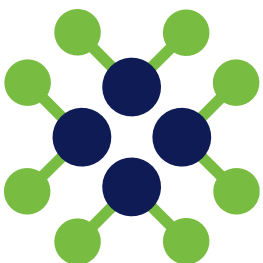




ATLAS-CAMPASPE MINERAL SANDS PROJECT
OPTIMISED SERVICES CORRIDOR MODIFICATION (MOD 6)
MODIFICATION REPORT



EXECUTIVE SUMMARY

ES.1 INTRODUCTION

Tronox Mining Australia Limited (Tronox) is the proponent of the Atlas-Campaspe Mineral Sands Project (the Project) which includes the development of a mineral sands mining operation (the Atlas-Campaspe Mine), together with the construction and operation of the Ivanhoe Rail Facility (a rail loadout facility) in western New South Wales (NSW).

Development Consent (SSD_5012) was granted for the Project under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) in 2014.

Tronox has identified an opportunity to improve operational efficiency at the Atlas-Campaspe Mine by developing an optimised services corridor alignment between the Atlas and Campaspe deposits (the Modification).

ES.2 OVERVIEW OF THE MODIFICATION

The Modification would improve operational efficiency and reduce greenhouse gas emissions at the Atlas-Campaspe Mine by developing an optimised services corridor alignment between the Atlas and Campaspe deposits which would reduce the length of the transport route between the pre-concentrator plant (PCP) and primary gravity concentration unit (PGCU).

The Modification would include the following changes to the Project:

- development of an optimised services corridor between the Atlas and Campaspe deposits, including haul road, pipelines, electricity transmission line, soil stockpiles and water management infrastructure;
- transport of pre-mineral concentrate and ore from the PCP to the PGCU via a pipeline and/or truck along the optimised transport route;
- a supplementary biodiversity offset area to replace a small section of the approved biodiversity offset area that would be impacted by the optimised services corridor; and
- rehabilitation of the optimised services corridor so that it can be incorporated into the existing biodiversity offset area post-mining.

The existing services corridor would remain to provide an alternative access between the Atlas and Campaspe deposits.

ES.3 STAKEHOLDER ENGAGEMENT OVERVIEW

Tronox has consulted with a number of stakeholders during the development of the Modification, including:

- Commonwealth Department of Climate Change, Energy, the Environment and Water;
- Registered Aboriginal Parties;
- Balranald Shire Council;
- NSW Department of Planning, Housing and Infrastructure, including:
 - Resource Assessments Branch; and
 - Crown Lands.
- NSW Department of Primary Industries and Regional Development, including:
 - NSW Resources; and
 - NSW Resources Regulator.
- NSW Department of Climate Change, Energy, the Environment and Water, including:
 - Conservation Programs, Heritage and Regulation;
 - Heritage NSW; and
 - NSW Environment Protection Authority.
- NSW National Parks and Wildlife Service/Willandra Lakes Region World Heritage Advisory Committee.

The outcomes of engagement with these stakeholders have informed the development of the scope of the Modification and Tronox's preparation of the Modification Report.

ES.4 ASSESSMENT OF IMPACTS

Tronox has undertaken a review of the potential environmental impacts of the Modification to identify key potential environmental aspects requiring assessment. The key outcomes of the environmental review are summarised in Table ES-1.

Table ES-1
Key Outcomes of Environmental Review for the Modified Atlas-Campaspe Mine

Environmental Aspect	Summary of Key Environmental Review Conclusions
Land and Agricultural Resources	<ul style="list-style-type: none"> The Modification is not expected to have a significant impact on land use and capability, and no significant changes to the approved potential hazards and/or risks are expected.
Biodiversity	<ul style="list-style-type: none"> The Modification would result in clearance of approximately 50.5 hectares of native vegetation within the optimised services corridor. Tronox would satisfy the biodiversity credit requirements for the Modification using offset mechanisms allowed by the NSW Biodiversity Offsets Scheme.
Aboriginal Cultural Heritage	<ul style="list-style-type: none"> Seven new Aboriginal cultural heritage sites were recorded in the Study Area. The optimised services corridor surface development area would avoid the seven known Aboriginal cultural heritage sites within the Study Area.
Historic Heritage	<ul style="list-style-type: none"> No items of state or regional historic heritage were identified during surveys and therefore it is expected that the Modification would have no impact on historic heritage.
Surface Water Resources	<ul style="list-style-type: none"> Potential surface water impacts associated with the Modification would be minimal with the implementation of existing surface water management measures from the broader Atlas-Campaspe Mine.
Air Quality	<ul style="list-style-type: none"> It is expected that the modified Atlas-Campaspe Mine would continue to comply with the relevant air quality criteria at all sensitive receptors surrounding the Atlas-Campaspe Mine over the modified Atlas-Campaspe Mine life.
Noise	<ul style="list-style-type: none"> The modified Atlas-Campaspe Mine operations are expected to continue to comply with the Development Consent (SSD_5012) noise criterion and the Noise Policy for Industry Project noise trigger levels.
Greenhouse Gas	<ul style="list-style-type: none"> The total greenhouse gas emissions from the Atlas-Campaspe Mine (over the whole mine life) would reduce as a result of the Modification.
Visual	<ul style="list-style-type: none"> Given the insignificant level of visual modification and the remote location (i.e. limited number of viewers), a low level of visual impact would be expected.
Hazards and Risks	<ul style="list-style-type: none"> As the Modification would not significantly change the existing potential risks or hazard consequences identified in the Preliminary Hazard Analysis for the approved Atlas-Campaspe Mine, no significant changes to the approved potential hazards and/or risks are expected.

ES.5 EVALUATION

Approval of the Modification is considered to be justified given that it would:

- Promote the efficient and economic recovery of mineral sands resources, also supporting increase reserve exploitation while maximising the use of Tronox's established facilities and associated returns on existing financial investment.
- Avoid and/or minimise environmental impacts.
- Support the continued employment of approximately 200 Tronox employees and contractors at the Atlas-Campaspe Mine.
- Allow Tronox to continue to meet business objectives while operating in a manner that minimises environmental impacts through the continued implementation of environmental management measures.
- Support the vision and objectives outlined in the Commonwealth *Critical Minerals Strategy 2023-2030*.
- Support the vision and strategy outlined in the NSW *Critical Minerals and High-Tech Metals Strategy*.
- Align with Tronox's decarbonisation map and greenhouse gas emissions reduction targets.

In weighing up the main environmental impacts (costs and benefits) associated with the proposal as assessed and described in this Modification Report, the Modification is on balance, considered to be in the public interest of the State of NSW.

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Appendix C	Aboriginal Cultural Heritage Assessment
Appendix D	Noise Review
Appendix E	Air Quality & Greenhouse Gas Assessment

1 INTRODUCTION

Tronox Mining Australia Limited (Tronox) is the proponent of the Atlas-Campaspe Mineral Sands Project (the Project) which includes the development of a mineral sands mining operation (the Atlas-Campaspe Mine), together with the construction and operation of the Ivanhoe Rail Facility (a rail loadout facility) in western New South Wales (NSW) (Figure 1).

Development Consent (SSD_5012) was granted for the Project under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) in 2014.

EPBC Approval 2012/6447 was granted for the Project under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in 2014.

Tronox has identified an opportunity to improve operational efficiency at the Atlas-Campaspe Mine by developing an optimised services corridor alignment between the Atlas and Campaspe deposits (the Modification) (Figure 2).

This Modification Report has been prepared in consideration of the *State Significant Development Guidelines* (NSW Department of Planning, Housing and Infrastructure [DPHI], 2024a), in particular *Appendix E – preparing a modification report* (NSW Department of Planning and Environment [DPE], 2022a).

1.1 APPROVED ATLAS-CAMPASPE MINERAL SANDS PROJECT

The Atlas-Campaspe Mine is located approximately 80 kilometres (km) north of Balranald in western NSW. The Ivanhoe Rail Facility is located approximately 135 km north-east of the Atlas-Campaspe Mine (Figure 1).

The Atlas-Campaspe Mine includes the sequential development of the Atlas and Campaspe deposits (Figure 2). Tronox is approved to extract up to 10 million tonnes per annum (Mtpa) of mineral sands ore and transport a maximum of 665,000 tonnes per annum (tpa) of mineral product from the Atlas-Campaspe Mine.

Mineral product generated at the Atlas-Campaspe Mine is trucked to the Ivanhoe Rail Facility where it is loaded onto trains for transfer to Tronox's Broken Hill Mineral Separation Plant (MSP) in Broken Hill for further processing. The approved haulage route (road and rail) is shown on Figure 1.

At the Broken Hill MSP, the mineral product from the Atlas-Campaspe Mine is separated and treated to produce valuable minerals (e.g. leucoxene, sulphate ilmenite and non-magnetic concentrate products).

At full development, the Project operational workforce will be approximately 200 personnel.

1.2 OVERVIEW OF THE MODIFICATION

1.2.1 Background

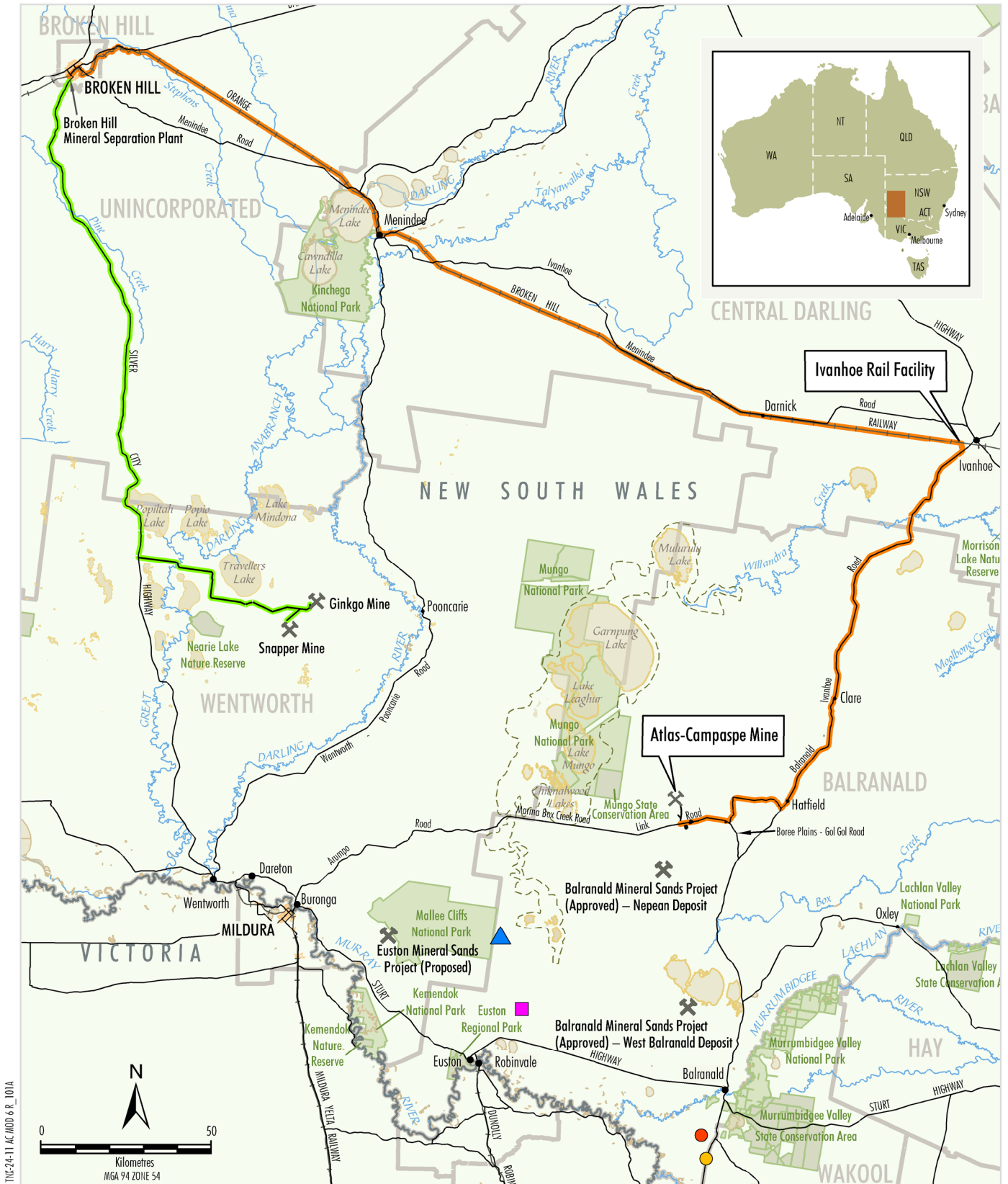
The approved Atlas-Campaspe Mine includes the development of a pre-concentrator plant (PCP) at the Campaspe deposit to initially process Campaspe deposit ore to produce a pre-mineral concentrate that is approved to be pumped and/or trucked via the transport route to the existing primary gravity concentration unit (PGCU) at the Atlas deposit for further processing (Figure 3). The transport route follows the approved services corridor between the Atlas and Campaspe deposits (Figure 3).

The Modification would include the development of an optimised services corridor between the Atlas and Campaspe deposits to reduce the length of the transport route between the PCP and PGCU by approximately 7 km (Figure 3), which would improve operational efficiency and reduce greenhouse gas emissions at the Atlas-Campaspe Mine.

1.2.2 Description of the Modification

The Modification would include the following (Figure 2):

- development of an optimised services corridor between the Atlas and Campaspe deposits, including haul road, pipelines, electricity transmission line, soil stockpiles and water management infrastructure;
- transport of pre-mineral concentrate and ore from the PCP to the PGCU via a pipeline and/or truck along the optimised transport route;
- a supplementary biodiversity offset area to replace a small section of the approved biodiversity offset area that would be impacted by the optimised services corridor; and
- rehabilitation of the optimised services corridor so that it can be incorporated into the existing biodiversity offset area post-mining.



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LEGEND

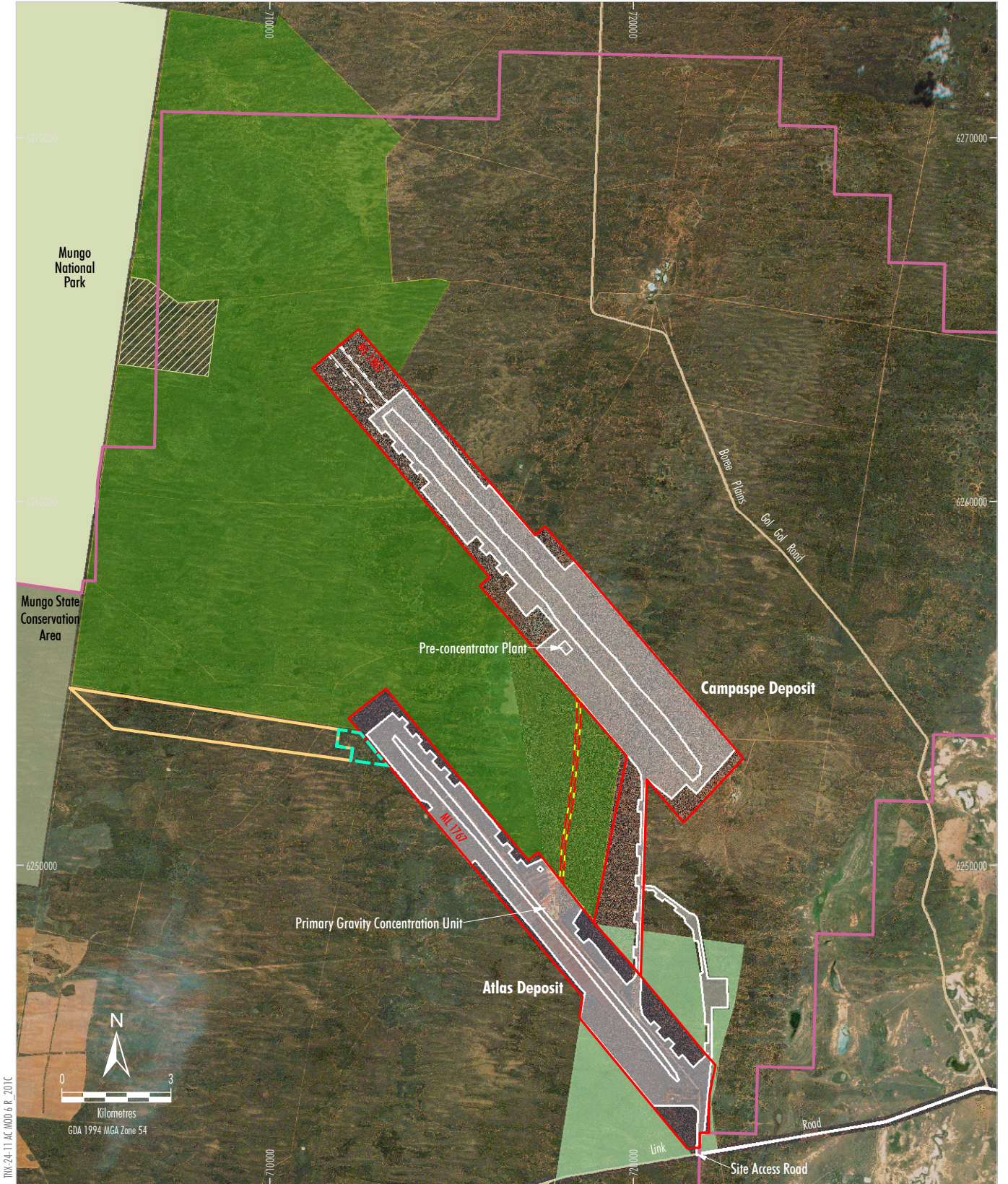
- National Park, Regional Park or State Conservation Area
- Willandra Lakes Region World Heritage Area
- Local Government Area Boundary
- Snapper and Ginkgo Mines Haulage Route
- Atlas-Campaspe Mine Mineral Haulage Route

Other Key Projects Potentially Relevant to the Project

- Mine Site
- Limondale Sun Farm (Approved)
- Sunraysia Solar Farm (Approved)
- Euston Wind Farm (Proposed)
- Koorakee Energy Park Project (Proposed)

Source: NSW Spatial Services (2021); Cristal Mining Australia (2012)

Figure 1

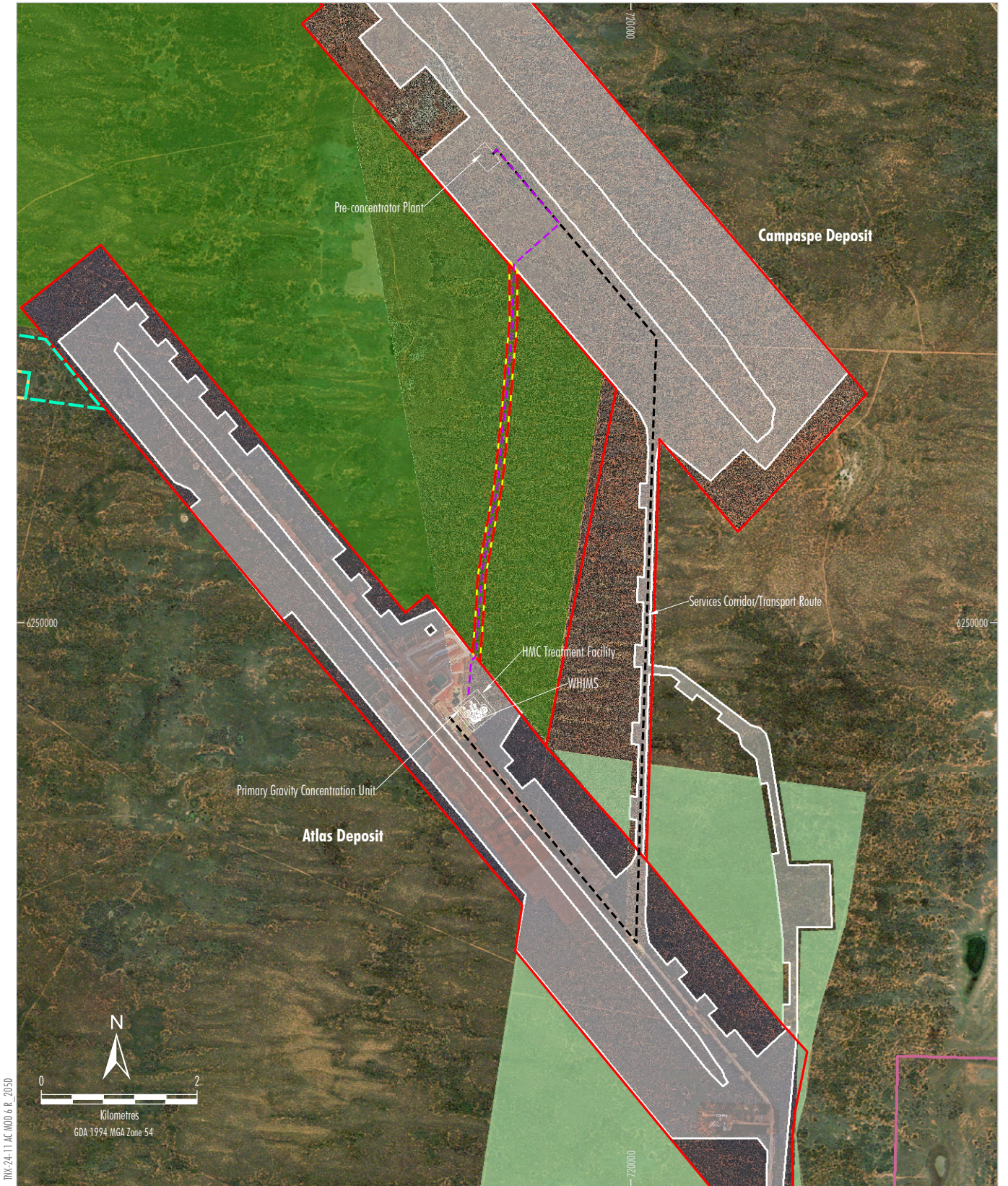


Source: NSW Spatial Services (2024); Tronox (2024); Cristal Mining Australia (2012)
 Orthophoto Mosaic: Tronox (2023); AAM (2011)

- | | |
|---|---|
| LEGEND | Modification Components |
| National Park/State Conservation Area | Mining Lease Application (MLA2) |
| Southern Mallee Landuse Agreement Reserve | Surface Development Area |
| Approved Project Components | Supplementary Biodiversity Offset Area |
| Mining Lease Boundaries (ML 1762 & ML 1882) | Potential Biodiversity Stewardship Site |
| Exploration Licence Boundary (EL 5359) | |
| Surface Development Area | |
| Groundwater Borefield Study Area ^ | |
| Mine Path Extent | |
| Biodiversity Offset Area | |
| Vegetation Management Area | |

^ The layout of the groundwater borefield would be confirmed based on the outcomes of ongoing hydrogeological test work/design.

