Government of Western Australia
Department of Water and Environmental Regulation

Amendment Report

Application for Licence Amendment

Part V Division 3 of the *Environmental Protection Act 1986*

Licence Number	L8454/2010/2
Licence Holder	Chichester Metals Pty Ltd
ACN	109 264 262
File Number	2010/003105-4, APP-0028500 and APP-0026542
Premises	Christmas Creek Mine Site Legal description – Tenements E46/610, E46/612, M46/320, M46/321, M46/322, M46/323, M46/324, M46/325, M46/326, M46/327, M46/328, M46/329, M46/330, M46/331, M46/332, M46/333, M46/334, M46/335, M46/336, M46/337, M46/338, M46/339, M46/340, M46/341, M46/342, M46/343, M46/344, M46/345, M46/346, M46/347, M46/348, M46/349, M46/350, M46/351, M46/352, M46/353, M46/354, M46/355, M46/403, M46/406, M46/412, M46/413, M46/414, M46/415, M46/416, M46/417, M46/418, M46/419, M46/420, M46/421, M46/422, M46/423, M46/424, G46/7, L46/49, L46/56, L46/58, L46/86, L46/87, L46/106, L46/111, E46/566 and L46/66 MULGA DOWNS WA 6751 As defined by the Premises maps attached to the Revised Licence
Date of Report	27 November 2025 (**FINAL**)
Choose an item.	Revised licence granted

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1. Decision summary

Licence L8454/2010/1 is held by Chichester Metals Pty Ltd (Licence Holder) for the Christmas Creek Mine Site (the Premises), located at Mulga Downs.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the construction and operation of the Premises. As a result of this assessment, Revised Licence L8454/2020/2 has been granted.

The Revised Licence issued as a result of this amendment consolidates and supersedes the existing Licence previously granted in relation to the Premises. The Revised Licence has been granted in a new format with existing conditions being transferred, but not reassessed, to the new format.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Application summary

On 10 April 2025, the Licence Holder submitted an application to the department to amend Licence L8454/2010/2 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Amendments to the existing Christmas Creek Green Iron Pilot Plant (CCGIPP) (extension of site boundary, an increase in the estimated water usage and the use of reverse osmosis (RO) reject for dust suppression).
- Construction and operation of the new (Low Energy Direct Electrochemical Reduction) LEDER Pilot Plant under the existing Category 44 (metal melting or refining) to convert iron to green iron. The LEDER Pilot Plant is anticipated to produce up to 150 tonnes per annum of green iron.

On 15 November 2024, the licence holder submitted an application to the department to amend L8454/2010/2 for several amendments. It was decided that an component of this amendment application would be put on hold, as there were a number of outstanding issues. Therefore, the amendment in relation to increasing the groundwater reinjection has been included in this amendment – this component is summarised further below:

- Increase in groundwater reinjection at the Christmas Creek Mine Site from the existing 43 gigalitres per annum (GL/annum) to the proposed 110 GL/a in accordance with Ministerial Statement (MS) 1033 under section 45C of the EP Act. No additional changes are required, as the existing infrastructure is deemed sufficient to support the projected increase. An amendment is required to only increase the production capacity of Category 6 of the prescribed premises category.

This amendment is limited only to changes to Category 6 and Category 44 activities from the Existing Licence. No changes to the aspects of the existing Licence relating to Category 5, 31, 52, 54, 57, 64, 73 and 77 have been requested by the Licence Holder. Table 1below outlines the proposed changes to the existing Licence.

