Our Ref: UID 70709
Your Ref:

Fortescue
The New Force in Iron Ore

Anthony Sutton
Assessment and Compliance
Office of the Environmental Protection Authority
Department of Water and Environmental Regulation
Locked Bag 33, Cloisters Square
PERTH WA 6850

7 July 2017

Dear Mr Sutton

ELIWANA IRON ORE MINE – REFERRAL OF PROPOSAL

Please find enclosed a Referral of the Eliwana Iron Ore Mine by the proponent, Fortescue Metals Group Limited (Fortescue), under section 38 of the *Environmental Protection Act 1986*.

The Proposal consists of the development of an iron ore mine located 90 km west-north-west of Tom Price (110 km south-west of the existing Solomon Iron Ore Mine). The extent of proposed ground disturbance associated with the Proposal is approximately 8,560 ha within the Mine Development Envelope of approximately 70,000 ha.

A copy of this Referral has also been emailed to Registrar@epa.wa.gov.au. If you have any queries regarding the enclosed information, please do not hesitate to contact Rachael Sharp, Fortescue's Senior Environmental Advisor for the Eliwana Project on 08 6218 8805 or rsharp@fmgl.com.au.

Yours sincerely
FORTESCUE METALS GROUP

per

BRETT MCGUIRE
Group Manager, Environment

Enc.
Attachment 1 Completed EPA Referral Form – Eliwana Iron Ore Mine

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GOVERNMENT OF WESTERN AUSTRALIA

Environmental Protection Authority

EPA Referral Form

Form for the referral of a proposal to the Environmental Protection Authority under Section 38 of the *Environmental Protection Act 1986*

Referrer information			
Who is referring this proposal?	☑ Proponent ☐ Decision-making authority ☐ Community member/third party		
Name (print) Brett McGuire	**Signature**		
Position	Group Manager, Environment	Organisation	Fortescue Metals Group Ltd
Email	bmcguire@fmgl.com.au		
Address	87	Adelaide Tce	
	EAST PERTH	WA	6004
Date	7/7/2017		
Does the referrer request that the EPA treat any part of the proposal information in the referral as confidential? *Provide confidential information in a separate attachment.*	☐ Yes ☑ No		
Referral declaration for organisations, proponents and decision-making authorities: I, **Brett McGuire**, *(full name)* declare that I am authorised to refer this proposal on behalf of **Fortescue Metals Group Ltd** and further declare that the information contained in this form is true and not misleading.			

Part A: Proponent and proposal description

Proponent information	
Name of the proponent/s (including Trading Name if relevant)	Fortescue Metals Group Ltd (Fortescue)
Australian Company Number(s) ☐ **OR** Australian Business Number(s) ☑	57 002 594 872
Contact for the proposal (if different from the referrer) *Please include: name; physical address; phone; and email.*	Sean McGunnigle Manager, Environmental Approvals 87 Adelaide Tce East Perth WA 6004 08 6218 8415 smcgunnigle@fmgl.com.au

Does the proponent have the legal access required for the implementation of all aspects of the proposal? *If yes, provide details of legal access authorisations / agreements / tenure.* *If no, what authorisations / agreements / tenure is required and from whom?*	☐ Yes ☑ No The Mine Development Envelope consists of the following Fortescue-managed tenure: • M47/1509 • M47/1522 (Pending) • M47/1523 (Pending) • M47/1524 (Pending) • M47/1525 (Pending) • M47/1526 (Pending) • E47/1194 • E47/1195 • E47/1196 • E47/1299 • E47/1300 • E47/1301 • E47/1302 • E47/1373 • E47/1500 • E47/1533 • E47/1861 • E47/2037 • E47/3291 • E47/3334 • E47/3686 • P47/1650 • P47/1665 • P47/1667 • P47/1668 • P47/1669 • P47/1670 • P47/1671. There are portions of unallocated crown land (UCL) and third party tenure within the Mine Development Envelope. Unless tenure or access arrangements are negotiated, no disturbance will take place in these areas. The Mine Development Envelope may be refined as the project progresses to align with changes in tenure or access agreements.
Proposal type	
What type of proposal is being referred? For a change to an approved proposal please state the Ministerial Statement number/s (MS No./s) of the approved proposal For a derived proposal please state the Ministerial Statement number (MS No.) of the associated strategic proposal	☑ significant – new proposal ☐ significant – change to approved proposal (MS No./s: _____) ☐ proposal under an assessed planning scheme ☐ strategic ☐ derived (Strategic MS No.: _____)
For a significant proposal: • Why do you consider the proposal may have a significant effect on the environment and warrant referral to the EPA?	The Eliwana Mine Project incorporates the development of a new iron ore mine, including up to 8,560 ha of land disturbance.
For a proposal under an assessed planning scheme, provide the following details: • Scheme name and number For the Responsible Authority:	N/A

• What new environmental issues are raised by the proposal that were not assessed during the assessment of the planning scheme? • How does the proposal not comply with the assessed scheme and/or the environmental conditions in the assessed planning scheme?	
Proposal description	
Title of the proposal	Eliwana Iron Ore Mine Project
Name of the Local Government Authority in which the proposal is located.	Shire of Ashburton
Location: a) street address, lot number, suburb, and nearest road intersection; or b) if remote the nearest town and distance and direction from that town to the proposal site.	The proposed Eliwana Iron Ore Mine Project is located 90 km west-north-west of Tom Price (110 km south-west of Fortescue's Solomon Iron Ore Mine).
Proposal description – including the key characteristics of the proposal *Provide as an attachment to the form*	Please see **Attachment 1**.
Have you provided electronic spatial data, maps and figure in the appropriate format? *Refer to instructions at the front of the form*	☑ Yes ☐ No Spatial data enclosed. Figure 1: Eliwana Iron Ore Mine Project Location Figure 2: Eliwana Iron Ore Mine Project Development Envelope.
What is the current land use on the property, and the extent (area in hectares) of the property?	The current land use is primarily pastoral grazing, with the Project intersecting portions of the following pastoral stations: • Hamersley • Rocklea • Cheela Plains • Mount Stuart. Other land uses include: • Public and private infrastructure (including roads and railways) • Vacant Crown Land. Existing iron ore mines in close proximity to the Project include Fortescue's Solomon Iron Ore Mine and Rio Tinto's Silvergrass and Brockman/ Nammuldi operations. The Project Area consists of a Mine Development Envelope; approximately 70,000 ha in size.
Have you had pre-referral discussions with the OEPA? If so, quote the reference number and/or the OEPA contact.	Pre-referral discussions with the OEPA include regular monthly meetings with Peter Tapsell. A specific consultation session for the Eliwana Project also took place on 2 June 2017.