Figure 2



TRONOX-24-11 AC (MOD & R, 2025)

LEGEND

Approved Project Components

- Mining Lease Boundaries (ML 1762 & ML 1882)
- Exploration Licence Boundary (EL 5359)
- Surface Development Area
- Mine Path Extent
- Mineral Transport Route
- Biodiversity Offset Area
- Vegetation Management Area

Modification Components

- Mining Lease Application (MLA2)
- Surface Development Area
- Mineral Transport Route
- Supplementary Biodiversity Offset Area
- Potential Biodiversity Stewardship Site

Source: NSW Spatial Services (2024); Tronox (2024); Cristal Mining Australia (2012) Orthophoto Mosaic: Tronox (2023); AAM (2011)



MODIFICATION 6

Approved and Modified Services Corridor General Arrangement

Figure 3

The existing services corridor would remain to provide an alternative access between the Atlas and Campaspe deposits.

The Modification would not change the following Project components:

- mine path;
- mine life;
- mining methods or rate;
- processing methods or rate;
- product transport;
- overburden and process waste management;
- annual maximum water supply/demand; and
- workforce.

A detailed description of all components of the Modification is provided in Section 3.

1.2.3 Requirement for the Modification

The optimised services corridor is required to facilitate the more efficient transport of pre-mineral concentrate and ore from the PCP to the PGCU and reduce greenhouse gas emissions.

The Modification would be consistent with Commonwealth and State greenhouse gas emission policies, as well as Tronox's decarbonisation roadmap and greenhouse gas emissions reduction targets, as it would result in a reduction in greenhouse gas emissions associated with the transfer of materials from the Campaspe deposit to the Atlas deposit.

1.2.4 Analysis of Feasible Alternatives

The alternative to proceeding with the Modification would be to continue utilising the sub-optimal approved services corridor.

The consequence of this would be a significantly less efficient extraction process of the State's resources, and additional greenhouse gas emissions relative to the modified Project.

1.3 APPLICANT DETAILS

The Applicant for the Modification is:

Tronox Mining Australia Limited
 Lot 962 Koombana Drive
 BUNBURY WA 6230
<https://www.tronox.com>

1.4 STRUCTURE OF THIS DOCUMENT

This Modification Report has been prepared in consideration of the *State Significant Development Guidelines* (DPHI, 2024a), in particular *Appendix E – preparing a modification report* (DPE, 2022a), and is structured as follows:

Section 1	Provides an overview of the existing/approved Project and an overview of the Modification.
Section 2	Provides an overview of the strategic context for the Modification.
Section 3	Provides a description of the Modification.
Section 4	Describes the statutory context of the Modification.
Section 5	Provides a summary of the engagement undertaken for the Modification and key issues raised.
Section 6	Provides an assessment of the potential environmental impacts of the Modification.
Section 7	Evaluates the merits of the Modification and provides justification for approval of the Modification.
Section 8	Lists the references cited in Sections 1 to 7.
Attachment 1	Statutory Compliance Reconciliation Tables
Attachment 2	Secretary's Environmental Assessment Requirements
Attachment 3	Consideration of World Heritage Properties and National Heritage Places Listed Under the EPBC Act
Appendix A	Biodiversity Development Assessment Report
Appendix B	Replacement Offset Area Assessment
Appendix C	Aboriginal Cultural Heritage Assessment
Appendix D	Noise Review
Appendix E	Air Quality & Greenhouse Gas Assessment

2 STRATEGIC CONTEXT

2.1 REGIONAL CONTEXT

The Project is located in the Far West region of NSW, which comprises the local government areas (LGAs) of Balranald, Brewarrina, Bourke, Broken Hill, Central Darling, Cobar, Walgett, Wentworth and the Unincorporated Area (DPE, 2022b).

The Far West has a “diversified regional economy [which] is focused on a sustainable mining sector in Broken Hill, Cobar, Wentworth and Balranald, which generates jobs, supports related industries and requires new housing that contributes to centres and communities.” The regional economy is centred around mining and agriculture, which contribute approximately 38 percent (%) of the region’s gross regional product (DPE, 2022b).

Land use in the vicinity of the Atlas-Campaspe Mine reflects the dominant industries of the Far West region and comprises mineral sands mining and pastoral leasehold lands that are used for light intensity grazing. The area around the Atlas-Campaspe Mine is sparsely populated, with the closest sensitive receivers located significant distances from the Atlas-Campaspe Mine (Sections 6.5 and 6.6). The nearest boundary of Mungo National Park is approximately 10 km to the west and the nearest boundary of the Willandra Lakes Region World Heritage Area is approximately 15 km to the west (Figure 1).

The Ivanhoe Rail Facility is located approximately 4.5 km south-west of the township Ivanhoe. Land use in the vicinity of the Ivanhoe Rail Facility includes pastoral leasehold lands that are used for light intensity grazing, the Orange – Broken Hill railway and the township of Ivanhoe.

The Project integrates with Tronox’s other mineral sands mining and processing operations located in the Far West region. Tronox is a significant employer and engages a range of local contractors at its operations in the Far West region.

2.2 PROJECT CONTEXT

In preparation for the commencement of mining operations at the Campaspe deposit in 2026, Tronox has commenced detailed planning for the development and operation of the Campaspe deposit.

As a result of this detailed planning, Tronox has identified proposed changes to the approved Atlas-Campaspe Mine to ensure it continues to meet Tronox’s business objectives, while operating in a manner that minimises environmental impacts through the continued implementation of environmental management measures (Section 6).

2.3 POTENTIAL CUMULATIVE INTERACTIONS WITH OTHER PROJECTS

In accordance with the *Cumulative Impact Assessment Guidelines for State Significant Projects* (NSW Department of Planning, Industry and Environment [DPIE], 2022) relevant cumulative impacts of the modified Project and other developments have been considered in this Modification Report (where relevant) (Section 6).

Key proposed or approved projects that may potentially interact with or have potential cumulative impacts with the Project include (Figure 1):

- Balranald Mineral Sands Project (consisting of the Nepean and West Balranald deposits) – is operational and the Nepean and West Balranald deposits are located approximately 20 km and 60 km to the south of the Atlas-Campaspe Mine, respectively;
- Limondale Sun Farm – is operational and is located approximately 100 km to the south of the Atlas-Campaspe Mine;
- Sunraysia Solar Farm – is operational and is located approximately 105 km to the south of the Atlas-Campaspe Mine;
- Koorakee Energy Park Project (Environmental Impact Statement [EIS] in preparation), which would be located approximately 75 km south-west of the Atlas-Campaspe Mine;
- Euston Mineral Sands Project (EIS in preparation), which would be located approximately 90 km south-west of the Atlas-Campaspe Mine; and
- Euston Wind Farm (EIS in preparation), which would be located approximately 65 km southwest of the Atlas-Campaspe Mine.

Relevant cumulative impacts with the modified Project and the existing Balranald Mineral Sands Project (where relevant) have been considered in this Modification Report (Section 6).

Given the significant distances the Limondale Sun Farm and the Sunraysia Solar Farm are located from the Project (approximately 100 km and 105 km respectively), and the relatively minor nature of the impacts associated with operational solar farm projects, the potential cumulative impacts associated with these projects and the modified Project would be negligible and have therefore not been considered further in the Modification Report.

Consistent with the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPIE, 2022), the potential interactions between the Project and any cumulative impacts with Koorakee Energy Park Project, Euston Mineral Sands Project and the Euston Wind Farm would be assessed as part of development applications for these developments.

2.4 RELEVANT STRATEGIC PLANNING DOCUMENTS

2.4.1 Far West Regional Plan 2036

The *Far West Regional Plan 2036* (NSW Government, 2017) (the Regional Plan) applies to the Balranald LGA, and is therefore relevant to the Modification.

The Regional Plan recognises the significance of mineral resource development and includes sustainable management of mineral resource development in the overall vision for the region.

The Modification would be consistent with the overall vision outlined in the Regional Plan to provide for the continuation of mineral resource development that incorporates a range of strategies to manage and minimise potential impacts on the surrounding environment (Section 6).

2.4.2 Critical Minerals

Critical Minerals Strategy 2023-2030

The Australian Government developed the *Critical Minerals Strategy 2023-2030* (Commonwealth of Australia, 2023) to assist growth in the critical minerals sector, expand downstream processing and help meet global demand.

The Project is listed as an Australian “critical mineral deposit and mine” under the *Critical Minerals Strategy 2023-2030*.

The Modification would allow the Project to continue to meet business objectives, therefore supporting the vision and objectives outlined in the *Critical Minerals Strategy 2023-2030*, and facilitate continuity of the production of mineral product.

Critical Minerals and High-Tech Metals Strategy 2024-2035

The NSW Government (2024) developed the NSW *Critical Minerals and High-Tech Metals Strategy 2024-2035* to build on existing potential and position NSW as a major global supplier and processor of critical minerals and high-tech metals well into the future.

Heavy mineral sands mining operations, such as the Project are considered as a “critical mineral and high-tech metal deposits in NSW” under the NSW *Critical Minerals and High-Tech Metals Strategy 2024-2035*.

The Modification would allow the Project to continue to meet business objectives, therefore supporting the vision and strategy outlined in the NSW *Critical Minerals and High-Tech Metals Strategy 2024-2035* and attract investment to support a strong economic position for regional NSW.

2.4.1 Greenhouse Gas Reduction

Paris Agreement

Australia’s Nationally Determined Contribution (NDC) under the *Paris Agreement* (United Nations Framework Convention on Climate Change, 2022) identifies a GHG reduction target of 43% below 2005 levels by 2030 (Australian Government Department of Industry, Science, Energy and Resources, 2022). The NDC also:

- adopts a multi-year emissions budget from 2021 to 2030;
- re-affirms the commitment to achieve net zero emissions by 2050; and
- refers to a substantial and rigorous suite of new policies across the economy to drive the transition to net zero.

The Modification would be consistent with the NDC by reducing Scope 1 emissions from diesel consumption at the Atlas-Campaspe Mine, contributing to Australia’s progress toward its 2030 and 2050 targets.

Australia's Long-term Emissions Reduction Plan

Australia's Long-term Emissions Reduction Plan (Commonwealth of Australia, 2021) (the Emissions Reduction Plan) sets out the national pathway to achieving net zero emissions by 2050.

The Emissions Reduction Plan outlines strategies to reduce greenhouse gas emissions across all sectors of the economy. It focuses on investment in low-emissions technologies, improved energy efficiency, and the transition to cleaner energy sources. It provides certainty for businesses and industries by identifying a clear national framework for reducing greenhouse gas emissions while supporting economic growth and regional development.

The Modification would be consistent with the objectives of the Emissions Reduction Plan by reducing Scope 1 greenhouse gas emissions associated with diesel consumption at the Atlas-Campaspe Mine. This supports national efforts to decarbonise the mining sector and aligns with Australia's long-term commitment to achieving net zero emissions by 2050.

Climate Change (Net Zero Future) Act 2023

The *NSW Climate Change (Net Zero Future) Act 2023* establishes NSW's legislated commitment to reduce greenhouse gas emissions by 50% below 2005 levels by 2030, 70% by 2035, and achieve net zero by 2050. The *Climate Change (Net Zero Future) Act 2023* provides the statutory framework for delivering long-term, coordinated climate action across the state.

The Modification aligns with the objectives of the *Climate Change (Net Zero Future) Act 2023* by reducing Scope 1 greenhouse gas emissions associated with diesel consumption at the Atlas-Campaspe Mine, supporting NSW's legislated emissions reduction pathway.

Net Zero Plan Stage 1: 2020–2030

The *Net Zero Plan Stage 1: 2020–2030* (the Net Zero Plan) (DPIE, 2020a) outlines the NSW Government's approach to reducing emissions across key sectors and achieving net zero emissions by 2050. The Net Zero Plan promotes the adoption of clean technologies, including solar energy and battery storage, particularly in industrial and regional settings.

The Modification would directly support the goals of the Net Zero Plan by reducing diesel consumption at the Atlas-Campaspe Mine. The Modification would reduce Scope 1 greenhouse gas emissions contributing to cleaner energy use and improved environmental outcomes without increasing the approved disturbance footprint for the Project.

3 DESCRIPTION OF THE MODIFICATION

3.1 OVERVIEW

Table 1 provides a comparison between the originally approved project existing/approved operations at the Project and the changes in this Modification.

The modified Atlas-Campaspe Mine general arrangement is shown on Figures 2 and 3.

3.2 MINERALS PROCESSING

Processing of mineral sands ore is approved to occur at the Atlas-Campaspe Mine up to 24 hours per day, seven days per week.

At the Atlas deposit, primary separation of heavy mineral concentrate (HMC) from ore occurs in the PGCU (Figures 2 and 3).

Ore from the Campaspe deposit is approved to be:

- initially processed at the PCP to produce a pre-mineral concentrate that will be trucked and/or pumped to the PGCU for further processing; and/or
- trucked and/or pumped directly to the PGCU for processing.

The Campaspe deposit ore and pre-mineral concentrate is approved to be trucked and/or pumped along the transport route (which includes the services corridor) to the PGCU (Figure 3).

HMC recovered by the PGCU is approved to be transported and processed further at the HMC treatment facility (including a salt washing facility and the wet high-intensity magnetic separation [WHIMS] circuit). A WHIMS circuit is a preliminary treatment stage that separates the HMC into ilmenite-rich, leucoxene-rich and non-magnetic (containing rutile-rich and zircon-rich) mineral concentrates. The mineral concentrates from the WHIMS circuit are approved to be stockpiled in the mineral concentrate stockpile areas by product stackers before they are loaded onto trucks for transport to the Ivanhoe Rail Facility.

Up to 665,000 tpa of mineral concentrate is approved to be produced and transported from the Atlas-Campaspe Mine.

Although no changes to the mineral processing methodology or rates are proposed, the Modification would allow the Campaspe deposit ore and pre-mineral concentrate to be trucked and/or pumped to the PCGU via the shorter optimised services corridor (Section 3.3).

3.3 OPTIMISED SERVICES CORRIDOR

The approved Atlas-Campaspe Mine includes a services corridor between the Atlas and Campaspe deposits (Figure 2). This existing services corridor is approved to accommodate haul roads, pipelines, and supporting infrastructure, enabling ore and pre-concentrate transport using trucks or the existing pipeline.

The Modification would allow for the development of an optimised services corridor between the Atlas and Campaspe deposits (Figures 2 and 3).

The optimised services corridor would be approximately 5 km long and up to 100 metres (m) wide.

Haul roads within the optimised services corridor would be constructed to support the transport of ore and pre-concentrate. These haul roads would be designed with appropriate grades, drainage, and maintenance access to ensure safe and efficient vehicle movement.

Pipeline infrastructure would be installed to transport pre-concentrate and ore slurries. Pumping stations would be installed where required to maintain operational efficiency.

The optimised services corridor would also include electricity transmission lines to supply power to processing and supporting infrastructure.

Areas within the optimised services corridor would be designated for vegetation and topsoil stockpiles (Figure 4).

A conceptual cross-section of the optimised services corridor is provided on Figure 4.

3.4 REHABILITATION STRATEGY

The optimised services corridor would be rehabilitated consistent with the rehabilitation objectives outlined in Condition 32, Schedule 3 of Development Consent (SSD_5012).

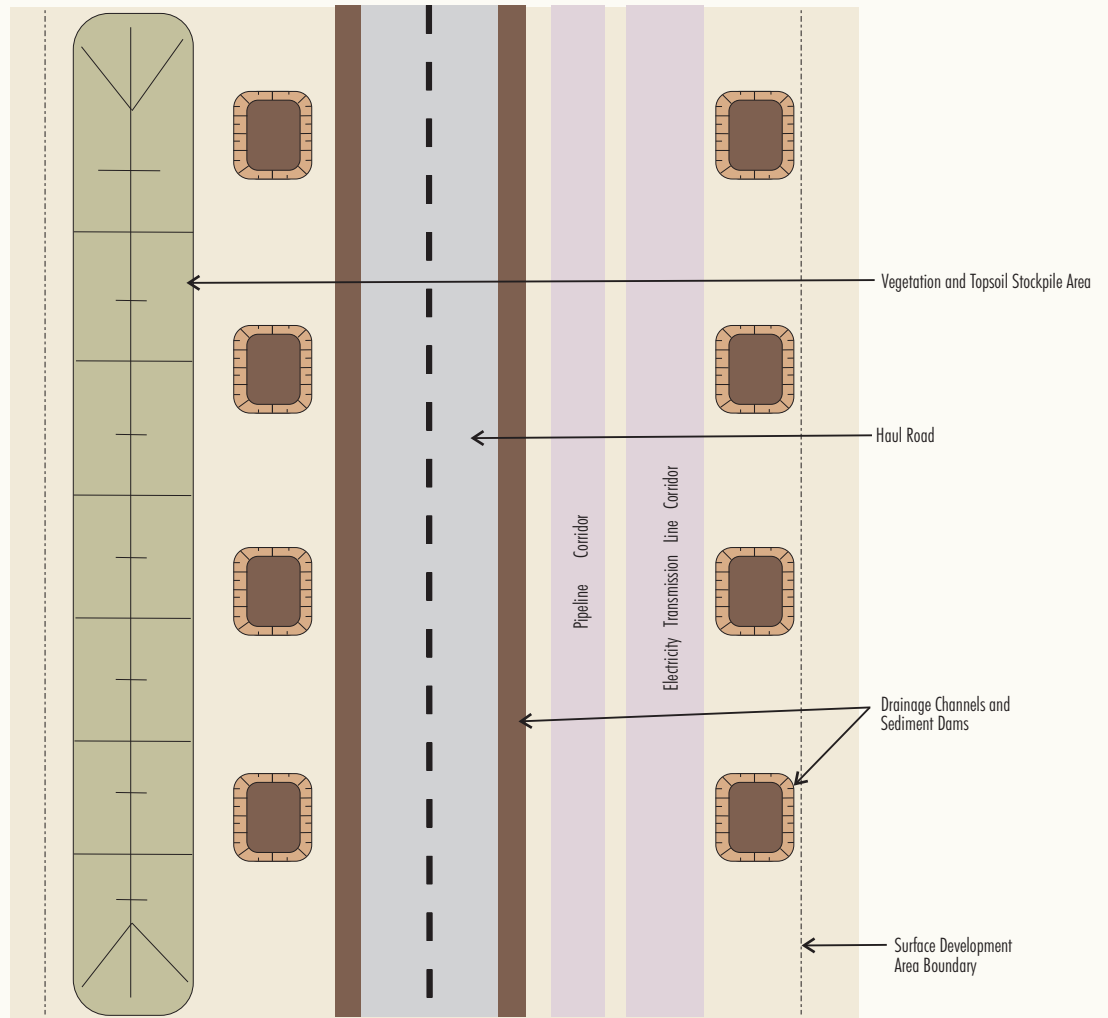
Consistent with the approved rehabilitation strategy for infrastructure areas, the optimised services corridor would be decommissioned and the area re-profiled to the natural surface for rehabilitation.

