	Stephen Douglass		Stephen Douglass		24/03/2026
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