Part B: Environmental impacts

Environmental factors

What are the likely significant environmental factors for this proposal?	☐ Benthic Communities and Habitat Not applicable – no impacts to benthic communities or habitats ☐ Coastal Processes Not applicable – no impacts to coastal processes ☐ Marine Environmental Quality Not applicable – no impacts to the marine environment ☐ Marine Fauna Not applicable – no impacts to the marine environment ☑ Flora and Vegetation Identified as a preliminary environmental factor – please see information below. ☐ Landforms Not identified as a preliminary environmental factor. Landforms are not expected to be significantly impacted as a result of the proposed activities. It is the intention of the Proponent to present physical characteristics of the project area (including landforms, soils and geochemical characteristics) in a Physical Environmental Setting section of any detailed environmental review documentation. ☑ Subterranean Fauna Identified as a preliminary environmental factor – please see information below. ☐ Terrestrial Environmental Quality No significant impacts to terrestrial environmental quality are expected to occur as a result of the Proposal. It is the intention of the Proponent to present physical characteristics of the project area (including landforms, soils and geochemical characteristics) in a Physical Environmental Setting section of any detailed environmental review documentation. ☑ Terrestrial Fauna Identified as a preliminary environmental factor – please see information. ☑ Hydrological Processes Identified as a preliminary environmental factor – please see information below. ☑ Inland Waters Environmental Quality Identified as a preliminary environmental factor – please see information below. ☐ Air Quality Unlikely to constitute a preliminary key environmental factor. Greenhouse and dust emissions are expected to be produced as a result of the Proposal. ☐ Social Surroundings Not identified as a preliminary environmental factor. Social surroundings are not expected to be significantly impacted as a result of the proposed activities. Fortescue has processes in place to identify and manage impacts to sites of ethnographic or archaeological heritage significance in accordance with the requirements of the *Aboriginal Heritage Act 1972*. ☐ Human Health Not identified as a preliminary environmental factor. Human health is not expected to be significantly impacted as a result of the proposed activities.

Part B: Environmental impacts

Environmental factors

For the environmental factors identified above, complete the following table, or provide the information in a supplementary report. Please be sure to complete a separate table per factor identified above.

Potential environmental impacts		
1	EPA Factor	Flora and Vegetation
2	***EPA policy and guidance*** - What have you considered and how have you applied them in relation to this factor?	The EPA's overarching Statement of Environmental Principles, Factors and Objectives (EPA 2016) lists the objective for flora and vegetation as follows: *To protect flora and vegetation so that biological diversity and ecological integrity are maintained.* In considering this objective, Fortescue has sought to quantify the existing biological diversity and ecological integrity of the area through environmental surveying. The following policy and guidance is relevant to this factor: • *Environmental Factor Guideline: Flora and Vegetation* (EPA 2016a). Note, this guidance supersedes EPA Position Statements 2 and 3. • *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b). Note, this guidance supersedes EPA Guidance Statement 51. **Environmental Factor Guideline: Flora and Vegetation** This guideline provides an outline of how Flora and Vegetation is considered by the EPA in the environmental impact assessment (EIA) process. Relevant matters discussed in Guideline include the following: • description of EIA considerations, including o application of the mitigation hierarchy o the flora and vegetation affected by the proposal o the potential impacts and the activities that will cause them o surveys and analyses required o the significance of the flora and vegetation, and the risk to the flora and vegetation o the current state of knowledge of flora and vegetation and the level of confidence underpinning the predicted residual impacts • describes issues commonly encountered by the EPA during EIA of this factor • provides a summary of the type of information that may be required by the EPA to undertake EIA related to this factor. Fortescue has specifically considered this guidance in the following ways: • surveys and analyses undertaken and planned to describe the receiving environment and its significance (see section 4 in this table) • identification of activities which may lead to impacts to flora and vegetation (refer to section 5 in this table)

		• application of the mitigation hierarchy in elements of project design. **Technical Guidance – Flora and Vegetation Surveys for EIA** This guidance is intended to ensure adequate flora and vegetation data of an appropriate standard are obtained and used in EIA, specifically providing advice on: • survey preparation and desktop study; • determining the type of survey required; • sampling techniques and survey design; and • data analysis and reporting. Fortescue has specifically applied this guidance in the planning, design and implementation of flora and vegetation surveys currently underway in the Eliwana Mine Project Area.
3	***Consultation*** – Outline the outcomes of consultation in relation to the potential environmental impacts	Preliminary consultation has been undertaken with the EPA (2 June 2017) and DoEE (19 May 2017) and Department of Water (DoW) (17 May 2017) for the Proposal. Fortescue has provided preliminary Project information to DPaW with a view to commencing a formal consultation as soon as possible. No specific concerns or queries have been raised regarding Flora and Vegetation in consultation undertaken to date. Targeted consultation with regulatory and other stakeholders will continue following referral of the Proposal. Consultation with native title groups is ongoing. An environment presentation was provided to the PKKP working group at the regular working group meeting on 23 March 2017. Aside from general interest in the environmental surveys planned at Eliwana, no specific concerns or issues were raised in relation to the Proposal at this stage.
4	***Receiving environment*** - Describe the current condition of the receiving environment in relation to this factor.	The receiving environment in the Eliwana Mine Project Area is generally well understood. Fortescue has conducted extensive mineral exploration activities in the area and significant survey effort was undertaken to support these exploration activities. The most relevant previous survey relating to flora and vegetation is: • Eliwana and Flying Fish Level 2 Flora and Vegetation Survey (ecoscape 2015). **Vegetation** The project is located within the Hamersley subregion of the Pilbara IBRA bioregion. Vegetation systems occurring within the project area, as mapped by Beard (DAFWA 2012) include: • 18 – Low woodland; Mulga (*Acacia aneura*) • 82 – Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* • 175 – Short bunch grassland - savanna/grass plain (Pilbara) • 567 – Hummock grasslands, shrub steppe; mulga & kanji over soft spinifex and *Triodia basedowii.* Mapping of vegetation types within portions of the project area from previous

		surveys has resulted in a significant amount of pre-existing data which will be verified and consolidated as part of the current flora and vegetation surveys. The condition of vegetation within the Eliwana Mine Project Area ranges from Completely Degraded/Cleared to Excellent, with the majority falling within the Very Good – Excellent categories. **Significant Vegetation** No vegetation within the Mine Development Envelope is known to represent a Threatened Ecological Community (TEC). Vegetation type AcTwEl, which is known from previous surveys to occupy a small portion of the Mine Development envelope, was determined as marginally representing the P3 '*Triodia* sp. Robe River assemblages of mesas of the West Pilbara' Priority Ecological Community (PEC). Vegetation considered to represent a Groundwater Dependent Ecosystem (GDE) or potential GDE is known to occur within the project area. **Flora** No Threatened Flora are known to exist within the project area. A number of Priority flora species have been recorded within the Project area: • P3 *Eremophila magnifica* subsp. *velutina* • P3 *Gymnanthera cunninghamii* • P3 *Indigofera* sp. Bungaroo Creek (S. van Leeuwen 4301) • P3 *Triodia basitricha* • P3 *Triodia* sp. Robe River (M.E. Trudgen et al. MET 12367) • P4 *Acacia bromilowiana* • P4 *Eremophila magnifica* subsp. *magnifica* • P4 *Goodenia nuda* • P4 *Ptilotus mollis* • P4 *Rhynchosia bungarensis* Fortescue is currently undertaking further flora and vegetation surveys in the Eliwana Mine Project Area to support this Proposal and provide adequate and up-to-date data to support EIA. Following completion of the current surveys, a consolidated flora and vegetation report for the Eliwana Mine Project Area will be prepared.
5	***Proposal activities*** – Describe the proposal activities that have the potential to impact the environment	Proposal activities (typical of iron ore mines) which have the potential to impact flora and vegetation include: • Direct clearing of vegetation • Direct loss of significant flora or vegetation • Fragmentation of vegetation • Indirect impacts to groundwater dependent vegetation resulting from groundwater abstraction • Indirect impacts to sheetflow/surface water dependent vegetation resulting from infrastructure or landform placement.
6	***Mitigation*** - Describe the measures	Fortescue has applied the mitigation hierarchy to the Project in relation to flora