Table 1
Comparison of the Existing/Approved and Modified Project

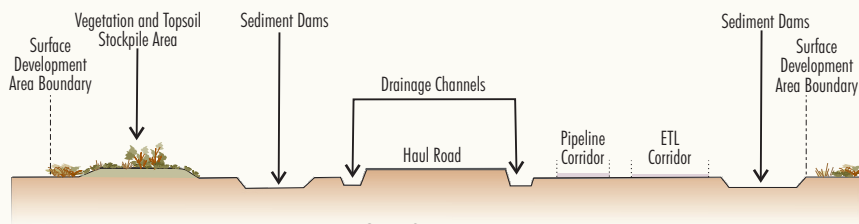
Project Component	Originally Approved Project	Existing/Approved Project	Modified Project
Project Life	<ul style="list-style-type: none"> Mining operations until 30 June 2034. 	<ul style="list-style-type: none"> No change. 	<ul style="list-style-type: none"> No change.
Tenements	<ul style="list-style-type: none"> Mining Lease Application (MLA) 1. 	<ul style="list-style-type: none"> MLA 1 converted to Mining Lease (ML) 1767 and ML 1882. 	<ul style="list-style-type: none"> Addition of MLA 2 for the optimised services corridor.
Mining	<ul style="list-style-type: none"> Dry mining (i.e. dozers and/or loaders and excavators) operation producing approximately 7.2 Mtpa of ore. 	<ul style="list-style-type: none"> Increase in ore extraction rate up to 10 Mtpa. Option to adopt an alternative mining sequence at the Campaspe deposit. 	<ul style="list-style-type: none"> No change.
Mineral Concentration and Mineral Product Transport	<ul style="list-style-type: none"> Ore concentrated in the relocatable PGCU (comprising a screen, surge bin and wet concentrator) to produce HMC. HMC washed in the salt washing facility prior to processing in the WHIMS circuit to produce ilmenite rich, leucoxene rich and non-magnetic (containing rutile-rich and zircon rich) mineral product. Mineral product production up to 546,000 tpa. Mineral product transport up to 450,000 tpa. Up to 24 Transport for NSW (TfNSW) approved haulage vehicle trips per day. 	<ul style="list-style-type: none"> Addition of a PCP at the Campaspe deposit. PGCU would remain in the existing location at the Atlas deposit. Transfer of pre-mineral concentrate from the PCP to the PGCU (pumped and/or trucked) via the services corridor. Option to not undertake further processing at the WHIMS. Increase in mineral product production and transport up to 665,000 tpa. Increase in TfNSW approved haulage vehicle trips up to 35 per day. 	<ul style="list-style-type: none"> Transfer of pre-mineral concentrate from the PCP to the PGCU (pumped and/or trucked) via the optimised services corridor. No change to approved methods or rates.
Overburden Management	<ul style="list-style-type: none"> Overburden removal ahead of ore extraction areas using conventional truck and shovel methods (e.g. excavators and haul trucks). Overburden replacement, including progressive backfilling of mine voids behind the advancing ore extraction areas or in overburden emplacements adjacent to the mine path using haul trucks. 	<ul style="list-style-type: none"> Option to use an overland conveyor to transfer overburden in addition to haul trucks. 	<ul style="list-style-type: none"> No change.
Sand Residue and Coarse Reject Management	<ul style="list-style-type: none"> Sand residues and coarse rejects placed in either overburden emplacement cells behind the advancing ore extraction area or in off-path sand residue dams. 	<ul style="list-style-type: none"> Changes to sand residue emplacement locations due to the revised mineral processing methodology and alternative mining sequence at Campaspe deposit (if adopted). Addition of a separate fine residue emplacement area. 	<ul style="list-style-type: none"> No change.

Table 1 (Continued)
Comparison of the Existing/Approved and Modified Project

Project Component	Originally Approved Project	Existing/Approved Project	Modified Project
MSP Process Waste Management	<ul style="list-style-type: none"> Broken Hill MSP process waste placed behind the advancing ore extraction areas at either the Ginkgo Mine, Snapper Mine or Atlas-Campaspe Mine. Broken Hill MSP process waste production of up to 50,000 tpa. 	<ul style="list-style-type: none"> No change to Broken Hill MSP process waste management. Increase in Broken Hill MSP process waste production up to 65,000 tpa. 	<ul style="list-style-type: none"> No change.
Water Supply	<ul style="list-style-type: none"> Water requirements will be supplied by the Atlas-Campaspe Mine borefield. 	<ul style="list-style-type: none"> Addition of a groundwater borefield. 	<ul style="list-style-type: none"> No change.
Electricity Supply	<ul style="list-style-type: none"> Electricity supplied by diesel generator sets. 	<ul style="list-style-type: none"> Addition of Atlas and Campaspe deposit solar farms and battery energy storage system. 	<ul style="list-style-type: none"> No change.
Supporting Infrastructure	<ul style="list-style-type: none"> Construction of supporting infrastructure within the approved surface development area. 	<ul style="list-style-type: none"> Relocation of the accommodation camp. Construction and operation of a telecommunications tower. 	<ul style="list-style-type: none"> Development of an optimised services corridor between the Atlas and Campaspe deposits.
Site Access	<ul style="list-style-type: none"> Access to the Atlas-Campaspe Mine is via the road haulage route. The use of other local roads other than the haulage route by Project related light vehicles to access site. 	<ul style="list-style-type: none"> The use of the shuttle bus access routes by Project related shuttle buses and light vehicles to access site. 	<ul style="list-style-type: none"> No change.
Employment	<ul style="list-style-type: none"> Approximately 300 personnel during peak construction. Approximately 200 personnel during operations. 	<ul style="list-style-type: none"> No change. 	<ul style="list-style-type: none"> No change.
Rehabilitation Works	<ul style="list-style-type: none"> Progressive rehabilitation undertaken as mining advances. 	<ul style="list-style-type: none"> Refined optimised final landform to reflect the revised mineral processing concentration methodology and the alternative mining sequence at Campaspe deposit (if adopted). 	<ul style="list-style-type: none"> No change.
Biodiversity Offset Area	<ul style="list-style-type: none"> Approximately 16,540 hectares (ha) will be established to offset native vegetation communities cleared for the Project. 	<ul style="list-style-type: none"> No change. 	<ul style="list-style-type: none"> Supplementary biodiversity offset area to replace a small section of the approved biodiversity offset area that would be impacted by the optimised services corridor.



Plan View



Cross Section

Note: The final layout, including the arrangement and size of individual components, within the modified surface development area would be subject to the outcomes of additional engineering studies and detailed design.

Not to Scale

TRX-24-11 AC MOD 6 R 0028

The optimised services corridor would be rehabilitated to be self-sustaining ecosystems with endemic native species so that it can be reincorporated into the approved biodiversity offset area at the end of the Project life. This includes permanent self-propagating vegetation cover including native species characteristic of vegetation communities cleared for the corridor but does not include replicating existing Plant Community Types (PCTs).

There is no change proposed to the final land use as part of the Modification, which is currently approved as either light intensity grazing or nature conservation.

3.5 BIODIVERSITY OFFSET AREA

In accordance with Condition 10, Schedule 3 of Development Consent (SSD_5012) and Condition 3 of EPBC (2012/6447), the approved biodiversity offset area for the Project is approximately 16,540 ha and is comprised of 16,270 ha of existing native vegetation and 270 ha of cleared land (Figure 2).

The biodiversity offset area adjoins Mungo National Park, Mungo State Conservation Area and a Southern Mallee Landuse Agreement Reserve to the west of the Atlas-Campaspe Mine (Figure 2).

The Modification would include a supplementary biodiversity offset area to replace an approximate 50.5 ha of the approved biodiversity offset area that would be impacted by the optimised services corridor (Figure 2).

The supplementary biodiversity area would be approximately 65 ha in size and have similar biodiversity values to the approved biodiversity offset area that would be impacted by the optimised services corridor (Appendix B).

The supplementary biodiversity offset area would be managed in accordance with the measures outlined in the approved Biodiversity Management Plan which has been prepared in accordance with Conditions 4, 5 and 6 in EPBC (2012/6447), and Condition 14, Schedule 3 of Development Consent (SSD_5012).

The supplementary biodiversity offset area would be secured by applying for a change of lease purpose to conservation under the *Crown Lands Management Act 2016* consistent with the approved biodiversity offset area and the mechanisms outlined in Development Consent (SSD_5012).

As described in Section 3.4, the optimised services corridor would be rehabilitated to be a self-sustaining ecosystem with endemic native species so that it can be reincorporated into the approved biodiversity area at the end of the Project life.

The Modification would therefore increase the size of the Project biodiversity offset area by 65 ha to approximately 16,605 ha in the long-term following the completion of the Project.

The supplementary biodiversity offset area would therefore remain generally consistent with the biodiversity offset strategy outlined in Conditions 10 and 11 of Schedule 3 of Development Consent (SSD_5012).

In addition, Tronox would provide a biodiversity offset for the optimised services corridor in accordance with the NSW *Biodiversity Conservation Act* (BC Act) (Section 6).

4 STATUTORY CONTEXT

This section outlines the statutory requirements relevant to the assessment of the Modification.

In accordance with the *State Significant Development Guidelines* (DPHI, 2024a), in particular, *Appendix E – preparing a modification report* (DPE, 2022a), Attachment 1 provides a detailed statutory compliance table for the Project incorporating the Modification that identifies all the relevant statutory requirements and the relevant sections in this Modification Report that address these requirements.

4.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The EP&A Act and the NSW *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) set the framework for planning and environmental assessment in NSW.

4.1.1 Applicability of section 4.55(2) of the Environmental Planning and Assessment Act 1979

The Project was approved under Part 4 of the EP&A Act in 2014 (Development Consent [SSD_5012]).

Section 4.55(2) of the EP&A Act relevantly states (emphasis added):

4.55 Modification of consents—generally

...

- (2) **Other modifications** A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if:
- (a) it is satisfied that the development to which the consent as modified relates is the **same or substantially the same development** as the development for which consent was originally granted and before that consent as originally granted was modified (if at all), and
- (b) it has consulted with the relevant Minister, public authority or approval body (within the meaning of Division 4.8) in respect of a condition imposed as a requirement of a concurrence to the consent or in accordance with the general terms of an approval proposed to be granted by the approval body and that Minister, authority or body has not, within 21 days after being consulted, objected to the modification of that consent, and

- (c) it has notified the application in accordance with:
- (i) the regulations, if the regulations so require, or
- (ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and
- (d) it has considered any submissions made concerning the proposed modification within the period prescribed by the regulations or provided by the development control plan, as the case may be.

Subsections (1) and (1A) do not apply to such a modification.

Same or Substantially the Same Development

The Project has demonstrably remained a large mineral sands mining project that incorporates the following key elements approved under Development Consent (SSD_5012):

- mining of two mineral sands deposits;
- overburden emplacements and sand residue emplacements;
- mineral handling and processing facilities;
- mineral product transport activities;
- rail loadout facility;
- water supply and water management systems; and
- supporting infrastructure and facilities.

This would also clearly continue to be the case if the Modification was approved, and therefore the consent authority can be satisfied that the Project incorporating the Modification would remain 'substantially the same' (Table 1).

4.1.2 Environmental Planning and Assessment Act 1979 Objects

Section 1.3 of the EP&A Act relevantly describes the objects of the EP&A Act as follows:

- (a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,
- (b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,

- (c) to promote the orderly and economic use and development of land,
- ...
- (e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,
- (f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),
- ...
- (i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,
- (j) to provide increased opportunity for community participation in environmental planning and assessment.

The Modification is considered to be generally consistent with the objects of the EP&A Act, as the Modification:

- incorporates:
 - development of the State’s mineral resources approved to be extracted from the Atlas-Campaspe Mine in a manner that minimises environmental impacts and other measures (Section 6); and
 - continued employment and other socio-economic benefits to the community.
- involves the orderly economic use and development of land;
- would facilitate ecologically sustainable development, as economic efficiencies can be achieved with no change to the accepted emissions-based environmental performance measures;
- would include implementation of avoidance and mitigation measures to limit impacts on biodiversity and Aboriginal cultural heritage items;
- would support the ongoing provision of community services and facilities through contributions to NSW Government royalties, NSW Government taxes, Commonwealth tax revenue and council rates; and
- involves public involvement and participation through Tronox’s consultation activities, which would be ongoing following the public exhibition of this Modification Report and DPHI assessment of the Modification in accordance with the requirements of the EP&A Act.

4.1.3 Evaluation under Section 4.55(3) of the Environmental Planning and Assessment Act 1979

Section 4.55(3) of the EP&A Act states:

- (3) In determining an application for modification of a consent under this section, the consent authority must take into consideration such of the matters referred to in section 4.15(1) as are of relevance to the development the subject of the application. The consent authority must also take into consideration the reasons given by the consent authority for the grant of the consent that is sought to be modified.

As required by section 4.55(3) of the EP&A Act, Section 4.1.4 provides an evaluation of the Modification under section 4.15(1) of the EP&A Act. In addition, the consent authority must also take into consideration the reasons given for the grant of Development Consent (SSD_5012).

4.1.4 Evaluation under section 4.15(1) of the Environmental Planning and Assessment Act 1979

In evaluating the Modification under section 4.15(1) of the EP&A Act, the consent authority is required to take into consideration a range of matters as they are of relevance to the subject of the application.

While this is a requirement of the consent authority, this Modification Report has been prepared to generally address the requirements of section 4.15(1) of the EP&A Act to assist the consent authority, as follows:

- Consideration of the requirements of relevant environmental planning instruments (Section 4.3).
- Clause 2.10 of the *State Environmental Planning Policy (Planning Systems) 2021* states that development control plans do not apply to State Significant Developments.
- This Modification Report has been prepared in consideration of the prescribed matters in the EP&A Regulation.
- The predicted impacts of the Modification, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality (Section 6).
- Consideration of whether, on evaluation, the Modification is considered to be in the public interest (Section 7).

4.2 OTHER NSW LEGISLATION

Other NSW legislation that may be applicable to the Project were described in the relevant Project environmental approval documentation (i.e. Project EIS and subsequent modifications).

Tronox would continue to obtain relevant licences or approvals required under this NSW legislation for the Project incorporating the Modification.

Mining Act 1992

The objects of the *Mining Act 1992* are to encourage and facilitate the discovery and development of mineral resources in NSW, having regard to the need to encourage economic sustainable development.

Tronox holds ML 1767 and ML1882 for the Atlas-Campaspe deposits. There would be no need for the amendment or variation of the existing authorities under the *Mining Act 1992* as a result of the Modification.

Tronox would apply for a new Mining Lease Application (MLA 2) to cover the full extent of the surface development area for the optimised services corridor, to ensure ongoing compliance with the *Mining Act 1992*.

Biodiversity Conservation Act 2016

The BC Act provides the approach to be followed for conducting an assessment of a development's impacts on threatened species and ecological communities.

A Biodiversity Development Assessment Report (BDAR) has been prepared for the Modification and is provided in Appendix A. The BDAR was prepared in consideration of the *Biodiversity Assessment Method* (DPIE, 2020b) (BAM) and relevant provisions of the NSW *Biodiversity Conservation Regulation 2017* (BC Regulation).

Protection of the Environment Operations Act 1997

The NSW *Protection of the Environment Operations Act 1997* (PoEO Act) is the primary NSW legislation that regulates pollution control and licensing. One key feature of the PoEO Act is the statutory requirement to apply for and obtain an Environment Protection Licence (EPL) in circumstances where a scheduled activity or activities are being carried out (those activities being defined in Schedule 1 of the PoEO Act).

The approved Project is currently licensed under EPL 21007 to conduct “crushing, grinding or separating”, “metallurgical activities” and “mining for minerals” as defined in Schedule 1 of the PoEO Act.

Tronox would review EPL 21007 in consultation with the NSW Environment Protection Authority (EPA), and if necessary, vary EPL 21007 under the PoEO Act to incorporate the Modification.

Water Management Act 2000

The NSW *Water Management Act 2000* (WM Act) contains provisions for the licensing, allocation, capture and use of water resources. Under the WM Act, water sharing plans are being introduced (and many have commenced) for water sources. Water sharing plans establish rules for sharing water between different users and between the various environmental sources (namely rivers or aquifers).

The Atlas-Campaspe Mine is located within the Western Murray Porous Rock Water Source as defined in the *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2020* under the WM Act.

Tronox currently holds a combined total of 21,442 share components (units or million litres) in the Western Murray Porous Rock Water Source.

No additional water licences under the WM Act are required for the Modification (Section 6.7).

National Parks and Wildlife Act 1974

The NSW *National Parks and Wildlife Act 1974* (NPW Act) contains provisions for the protection and management of national parks, historic sites, nature reserves and Aboriginal heritage in NSW.

An Aboriginal Cultural Heritage Assessment (ACHA) has been undertaken for the Modification by Landskape Natural and Cultural Heritage Management (Landskape) (2026) to assess the potential impacts of the Modification on Aboriginal cultural heritage (Appendix C).

Crown Land Management Act 2016

The NSW *Crown Land Management Act 2016* (Crown Land Act) provides for the management of Crown land in NSW.

Relevant licences or approvals required under the Crown Land Act would continue to be obtained for the Project, incorporating the Modification, where required.

Climate Change (Net Zero Future) Act 2023

The *Climate Change (Net Zero Future) Act 2023* (the Net Zero Act) sets out NSW's approach to climate change and legislates whole-of-government climate action.

The objects of the Net Zero Act are identified in section 4 of the Act as follows:

- (a) *to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,*
- (b) *to establish guiding principles for action to address climate change,*
- (c) *to set targets for the reduction in net greenhouse gas emissions in New South Wales until 2050,*
- (d) *to set an objective for New South Wales to be more resilient to a changing climate,*
- (e) *to establish the Net Zero Commission to independently monitor, review and report on progress in New South Wales towards the targets, the adaptation objective and other matters.*

Part 2 of the Net Zero Act sets out guiding principles, targets for reducing net greenhouse gas emissions in NSW, an adaptation objective and a provision relating to achieving the 2050 net zero target.

The Net Zero Act sets progressive reduction targets for NSW's net greenhouse gas emissions as follows:

- 50% reduction on 2005 levels by 30 June 2030;
- 70% reduction on 2005 levels by 30 June 2035; and
- 'net zero' by 30 June 2050.

Consideration of the Net Zero Act NSW emission reduction targets and a comparison of these targets to the estimated greenhouse gas emissions of the Project incorporating the Modification is presented in Section 6.8.

4.3 ENVIRONMENTAL PLANNING INSTRUMENTS

State environmental planning policies relevant to the Project were described in the Project EIS and subsequent modifications. Details on potential Modification requirements under the key environmental planning instruments are included in the statutory compliance table provided in Attachment 1.

4.4 COMMONWEALTH LEGISLATION

4.4.1 Environment Protection and Biodiversity Conservation Act 1999

The objective of the EPBC Act is to provide for the protection of the environment, especially those aspects of the environment that are Matters of National Environmental Significance (MNES).

Proposals that are likely to have a significant impact on a MNES are defined as a controlled action under the EPBC Act. A proposal that is, or may be, a controlled action is required to be referred to the Commonwealth DCCEEW to determine whether the action is a controlled action.

The proposed action to develop the optimised services corridor at the Atlas-Campaspe Mine was referred to the Commonwealth Minister on 6 November 2025.

A delegate of the Commonwealth Minister determined on 22 December 2025, that the proposed development is a "controlled action" for the purposes of the EPBC Act, as a result of potential impacts on the following controlling provisions under Chapter 2, Part 3 of the EPBC Act:

- World Heritage properties (sections 12 and 15A).
- National Heritage places (sections 15B and 15C).
- Listed threatened species and communities (sections 18 and 18A).

The delegate of the Commonwealth Minister also determined that the proposed Action is to be assessed under the Assessment Bilateral Agreement with the NSW Government. Therefore, this Modification Report provides an assessment of potential impacts of the proposed Action on the above MNES, outlined in the Secretary Environmental Assessment Requirements provided in Attachment 2.

The proposed Action would be assessed in accordance with the Assessment Bilateral Agreement and would require approval under both the EP&A Act and the EPBC Act.

The potential impacts of the Modification on listed threatened species and communities have been assessed in the BDAR (Appendix A) and summarised in Sections 6.2.

The potential impacts of the Modification on world heritage properties and national heritage places are considered in Appendix C and Attachment 3.

4.4.2 National Greenhouse and Energy Reporting Act 2007

The Commonwealth *National Greenhouse and Energy Reporting Act 2007* (NGER Act) introduced a single national reporting framework for the reporting and dissemination of corporations' greenhouse gas emissions and energy use information.

The NGER Act makes registration and reporting mandatory for corporations whose energy production, energy use or greenhouse gas emissions meet specified thresholds. Tronox reports both Group and Facility greenhouse gas emissions under the NGER Act, noting that the existing Project triggers the NGER Act reporting threshold for facilities. This would continue to be the case for the Modification (Section 6.8).

Additionally, the Safeguard Mechanism (underpinned by the Commonwealth *National Greenhouse and Energy Reporting [Safeguard Mechanism] Rule 2015*) was established through the NGER Act.

The Project is not a facility that is subject to the Safeguard Mechanism, as it emits less than 100,000 tonnes of carbon dioxide equivalent (t CO₂-e) covered emissions per year.

Further discussion of greenhouse gas emission policy and guidance materials is provided in Section 6.8.

5 ENGAGEMENT

Tronox has consulted with relevant NSW Government agencies and local councils during the preparation of this Modification Report in consideration of the *Undertaking Engagement Guidelines for State Significant Projects* (DPHI, 2024b). A summary of this consultation is provided below.

It is anticipated that consultation with relevant NSW Government agencies and local councils will continue during the assessment of the Modification by the NSW Government.

5.1 COMMONWEALTH GOVERNMENT AGENCIES

5.1.1 Department of Climate Change, Energy, the Environment and Water

Tronox initially met with the Commonwealth DCCEEW Assessments Branch on 2 May 2024 to discuss the proposed Action during the preliminary stages of project development and to seek early guidance on the potential approval pathway.

Following this initial meeting, Tronox provided preliminary environmental outcomes from biodiversity studies to the Commonwealth DCCEEW Assessments Branch on 1 August 2024.

Tronox subsequently met with the Commonwealth DCCEEW Assessments Branch on 8 and 14 October 2025 to provide an overview of the proposed Action and approval pathway.

The Modification (the proposed Action) was referred to the Commonwealth Minister in November 2025 (EPBC 2025/10354). A delegate of the Commonwealth Minister determined on 22 December 2025 that the proposed Action is a ‘controlled action’ and therefore, requires approval under the EPBC Act.

Assessment requirements for this Modification under the EPBC Act were issued on 29 January 2026.

5.1.2 Willandra Lakes Region World Heritage Advisory Committee

Tronox met with the Willandra Lakes Region World Heritage Advisory Committee in February 2025 to provide an overview of the Modification, proposed approval pathway and the proposed scope of the environmental assessment. The meeting also included discussion of potential light spill and light pollution impacts, which were raised as a key issue by members.

Tronox provided the Willandra Lakes Region World Heritage Advisory Committee with further briefing material on 8 December 2025 to present the preliminary results of the BDAR and ACHA undertaken for the Modification (Appendices A and C).

5.2 NSW GOVERNMENT AGENCIES

Tronox continues to consult with relevant NSW Government agencies on a regular basis in relation to the current activities at the Project.

5.2.1 NSW Department of Planning, Housing and Infrastructure

Resource Assessments Branch

Tronox met with the DPHI on 2 December 2024 to provide an overview of the Modification, proposed approval pathway and the proposed scope of the environmental assessment.

On 17 January 2025, Tronox submitted a scoping letter to DPHI confirming the description of the Modification, proposed approval pathway and the proposed scope of the environmental assessment.

Feedback received from DPHI has been incorporated into this Modification Report.

Crown Lands

Tronox provided the DPHI – Crown Lands with further briefing material on 2 December 2025. At the time of writing, DPHI – Crown Lands had no comments regarding the Modification.

DPHI – Crown Lands had no comments regarding the Modification.

5.2.2 NSW Department of Climate Change, Energy, the Environment and Water

Conservation Programs, Heritage and Regulation Group

Tronox provided the Conservation Programs, Heritage and Regulation (CPHR) Group with briefing material on 2 December 2025 to present the preliminary results of the BDAR undertaken for the Modification (Appendix A).

At the time of writing, the CPHR had no comments regarding the Modification.

Heritage NSW

Tronox provided Heritage NSW with briefing material on 26 November 2025 to provide an overview of the Modification and preliminary results of the ACHA undertaken for the Modification (Appendix C).

At the time of writing, Heritage NSW had no comments regarding the Modification.

Environment Protection Authority

Tronox provided the EPA with briefing material on 2 December 2025 to provide an overview of the Modification and preliminary results of the Noise Review and Air Quality and Greenhouse Gas Assessment undertaken for the Modification (Appendices D and E).

At the time of writing, NSW EPA had no comments regarding the Modification.

5.2.3 Department of Primary Industries and Regional Development

NSW Resources

Tronox provided NSW Resources with briefing material on 1 December 2025 to provide an overview of the Modification.

At the time of writing, NSW Resources had no comments regarding the Modification.

Resources Regulator

Tronox provided NSW Resources Regulator with briefing material on 1 December 2025 to provide an overview of the Modification.

At the time of writing, NSW Resources Regulator had no comments regarding the Modification.

5.3 NSW NATIONAL PARKS AND WILDLIFE SERVICE

Tronox provided NSW National Parks and Wildlife Service (NPWS) with briefing material on 2 December 2025 to present the preliminary results of the BDAR and ACHA undertaken for the Modification (Appendices A and C).

At the time of writing, the NPWS did not have any comments regarding the Modification.

5.4 LOCAL COUNCILS

5.4.1 Balranald Shire Council

Tronox regularly meets with representatives of the Balranald Shire Council regarding the Project.

An overview of the Modification and proposed scope of environmental assessment and engagement was provided to Balranald Shire Council on 26 November 2025.

At the time of writing, the Balranald Shire Council had no comments regarding the Modification.

5.5 ABORIGINAL STAKEHOLDERS

5.5.1 Registered Aboriginal Parties

Aboriginal stakeholders were consulted throughout the preparation of the ACHA for the Modification (Appendix C).

Consultation was conducted with reference to the policy *Aboriginal cultural heritage consultation requirements for proponents 2010* (NSW Department of Environment, Climate Change and Water [DECCW], 2010a).

Further detail on consultation with Aboriginal stakeholders for the Modification is provided in Section 6.3 and Appendix C.

6 ASSESSMENT OF IMPACTS

6.1 IDENTIFICATION OF KEY ISSUES

Tronox has undertaken a review of the potential environmental impacts of the Modification to identify key potential environmental issues requiring assessment.

The optimised services corridor surface development area would result in potential impacts to biodiversity, Aboriginal cultural heritage, historic heritage, land resources, visual amenity and surface water resources.

The addition of the optimised services corridor would also result in changes to the existing/approved noise and air quality impacts and greenhouse gas emissions.

Sections 6.2 to 6.10 and the relevant appendices include a description of the methodology undertaken for each assessment, the existing environment, an assessment of the potential impacts of the Modification, and, where relevant, a description of measures that would be implemented to avoid, minimise and/or mitigate the potential impacts.

Section 6.11 discusses the potential environmental impacts of the Modification on other aspects, including groundwater, road transport, social and hazards and risk.

6.2 BIODIVERSITY

A BDAR has been prepared by GHD Pty Ltd (GHD) (2026a) for the Modification and is presented in Appendix A.

6.2.1 Methodology

The BDAR was prepared in accordance with the Biodiversity Assessment Method (BAM) (DPIE, 2020a) established under section 6.7 of the BC Act.

The BDAR covers the optimised services corridor surface development area (referred to as Development Footprint within the BDAR), which is situated in the Study Area that is located between the Atlas and Campaspe deposits, and is approximately 50.5 ha in size.

The entire Study Area was initially intended to be developed as part of the Modification (Figure 5). After a review by Tronox of preliminary environmental survey outcomes (including the preliminary findings of the biodiversity surveys), the surface development area to be developed for the optimised services corridor was refined to be 50.5 ha in size rather than the entire 92.1 ha Study Area (Figure 5).

Extensive flora and fauna surveys were conducted within the Study Area in October and November 2024 and July and October 2025. These survey outcomes are included in the BDAR (Appendix A) (GHD, 2026a) and the relevant methodology is summarised below.

Vegetation and Flora Surveys

PCTs and vegetation zones in the Study Area were mapped by GHD (2026a) (Figure 5).

Targeted surveys for threatened species and populations listed under the BC Act and EPBC Act were undertaken by GHD (2026a) in October 2024 and 2025.

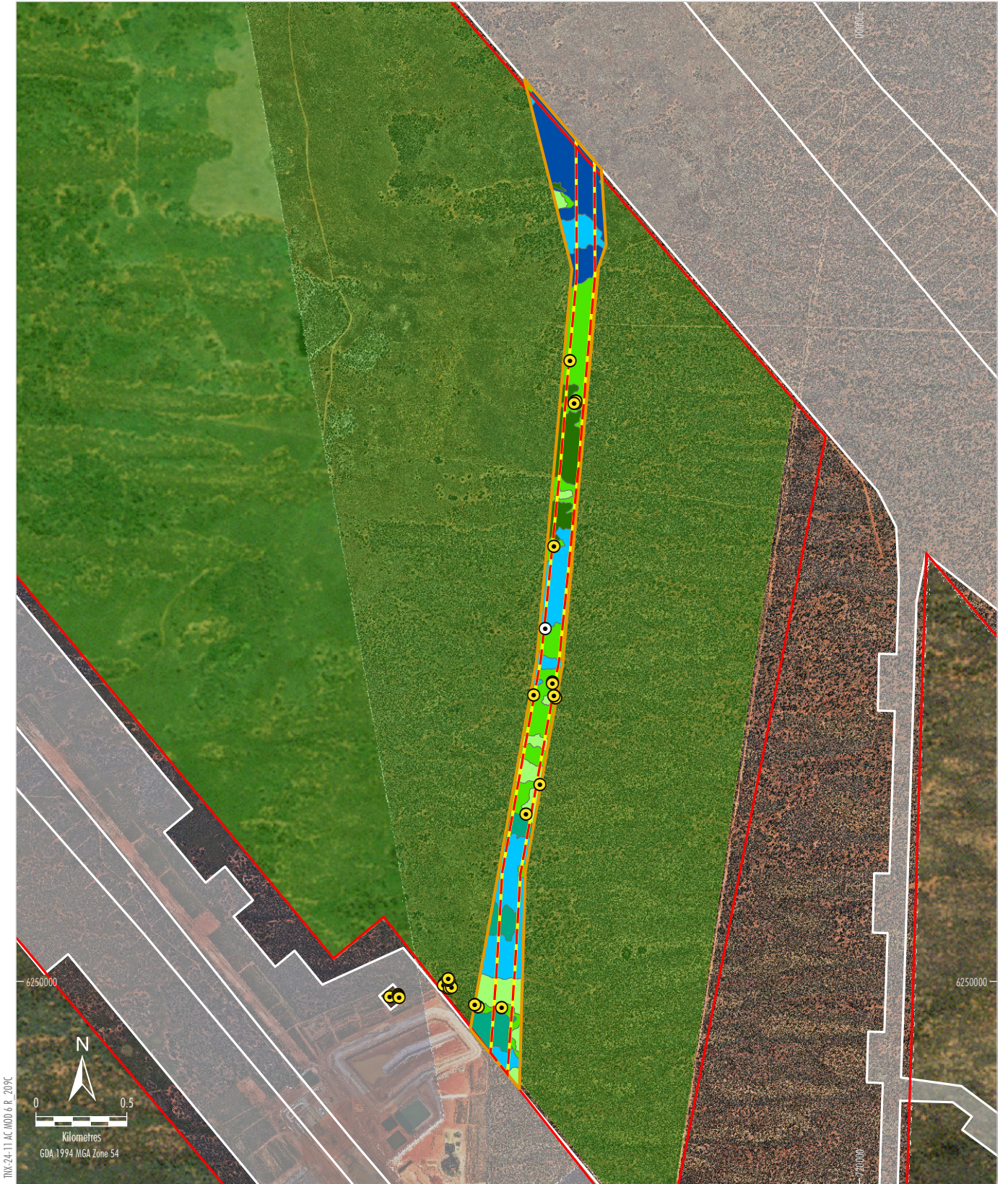
A detailed description of the methodology employed by GHD (2026a) is provided in Appendix A.

Terrestrial Fauna Surveys

GHD (2026a) undertook targeted fauna surveys in the Study Area in October and November 2024. The fauna survey techniques included (Appendix A):

- pitfall, funnel and Elliot trapping surveys for reptiles, amphibians and small mammals;
- terrestrial fauna habitat and diurnal active searches;
- spotlight surveys for reptile, amphibian and small mammal species;
- call playbacks;
- nest tree census;
- diurnal bird surveys;
- fauna habitat assessment; and
- opportunistic observations.

A detailed description of the methodology employed by GHD (2026a) is provided in Appendix A.



Source: NSW Spatial Services (2024); Tronox (2024); Cristal Mining Australia (2012)
 Orthophoto Mosaic: Tronox (2023); AAM (2011)

LEGEND

- Cobar Greenhood Orchid
- Southern Whiteface
- Approved Project Components**
- Mining Lease Boundaries (ML 1762 & ML 1882)
- Surface Development Area
- Mine Path Extent
- Biodiversity Offset Area
- Modification Components**
- Mining Lease Application (MLA2)
- Surface Development Area
- Study Area

PCT Mapping

- VZ1 - Spinifex Linear Dune Mallee mainly of the Murray Darling Depression Bioregion Intact (PCT 171)
- VZ2 - Chenopod Sandplain Mallee Intact (PCT 170)
- VZ3 - Narrow-leaved Hopbush-scrub Turpentine Senna Shrubland on semi-arid sandplains and dunes Intact (PCT 143)
- VZ4 - Belah Oak-Western Rosewood Open Woodland on deep sandy loams Intact (PCT 58)
- VZ5 - Belah Oak-Western Rosewood Open Woodland on deep sandy loams Disturbed (PCT 58)
- VZ6 - Belah Oak-Western Rosewood Open Woodland on deep sandy loams Cleared (PCT 58)
- Cleared Road



MODIFICATION 6
Optimised Services Corridor Study Area
Plant Community Types

Figure 5

6.2.2 Existing Environment

Landscape Features

The surface development area is located within the NSW Murray Darling Depression Bioregion (South Olary Plains Sub-Region) (Appendix A).

Habitat within the surface development area is extensively connected to areas of similar semi-arid woodland habitat in the surrounding locality (Appendix A).

The surface development area is located on a gently undulating sandplain and does not contain any mesas, substantial rock outcrops or other significant geological features, gullies or ephemeral water courses (Appendix A).

The surface development area falls within the Mungo-Marona Dunes and Mungo-Marona Linear Dunes Mitchell Landscapes (Appendix A).

There are no areas of outstanding biodiversity value listed under the BC Regulation associated with the surface development area (Appendix A).

Native Vegetation and Threatened Ecological Communities

Four PCTs were identified within the surface development area (Figure 5 and Table 2).

None of the PCTs identified within the surface development area (Table 2) are listed as threatened ecological communities under the BC Act (Appendix A).

The surface development area contains suitable habitat for the Mallee Bird Ecological Community of the Murray Darling Depression Bioregion (the Mallee Bird Community), a threatened ecological community listed under the EPBC Act (Appendix A).

Threatened Flora Species and Endangered Populations

Surveys conducted in October 2024 and October 2025 confirmed the presence of one flora species, Cobar Greenhood (*Pterostylis cobarensis*), listed as vulnerable under the BC Act (Appendix A).

Threatened Fauna

Surveys conducted in October and November 2024 within the Study Area recorded fauna species listed as threatened under the NSW BC Act including (Appendix A):

- Jewelled Gecko;
- Chestnut Quail-thrush;
- Hooded Robin (south-eastern);
- Pink Cockatoo; and
- Southern Whiteface.

The Hooded Robin (south-eastern), Pink Cockatoo and Southern Whiteface are also listed as threatened under the EPBC Act (Appendix A).

GHD (2026a) concluded the threatened fauna species listed above showed no evidence of breeding or any important habitat features and resources were observed to suggest that the surface development area is of particular importance to local populations of these species (Appendix A).

Groundwater Dependent Ecosystems

The Hydrogeological Assessment previously prepared for the Project found that there are no high priority groundwater dependant ecosystems (GDEs) located in the vicinity of the Atlas-Campaspe Mine (GEO-ENG, 2013).

Table 2
Mapped Vegetation Communities in the Development Footprint

PCT Name	PCT Number	Area within the Development Footprint (ha)
Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion	PCT 171	4.4
Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	PCT 170	16.3
Narrow-leaved Hobbush – Scrub Turpentine- Senna shrubland on semi-arid and arid sandplains and dunes	PCT 143	5.5
Black-Oak -Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	PCT 58	24.2

Source: Appendix A

6.2.3 Potential Impacts

Potential direct and indirect impact on biodiversity would be associated with the development of the optimised services corridor and a summary is provided below.

Measures to Avoid and Minimise Impacts

During the scoping phases of the Modification and with further review of operational requirements, and outcomes of environmental surveys for the Modification, Tronox considered and implemented numerous measures, which included:

- minimising impacts to native vegetation by refining the proposed footprint and reducing the overall amount of disturbance that would be required for the optimised services corridor (only 55% of the original Study Area is being proposed to be disturbed);
- complete avoidance of any watercourses, minimising the number of large or old trees to be impacted, and avoiding indirect impacts to retained native vegetation where possible; and
- avoidance of numerous Cobar Greenhood individuals by adjusting the surface development area where practical.

Direct Impacts

After applying the measures to avoid and/or minimise impacts on biodiversity values as described above, the Modification would result in direct impacts to native vegetation and associated threatened species habitat through clearing of up to 50.5 ha of native vegetation for development of the optimised services corridor and associated infrastructure.

The measures outlined in the BMP would be implemented to mitigate impacts on biodiversity (e.g. vegetation clearance protocol).

Indirect Impacts

Indirect impacts on habitat and vegetation (e.g. increased risk of fire or introduction of pest species) are assessed in Appendix A. Measures to mitigate and manage potential indirect impacts are described in Section 6.2.4.

Prescribed Biodiversity Impacts

The BC Regulation identifies actions that are prescribed as impacts to be assessed under the NSW Biodiversity Offsets Scheme. 'Prescribed biodiversity impacts' are defined in the BC Regulation.

The Modification would result in residual prescribed impacts through the removal or change of vegetation within habitat corridors, minor changes to surface water flows and a moderate risk of vehicle strike causing harm to threatened fauna species and other native fauna using habitats in the vicinity of the surface development area. These residual impacts are likely to be minor in intensity and consequence (Appendix A).

Serious and Irreversible Impacts

Under the BC Act, there is a small list of threatened species and communities that are considered by the NSW Government to be at risk of a Serious and Irreversible Impact (SAIL). These species/ecological communities are named SAIL entities (Appendix A).

No threatened species or ecological communities considered known or likely to occur in the Study Area are SAIL entities. The Modification would not result in any impacts to known or potential SAIL entities or their habitat (Appendix A).

Threatened Species – Ecosystem Credit Species

The total number of ecosystem credits for PCTs, ecological communities and threatened species habitat in the surface development area for the optimised services corridor is 1,226 (Table 3).

Table 3
Ecosystem Credit Requirements for the Optimised Services Corridor

PCT Number	Clearance within the Optimised Services Corridor (ha)	Credit Requirements
PCT 171	4.4	98
PCT 170	16.3	402
PCT 143	5.5	186
PCT 58	24.2	540

Source: Appendix A

Threatened Species – Species Credit Species

The total number of species credits for the one relevant threatened flora species is 533 (Table 4).

Table 4
Species Credit Requirements for the Optimised Services Corridor

Species	Clearance within the Optimised Services Corridor (ha)	Credit Requirements
Cobar Greenhood (<i>Pterostylis cobarensis</i>)	20.73	533

Source: Appendix A.

Biodiversity Credit Requirement for the Modification

Tronox would offset the credit requirement for the Modification (Tables 3 and 4) by one or a combination of the following options (Appendix A):

- the retirement of the required number and class of like-for-like biodiversity credits;
- the retirement of the required biodiversity credits in accordance with the variation rules; and/or
- the payment of an amount into the Biodiversity Conservation Fund.

Matters of National Environmental Significance

Assessments of significance of impacts on MNES determined that the Modification is not likely to have a significant impact on any threatened biota or migratory species listed under the EPBC Act (Appendix A).

Threatened Ecological Communities

One threatened ecological community listed under the EPBC Act, the Mallee Bird Community, occurs within the optimised services corridor surface development area (Appendix A).

GHD (2026a) concluded that the Modification is unlikely to result in a significant impact on the Mallee Bird Community, having regard to the limited extent of habitat removal, the minor increase in fragmentation, the absence of important populations, and the lack of impacts to habitat critical to the survival or recovery of the community (Appendix A).