	proposed to manage and mitigate the potential environmental impacts.	and vegetation. Mitigation measures include: Avoidance • Fortescue is currently undertaking flora and vegetation surveys which will identify flora and vegetation of significance which may be able to be avoided during the detailed design of the Project footprint. • Disturbance will be managed using Fortescue's Land Use Certificate system (superseding the Ground Disturbance Permit system) to avoid unauthorised clearing of vegetation. Minimisation • Clearing and direct disturbance will be minimised where possible. • Disturbance will be managed using Fortescue's Land Use Certificate system in order to minimise clearing of vegetation. • Undertaking groundwater modelling to simulate groundwater drawdown in areas of groundwater dependent vegetation. • Undertaking surface water modelling identifying any impacts to sheetflow-dependent vegetation, should any be identified in the current survey. Rehabilitation/Revegetation • Fortescue will rehabilitate disturbed areas at the end of their serviceable or operational life. These activities will be undertaken progressively during the operating life of the mine. • Fortescue will develop a Mine Closure Plan (as required under the *Mining Act 1978* and in accordance with DMP's Guidelines for Preparing Mine Closure Plans, May 2015) which will outline specific closure objectives and completion criteria related to rehabilitation. Offset • Fortescue will develop an offset strategy, including offsets for disturbance of vegetation in good – excellent condition, in consultation with DPaW, EPA and DoEE.
7	***Impacts*** - Assess the impacts of the proposal and review the residual impacts against the EPA objective.	A detailed environmental impact assessment has not yet been undertaken for this Project. Likely residual impacts are listed below and are generally not quantified: • Direct clearing of vegetation (up to 8,560 ha) • Direct loss of significant flora or vegetation (including loss of Priority flora) • Fragmentation of vegetation • Indirect impacts to groundwater dependent vegetation resulting from groundwater abstraction • Indirect impacts to sheetflow or surface water dependent vegetation resulting from infrastructure or landform placement.
8	***Assumptions*** - Describe any assumptions critical to your assessment *e.g. particular mitigation*	N/A

	measures or regulatory conditions.	
1	EPA Factor	Terrestrial Fauna
2	***EPA policy and guidance*** - What have you considered and how have you applied them in relation to this factor?	The EPA's overarching Statement of Environmental Principles, Factors and Objectives (EPA 2016) lists the objective for terrestrial fauna as follows: *To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.* In considering this objective, Fortescue has sought to quantify the existing biological diversity and ecological integrity of the area through environmental surveying. The following policy and guidance is relevant to this factor: • *Environmental Factor Guideline: Terrestrial Fauna* (EPA 2016c). • *Technical Guidance – Terrestrial Fauna Surveys* (EPA 2016d). Note, this guidance supersedes EPA Guidance Statement 56. • *Technical Guidance – Sampling Methods for Terrestrial Vertebrate Fauna* (EPA 2016e). Note, this guidance supersedes EPA/DEC Technical Guide for Terrestrial vertebrate Fauna Surveys for EIA (2010). **Environmental Factor Guideline: Terrestrial Fauna** This guideline provides an outline of how Terrestrial Fauna is considered by the EPA in the environmental impact assessment (EIA) process. Relevant matters discussed in Guideline include the following: • description of EIA considerations, including o application of the mitigation hierarchy o the terrestrial fauna affected by the Proposal o the potential impacts and the activities that will cause them o surveys and analyses required o the significance of and risks to the fauna o the current state of knowledge of terrestrial fauna and the level of confidence underpinning the predicted residual impacts • describes issues commonly encountered by the EPA during EIA of this factor • provides a summary of the type of information that may be required by the EPA to undertake EIA related to this factor. Fortescue has specifically considered this guidance in the following ways: • surveys and analyses undertaken and planned to describe the receiving environment and its significance (see section 4 in this table) • identification of activities which may lead to impacts to terrestrial fauna (refer to section 5 in this table) • application of the mitigation hierarchy in elements of project design. **Technical Guidance – Terrestrial Fauna Surveys** This guidance is intended to provide information on standards and protocols for

		terrestrial fauna surveys to ensure adequate data of an appropriate standard are obtained and used in EIA, specifically providing advice on: • survey preparation and planning; • determining the type of survey required; and • presentation and reporting. Fortescue has specifically applied this guidance in the planning, design and implementation of terrestrial fauna surveys currently underway in the Proposal Area. **Technical Guidance – Sampling Methods for Terrestrial Vertebrate Fauna** This guidance is intended to provide information on standards and protocols for terrestrial fauna surveys to ensure adequate data of an appropriate standard are obtained and used in EIA, specifically providing advice on: • pre-survey protocols; • determining the level of survey required; • sampling techniques for specific fauna; • survey design; and • data analysis and and reporting. Fortescue has specifically applied this guidance in the planning, design and implementation of terrestrial fauna surveys currently underway in the Proposal Area.
3	***Consultation*** – Outline the outcomes of consultation in relation to the potential environmental impacts	Preliminary consultation has been undertaken with the EPA, DoEE, DoW and the PKKP Native Title Group. No specific concerns or queries have been raised regarding Terrestrial Fauna in consultation undertaken to date. Targeted consultation with regulatory and other stakeholders will continue following referral of the Proposal.
4	***Receiving environment*** - Describe the current condition of the receiving environment in relation to this factor.	The receiving environment in the Eliwana Mine Project Area is generally well understood. Fortescue has conducted extensive mineral exploration activities in the area and significant survey effort was undertaken to support these exploration activities. The most relevant previous survey relating to terrestrial fauna is: • Western Hub Project – Eliwana and Flying Fish Terrestrial Vertebrate Fauna Assessment (Ecologia 2015). This survey incorporated opportunistic observations, trapping (pit traps/drift fence, Elliott traps, funnel traps and cage traps), acoustic recording and motion cameras. **Fauna Habitat** Broad fauna habitat types known to occur within the project area include: • Hilltops, hillslopes, ridges and cliffs • Footslopes and plains • Major creeklines • Gorges and gullies