Threatened Species

The BDAR identified known and potential habitat within the surface development area for several fauna species listed as threatened under the EPBC Act, including (Appendix A):

- Pink Cockatoo (eastern);
- Malleefowl;
- South-eastern Hooded Robin;
- Corben's Long-eared Bat; and
- Southern Whiteface.

Targeted flora surveys did not record any flora species listed under the EPBC Act within the optimised services corridor surface development area (Appendix A).

Assessment of potential direct and indirect impacts determined that the Modification is unlikely to have a significant impact on any threatened fauna, flora or migratory species listed under the EPBC Act (Appendix A).

6.2.4 Mitigation measures

The Modification does not represent any new types of potential impacts on biodiversity, but rather an incremental increase within the surface development area and continued activities within approved disturbance areas.

On this basis, no changes to existing mitigation, management and monitoring measures under the approved BMP are warranted as a result of the Modification (Appendix A).

Notwithstanding the above, the Biodiversity Management Plan would be reviewed and, if necessary, revised by Tronox to include the Modification (subject to any modified Development Consent conditions).

6.2.5 Supplementary Biodiversity Offset Area

As described in Section 3.5, the Modification would include an approximate 65 ha supplementary biodiversity offset area to replace an approximate 50.5 ha of the approved biodiversity offset area that would be impacted by the optimised services corridor (Figure 2).

GHD (2026b) has completed an assessment of the proposed supplementary offset area to determine its suitability to act as a replacement offset (Appendix B).

GHD (2026b) concluded the supplementary biodiversity area would have similar biodiversity values to the approved biodiversity offset area that would be impacted by the optimised services corridor (Appendix B).

A detailed description of the biodiversity values of the supplementary biodiversity offset area is provided in Appendix B.

Comparison of Supplementary Biodiversity Offset Area and Optimised Services Corridor

The supplementary biodiversity offset area supports all four PCTs that occur within the optimised services corridor. These PCTs are in broadly similar condition across the two sites of the community (Table 5) (Appendix B).

The supplementary offset area also provides better habitats for both the Malleefowl and Corben's Long-eared Bat when compared to those within the optimised services corridor surface development area (Appendix B).

The BAM Calculator was applied to the supplementary biodiversity offset area to calculate the biodiversity credits that it would generate. A comparison of the credits associated with the supplementary offset area with the credits for the optimised services corridor is provided in Table 6. The supplementary offset area would generate higher amounts of species and ecosystem credits than the development of the optimised services corridor.

The supplementary offset area is considered to be a superior offset compared to the approved biodiversity offset area, as it is located adjacent to the existing offset within a large corridor of vegetation that is connected to the Mungo National Park and conservation area to the west of Atlas-Campaspe Mine (Appendix B).

Overall, GHD (2026b) concluded the supplementary offset area would be suitable to compensate for the loss of native vegetation within the existing offset area that would occur as a result of the Modification.

The optimised services corridor would be rehabilitated to be a self-sustaining ecosystem with endemic native species so that it can be reincorporated into the approved biodiversity area at the end of the Project life.

Table 5
Comparison of Mapped Vegetation Communities in the Optimised Services Corridor and Supplementary Offset Area

PCT Name	PCT Number	Area within the Optimised Services Corridor (ha)	Area within the Supplementary Offset Area (ha)
Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion	PCT 171	4.4	4.5
Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	PCT 170	16.3	19.8
Narrow-leaved Hopbush – Scrub Turpentine- Senna shrubland on semi-arid and arid sandplains and dunes	PCT 143	5.5	6.1
Black-Oak -Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	PCT 58	24.2	34.4

Source: Appendices A and B.

Table 6
Comparison Between Biodiversity Credits Required for Optimised Services Corridor and Supplementary Offset Area

Credit Type and Name	Credits Required for Optimised Services Corridor	Credits Required If Supplementary Offset Area Was Cleared	Difference
Ecosystem Credit			
Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (PCT 171)	98	112	+14
Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (PCT 170)	402	451	+49
Narrow-leaved Hopbush – Scrub Turpentine- Senna shrubland on semi-arid and arid sandplains and dunes (PCT 143)	186	198	+12
Black-Oak -Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (PCT 58)	540	831	+291
Species Credit			
Cobar Greenhood (<i>Pterostylis cobarensis</i>)	533	600	+67

Source: Appendices A and B.

6.3 ABORIGINAL CULTURAL HERITAGE

An ACHA has been prepared for the Modification by Landskape (2026) and is presented in Appendix C.

6.3.1 Methodology

The ACHA for the Modification has been undertaken in consideration of relevant requirements of various advisory documents and guidelines, including but not limited to:

- NPW Act and the *National Parks and Wildlife Regulation 2019*;
- *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW, 2010a);
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b);
- *Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW* (Office of Environmental Heritage [OEH], 2011);
- *NSW Minerals Industry Due Diligence Code of Practice for the Protection of Aboriginal Objects* (NSW Minerals Council, 2010); and
- *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Australia International Council on Monuments and Sites, 2013).

Aboriginal Cultural Heritage Assessment

The ACHA incorporates relevant information from previous assessments, the results of field surveys undertaken for the Modification and consultation with the Aboriginal community, including:

- results from field work and investigations previously undertaken by archaeologists and representatives of the Aboriginal community;
- search results from the Aboriginal Heritage Information Management System (AHIMS) database as well as other heritage registers;
- results from field surveys conducted by archaeologists and representatives of the Aboriginal community for the Modification in March and July 2025;
- a consultation program undertaken for the Modification; and
- outcomes of consultation with the Aboriginal community regarding archaeological and cultural values as part of the ACHA.

6.3.2 Existing Environment

Previous Archaeological Investigations

An Aboriginal and Non-Aboriginal Cultural Heritage Assessment was previously prepared for the Project by Niche Environment and Heritage (Niche) (2012). A total of 12 Aboriginal cultural heritage sites were identified within the Atlas-Campaspe Mine area and surrounds. None of these Aboriginal heritage sites are located within the surface development area for the Modification (Figure 6).

One site of high archaeological significance was recorded in the Atlas-Campaspe Mine area. A total of four sites of moderate archaeological significance and seven sites of low archaeological significance were recorded in the Study Area (Niche, 2012).

A detailed description of previous archaeological investigations and assessments undertaken in the Atlas-Campaspe surface development area and surrounding region is provided in Appendix C.

Desktop Review

An AHIMS search was undertaken for the Modification area and surrounds. The search identified no Aboriginal heritage sites located within the Study Area.

Consultation

The ACHA included consultation with 11 Registered Aboriginal Parties (RAPs) for the Project, which were identified during the registration process undertaken for the Project, consistent with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW, 2010a).

Consultation with the Aboriginal community regarding the Project has been extensive and involved various methods of communication including public notices, meetings, written and verbal correspondence and archaeological survey attendance, review of the draft Heritage Management Plan (CMA, 2019a), participation in the ACHAs prepared for the Modification (Landskape, 2019 and 2024) and archaeological salvage at the Atlas-Campaspe Mine.

A detailed description of the consultation undertaken with the RAPs for the Modification is provided in Appendix C, and a summary is provided in the following sections.

Information Sessions

Information regarding the Modification was provided in writing to all RAPs on 7 February 2025, which included an invitation to attend an information session about the Modification, held on 4 March 2025 at the Atlas-Campaspe Mine office. One RAP attended the information session.

Aboriginal Cultural Heritage Field Surveys

All RAPs were invited to attend field surveys for the modified surface development area, which were completed on 4 March 2025 and 29 July 2025. One RAP attended the field survey.

Review of the Draft Aboriginal Cultural Heritage Assessment

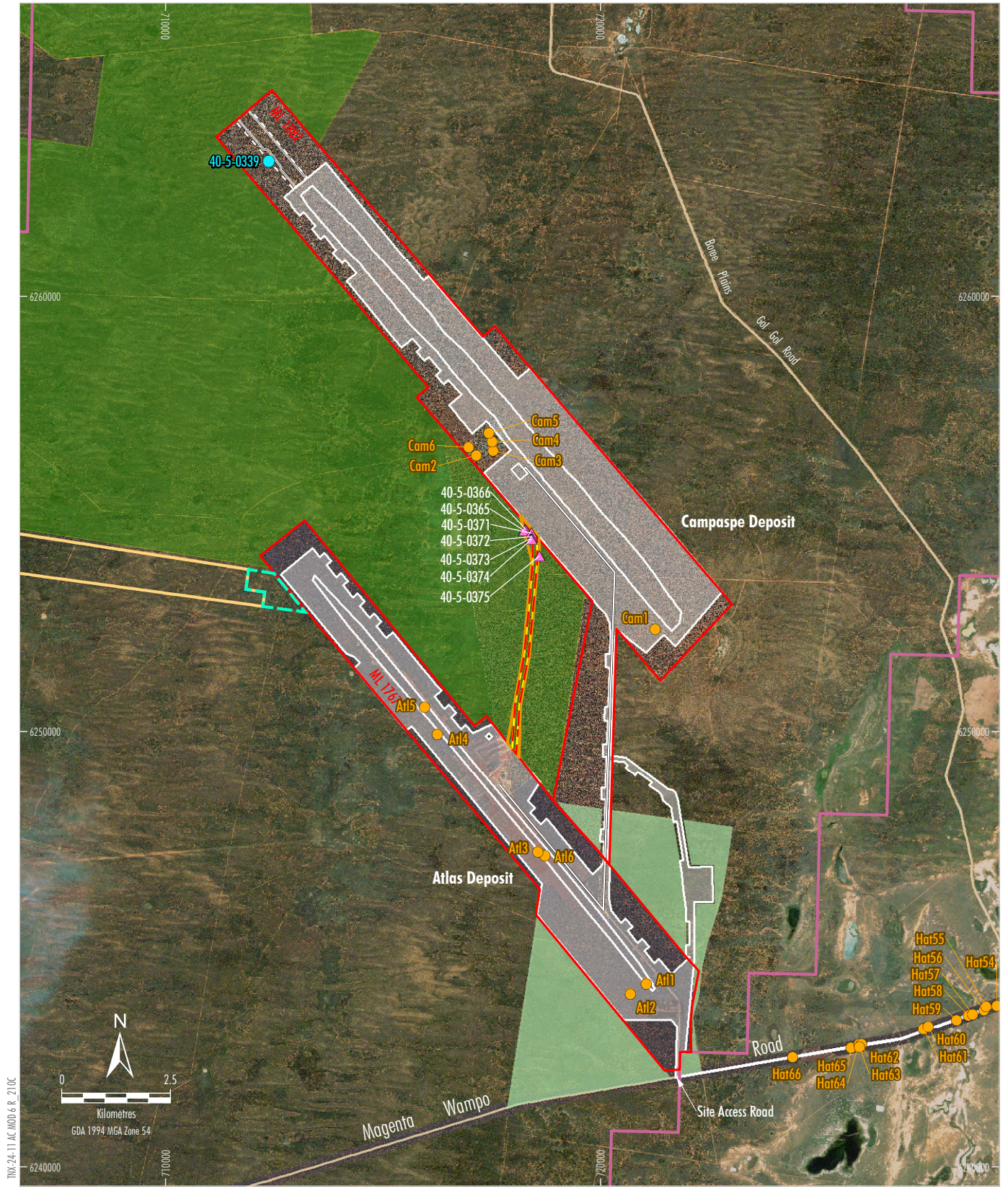
A copy of the draft ACHA was provided to all RAPs on 27 October 2025.

Archaeological Survey and Results

As described previously, the field survey for the Modification was undertaken by suitably qualified archaeologist Dr Matt Cupper and a RAP representative on 4 March 2025 and 29 July 2025, in accordance with the requirements of DECCW (2010b) and OEH (2011).

Seven new Aboriginal cultural heritage sites were recorded in the Study Area (AHIMS sites 40-5-0365, 40-5-0366, 40-5-0371, 40-5-0372, 40-5-0373, 40-5-0374) (Figure 7), and they were assessed as low archaeological (scientific) significance.

A detailed description of each Aboriginal heritage site identified in the ACHA is provided in Appendix C.



Source: NSW Spatial Services (2024); Tronox (2024); Cristal Mining Australia (2012) Orthophoto Mosaic: Tronox (2023); AAM (2011)

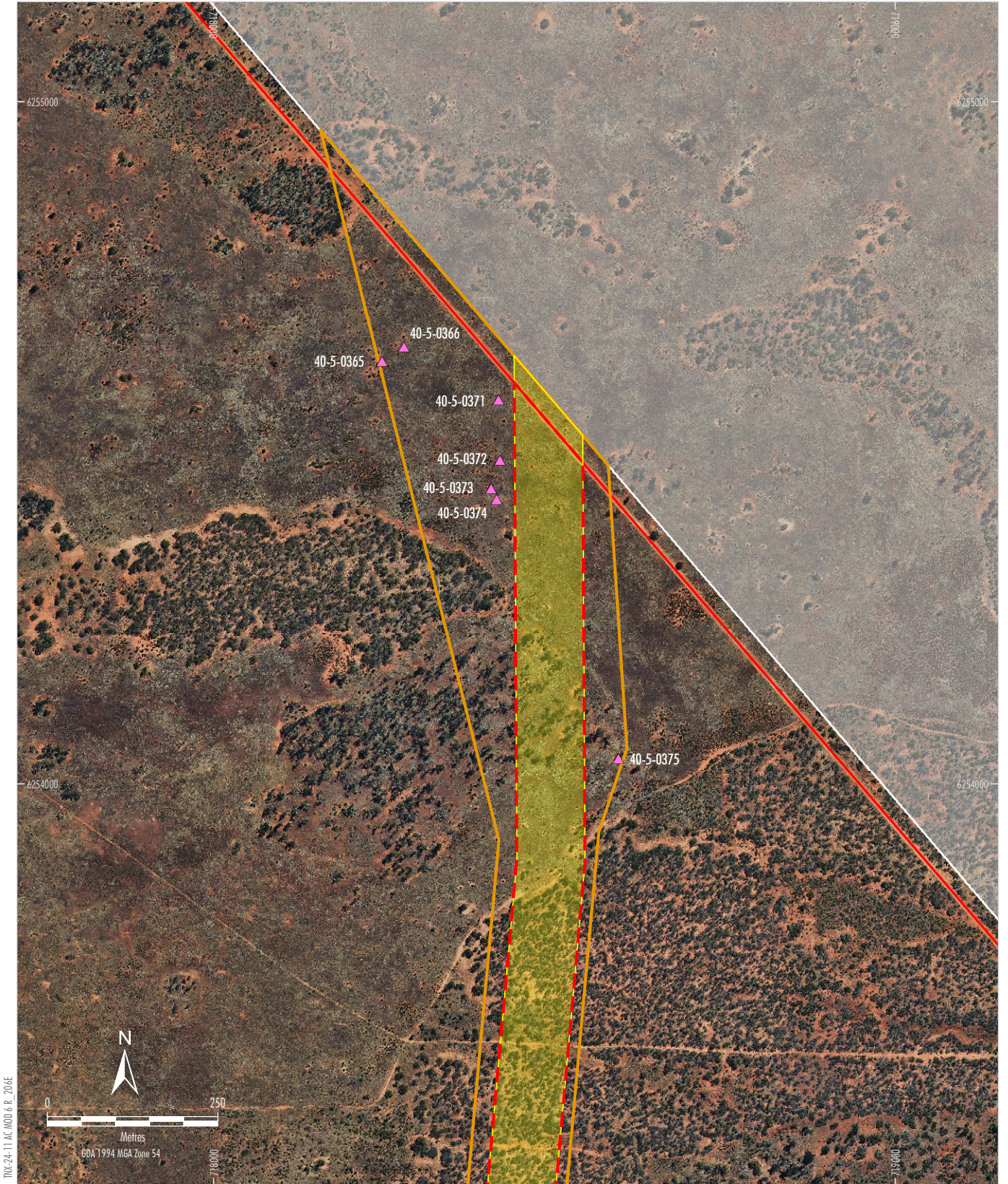
- LEGEND**
- Aboriginal Heritage Site (Landscape, 2024)
 - Aboriginal Heritage Site (Niche, 2012)
 - ▲ Aboriginal Heritage Site (Landscape, 2025)
 - Approved Project Components**
 - ▭ Mining Lease Boundaries (ML 1762 & ML 1882)
 - ▭ Exploration Licence Boundary (EL 5359)
 - ▭ Surface Development Area
 - ▭ Mine Path Extent
 - ▭ Groundwater Borefield Study Area ^
 - ▭ Biodiversity Offset Area
 - ▭ Vegetation Management Area

- Modification Components**
- ▭ Mining Lease Application (MLA2)
 - ▭ Study Area
 - ▭ Surface Development Area
 - ▭ Supplementary Biodiversity Offset Area
 - ▭ Potential Biodiversity Stewardship Site

TRONOX
 M O D I F I C A T I O N 6
 Location of Known
 Aboriginal Cultural Heritage Sites









^ The layout of the groundwater borefield would be confirmed based on the outcomes of ongoing hydrogeological test work/design.

Figure 6



TRONOX-24-11 AC MOD 6 R. 206E

LEGEND

- | | | | |
|---|---|---|---------------------------------|
|  | Aboriginal Heritage Site (Landscape, 2025) |  | <u>Modification Components</u> |
|  | Approved Project Components |  | Mining Lease Application (MLA2) |
|  | Mining Lease Boundaries (ML 1762 & ML 1882) |  | Study Area |
|  | Surface Development Area |  | Surface Development Area |

Source: NSW Spatial Services (2024); Tronox (2024); Cristal Mining Australia (2012)
 Orthophoto Mosaic: Tronox (2023); AAM (2011)

Figure 7

Aboriginal Cultural Heritage Management Regime

In accordance with Condition 28, Schedule 3 of Development Consent (SSD_5012), a Heritage Management Plan has previously been prepared for the Project. The Heritage Management Plan:

- identifies Aboriginal heritage sites and values;
- details the management of Aboriginal heritage sites, including:
 - protocol for the ongoing involvement of the Aboriginal community; and
 - monitoring, management and avoidance measures for known and unknown Aboriginal objects.
- establishes a contingency plan; and
- establishes the roles and responsibilities of Tronox staff with regard to the Heritage Management Plan.

6.3.3 Potential Impacts

The following section discusses the potential impacts on Aboriginal cultural heritage associated with the development of the optimised services corridor.

Direct Impacts

No known Aboriginal cultural heritage sites are located within the optimised services corridor surface development area and therefore would not be directly impacted as a result of the Modification.

The optimised services corridor surface development area would avoid the Aboriginal cultural heritage sites identified during recent surveys within the Study Area (Figure 7).

Notwithstanding, a temporary barrier/fence would be erected around the Aboriginal cultural heritage sites (including a minimum 10 m radius buffer) identified during recent surveys by Landskape (2026) to avoid direct damage.

Potential for Previously Unidentified Aboriginal Cultural Heritage

Although the Study Area was extensively surveyed, there remains the unlikely potential for Aboriginal cultural heritage sites to be located within this area (e.g. sites that may have been obscured by grass or soil at the time of survey). Such previously unidentified features, should they occur, would likely be isolated finds or low-density concentrations of stone artefacts (Appendix C).

The shallow soils of the Study Area, coupled with past disturbance from pastoralism and mining exploration, means that significant *in situ* subsurface cultural deposits are highly improbable (Appendix C).

The Study Area does not contain culturally sensitive landforms such as lunettes or source-bordering sand dunes where subsurface Aboriginal cultural deposits (e.g. burials) have been recorded previously (Appendix C).

The management of any newly identified Aboriginal objects during the life of the Modification would be conducted in accordance with the Heritage Management Plan.

Potential Impact to the Willandra Lakes Regional World Heritage Area

The Willandra Lakes Region World Heritage Area includes the dunes of Lake Mungo, where the remains of a 42,000-year-old male and female (i.e. Mungo Man and Mungo Lady) were discovered. Mungo Lady is believed to be the oldest site of ritual cremation in the world (NSW Department of the Environment and Water Resources, 2007).

The Atlas-Campaspe Mine is located approximately 10 km to the east of the Willandra Lakes Region World Heritage Area (Figure 2).

The Modification would not have an impact on the natural and cultural heritage values of the Willandra Lakes Region World Heritage Area, based on the following:

- The optimised services corridor would be located approximately 10 km further away from the Willandra Lakes Region World Heritage Area compared to the closest component of the approved Atlas-Campaspe Mine.
- The dunefields and sandplains on which the optimised services corridor is located do not contain the landscape features (i.e. relic lakes and lunettes) directly associated with the natural heritage values of the Willandra Lakes Region World Heritage Area.
- The Modification would not change the approved haulage route in the vicinity of relic lakes and lunettes landforms are approximately 30 km south-east of the Willandra Lakes Region World Heritage Area.

- Consultation has been undertaken with Aboriginal stakeholders including those from the Barkandji (Paakantji), Muthi Muthi and Ngiyampaa tribal groups associated with the Willandra Lakes Region World Heritage Area.
- The RAPs have not identified any of the recorded sites as being of particular cultural significance or raised any concerns regarding potential impacts to the Willandra Lakes Region World Heritage Area or its cultural values (Appendix C).

Further consideration of World Heritage Areas and National Heritage Places is provided in Attachment 3.

Potential Cumulative Impacts

The Atlas-Campaspe Mine is located within the south-western region of NSW, which contains a number of currently approved or operational mine sites and/or other large-scale infrastructure projects (Section 2.3).

A consideration of the potential cumulative impacts associated with the Modification, including the existing Atlas-Campaspe Mine and other surrounding operations, has been undertaken and is presented in Appendix C.

The survey undertaken for this ACHA indicates that the types of Aboriginal cultural heritage sites within the Study Area that may be impacted by the Modification comprise part of a region-wide distribution of very small open occupation sites, including disturbed artefacts (Appendix C).

Given the low scientific significance of these Aboriginal cultural heritage sites, the potential cumulative impacts that may result from the Modification is considered to be low. On this basis, it is considered that the Modification would not significantly increase cumulative impacts to Aboriginal cultural heritage in the region (Appendix C).

In terms of cultural values, the Modification is located within an area that has already been modified by past clearing and pastoral and mining exploration activities (Appendix C).

6.3.4 Mitigation Measures, Management and Monitoring

A temporary barrier/fence would be erected around the Aboriginal cultural heritage sites (including a minimum 10 m radius buffer) recently found during surveys by Landskape (2026) when works are occurring in its vicinity to avoid direct impact to Aboriginal cultural heritage site.

The Heritage Management Plan would be reviewed and, if necessary, revised by Tronox to include the Modification (subject to any modified Development Consent conditions).

6.4 HISTORIC HERITAGE

6.4.1 Background

A Historic Heritage Assessment for the Project was undertaken by Niche for the Project EIS. No items of state or regional historic heritage were identified at the Atlas-Campaspe Mine (Niche, 2012).

6.4.2 Potential Impacts

Potential impacts on historic heritage are considered to be low based on the following:

- No historic heritage was encountered in the Study Area during the archaeological survey for the ACHA.
- The optimised services corridor avoids pastoral homesteads and outbuildings which are the most likely historical cultural heritage features to occur in the region (Appendix C).
- Although the surface development area was sufficiently surveyed, the Heritage Management Plan (CMA, 2019a) prepared in accordance with Condition 28, Schedule 3 of Development Consent (SSD_5012), contains management measures for any newly identified historic heritage sites.

6.4.3 Mitigation Measures, Management and Monitoring

The Heritage Management Plan would be reviewed and, if necessary, revised by Tronox to include the Modification (subject to any modified Development Consent conditions).

6.5 NOISE

The Noise Review was completed by VMS Australia Pty Ltd (VMS) (2026) and evaluated the potential noise impacts of the Modification, and a summary is provided below. The Noise Review is included as Appendix D.

6.5.1 Methodology

The Noise Review was conducted in the context of the Modification, past assessments, modified activities (including a sound power level [SWL] comparison) and contemporary assessment requirements (i.e. the *Noise Policy for Industry* [NPfI] [EPA, 2017]).

6.5.2 Existing Environment

Sensitive Receivers

The Atlas-Campaspe Mine is located significant distances from sensitive receivers (Figure 8). The closest privately-owned sensitive receiver to the Atlas-Campaspe Mine is located approximately 14 km to the north-east (Figure 8).

In addition to the sensitive receiver noted above, the following potentially sensitive land uses are located to the west of the Atlas-Campaspe Mine (Figure 8):

- Mungo National Park – located approximately 5 km west.
- Mungo State Conservation Area – located approximately 8 km west.
- Willandra Lakes Region World Heritage Area – located approximately 10 km west.

Previous Assessments

A Noise Assessment for the broader Atlas-Campaspe Mine (Wilkinson Murray, 2012) was prepared in accordance with the *Industrial Noise Policy* (EPA, 2000).

Wilkinson Murray (2012) concluded that the Atlas-Campaspe Mine will comply with the project-specific noise criteria and the applicable sleep disturbance criteria at all privately-owned sensitive receptors during construction and operation.

Furthermore, it was predicted that the Atlas-Campaspe Mine will comply with the relevant amenity criteria at the Mungo National Park, Mungo State Conservation Area and the Willandra Lakes Region World Heritage Area (Wilkinson Murray, 2012).

It was also concluded that no cumulative impacts between the Atlas-Campaspe Mine and the Balranald Mineral Sands Project will occur (Wilkinson Murray, 2012).

Wilkinson Murray (2019) conducted a review of the potential noise impact associated with Atlas-Campaspe Mineral Sands Project Optimisation Modification (Modification 1) and VMS (2024) conducted a review for Modification 5.

Wilkinson Murray (2019) and VMS (2024) concluded these Modifications would not result in an increase in operational noise at the modified Atlas-Campaspe Mine, and compliance with the Development Consent (SSD_5012) and NPfl noise criteria for all modelled receivers under neutral and adverse meteorological conditions is predicted (Wilkinson Murray, 2019) (VMS, 2024).

Noise Criteria

VMS (2026) has assessed the Modification in consideration of noise criteria outlined in Condition 16, Schedule 3 of Development Consent (SSD_5012) (Table 7) and Condition L3.1 of EPL 21007 (Table 8).

VMS (2026) has also considered the potential noise impacts of the Modification against the NPfl criteria.

The NPfl increased the minimum daytime noise criterion to 40 decibels A-weighting (dBA), while the evening and night-time criteria remained at 35 dBA.

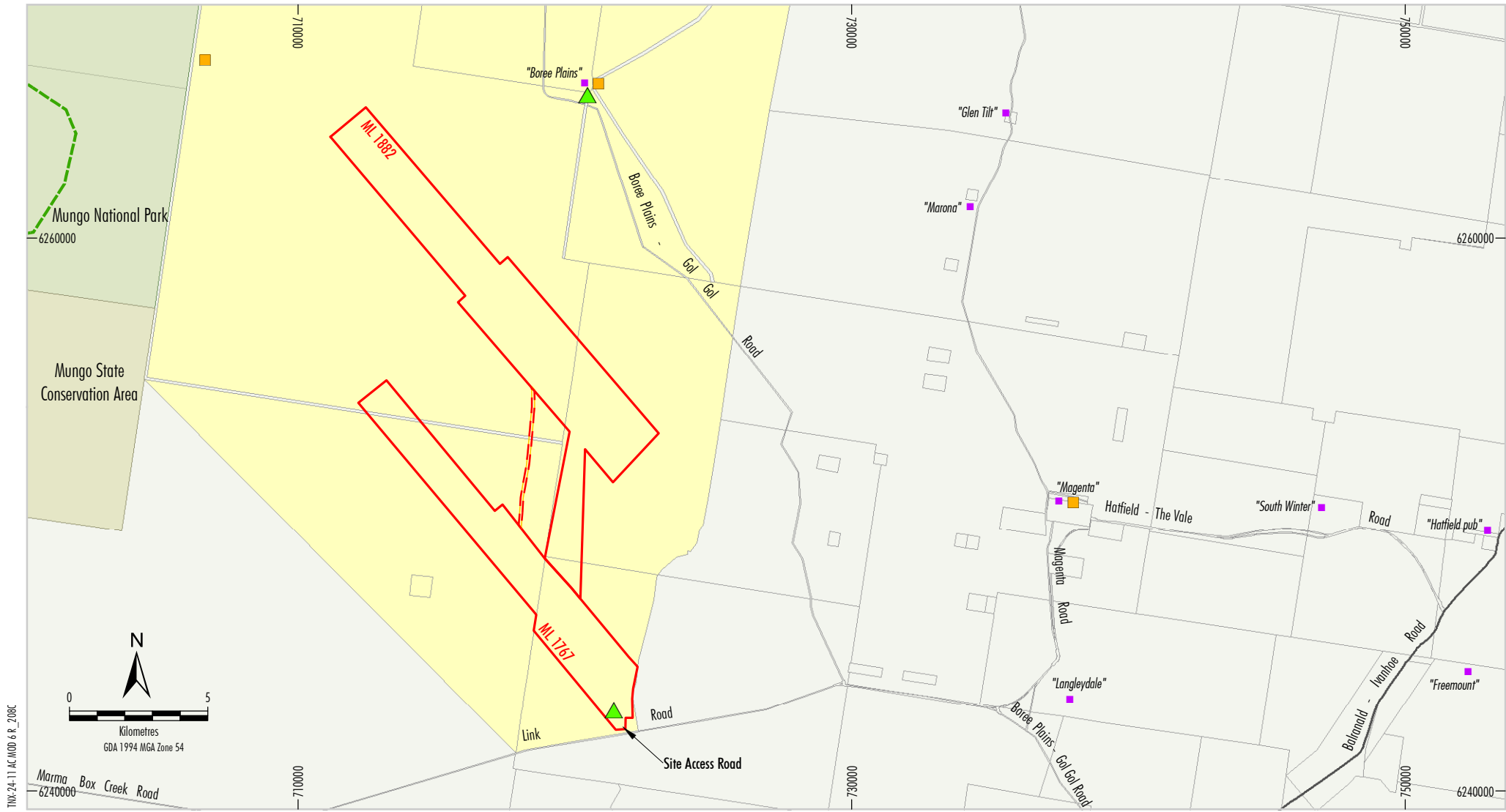
Noise Management and Monitoring Regime

In accordance with Condition 18, Schedule 3 of Development Consent (SSD_5012), a Noise Management Plan (CMA, 2019b) has been prepared for the Project. The Noise Management Plan:

- identifies relevant noise criteria;
- identifies potential sources of noise during the construction and operational phases;
- identifies noise mitigation and management measures;
- details the noise monitoring program;
- establishes proactive and responsive noise emission management protocols including a standard protocol, a complaint response protocol and an amenity protocol; and
- establishes community consultation protocols.

No exceedances of the relevant noise criteria have been recorded to date. Noise from the Atlas-Campaspe Mine was observed to be inaudible during all the operator-attended noise monitoring at all sensitive receivers.

During the 2024 Annual Review reporting period, Tronox received no complaints due to the Atlas-Campaspe Mine in regard to noise (Tronox, 2025).



TNX-24-11 AC MOD 6 R_208C

- LEGEND**
- National Park
 - State Conservation Area
 - Willandra Lakes Region World Heritage Area
 - Mining Lease Boundaries (ML 1762 & ML 1882)
 - Tronox Controlled Land
 - Private Landholder/Leaseholder
 - Dwelling
 - Automatic Weather Station *
 - Noise Monitoring Location
 - Modification Components
 - Mining Lease Application (MLA2)
 - Surface Development Area

*Note ** The automatic weather station was relocated from Boree Plains to the accommodation camp in 2021

Source: NSW Spatial Service (2024)
Cristal Mining Australia (2012); Tronox (2024)

Figure 8

Table 7
Development Consent (SSD_5012) Noise Criteria

Location	Day	Evening	Night	
	L _{Aeq(15min)} dBA	L _{Aeq(15min)} dBA	L _{Aeq(15min)} dBA	L _{A1(1min)} dBA
All privately-owned land	35	35	35	45
Mungo National Park & Mungo State Conservation Area	50	50	50	-

Table 8
EPL 21007 Operational Noise Criteria

Location	Noise Level (Day, Evening and Night) L _{Aeq(15min)} dBA
Mungo National Park & Mungo State Conservation Area	50
NAC1 "Boree Plains"	35
NAC2 "Magenta"	35

6.5.3 Potential Impacts

The Noise Review (Appendix D) has evaluated the potential noise impacts of the Modification, and a summary is provided below.

The following components of the Modification would have the potential to alter noise emissions at the Atlas-Campaspe Mine:

- the construction of the optimised services corridor and its infrastructure (i.e. pipelines, electricity transmission line, soil stockpiles and water management infrastructure); and
- trucking/pumping of mineral concentrates from the Campaspe deposit to the Atlas deposit (PCP to PGCU).

The potential noise impacts associated with the construction and operation of the optimised services corridor would be negligible in the context of full-scale mining operations at the Atlas-Campaspe Mine (Appendix D).

The addition of the optimised services corridor would result in changes to the location of existing Atlas-Campaspe Mine noise sources (e.g. mining fleet items and construction noise). Given the Atlas-Campaspe Mine is located significant distances from sensitive receivers (Section 6.6.2), any minor changes to the location of the Atlas-Campaspe Mine noise sources are unlikely to cause significant changes to existing intrusive or amenity noise levels at sensitive receivers (Appendix D).

Based on a SWL review, noise levels are predicted to continue to comply with the operational noise criteria outlined in Development Consent (SSD_5012) and EPL 21007 at all noise sensitive receivers under neutral and adverse weather conditions for the Modification (Appendix D).

The noise emission from the maximum noise event of the Modification are expected to comply with the sleep disturbance noise criteria at all sensitive receivers during the night-time period in accordance with the NPfl (Appendix D).

Potential Cumulative Impacts

The noise emission from the approved Balranald Mineral Sands Project at the sensitive receivers closest to the Atlas-Campaspe Mine are predicted as less than 30 dBA in the Noise Impact Assessment prepared by EMM (2022).

The noise emissions from the modified Atlas-Campaspe Mine at these sensitive receivers are expected to also be less than 30 dBA under both calm and adverse weather conditions. Therefore, the cumulative noise levels from the Modification and Balranald Mineral Sands Project are expected to comply with the cumulative amenity noise criteria.

6.5.4 Mitigation Measures, Management and Monitoring

The Noise Management Plan would continue to be implemented for the Modification.

Given the Modification is not expected to contribute to any additional exceedances of the relevant noise criteria at any sensitive receptors in the vicinity of the Atlas-Campaspe Mine, Tronox does not propose any additional noise management measures.

Notwithstanding, the Noise Management Plan would be reviewed and, if necessary, revised by Tronox to include the Modification (subject to any modified Development Consent conditions).

6.6 AIR QUALITY

An Air Quality and Greenhouse Gas Assessment was completed by Airen Consulting (Airen) (2026) and evaluated the potential air quality impacts of the Modification. The review is provided in Appendix E and a summary is provided below.

6.6.1 Methodology

Airen (2026) conducted a review of the Modification in the context of past assessments, proposed activities, contemporary assessment requirements, and recent air quality and meteorological monitoring. Airen (2026) has assessed the potential air quality impacts of the Modification against the updated *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (Approved Methods) (EPA, 2022).

6.6.2 Existing Environment

Sensitive Receivers

The Atlas-Campaspe Mine is located significant distances from sensitive receivers (Figure 9). The closest privately-owned sensitive receiver to the Atlas-Campaspe Mine is located approximately 14 km to the north-east (Figure 9).

Previous Assessments

Katestone Environmental Pty Ltd (Katestone) (2013) prepared an Air Quality and Greenhouse Gas Assessment for the Project. The Air Quality and Greenhouse Gas Assessment was prepared in accordance with the Approved Methods (NSW Department of Environment and Conservation, 2005).

Potential air quality impacts at the Atlas-Campaspe Mine were modelled and the assessment indicated (Katestone, 2013):

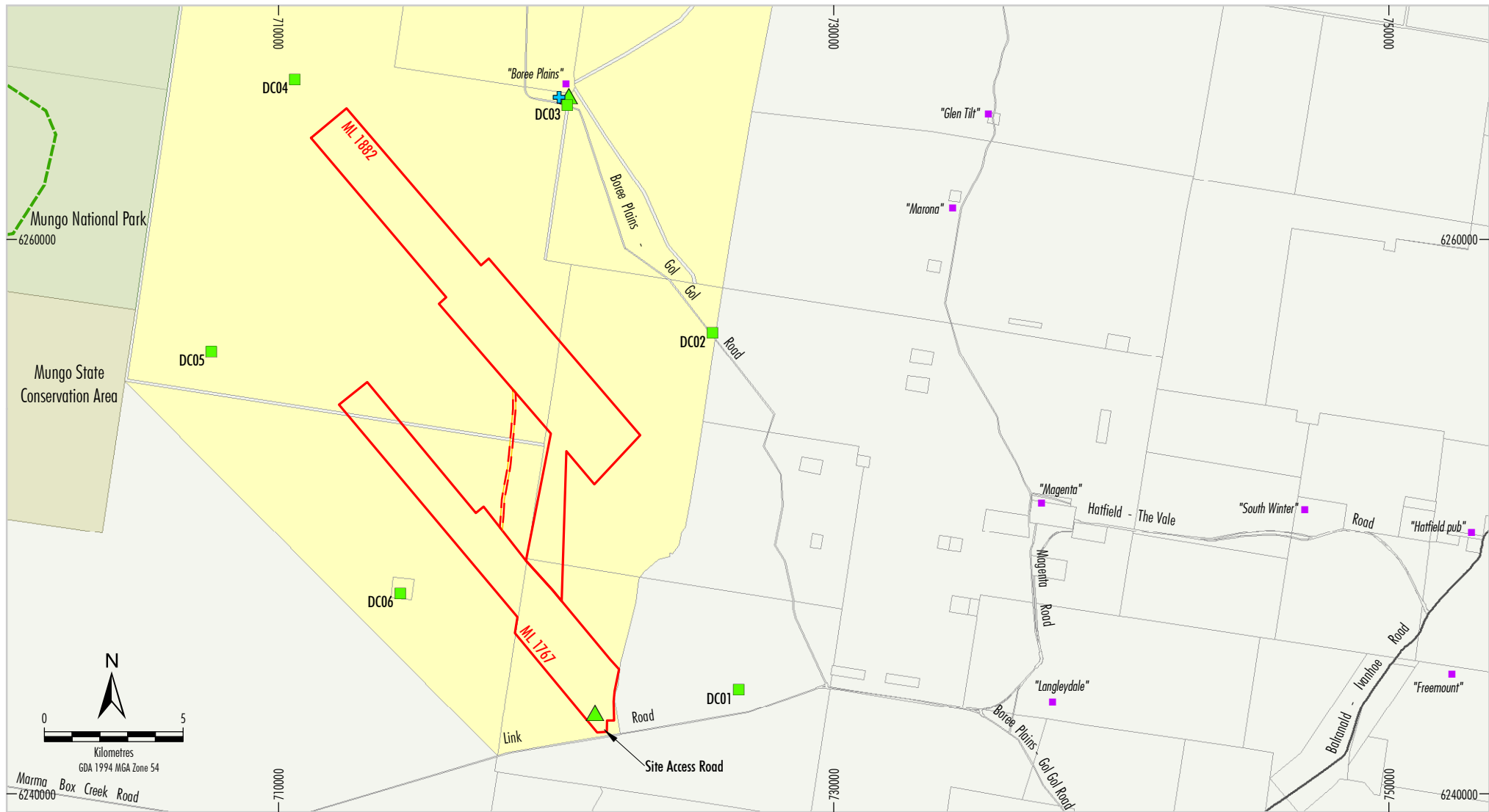
- compliance with annual average impact assessment criteria for total suspended particles (TSP), particulate matter 10 micrometres or less in diameter (PM₁₀) and dust deposition at all sensitive receptors for the Atlas-Campaspe Mine in isolation;
- compliance with 24-hour average impact assessment criteria for TSP, PM₁₀ and dust deposition at all sensitive receptors for the Atlas-Campaspe Mine in isolation;
- compliance with annual average impact assessment criteria for TSP, PM₁₀ and dust deposition for the Atlas-Campaspe Mine with the inclusion of conservative background levels;
- compliance with the relevant annual average National Environment Protection (Ambient Air Quality) Measure (Air-NEPM) advisory standard for particulate matter 2.5 micrometres or less in diameter (PM_{2.5}) for the Project in isolation and with the inclusion of conservative background levels; and
- compliance with the relevant 24-hour average Air-NEPM advisory standard for PM_{2.5} for the Project in isolation and with the inclusion of conservative background levels.

No cumulative air quality impacts were predicted from the coincident construction and operation of the approved Atlas-Campaspe Mine and the Balranald Mineral Sands Project (Katestone, 2013).

Katestone (2019) conducted a review of the potential air quality impacts associated with Modification 1 and concluded either a decrease or a relatively small increase in emissions (depending on the overburden handling option adopted) would occur, and due to the significant distances to the nearest sensitive receivers, it is likely the conclusions of the Air Quality and Greenhouse Gas Assessment (Katestone, 2013) for the approved Atlas-Campaspe Mine would remain valid (i.e. the potential air quality impacts of the modified Atlas-Campaspe Mine on privately-owned sensitive receptors would be very low) (Katestone, 2019).