		• Mixed acacia woodlands. Fauna habitat is affected to some extent by grazing and trampling by cattle and feral donkeys in localised areas, but generally is considered to be in good condition. Despite targeted searches, no significant roost caves supporting the Pilbara Leaf-nosed Bat or Ghost Bat are known from within the Project area. Mapping of habitat types within portions of the project area from previous surveys has resulted in a significant amount of pre-existing data which will be verified and consolidated as part of the current terrestrial fauna surveys. **Significant Fauna** Several significant fauna species have previously been recorded from within the Project area: • S2 (Endangered) Northern Quoll (*Dasyurus Hallucatus*) [Unidentifiable scat potentially belonging to Northern Quoll] • S3 (Vulnerable) Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) • S3 (Vulnerable) Ghost Bat (*Macroderma gigas*) • S3 (Vulnerable) Pilbara Olive Python (*Liasis olivaceus barroni*) • S5 Rainbow Bee-eater (*Merops ornatus*) • P4 Lined Soil-crevice Skink (*Notoscincus butleri*) • P4 Western Pebble-mound Mouse (*Pseudomys chapmani*). Fortescue is currently undertaking further terrestrial fauna surveys incorporating general and targeted searches and delineation of fauna habitat in the Eliwana Mine Project Area to support this Proposal and provide adequate and up-to-date data to support EIA. Following completion of the current surveys, a consolidated terrestrial fauna report for the Eliwana Mine Project Area will be prepared. In addition, specifically targeted surveys for Pilbara Leaf-nose Bats and Ghost Bats are also being undertaken.
5	***Proposal activities*** – Describe the proposal activities that have the potential to impact the environment	Proposal activities (typical of iron ore mines) which have the potential to impact terrestrial fauna include: • Direct clearing of fauna habitat • Fragmentation of fauna habitat due to linear infrastructure or landforms • Mortality or displacement of fauna due to infrastructure or landform placement, vehicle interactions, artificial water bodies, modification of water quality and water regimes, and attraction of feral predators.
6	***Mitigation*** - Describe the measures proposed to manage and mitigate the potential environmental	Fortescue has applied the mitigation hierarchy to the Project in relation to terrestrial fauna. Mitigation measures include: Avoidance • Fortescue is currently undertaking terrestrial fauna surveys (incorporating targeted searches) which will identify terrestrial fauna and supporting habitat of significance which may be able to be avoided during the detailed design of the Project footprint. • Disturbance will be managed using Fortescue's Land Use Certificate system

	impacts.	(superseding the Ground Disturbance Permit system) to avoid unauthorised clearing of vegetation. • Clearing of critical habitat for the Northern Quoll, Pilbara Leaf-nosed Bat, Ghost Bat and Pilbara Olive Python will be avoided where possible. Minimisation • Where it cannot be avoided, clearing of critical habitat for the Northern Quoll, Pilbara Leaf-nosed Bat, Ghost Bat and Pilbara Olive Python will be minimised where possible. • Clearing and direct disturbance will be minimised where possible. • Disturbance will be managed using Fortescue's Land Use Certificate system in order to minimise clearing of fauna habitat. • Vehicle speed limits will be enforced. Rehabilitation/Revegetation • Fortescue will rehabilitate disturbed areas at the end of their serviceable or operational life. These activities will be undertaken progressively during the operating life of the mine. • Fortescue will develop a Mine Closure Plan (as required under the *Mining Act 1978* and in accordance with DMP's *Guidelines for Preparing Mine Closure Plans*, May 2015) which will outline specific closure objectives and completion criteria related to rehabilitation with respect to suitability for fauna habitat. Offset • Fortescue will develop an offset strategy, including offsets for disturbance of critical fauna habitat, in consultation with DPaW, EPA and DoEE.
7	***Impacts*** - Assess the impacts of the proposal and review the residual impacts against the EPA objective.	A detailed environmental impact assessment has not yet been undertaken for this Project. Likely residual impacts are listed below and have not yet been quantified: • Direct clearing of fauna habitat (up to 8,560 ha) • Fragmentation of fauna habitat due to linear infrastructure or landforms • Mortality or displacement of fauna due to infrastructure or landform placement, vehicle interactions, artificial water bodies, modification of water quality and water regimes, and attraction of feral predators.
8	***Assumptions*** - Describe any assumptions critical to your assessment *e.g. particular mitigation measures or regulatory conditions.*	N/A

1	EPA Factor	Subterranean Fauna
2	***EPA policy and guidance*** - What have you considered and how have you applied them in relation to this factor?	The EPA's overarching Statement of Environmental Principles, Factors and Objectives (EPA 2016) lists the objective for subterranean fauna as follows: *To protect subterranean fauna so that biological diversity and ecological integrity are maintained.* In considering this objective, Fortescue has sought to quantify the existing biological diversity and ecological integrity of the area through environmental surveying. The following policy and guidance is relevant to this factor: • *Environmental Factor Guideline: Subterranean Fauna* (EPA 2016f). Note, this guidance supersedes EPA's GS 54a. • *Technical Guidance – Subterranean Fauna Surveys* (EPA 2016g). Note, this guidance supersedes EPA's EAG 12. **Environmental Factor Guideline: Subterranean Fauna** This guideline provides an outline of how Subterranean Fauna is considered by the EPA in the environmental impact assessment (EIA) process. Relevant matters discussed in Guideline include the following: • description of EIA considerations, including o application of the mitigation hierarchy o the subterranean fauna affected by the Proposal o the potential impacts and the activities that will cause them o surveys and analyses required o the significance of and risks to the fauna o the current state of knowledge of subterranean fauna and the level of confidence underpinning the predicted residual impacts • describes issues commonly encountered by the EPA during EIA of this factor • provides a summary of the type of information that may be required by the EPA to undertake EIA related to this factor. Fortescue has specifically considered this guidance in the following ways: • surveys and analyses undertaken and planned to describe the receiving environment and its significance (see section 4 in this table) • identification of activities which may lead to impacts to subterranean fauna (refer to section 5 in this table) • application of the mitigation hierarchy in elements of project design. **Technical Guidance – Subterranean Fauna Surveys** This guidance is intended to provide information on standards and protocols for terrestrial fauna surveys to ensure adequate data of an appropriate standard are obtained and used in EIA, specifically providing advice on: • determining the type and level of survey required • survey design (including sampling, use of genetics and use of surrogates) • specimen vouchering and lodgement

		• data interpretation and reporting. Fortescue has specifically applied this guidance in the planning, design and implementation of subterranean fauna surveys currently underway in the Proposal Area.
3	***Consultation*** – Outline the outcomes of consultation in relation to the potential environmental impacts	Preliminary consultation has been undertaken with the EPA, DoEE, DoW and the PKKP Native Title Group. No specific concerns or queries have been raised by EPA or DOEE regarding Subterranean Fauna in consultation undertaken to date. DoW have raised concerns regarding potential impacts to subterranean fauna in a highly compartmentalised hydrogeological system. Fortescue is in the process of developing the hydrogeological model and undertaking targeted surveying for subterranean fauna in order to obtain sufficient baseline data to support environmental impact assessment for this factor. Consultation with DoW will be ongoing as studies progress. Targeted consultation with regulatory and other stakeholders will continue following referral of the Proposal.
4	***Receiving environment*** - Describe the current condition of the receiving environment in relation to this factor.	Fortescue is currently developing geological and hydrogeological conceptual models which will assist in describing the receiving environment relevant to subterranean fauna. Generally, subterranean fauna habitat within the Mine Development Envelope is considered to be a highly compartmentalised system, with shale units forming northern and southern boundaries and numerous dolerite dykes running north-west to south-east. One previous subterranean fauna survey was undertaken in 2013: • Western Hub Baseline Subterranean Fauna Assessment (Bennelongia 2015). Significance of subterranean fauna in the Project area is generally associated with local endemism or restricted distribution of a particular species. Three stygofauna species have previously been identified as having the potential to be of conservation significance due to limited known ranges: • *Areacandona* nr *triangulum* (Ostracoda Group) • *Brevisomabathynella* sp. B03 (Syncarida Group) • *Bogidiella* sp. B05 (Amphipoda Group). Seven stygofauna species have previously been identified as having the potential to be of conservation significance due to limited known ranges: • *Prethopalpus* sp. B25 (nr *boltoni*) (Arachnida Group) • *Stenoniscidae* gen. nov. sp. B05 (Isopoda Group) • *Troglarmadillo* sp. B46 (Isopoda Group) • *Hanseniella* sp. B23 (Symphyla Group) • *Projapygidae* sp. B14 (Diplura Group) • *Projapygidae* sp. B17 (Diplura Group) • *Hemitrinemura* sp. B10 (Thysanura Group). Current subterranean fauna surveys are focussed on refining the known ranges of these species, in addition to searching for additional species which may be present and could be considered conservation significant. The current survey will assess