Airen (2024) conducted an Air Quality Assessment for Modification 5. Modification 5 was expected to increase total emissions from the modified Atlas-Campaspe Mine by up to approximately 16% compared to emissions from the existing operations at Atlas-Campaspe Mine.

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- | | | | |
|--|---|--|---------------------------------------|
| | National Park | | Automatic Weather Station * |
| | State Conservation Area | | Dust Gauge Location |
| | Willandra Lakes Region World Heritage Area | | PM ₁₀ /TSP Monitoring Site |
| | Mining Lease Boundaries (ML 1762 & ML 1882) | | Mining Lease Application (MLA2) |
| | Tronox Controlled Land | | Surface Development Area |
| | Private Landholder/Leaseholder | | |
| | Dwelling | | |

*Note * The automatic weather station was relocated from Boree Plains to the accommodation camp in 2021*

*Source: NSW Spatial Service (2024)
Cristal Mining Australia (2012); Tronox (2024)*

Figure 9

Air Quality Criteria

Airen (2026) has assessed the Modification in consideration of air quality criteria outlined in Condition 19, Schedule 3 of Development Consent (SSD_5012) (Table 9).

Subsequent to the grant of Development Consent (SSD_5012), the Approved Methods was updated to include criteria for PM_{2.5} (consistent with the Air-NEPM advisory standard assessed by Katestone [2013] in the Air Quality and Greenhouse Gas Assessment).

The updated Approved Methods (EPA, 2022) also include a reduced annual average PM₁₀ criterion of 25 micrograms per cubic metre (µg/m³).

Airen (2026) has also assessed the Modification against the updated Approved Methods impact assessment criteria for PM_{2.5} and PM₁₀.

Air Quality Management and Monitoring Regime

In accordance with Condition 21, Schedule 3 of Development Consent (SSD_5012), an Air Quality Management Plan (CMA, 2019c) has been prepared for the Atlas-Campaspe Mine. The Air Quality Management Plan includes:

- emission control and management measures;
- an air quality monitoring program; and
- air quality management protocols.

During the 2024 Annual Review reporting period no dust incidents occurred that were associated with mining or related activities. However, PM₁₀ sampling did not occur for 25 weeks in 2024 due to equipment malfunction and lag time for getting a nominated service team to repair the sampler (Tronox, 2025).

6.6.3 Potential Impacts

The Modification would have the potential to alter particulate matter (e.g. dust) emissions at the Atlas-Campaspe Mine due to the construction and operation of the optimised services corridor and its infrastructure (i.e. pipelines, electricity transmission line, soil stockpiles and water management infrastructure) (Appendix E).

The potential air quality impacts associated with the construction and operation of the optimised services corridor would be negligible in the context of full-scale mining operations at the Atlas-Campaspe Mine (Appendix E).

The Modification is expected to decrease the total dust emissions from the modified Atlas-Campaspe Mine by up to 4% compared to emissions from the approved Atlas-Campaspe Mine, due to the shorter haul route using the optimised services corridor. The most significant change in emissions from the Modification would occur if the option of pumping the pre-mineral concentrates through a pipeline rather than trucking, which would reduce emissions up to 9% compared to the approved Atlas-Campaspe Mine (Appendix E).

In consideration of the 19 km distance between the surface development area and Willandra Lakes World Heritage Area, as well as the point stated above there is not expected to be any air quality impacts to the Willandra Lakes World Heritage Area.

Table 9
Development Consent (SSD_5012) Air Quality Criteria

Pollutant	Averaging Period	Criterion
Particulate Matter (PM ₁₀)	24-hour	50 µg/m ³
	Annual	25 µg/m ³
Total Suspended Particulate (TSP)	Annual	90 µg/m ³
Deposited Dust	Annual (maximum increase)	2 g/m ² /month
	Annual (maximum total)	4 g/m ² /month

Note: µg/m³ = micrograms per cubic metre, g/m²/month = grams per square metre per month.

Potential Cumulative Impacts

Environ Australia Pty Ltd (2015) assessed the potential air quality impacts of the Balranald Mineral Sands Project and determined that the annual average PM₁₀ concentrations (as the main air quality indicator) would be no more than 0.5 µg/m³ at locations at least 20 km south of the Atlas-Campaspe Mine.

This low level of contribution (relative to the EPA assessment criterion of 25 µg/m³) means that cumulative impacts between the Atlas-Campaspe Mine and the Balranald Mineral Sands Project would be highly unlikely.

In addition, the Balranald Mineral Sands Project was also subject to a modification in 2022. The air quality assessment for this modification (EMM, 2022) showed significant reductions (i.e. 74% to 90%) in previously assessed dust emissions, further reducing the risk of cumulative impacts with the Atlas-Campaspe Mine and the proposed Modification.

6.6.4 Mitigation Measures, Management and Monitoring

The Air Quality Management Plan would continue to be implemented for the Modification.

Given the Modification is not expected to contribute to any additional exceedances of the relevant air quality criteria at any sensitive receptors in the vicinity of the Atlas-Campaspe Mine, Tronox does not propose any additional air quality management measures.

Notwithstanding, the Air Quality Management Plan would be reviewed and, if necessary, revised by Tronox to include the Modification (subject to any modified Development Consent conditions).

6.7 SURFACE WATER RESOURCES

6.7.1 Methodology

A review of the potential surface water impacts of the Modification in the context of past assessments has been conducted.

6.7.2 Background

Previous Assessments

A Surface Water Assessment for the Project was undertaken by Evans & Peck (2012). Evans & Peck (2012) concluded the semi-arid climate combined with relatively mild slopes provide an environment in which the inherent risk of surface water impacts from any of the aspects of the Atlas-Campaspe Mine is very low, and these impacts would be further reduced by the mitigation measures that have been adopted for the Project.

Regional Hydrology

The Atlas-Campaspe Mine is located within the Benanee basin of the lower Murray River system in NSW. The Benanee basin borders the upstream effluent creeks of the Lachlan River basin, Darling and Murrumbidgee River basins and the downstream Murray River basin. The Benanee basin is made up of a number of ill-defined creeks, streams and ephemeral lakes that contribute negligible inflows to the Murray River (NSW Office of Water [NOW], 2012).

Local Hydrology

The Atlas-Campaspe Mine is located approximately mid-way between two ill-defined drainage systems (Evans & Peck, 2012):

- Willandra Creek and Willandra Lakes system (located to the north and west of the Atlas-Campaspe Mine) – this system contains numerous dry lakes (Mulurulu, Garpung, Leaghur, Mungo and Chibnalwood) which drain from north-east to south-west; and
- Arumpo Creek and Prungle Lakes system (to the east and south of the Atlas-Campaspe Mine) – this system also drains from north-east to south-west.

The regional surface drainage in the vicinity of the Atlas-Campaspe Mine site occurs by overland flow from north-east towards the south-west. The Atlas-Campaspe Mine site contains no defined watercourses other than a few minor drainage lines that drain from the south-eastern end of the Campaspe deposit towards a relic lake depression (Evans & Peck, 2012). Consistent with Evans and Peck (2012), there are no defined watercourses in the modified surface development area.

Temporary ponding of rainfall occurs in localised topographic depressions where rainfall runoff is concentrated, and the surficial soils have lower permeability (i.e. contains clays). These locations are isolated and do not contribute to any significant surface water system. Drainage from these locations is limited due to the low permeability surficial soils and the majority of the water eventually dissipates by evaporation. Given the limited rainfall and drought experienced in the area historically, the frequency of surface ponding is low (Evans & Peck, 2012).

Surface Water Users

The absence of defined drainage lines has led landholders to construct extensive catch drain systems in the region to direct overland flow into excavated tanks to provide water for domestic stock (Evans & Peck, 2012). These excavated tanks in the vicinity of the Atlas-Campaspe Mine would not be affected by the Modification

Surface Water Management and Monitoring Regime

Management of surface water resources for the approved Atlas-Campaspe Mine is conducted in accordance with the Water Management Plan, prepared in accordance with Condition 26, Schedule 3 of Development Consent (SSD_5012). The Water Management Plan includes:

- description of the water management system;
- erosion and sediment control management measures;
- details relevant surface water criteria;
- describes a program for surface water management and monitoring;
- monitoring and reporting requirements; and
- contingency measures.

6.7.3 Potential Impacts

The Atlas-Campaspe Mine is located in an area with gentle slopes and numerous closed depressions which pond with surface runoff after significant rainfall. The climate of the area is semi-arid (average annual rainfall less than 300 millimetres) and surface runoff is highly ephemeral.

Notwithstanding the above, potential surface water impacts associated with the Modification would be related to the following:

- addition of the optimised services corridor, which would increase the overall surface development area of the Atlas-Campaspe Mine;
- increase erosion and runoff rates due to land clearing.

At the optimised services corridor, water flow direction may change and in places a localised reversal of direction may occur where areas of temporary surface ponding adjacent to the optimised services corridor (e.g. following rainfall events) are disturbed.

The complex landform and semi-arid climate combine to provide conditions in which the risk of off-site surface water impacts is minimal.

Surface water runoff from the optimised services corridor surface development area could potentially contain sediments, dissolved solids, oil, grease, metals and salts. Drainage channels and sediment dams would run parallel to the road within the optimised services corridor to minimise runoff into the surrounding environment. The existing erosion and sediment controls would be implemented for the Modification consistent with the Water Management Plan.

The final landform post-closure would be rehabilitated to return to a natural ecosystem supporting previous land uses. The Modification would not significantly alter the landform. Previous water drainage and ponding is expected to return to its natural state, in accordance with the rehabilitation objectives outlined in Condition 32, Schedule 3 of Development Consent (SSD_5012).

The Modification would continue to be managed in accordance with the existing Water Management Plan, and therefore no significant surface water impacts are expected.

6.7.4 Mitigation Measures, Management and Monitoring

Given that the Modification would not result in any significant material surface water impacts, no additional management measures are proposed as part of the Modification. Surface water will continue to be managed at the Atlas-Campaspe Mine in accordance with the Water Management Plan.

Notwithstanding, the Water Management Plan would be reviewed and, if necessary, revised by Tronox to include the Modification (subject to any modified Development Consent conditions).

6.8 GREENHOUSE GAS

6.8.1 Methodology

Greenhouse gas emissions associated with the Modification were assessed in accordance with relevant *National Greenhouse Accounts Factors* (NGA Factors) (Commonwealth DCCEEW, 2023a). Under the *Greenhouse Gas Protocol* (World Business Council for Sustainable Development and World Resources Institute, 2020), establishing operational boundaries involves identifying emissions affiliated with a corporations' operations, categorising them as potential direct or indirect emissions, and determining the scope of accounting and reporting for indirect emissions.

Three "Scopes" of emissions (Scope 1, Scope 2 and Scope 3) are defined for greenhouse gas accounting and reporting purposes. These scopes are briefly outlined below.

Scope 1 – Direct Greenhouse Gas Emissions

Scope 1 emissions are direct greenhouse gas emissions within the boundary of the operation. Direct greenhouse gas emissions are defined as those emissions that occur from sources that are owned or controlled by the entity. In the case of the Modification, the direct emissions are mainly associated with greenhouse gas emissions from the combustion of diesel.

Scope 2 – Electricity Indirect Greenhouse Gas Emissions

Scope 2 emissions are indirect emissions outside the boundary of the operation, however, are controlled by the operation (e.g. electricity use). Purchased electricity is defined as electricity that is purchased or otherwise brought into the organisational boundary of the entity. Scope 2 emissions physically occur at the facility where the electricity is generated (i.e. the power station).

Scope 3 – Other Indirect Greenhouse Gas Emissions

Scope 3 emissions are defined as those emissions that are a consequence of the activities of an entity, but which arise from sources not owned or controlled by that entity. In the case of the Atlas-Campaspe Mine, Scope 3 emissions would consist of emissions associated with the purchase of diesel and other consumables used on site.

6.8.2 Existing Environment

Relevant Greenhouse Gas Policies

International

The Paris Agreement is a legally binding international treaty on climate change, which was adopted by 196 international parties in 2015 (United Nations Framework Convention on Climate Change, 2022).

Under the Paris agreement, each party is required to prepare, communicate and maintain NDCs which outlines the size and type of mitigation contribution each Party will make to the international effort.

The Paris Agreement aims to (United Nations Framework Convention on Climate Change, 2022):

- hold the increase in the global average temperature to well below 2 degrees Celsius (°C) above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels;
- increase the ability (of nations) to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and
- make finance flows consistent with a pathway towards low greenhouse gas emissions and climate resilient development.

The Paris Agreement seeks to meet its objectives by developing programs and mechanisms that:

- require participating Parties to prepare and communicate greenhouse gas mitigation contributions. Parties are expected to set mitigation targets for 2020 and then develop new targets every five years. Each successive target is expected to represent a larger mitigation effort than the previous target;
- promote climate change resilience and adaptation;
- provide mitigation and adaptation funding to developing countries;
- foster mitigation and adaptation technology transfer between Parties; and
- require participating parties to report progress towards their mitigation contributions on an annual basis.

Australia signed the Paris Agreement on 22 April 2016 and Australia's obligations under the Paris Agreement will drive national greenhouse gas policy between 2020 and 2030. Under the Paris Agreement, Australia is obliged to:

- prepare, communicate and maintain an NDC;
- pursue domestic mitigation measures, with the aim of achieving the objectives of its NDC;
- communicate an NDC every five years; and
- quantify its NDC in accordance with the Intergovernmental Panel on Climate Change methodologies, which promotes transparency and avoids double counting.

Commonwealth Government

Australia's commitment to the Paris Agreement includes reducing greenhouse gas emissions by 62 - 70% below 2005 levels by 2035. Australia's NDC (Commonwealth DCCEEW, 2025a) is summarised in Table 10.

Table 10
Summary of Australia's Nationally Determined Contributions

Australia's NDCs	Summary
Emissions reduction target	Economy wide target to reduce greenhouse gas emissions by 62 - 70% below 2005 levels by 2035
Scope and coverage	Economy wide
Gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , NF ₃

Source: Commonwealth DCCEEW (2025a).

Australia's NDC prescribes an unconditional economy wide target to reduce greenhouse gas emissions, and states that future policies will target emissions generated from:

- energy;
- industrial processes and product uses;
- agriculture;
- land-use, land-use change and forestry; and
- waste.

Australia's NDC does not contain sector or state-based targets.

The NGER Act established a single national reporting framework for the reporting and dissemination of corporations' greenhouse gas emissions and energy use.

The Safeguard Mechanism (underpinned by the Commonwealth *National Greenhouse and Energy Reporting [Safeguard Mechanism] Rule 2015*) was established through the NGER Act and provides baseline emissions and offset requirements for applicable facilities that emit over 100,000 t CO₂-e.

The Safeguard Mechanism sets a baseline level of emissions for facilities. If a facility exceeds its baseline level, it is generally required to surrender Australian Carbon Credit Units, equivalent to the exceedance, to the Clean Energy Regulator. In 2023, the Commonwealth government commenced a process to introduce reforms to facilitate greater abatement opportunities.

The Safeguard Mechanism Reforms (Commonwealth DCCEEW, 2023b) introduced an amendment to the NGER Act and other legislation (i.e. the *Commonwealth Climate Change Act 2022*) to establish the framework to give effect to key elements of the reforms, such as introducing credits to the scheme to provide an incentive for facilities to achieve greenhouse abatement via downward adjustment of baseline levels in-line with best practice in the particular industry.

The reforms apply a decline rate to facilities' baselines so that they are reduced predictably and gradually over time on a trajectory consistent with achieving Australia's emission reduction targets of 43% below 2005 levels by 2030 and net zero by 2050 (Commonwealth DCCEEW, 2023b).

New South Wales Government

The NSW Government released the *NSW Climate Change Policy Framework* (OEH, 2016), which commits NSW to the 'aspirational long-term objective' of achieving net zero emissions by 2050 and a state that is more resilient and responsive to climate change.

The Net Zero Act sets out NSW's approach to climate change and legislates whole-of-government climate action (Section 4.2). The Net Zero Act sets progressive reduction targets for NSW's net greenhouse gas emissions as follows:

- 50% reduction on 2005 levels by 30 June 2030;
- 70% reduction on 2005 levels by 30 June 2035; and
- 'net zero' by 30 June 2050.

The NSW Climate and Energy Action published the Net Zero Plan (DPIE, 2020a) in March 2020, which describes how, over the next decade, the NSW Government intends to work towards its objective of achieving net zero emissions by 2050. This includes a commitment from the NSW Government to conduct reporting under the Net Zero Plan (e.g. reporting on greenhouse gas emissions reductions achieved, forecasts and economic impact analyses), in addition to reporting of greenhouse gas emissions under the NGER Act.

New South Wales Guide for Large Emitters

In January 2025, EPA released the *NSW Guide for Large Emitters* (Large Emitters Guide) (EPA, 2025), following a period of consultation.

The Large Emitters Guide sets out a description of NSW's emission reduction objectives, types of greenhouse gases, and the EPA's suggested greenhouse gas assessment and mitigation requirements to be addressed in Modification Reports.

The Modification does not generate Scope 1 and Scope 2 greenhouse gas emissions exceeding 25,000 t CO₂-e per year in some operational years (Appendix I). Therefore, the Modification does not meet the EPA definition of a "large" emitter, and the Large Emitters Guide is not applicable (Appendix E).

Tronox Holdings

Tronox Holdings (Tronox's parent company) has taken an intentional approach to developing a roadmap for reaching carbon neutrality by 2050. The decarbonisation roadmap is based on a detailed analysis of carbon footprint and the steps to reduce greenhouse gas emissions in the short, medium, and long term (Tronox Holdings, 2024).

Tronox Holdings has set the following greenhouse gas emissions reduction targets across its global operations (Tronox Holdings, 2024):

- 25% reduction on 2019 levels by 2025;
- 50% reduction on 2019 levels by 2030; and
- Carbon Neutral by 2050.

Tronox will continue to provide a detailed five-year action update showing efforts to meet short, medium, and long-term goals to reach a net zero future (Tronox Holdings, 2024).

Previous Assessments

The major sources of Scope 1 and 2 emissions generated by the Project would include (Katestone, 2013):

- combustion of diesel during mining operations (Scope 1);
- combustion of diesel at the on-site diesel generator sets (Scope 1); and
- off-site generation of electricity consumed at Ivanhoe Rail Facility (Scope 2).

The peak annual Scope 1 and 2 greenhouse gas emissions from the Project were estimated in Modification 5 and would be 51,552 t CO₂-e (Tronox, 2024).

Modification 7 included the increase in capacities of the Atlas solar farm and Battery Energy Storage System (BESS) which was to reduce Scope 1 greenhouse gas emissions by 4.5% at the Atlas-Campaspe Mine (Tronox 2025).

Greenhouse Gas Management and Monitoring Regime

In accordance with Condition 21, Schedule 3 of Development Consent (SSD_5012), an Air Quality Management Plan has been prepared for the Atlas-Campaspe Mine.

The Air Quality Management Plan includes measures to minimise greenhouse gas emissions, including:

- maximising energy efficiency as a key consideration in the development of the mine plan (e.g. significant savings of greenhouse gas emissions are achieved by mine planning decisions which minimise haul distances for topsoil and overburden, and therefore fuel use);
- regular maintenance of plant and equipment to minimise fuel consumption;
- consideration of energy efficiency in the plan and equipment selection phase; and
- implementation of 'greenhouse awareness' training as part of induction programs.

Furthermore, Tronox has developed the approved solar farm and BESS to reduce on-site generator diesel consumption and associated greenhouse gas emissions.

The effectiveness of these measures to reduce the Project's greenhouse gas emissions (and energy consumption) will be monitored, as Tronox will annually estimate and report its greenhouse gas emissions and energy consumption in accordance with NGER Act scheme requirements.

6.8.3 Potential Impacts

Direct and indirect greenhouse gas emissions associated with the modified Project have been estimated using published emissions factors from the NGA Factors (Commonwealth DCCEEW, 2023a).

The major sources of greenhouse gas emissions generated by the modified Project would be the same as the approved Project.

The following components of the Modification would have the potential to alter diesel consumption at the Atlas-Campaspe Mine:

- diesel usage associated with transport of construction materials into and around the Atlas-Campaspe Mine; and
- construction and operation of the optimised services corridor and its associated infrastructure.

Purchased electricity consumption at the Ivanhoe Rail Facility would not significantly change as there would be no significant change to the approved Ivanhoe Rail Facility operations as part of the Modification.

The Modification would result in a decrease in the peak annual greenhouse gas emissions due to the shortened transport route via the optimised services corridor. The Modification is estimated to decrease the direct annual greenhouse gas emissions from the Atlas-Campaspe Mine by 1.5 kilotonnes of CO₂-e per year on average. This would represent a decrease in scope 1 emissions from the approved Project by approximately 3% (Appendix E).