		species of potential conservation significance with regard to their locations within the geological and hydrogeological environment to draw conclusions regarding habitat accessibility and connectivity.
5	***Proposal activities*** – Describe the proposal activities that have the potential to impact the environment	Proposal activities (typical of iron ore mines) which have the potential to impact subterranean fauna include: • Direct removal of individuals and habitat through mining • Removal of stygofauna habitat though mine dewatering and groundwater abstraction for water supply. • Indirect impacts due to changes in hydrology associated with placement of infrastructure or landforms • Indirect impacts due to contamination or changed nutrient status of water due to leaching from waste rock or tailings storage facilities.
6	***Mitigation*** - Describe the measures proposed to manage and mitigate the potential environmental impacts.	Fortescue has applied the mitigation hierarchy to the Project in relation to subterranean fauna. Mitigation measures include: Avoidance • Fortescue is currently undertaking subterranean fauna surveys which will identify fauna and supporting habitat of significance which may be able to be avoided during the detailed design of the Project footprint. Minimisation • Fortescue is currently developing geological and hydrogeological models of the Mine Development Envelope in order to allow impacts to be quantified. • Fortescue will undertake modelling of proposed groundwater drawdown associated with mine dewatering and water supply abstraction in order to allow impacts to be quantified. • Fortescue is undertaking exploration drilling in order to further define the resource area and develop pit shells to minimise unnecessary excavation of material. • Clearing will be minimised where possible. • Disturbance will be managed using Fortescue's Land Use Certificate system in order to minimise clearing of fauna habitat. Rehabilitation/Revegetation • Fortescue will rehabilitate disturbed areas at the end of their serviceable or operational life. These activities will be undertaken progressively during the operating life of the mine. Offset • Fortescue will develop an offset strategy, including offsets for disturbance to significant subterranean fauna as required, in consultation with DPaW, EPA and DoEE.

7	***Impacts*** - Assess the impacts of the proposal and review the residual impacts against the EPA objective.	A detailed environmental impact assessment has not yet been undertaken for this Project. Likely residual impacts are listed below and have not yet been quantified: • Direct loss of individuals and habitat through mining • Loss of stygofauna habitat though mine dewatering and groundwater abstraction for water supply. • Indirect impacts due to changes in hydrology associated with placement of infrastructure or landforms • Indirect impacts due to contamination or changed nutrient status of water due to leaching from waste rock or tailings storage facilities.
8	***Assumptions*** - Describe any assumptions critical to your assessment *e.g. particular mitigation measures or regulatory conditions.*	N/A

1	EPA Factor	Hydrological Processes
2	***EPA policy and guidance*** - What have you considered and how have you applied them in relation to this factor?	The EPA's overarching Statement of Environmental Principles, Factors and Objectives (EPA 2016) lists the objective for hydrological processes as follows: *To maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.* In considering this objective, Fortescue has sought to model the hydrological regimes of the area to ensure that impacts to these regimes can be assessed and environmental values can be protected. The following policy and guidance is relevant to this factor: • *Environmental Factor Guideline: Hydrological Processes* (EPA 2016h). **Environmental Factor Guideline: Hydrological Processes** This guideline provides an outline of how Hydrological Processes is considered by the EPA in the environmental impact assessment (EIA) process. Relevant matters discussed in Guideline include the following: • description of EIA considerations, including o application of the mitigation hierarchy o the environmental values associated with hydrological processes affected by the Proposal o the potential impacts and the activities that will cause them o analyses required o the current state of knowledge of hydrological processes and the level of confidence underpinning the predicted residual impacts • describes issues commonly encountered by the EPA during EIA of this factor • provides a summary of the type of information that may be required by the EPA to undertake EIA related to this factor. Fortescue has specifically considered this guidance in the following ways: • surveys and analyses undertaken and planned to describe the receiving environment and its significance (see section 4 in this table) • identification of activities which may lead to impacts to hydrological processes (refer to section 5 in this table) • application of the mitigation hierarchy in elements of project design.
3	***Consultation*** – Outline the outcomes of consultation in relation to the potential environmental impacts	Preliminary consultation has been undertaken with the EPA, DoEE, DoW and the PKKP Native Title Group. No specific concerns or queries have been raised by EPA or DoEE regarding Hydrological Processes in consultation undertaken to date. During consultation with the DoW, pit lakes were raised as an item of interest. Fortescue is currently developing its hydrogeological model, which will incorporate an assessment of pit lake water balances. Targeted consultation with regulatory and other stakeholders will continue following referral of the Proposal.

4	***Receiving environment -*** Describe the current condition of the receiving environment in relation to this factor.	The Mine Development Envelope falls within the Ashburton River catchment and the Duck Creek subcatchment (which encompasses Caves Creek and Boolgeeda Creek). Duck Creek and Caves Creek are located to the north of the Mine Development Envelope and Boolgeeda Creek to the south of the Mine Development Envelope. Duck Creek/Caves Creek and Boolgeeda Creek flow west to the Ashburton River, which runs north-west and reaches the coast just west of Onslow. Fortescue is currently developing a conceptual hydrogeological model of the Mine Development Envelope. Key features include shale units running in an east-west direction to the north and south of the mine. These units restrict groundwater flow to the north and south. A series of cross-cutting dolerite dykes restrict east-west groundwater flow. The result is a series of isolated compartments where there will be very little groundwater flow in and out.
5	***Proposal activities –*** Describe the proposal activities that have the potential to impact the environment	Proposal activities (typical of iron ore mines and groundwater abstraction) which have the potential to impact hydrological processes include: • Mine dewatering resulting in groundwater drawdown • Groundwater abstraction for water supply resulting in groundwater drawdown • Injection of surplus water resulting in groundwater mounding • Controlled release of excess water into inactive mine pits • Controlled release of excess water via surface discharge • Placement of infrastructure or landforms resulting in interruption of surface water flows (including cutting off/diversion of surface water streamflows and sheetflow shadowing).

6	***Mitigation*** **-** Describe the measures proposed to manage and mitigate the potential environmental impacts.	Fortescue has applied the mitigation hierarchy to the Project in relation to hydrological processes. Mitigation measures include: Avoidance • The broad project footprint avoids interaction with significant surface water features such as major rivers and major creeks where possible. • Where possible, infrastructure and landforms will be placed to avoid interaction with minor surface water features. Minimisation • Fortescue is currently developing geological and hydrogeological models of the Mine Development Envelope in order to allow impacts to be quantified. • Fortescue will undertake modelling of proposed groundwater drawdown associated with mine dewatering and water supply abstraction in order to allow impacts to be quantified. • Fortescue is surface water modelling in order to allow impacts to be quantified. • Fortescue is currently investigating options for management of surface water flow in areas of interaction with significant infrastructure or landforms in order to balance constraints such as topography and tenure with potential impacts to surface water flows and downstream impacts. Rehabilitation/Revegetation • Fortescue will rehabilitate disturbed areas at the end of their serviceable or operational life. These activities will be undertaken progressively during the operating life of the mine. Offset • Fortescue will develop an offset strategy, including offsets for disturbance to significant hydrological aspects as required, in consultation with DPaW, EPA and DoEE.

7	***Impacts*** - Assess the impacts of the proposal and review the residual impacts against the EPA objective.	A detailed environmental impact assessment has not yet been undertaken for this Project. Likely residual impacts are listed below and have not yet been quantified: • Groundwater drawdown as a result of mine dewatering and water supply abstraction. Drawdown is likely to be relatively well contained laterally but extensive vertically, as a result of the compartmentalised hydrogeology of the Project Area. • Groundwater mounding in areas of surplus water injection. • Permanent modification to existing catchments and associated impacts to flow paths of surface water streamflows. • Sheetflow shadowing in areas of sheetflow impacted by infrastructure or landform placement. • Altered hydrogeology and water balance associated with the creation of permanent and ephemeral pit lakes.
8	***Assumptions*** - Describe any assumptions critical to your assessment *e.g. particular mitigation measures or regulatory conditions.*	N/A

1	EPA Factor	Inland Waters Environmental Quality
2	***EPA policy and guidance*** - What have you considered and how have you applied them in relation to this factor?	The EPA's overarching Statement of Environmental Principles, Factors and Objectives (EPA 2016) lists the objective for inland waters environmental quality as follows: *To maintain the quality of groundwater and surface water so that environmental values are protected.* In considering this objective, Fortescue has sought to identify key receptors and undertake baseline water quality monitoring to ensure that impacts associated with this factor can be assessed and environmental values can be protected. The following policy and guidance is relevant to this factor: • *Environmental Factor Guideline: Inland Waters Environmental Quality* (EPA 2016i). **Environmental Factor Guideline: Inland Waters Environmental Quality** This guideline provides an outline of how this factor is considered by the EPA in the environmental impact assessment (EIA) process. Relevant matters discussed in Guideline include the following: • description of EIA considerations, including o application of the mitigation hierarchy o the environmental values associated with inland waters environmental quality affected by the Proposal o the potential impacts and the activities that will cause them o analyses required o the current state of knowledge and the level of confidence underpinning the predicted residual impacts • describes issues commonly encountered by the EPA during EIA of this factor • provides a summary of the type of information that may be required by the EPA to undertake EIA related to this factor. Fortescue has specifically considered this guidance in the following ways: • surveys and analyses undertaken and planned to describe the receiving environment and its significance (see section 4 in this table) • identification of activities which may lead to impacts to hydrological processes (refer to section 5 in this table) • application of the mitigation hierarchy in elements of project design.

3	***Consultation*** – Outline the outcomes of consultation in relation to the potential environmental impacts	Preliminary consultation has been undertaken with the EPA, DoEE, DoW and the PKKP Native Title Group. No specific concerns or queries have been raised by EPA or DoEE regarding Inland Waters Environmental Quality in consultation undertaken to date. During consultation with the DoW, pit lakes were raised as an item of interest. Fortescue is currently investigating potential impacts to water quality associated with permanent or ephemeral pit lakes. Targeted consultation with regulatory and other stakeholders will continue following referral of the Proposal.
4	***Receiving environment*** - Describe the current condition of the receiving environment in relation to this factor.	Fortescue is currently undertaking surveys to identify key features such as springs and pools, in addition to the commencement of ongoing monitoring of surface water and groundwater quality in order to establish a baseline dataset and allow the receiving environment to be adequately described.
5	***Proposal activities*** – Describe the proposal activities that have the potential to impact the environment	Proposal activities (typical of iron ore mines and groundwater abstraction) which have the potential to impact inland waters environmental quality include: • placement of infrastructure and landforms resulting in impacts to surface water quality resulting from erosion or sedimentation outside the range of natural conditions • potential leaching of acid and/or metalliferous drainage associated with open pit walls and waste rock storage facilities • post-closure pit lakes resulting in impacts to surface and/or groundwater quality • hydrocarbon or chemical spills resulting in impacts to surface or groundwater quality.

6	***Mitigation*** **-** Describe the measures proposed to manage and mitigate the potential environmental impacts.	Fortescue has applied the mitigation hierarchy to the Project in relation to inland waters environmental quality. Mitigation measures include: Avoidance • The broad project footprint avoids interaction with significant surface water features such as major rivers and major creeks where possible. • Where possible, infrastructure and landforms will be placed to avoid interaction with minor surface water features. Minimisation • Fortescue will undertake water quality modelling of pit lakes in order to allow impact assessment. • Fortescue will undertake a detailed geochemical assessment of waste and tailings materials in order to develop management strategies for any material which is likely to result in acid and/or metalliferous drainage. • Landforms will be designed to be acceptably stable in order to minimise impacts to water quality associated with erosion and sedimentation. • Operational and post closure surface water management strategies will be developed for key infrastructure and landforms. • Fortescue will ensure that appropriate handling and storage procedures are in place to avoid impacts to water quality associated with chemical or hydrocarbon spills. Rehabilitation/Revegetation • Fortescue will rehabilitate disturbed areas at the end of their serviceable or operational life. These activities will be undertaken progressively during the operating life of the mine. • Post closure surface water management will be integrated into the rehabilitation strategies. Offset • Fortescue will develop an offset strategy, including offsets for significant impacts associate with inland waters environmental quality as required, in consultation with DPaW, EPA and DoEE.

7	***Impacts*** - Assess the impacts of the proposal and review the residual impacts against the EPA objective.	A detailed environmental impact assessment has not yet been undertaken for this Project. Likely residual impacts are listed below and have not yet been quantified: • minor impacts to surface water quality resulting from erosion or sedimentation associated with the placement of infrastructure and landforms • potential leaching of acid and/or metalliferous drainage associated with open pit walls and waste rock storage facilities – note, preliminary assessment indicated that the majority of material represents a low risk for acid generating potential • impacts to groundwater quality associated with pit lakes • minor impacts to surface or groundwater quality associated with hydrocarbon or chemical spills.
8	***Assumptions*** - Describe any assumptions critical to your assessment *e.g. particular mitigation measures or regulatory conditions.*	N/A

Part C: Other approvals and regulation

State and Local Government approvals

Is rezoning of any land required before the proposal can be implemented? If yes, please provide details.	☐ Yes ☑ No
If this proposal has been referred by a decision-making authority, what approval(s) are required from you?	N/A

Proposal activities	**Land tenure/access**	**Type of approval**	**Legislation regulating the activity**
Mining	Mining Lease	Mining Proposal	*Mining Act 1978*
Ore Processing, Landfill, Tailings Storage, Power generation, sewage facilities, used tyre storage, fuel	Mining Lease	Works Approval/Licence	*Environmental Protection Act 1986* Part V
Mine Dewatering	Mining Lease	26D and 5C	*Rights in Water and Irrigation Act 1914*
Groundwater abstraction for water supply	Miscellaneous Lease/ Mining Lease	26D and 5C	*Rights in Water and Irrigation Act 1914*