The estimated annual greenhouse emissions for Australia for the year to March 2025 was 440.2 Million tonnes (Mt) of CO₂-e (Commonwealth DCCEEW, 2025b). In comparison, the maximum estimated annual greenhouse gas emissions for the modified Project are 0.05 Mt CO₂-e (Scopes 1 and 2). Therefore, the peak annual contribution of greenhouse gas emissions (Scopes 1 and 2) from the Modification in comparison to the Australian greenhouse gas emissions for the year to March 2025 period is estimated to be approximately 0.01%.

At a State level, the estimated greenhouse emissions for NSW in the 2023 financial year period was 114.45 Mt CO₂-e (Commonwealth DCCEEW, 2025c).

The peak annual contribution of greenhouse emissions (Scopes 1 and 2) from the modified Project in comparison to the NSW greenhouse emissions for the 2022 period is estimated to be approximately 0.04%.

In addition, the modified Project's Scope 1 proportion of projected NSW emissions in 2025 according to the NSW Net Zero Emissions Dashboard are:

- 0.05% of the 'base case' emission forecast (107.36 Mt CO₂-e).
- 0.05% of the 'current policy' emission forecast (106.35 Mt CO₂-e).

The modified Project's Scope 1 proportion of projected NSW emissions in 2030 according to the NSW Net Zero Emissions Dashboard are:

- 0.06% of the 'base case' emissions forecast (87.14 Mt CO₂-e).
- 0.06% of the 'current policy' emission forecast (82.97 Mt CO₂-e).

Tronox has considered the potential for climate change impacts to arise from the greenhouse gas emissions from the modified Project. As the Modification would reduce greenhouse gas emissions from the Project, the potential climate change impacts from the modified Project would be lower than the approved Project. Notwithstanding, assuming that all of the modified Project Scope 1, 2 and 3 emissions were globally additive, the modified Project's contribution to temperature change would be so small the no meaningful additional environmental implications could be considered to arise at the locality level.

6.8.4 Mitigation Measures, Management and Monitoring

Tronox would continue to implement Project-specific greenhouse gas mitigation measures in accordance with the Air Quality Management Plan.

Tronox would continue to monitor and report greenhouse gas emissions for the Project under the NGER Act, noting that the existing Project triggers the NGER Act reporting threshold for facilities.

6.9 LAND RESOURCES

This section considers potential land and agricultural resource impacts associated with the Modification.

6.9.1 Existing Environment

Topography

The Atlas-Campaspe Mine is located within the Benanee basin which is very flat and characterised by a number of ill-defined creeks, streams and ephemeral lakes (NOW, 2012).

The topography of the region is dominated by the Iona Ridge (along which the Atlas-Campaspe Mine is located) and the Neckarboo Ridge (located to the west of the Willandra Lakes Region World Heritage Area) which are on average 40 m higher than the adjacent land surface. The landform in the vicinity of the Atlas-Campaspe Mine is highly complex with numerous closed minor depressions ranging from approximately 60 m to 120 metres Australian Height Datum (m AHD).

Land Use and Capability

Contemporary land use in the vicinity of the Atlas-Campaspe Mine is dominated by agriculture activities conducted on Western Lands Leases. Low intensity grazing (primarily sheep) is the dominant agricultural activity although limited cropping has been conducted.

Only six private dwellings are located within 20 km of the Atlas-Campaspe Mine (Sections 6.5 and 6.6).

A number of reserved areas are located in the general vicinity of the Atlas-Campaspe Mine including the Willandra Lakes Region World Heritage Area, Mungo National Park, Mungo State Conservation Area, a number of private conservation areas established as Southern Mallee Land Use Agreements and a Timber Reserve to the south-east (Figure 1).

Agricultural activities known to have been conducted in the Atlas-Campaspe Mine area include sheep grazing for meat and wool production, cattle grazing for meat production and rain-fed cropping (grains).

The Project biodiversity offset area is approximately 16,540 ha.

Land Contamination

A Stage 1 Land Contamination Assessment (CMA, 2012a) was prepared for the Project EIS. No potentially contaminating activities or contaminated areas were identified in the Atlas-Campaspe Mine site. The results from this assessment combined with the regional location make it unlikely there is any contaminated land within the Modification surface development area.

Land Resources Management and Monitoring Regime

In accordance with Condition 14, Schedule 3 of Development Consent (SSD_5012), a MBP has been prepared for the Atlas-Campaspe Mine, and includes:

- weed control to reduce the abundance and distribution of weeds at the Atlas-Campaspe Mine site;
- feral animal control to reduce the numbers of feral animals at the Atlas-Campaspe Mine;
- erosion control measures; and
- bushfire management.

Management of land resources for the approved Atlas-Campaspe Mine is also conducted in accordance with the Water Management Plan, prepared in accordance with Condition 26, Schedule 3 of Development Consent (SSD_5012). In regard to land resources management, the Water Management Plan includes:

- erosion and sediment control management measures;
- soil-stripping management measures;
- monitoring and reporting requirements; and
- contingency measures.

General soil resource management practices are undertaken which include the stripping and stockpiling of soil resources for use in rehabilitation. The following management strategies are implemented for the stripping of soils within Atlas-Campaspe Mine disturbance areas:

- conducting pre-clearance soil surveys including delineating areas requiring soil stripping following vegetation clearing;
- quantification and characterisation of topsoil and subsoil materials prior to commencement of stripping (particularly the presence and depth of the carbonate layer);

- stripping in accordance with nominated depths and scheduling, as well as procedures for avoiding contamination of soils with material from the carbonate layer to minimise potential risks to the success of revegetation works; and
- preference for the direct placement of rehabilitation growth media in a manner which maintains the long-term viability of the soil.

6.9.2 Potential Impacts

The following land and agricultural resource aspects could potentially be impacted by Modification:

- land use and capability;
- land contamination; and
- soil and erosion potential.

Land resources potential impacts would be associated with the disturbance of approximately 50.5 ha associated with the optimised services corridor.

These potential impacts and how they relate to the Modification are described in the following subsections. Measures to mitigate these potential impacts are also provided in this sub-section.

Land Use and Capability

The Modification surface development area is located in the Project biodiversity offset area (Figure 2). This area would be returned back to an offset area post-mining and therefore there would be no lost impacts to land use over the longer-term.

Land Contamination

Potential land contamination risks were identified as part of the Preliminary Hazard Analysis (CMA, 2012b) for the Atlas-Campaspe Mine including leaks/spills, fires, explosions and failures.

As the Modification would not change the existing potential risks or hazard consequences identified in the Preliminary Hazard Analysis (CMA, 2012b), no significant changes to the approved potential hazards and/or risks are expected.

Soils and Erosion Management

The low rainfall and lack of defined drainage channels in the region generally limit the potential for fluvial erosion and sedimentation.

Notwithstanding the above, potential soil and erosion-related impacts relevant to the Modification include:

- disturbance of *in-situ* soil resources within the optimised services corridor development area;
- alteration of soil structure beneath the optimised services corridor infrastructure (i.e. haul road, pipelines, electricity transmission line, soil stockpiles and water management infrastructure);
- possible soil contamination in and around the optimised services corridor area resulting from spillage of fuels, lubricants, other chemicals and saline water;
- increased erosion and sediment movement due to exposure of soils during construction of the optimised services corridor; and
- alteration of physical and chemical soil properties (e.g. structure, fertility, permeability and microbial activity) due to soil stripping and land clearing operations.

6.9.3 Mitigation Measures, Management and Monitoring

Land resource management at the modified Project would continue to be conducted in accordance with the Water Management Plan, Biodiversity Management Plan and the general soil resource management practices.

In addition, the Water Management Plan and BMP would be reviewed and, if necessary, revised by Tronox to include the Modification (subject to any modified Development Consent conditions).

6.10 VISUAL

6.10.1 Background

Visual Setting

The Atlas-Campaspe Mine area and surrounds comprises a number of distinct land use types and landscape units of varying levels of landscape quality. These have been defined as follows:

- Rural residences – detached dwellings located mostly to the east of the Atlas-Campaspe Mine (Figures 8 and 9).
- Agricultural areas – the Atlas-Campaspe Mine is located on pastoral leasehold lands used for light intensity grazing.

- The Willandra Lakes Region World Heritage Area – located approximately 10 km west of the Atlas-Campaspe Mine footprint at its closest point (Figure 1).
- Mungo National Park – located approximately 5 km west of the Atlas-Campaspe Mine footprint at its closest point (Figure 1).
- Mungo State Conservation Area – located approximately 8 km west of the Atlas-Campaspe Mine footprint at its closest point (Figure 1).

Regional Setting (>5 km)

The regional setting of the Atlas-Campaspe Mine has attributes of moderate to high scenic quality due to the presence of a number of reserved areas (e.g. the Willandra Lakes Region World Heritage Area, Mungo National Park, Mungo State Conservation Area and other privately managed conservation reserves) (CMA, 2013).

There are no townships or settlements in the regional setting of the Atlas-Campaspe Mine that are of relevance (i.e. that contribute to visual character and scenic quality) (CMA, 2013).

Sub-regional Setting (1 to 5 km)

The sub-regional settings of both the Atlas-Campaspe Mine comprise similar features to that found within the regional setting, and therefore have similar attributes of scenic quality (CMA, 2013).

Local Setting (<1 km)

The local setting the Atlas-Campaspe Mine is characterised by limited topographical relief and pastoral lands and are of low scenic quality (CMA, 2013).

Previous Assessments

Potential visual impacts of the Atlas-Campaspe Mine on potentially sensitive viewpoints were assessed in the Project EIS and Modification 5 and are summarised below.

Willandra Lakes Region World Heritage Area (including Mungo National Park)

Based on three-dimensional digital terrain analysis, Marc&Co (2012) concluded the level of visual impact from key viewpoints within the Willandra Lakes Region World Heritage Area as a result of the Atlas-Campaspe Mine would be low given the generally low landforms and topographic depressions characteristic of the Willandra Lakes Region World Heritage Area; intervening regional topography; and the distance to the Atlas-Campaspe Mine landform components (i.e. greater than 10 km) and resultant negligible vertical change in landform elevations (i.e. there would be negligible vertical change in landform elevations at the Atlas-Campaspe Mine site from distances greater than 5 km) if visible at all (CMA, 2013).

Furthermore, Marc&Co (2012) concluded that potential views from Mungo National Park (outside of the Willandra Lakes Region World Heritage Area) would be limited given the lower elevation of the area (approximately 80 m AHD), intervening regional topography and vegetation and the distance to the Atlas-Campaspe Mine landform components (i.e. greater than 5 km). Hence, no further assessment of viewpoints from the Mungo National Park were undertaken.

Modification 5 included additional overburden emplacements and borefield infrastructure. It was concluded these would also not result in a significant level of visual modification as they would remain within the approved maximum height and due to the presence of intervening vegetation between public vantage points and the remote location (i.e. there would be a limited number of viewers) (Tronox, 2024).

Furthermore, the scale and intensity of night-lighting of the Atlas-Campaspe Mine would be of a similar intensity when compared to the existing night-lighting at the Atlas-Campaspe Mine (including Modification 5).

Mungo State Conservation Area

The Mungo State Conservation Area is located approximately 8 km west of the Atlas-Campaspe Mine footprint at its closest point, although the Atlas-Campaspe Mine landform components are located at distances greater than 8 km.

Potential views from the Mungo State Conservation Area are considered to be limited due to intervening topography and the distance between the Mungo State Conservation Area and the Atlas-Campaspe Mine landform components (i.e. greater than 8 km).

Additionally, the Mungo State Conservation Area is heavily wooded, with potential views restricted by vegetation, and is not readily accessible or routinely accessed by the public. Hence, no further assessment of viewpoints from the Mungo State Conservation Area were undertaken.

Rural Residences

The closest privately-owned sensitive receiver to the Atlas-Campaspe Mine is located approximately 14 km to the north-east (Figures 8 and 9). Potential views from this residence are considered to be limited given the distance to the Atlas-Campaspe Mine footprint (i.e. there are negligible vertical changes in landform elevations at the Atlas-Campaspe Mine site from distances greater than 5 km), relatively flat topography and intervening natural woodland vegetation. No views of the Atlas-Campaspe Mine operations are expected from these locations (CMA, 2013).

Modification 5 concluded that Potential glint and glare impacts associated with the modified solar farm would be negligible given the photovoltaic solar modules would not be visible from privately-owned sensitive receivers (closest is 14 km away) or public viewpoints (e.g. the closest road is more than 1 km away).

Local Roads (Link Road, Boree Plains-Gol Gol Road and Balranald-Ivanhoe Road)

Link Road and Boree Plains-Gol Gol Road are the closest local roads to the Atlas-Campaspe Mine and provide access to a limited number of rural residences. The visual sensitivity for local road network users on Link Road and Boree Plains-Gol Gol Road was therefore considered low. Given the moderate elevation of the initial mine landforms and intervening vegetation, no further assessment of potential views from these locations was undertaken (CMA, 2013). Modification 5 concluded there would be negligible impacts if any present on viewpoints from nearby roads.

6.10.2 Potential Impacts

The construction of the optimised services corridor could result in additional potential visual impacts at the Atlas-Campaspe Mine.

Potential temporary visual impacts would be associated with structures required for operation of the optimised services corridor (e.g. construction fleet and materials). The infrastructure required for the modified Atlas-Campaspe Mine would be temporary and would be removed or decommissioned after the mine life. No permanent visual impacts would result from the development of the optimised services corridor that would remain post-mining.

The level of visual modification associated with the rehabilitated optimised services corridor would not be significant, due to it returning to a natural ecosystem post mining and the presence of intervening vegetation between public vantage points and the Modification.

Lighting for the optimised services corridor would be limited to intersections and the vicinity of critical equipment (e.g. pump stations). Lighting would be designed to Australian Standard 4282:2023 and consider the principles of the *Dark Sky Planning Guideline* (NSW DPE, 2023).

The scale and intensity of night-lighting for the modified Atlas-Campaspe Mine would be of a similar intensity when compared to the existing night-lighting at the Atlas-Campaspe Mine.

6.10.3 Mitigation Measures, Management and Monitoring

Given the limited number of viewers and generally flat to undulating sandplains, intervening vegetation and progressive revegetation of landforms, no additional specific visual impact management measures are proposed.

6.11 OTHER ENVIRONMENTAL MATTERS

6.11.1 Road Transport

The Modification would not change the approved mineral product transport, peak workforce, mine life or access to the currently approved Atlas-Campaspe Mine.

Additional heavy vehicle deliveries may be required for the delivery of the construction materials for the optimised services corridor. However, these are expected to be minor and within the daily variation of existing heavy vehicle movements at the Atlas-Campaspe Mine.

As such, the Modification would not result in any significant changes to approved road transport impacts than the existing Atlas-Campaspe Mine and no specific management or mitigation measures are considered to be warranted.

6.11.2 Social

The Modification would not require additional workforce at the Project or extend the Project's life. Therefore, there are expected to be no additional impacts on the local population, or access to community infrastructure or services.

6.11.3 Hazard and Risk

A Preliminary Hazard Analysis was undertaken for the EIS in accordance with the general principles of risk evaluation and assessment outlined in the NSW Department of Planning and Infrastructure (DP&I) *Multi-Level Risk Assessment* (DP&I, 2011).

The major potentially hazardous materials associated with the Project include Broken Hill MSP process waste, hydrocarbons and chemicals (CMA, 2012b).

An assessment of the combination of the consequence and probability rankings concluded that the residual risk levels are tolerable with respect to surrounding land uses, did not preclude approval of the Project, and societal risk is negligible (CMA, 2012b).

As the Modification would not significantly change the existing potential risks or hazard consequences identified in the Preliminary Hazard Analysis for the approved Project, no significant changes to the approved potential hazards and/or risks are expected.

Tronox undertakes emergency management at the Atlas-Campaspe Mine in accordance with an Emergency Response Plan.

The environmental management plans relevant to risks and hazards (including the Emergency Response Plan), and their relevant mitigation measures, would be reviewed and, if necessary, revised by Tronox to include the Modification subject to any modified Development Consent conditions).

7 JUSTIFICATION OF THE MODIFICATION

This section provides a justification of the Modification and conclusion for the Modification Report.

As part of the justification of the Modification consideration has been given to:

- the engagement undertaken for the Modification (Section 7.1);
- key environmental assessment outcomes including the potential impacts of the Modification (Section 7.2);
- the relevant planning and policy objectives (Section 7.3); and
- the benefits of the Modification and the Atlas-Campaspe Mine (Section 7.4).

7.1 STAKEHOLDER ENGAGEMENT OVERVIEW

Tronox has consulted with a number of stakeholders during the development of this Modification Report (Section 5), including:

- Commonwealth DCCEE;W;
- key NSW Government agencies;
- local councils; and
- Aboriginal stakeholders.

Key comments and issues raised during consultation have been considered and addressed in the preparation of this Modification Report.

7.2 CONSOLIDATED SUMMARY OF ASSESSMENT OF IMPACTS

Tronox has undertaken a review of the potential environmental impacts of the Modification to identify key potential environmental issues requiring assessment. The key environmental issues identified are summarised in Section 6.

The Project (as modified) would continue to comply with existing criteria, performance measures and limits described in Development Consent (SSD_5012).

Tronox would operate the Atlas-Campaspe Mine incorporating the Modification in accordance with the current environmental management plans and environmental monitoring programs, including any necessary revisions.

7.3 COMPLIANCE WITH RELEVANT STATUTORY AND POLICY REQUIREMENTS

An outline of the statutory requirements relevant to the assessment of the Modification is provided in Section 4.

The Modification is considered to be generally consistent with the objects of the EP&A Act (Section 4.1.2).

A detailed statutory compliance table for the Project incorporating the Modification that identifies all the relevant statutory requirements and the relevant sections in this Modification Report that address these requirements is provided in Attachment 1.

In evaluating the Modification under section 4.15(1) of the EP&A Act, the consent authority is required to take into consideration a range of matters as they are of relevance to the subject of the application.

While this is a requirement of the consent authority, this Modification Report has been prepared to generally address the requirements of section 4.15(1) of the EP&A Act to assist the consent authority (Section 4.1.4).

7.4 JUSTIFICATION FOR THE MODIFICATION

Tronox is pursuing the Modification as a result of detailed planning for the development of the Campaspe deposit. The optimised services corridor is required to facilitate the more efficient transport of pre-mineral concentrate and ore from the PCP to the PCGU, as well as, aligning with Tronox's Commonwealth and State greenhouse gas emission policies. The proposed changes were identified based on Tronox's recent experience developing the Atlas deposit and contemporary information that has become available since the preparation of the Project EIS.

7.4.1 Operational Efficiency and Economic Recovery

The Modification would improve operational efficiency and economic recovery at the Atlas-Campaspe Mine by:

- Promote the efficient and economic recovery of mineral sands resources, also supporting increase reserve exploitation while maximising the use of Tronox’s established facilities and associated returns on existing financial investment.
- The optimised services corridor has been designed to avoid and/or minimise environmental impacts.
- Support the continued employment of approximately 200 Tronox employees and contractors at the Atlas-Campaspe Mine.
- Allow Tronox to continue to meet business objectives while operating in a manner that minimises environmental impacts through the continued implementation of environmental management measures.
- Support the vision and objectives outlined in the Commonwealth *Critical Minerals Strategy 2023-2030*.
- Support the vision and strategy outlined in the NSW *Critical Minerals and High-Tech Metals Strategy*.
- Align with Tronox’s decarbonisation map and greenhouse gas emissions reduction targets.

7.4.2 Strategic Alignment Summary

The Modification is consistent with key regional, state and national strategic planning documents. It supports the *Far West Regional Plan 2036* by facilitating sustainable mineral resource development that balances economic and environmental objectives.

The Modification aligns with the critical minerals strategies at both the Commonwealth and NSW levels by ensuring continued production from a critical mineral deposit, supporting regional investment and long-term economic growth.

In terms of greenhouse gas emissions, the Modification is consistent with Australia’s Paris Agreement commitments, the Emissions Reduction Plan, the *NSW Climate Change (Net Zero Future) Act 2023*, and the Net Zero Plan (DPIE, 2020a) by reducing Scope 1 emissions through more efficient transport of pre-mineral concentrate and ore.

The Modification also supports broader environmental objectives under the Nature Positive Plan by establishing replacement biodiversity offsets that enhance ecological outcomes relative to the approved Project. Collectively, these strategic planning documents demonstrate that the Modification contributes to economic, environmental, and climate-related objectives at local, state and national levels.

7.5 CONCLUSION

The modified Project would be substantially the same as the originally approved Project.

In weighing up the main environmental impacts (costs and benefits) assessed and described in this Modification Report, the Modification is, on balance, considered to be in the public interest of the State of NSW.

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