Commonwealth Government approvals

Does the proposal involve an action that may be or is a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)?	☑ Yes ☐ No
Has the proposed action been referred? If yes, when was it referred and what is the reference number (EPBC No.)?	☐ Yes ☑ No Date: _____ EPBC No.: _____ Fortescue anticipates referring the Proposal under the EP Act and EPBC Act simultaneously.
If referred, has a decision been made on whether the proposed action is a controlled action? If 'yes', check the appropriate box and provide the decision in an attachment.	N/A ☐ Yes ☐ No ☐ Decision – controlled action ☐ Decision – not a controlled action
Do you request that this proposal be assessed under the bilateral agreement or as an accredited assessment?	☑ Yes - Bilateral ☐ No ☐ Yes - Accredited

Part C: Other approvals and regulation	
State and Local Government approvals	
Is approval required from other Commonwealth Government/s for any part of the proposal? *If yes, describe.*	☐ Yes ☑ No Approval:

Attachment 1: Proposal Description

General Proposal Description

Fortescue Metals Group Ltd (Fortescue) is proposing to develop the Eliwana Mine Project in the Pilbara region of Western Australia (**Figure 1**). The Eliwana Mine Project Area is located approximately 90 km west-north-west of Tom Price.

Fortescue currently owns and operates a number of mining and infrastructure projects in the Pilbara; including the Cloudbreak, Solomon and Christmas Creek iron ore mines along with the Fortescue rail network and the Anderson Point port facility.

While preliminary planning for the location of these components and associated infrastructure has been undertaken, detailed design of the Eliwana Mine Project is still underway. To accommodate refinements in Project layout during the design process, the Project area has been defined through the use of a development envelope. The Mine Development Envelope is shown in **Figure 2**.

Over the life of the mine, the average annual production rate is estimated at 30 Mtpa but infrastructure will be constructed to reflect peaks in the annual production rate up to 50 Mtpa. The estimated mine life is 24 years.

Eliwana Railway

The Eliwana Railway is being progressed as a separate project and is the subject of a separate referral under the *Environmental Protection Act 1986*.

Key Characteristics

The key characteristics of the Eliwana Mine Project are summarised in **Tables 1** and **2**.

Table 1: Summary of the Proposal

Proposal title	Eliwana Iron Ore Mine Project
Proponent name	Fortescue Metals Group Ltd
Short description	The Proposal is to develop above and below water table iron ore deposits, 90 km west-north-west of Tom Price WA (Figure 1). The Proposal includes the development of mine pits and associated infrastructure, processing facilities, water management infrastructure for groundwater abstraction and surplus water disposal, temporary and permanent waste landforms and tailings storage facilities.

Table 2: Location and proposed extent of physical and operational elements			
Element	**Location**	**Proposed Extent**	
Physical elements			
Mine and associated infrastructure	Figure 2	Clearing of up to 8,560 ha of native vegetation within the 70,000 ha Mine Development Envelope	
Operational elements			
Mine pits	N/A	Eliwana Area: • Below water table mining • Operational temporary standing water • Permanent and ephemeral post closure pit lakes in mine voids	Flying Fish Area: • Above water table mining • Ephemeral (surface water driven) pit lakes
Ore processing (waste)	N/A	Disposal of up to 1.2 Bt of waste rock to temporary and permanent waste rock landforms	
Ore processing (tailings)	N/A	Disposal of up to 84 Mt of tailings into tailings storage facilities	
Water supply	N/A	Up to 12 GL/a, supplied from a combination of mine dewatering and water supply borefields.	
Power supply	N/A	Onsite power generation	
Dewatering	N/A	Abstraction of up to 12 GL/a of groundwater	
Surplus water management	N/A	Up to 4 GL/a of surplus water will be managed through a combination of surface discharge and controlled aquifer reinjection.	

Timing and Proposal Staging

Pending receipt of all relevant approvals, Fortescue plans to commence broad scale construction of the Eliwana Mine Project in June 2019. The target date for first ore production is June 2020. The Project is not a staged development.

Fortescue anticipates that a number of activities may be progressed under Section 41A(3) as minor or preliminary works. These may include (but are not limited to):

- accommodation camps and associated supporting infrastructure
- airstrip
- access roads
- fuel storage areas
- communications infrastructure
- construction laydown areas
- construction and potable water supply borefields and associated infrastructure.

A formal request will be submitted to the EPA following referral, in accordance with the *Instructions and checklist for request for EPA consent to undertake minor or preliminary work under Section 41A(3) of the Environmental Protection Act 1986*.

Proposed Infrastructure

Table 3 provides a list of major infrastructure associated with the development envelope for the Proposal.

Table 3: Proposed Infrastructure	
Mine Development Envelope	
• open cut pits • waste landforms • tailings storage facilities (above and below water table) • ore processing facility • rom facility • crushing and screening facilities • borrow areas • ore stockpiles • topsoil stockpiles • conveyors • haul roads • access roads • dewatering and surplus water management infrastructure • gas and water pipelines • water supply borefield	• culverts • bridges • water storage infrastructure • airport • accommodation camps (construction) • accommodation camp (operations) • communications infrastructure • landfill and bioremediation facilities • explosives storage facility • laydown areas • fuel storage • power station • power transmission lines • workshops and warehouses • laboratory and sample stations • administration buildings • wastewater treatment plants.

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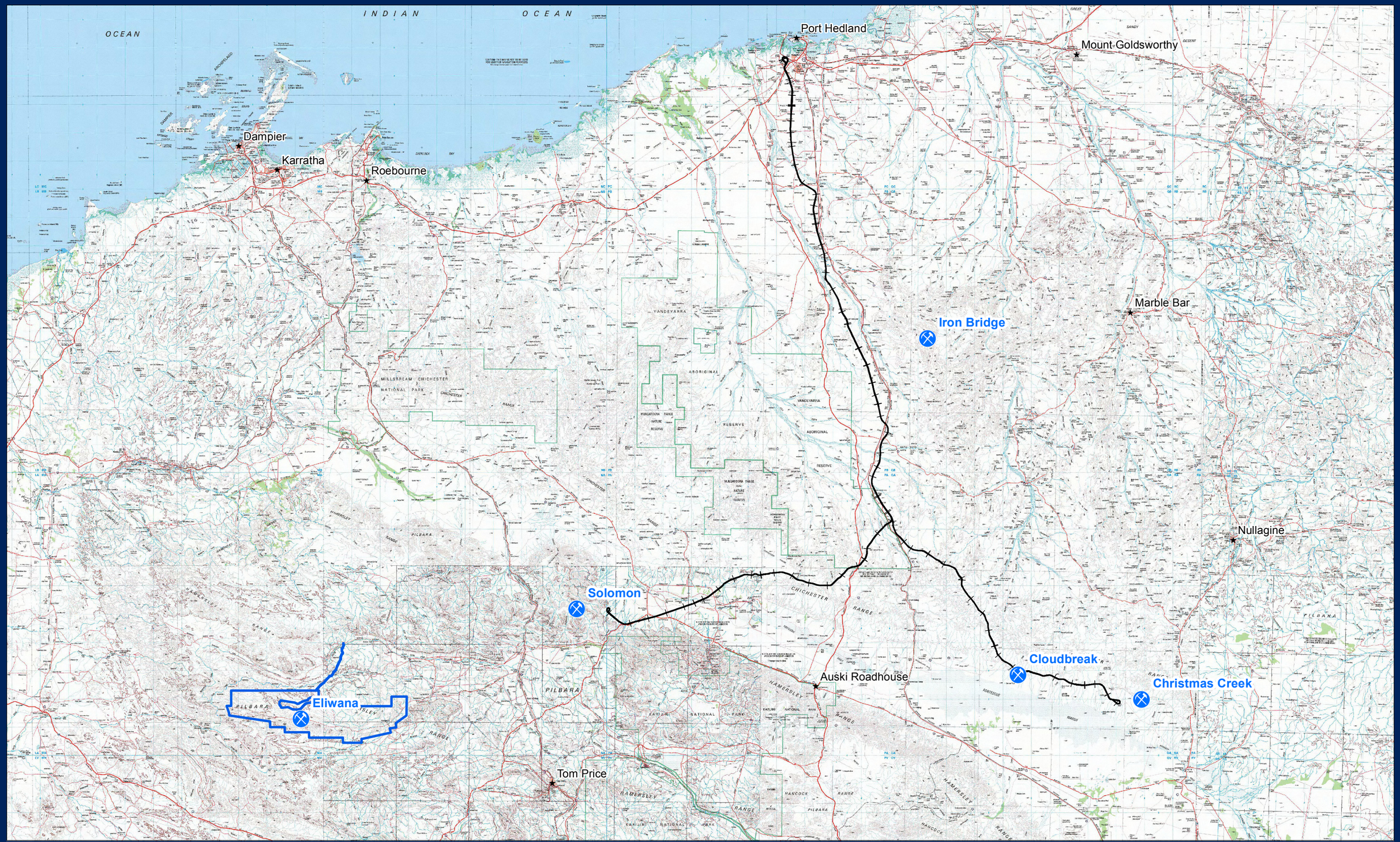

LEGEND

- Mine Development Envelope
- FMG Rail Alignments
- ★ GOV Towns

Data Source(s):
Aerial Imagery: Landgate
All other data: FMG, 2014

N

0 20 40 60 80 100
Kilometres

Requested By: Rachael Sharp
Drawn By: Rachael Sharp
Revised By: rsharp
Approved By:
Scale: 1:1,250,000
Coordinate System: GDA 1994 MGA Zone 50
Document Name: Eliwana Project Location

Date: 7/07/2017
Size: A3L
Revision: 0
Confidentiality: 1

Eliwana Iron Ore Mine Project Location

Fortescue Metals Group Ltd
The New Force in Iron Ore

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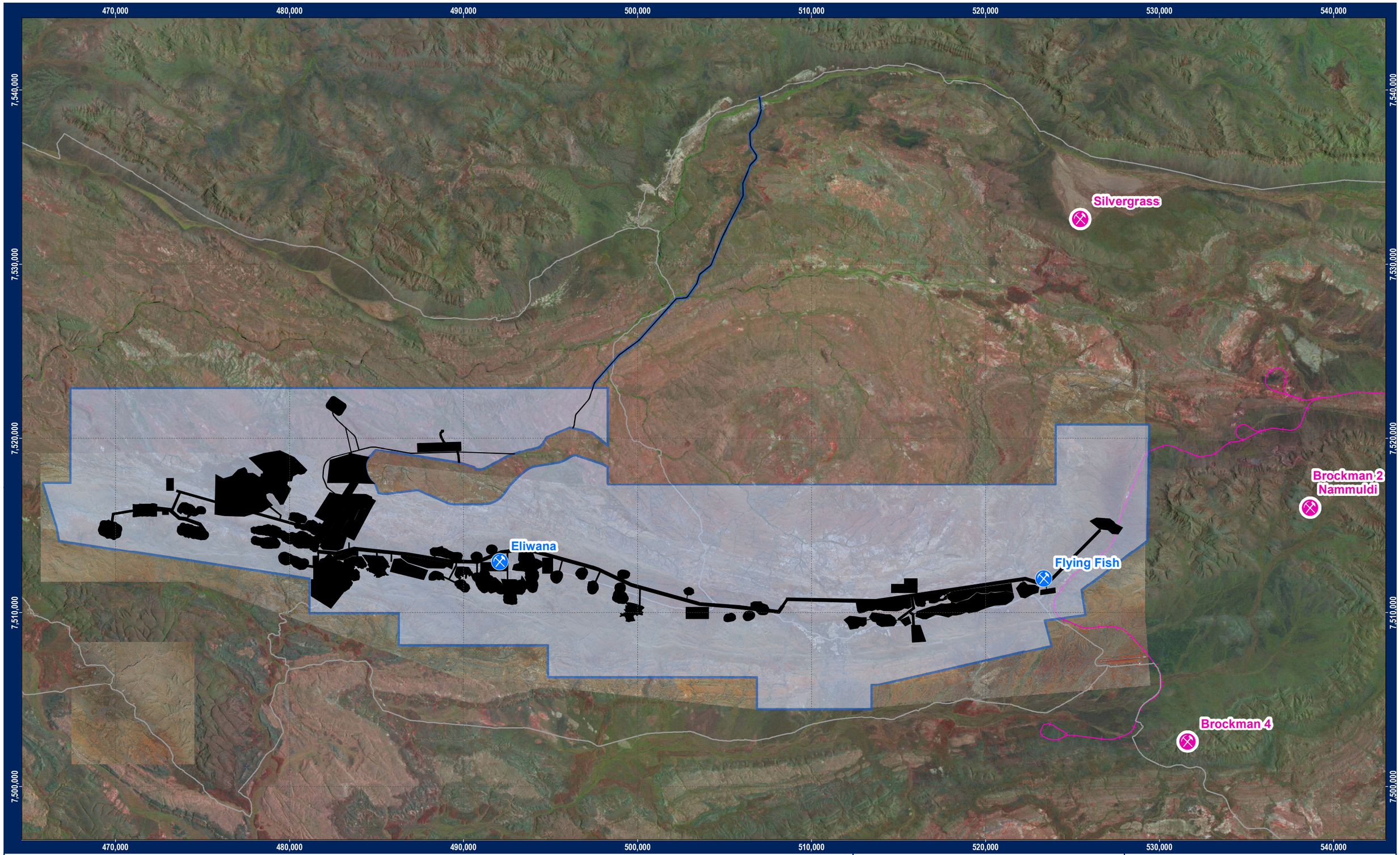

LEGEND

- Mine Development Envelope
- Eliwana Indicative Disturbance Footprint
- Rio Tinto Rail
- Major Roads

Data Source(s):
Aerial Imagery: Landgate
All other data: FMG, 2017

N

0 5 10 15
Kilometres

Requested By: Rachael Sharp
Drawn By: Rachael Sharp
Revised By: rsharp
Approved By:
Scale: 1:200,000
Coordinate System: GDA 1994 MGA Zone 50
Document Name: Eliwana Mine Development Envelope

Date: 7/07/2017
Size: A3L
Revision: 0
Confidentiality: 1

Eliwana Iron Ore Mine Project: Development Envelope

Fortescue Metals Group Ltd
The New Force in Iron Ore

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