Table 1: Proposed design or throughput capacity changes

Category	Current design throughput capacity	Proposed design throughput capacity	Description of proposed amendment
5 Processing or beneficiation of metallic or non-metallic ore	77,000,000 tonnes per annual period	77,000,000 tonnes per annual period	LEDER Pilot plant crushing and screening activities will be within the Category throughout.
6 Mine dewatering	43,000,000 tonnes per annual period (reinjected)	110,000,0000 tonnes per annual period (reinjected)	Increase of 67,000,000 tonnes per annual period (reinjected) to reflect the increase in the groundwater abstraction and reinjection in accordance with MS 1033 of 110,000,000 tonnes per annual period.
31 Chemical manufacturing	195 tonnes per annual period	195 tonnes per annual period	No change
44 Metal melting or refining	5,000 tonnes per annual period (output of 2,500 tonnes of pig iron per annual period)	No change: 150 tonnes per annual period from the new LEDER Pilot Plant. No change in production or design capacity as 5,000 tonnes per annual period is sufficient.	Operation: Construction and operation of the new infrastructure for the new LEDER pilot plant.
52 Electric power generation	63.6 Mwe per annual period	63.6 Mwe per annual period	No change
54 Sewage facility	1,040 cubic meters per day (m^3/day)	1,040 cubic meters per day (m^3/day)	No change
57 Used tyre storage facility	2,000 tyres	2,000 tyres	No change
64 Class II putrescible landfill	10,000 tonnes per annual period	10,000 tonnes per annual period	No change
73 Bulk storage of chemicals	15,183.1 m^3 in aggregate	15,183.1 m^3 in aggregate	No change

Category	Current design throughput capacity	Proposed design throughput capacity	Description of proposed amendment
77 Concrete batching cement products manufacturing	100,000 tonnes per annual period	100,000 tonnes per annual period	No change

2.2.1 Christmas Creek Green Iron Pilot Plant Site Boundary

The Christmas Creek Green Iron Pilot Plant (CCGIPP) was constructed and included on licence L8454/2010/2 issued on 14 June 2024. The CCGIPP is a small-scale trial production of green iron that is located within the Licence prescribed premises boundary. The CCGIPP uses hydrogen and sources of energy from the existing Christmas Creek power supply and future renewable energy network to produce an iron product.

The pilot plant has a maximum design throughput of 5,000 tonnes per annum or iron ore with an output of up to 2,500 tonnes per annum of pig iron and is operated intermittently on a batched basis. The licence holder operates the pilot plant to determine the technical viability of the hydrogen-based conversion of Fortescue's iron ores into green iron and the suitability for the final market.

Due to the progression of the detailed engineering and design surrounding the CCGIPP, the licence holder is requesting the following amendment to the CCGIPP and associated infrastructure: an extension of site boundary, an increase in the estimated water usage and the use of RO reject for dust suppression.

The proposed Low Energy Direct Electrochemical Reduction (LEDER) Pilot Plant will be located next to the CCGIPP with is area being expanded, as the licence holder has a better understanding of the process of producing green iron. The licence holder notes that the extension of the boundary is to ensure that there is adequate space for the safe installation of the equipment on site. The indicative amendment of the CCGIPP is shown in Figure 1 below. The overall prescribed premises boundary is not being amended, as shown in Figure 2.

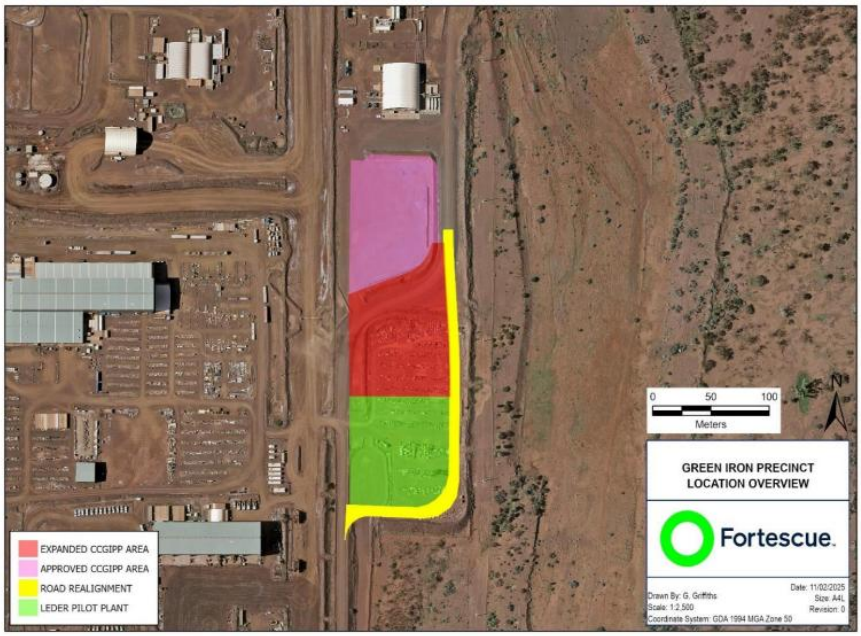

Figure 1: Proposed amendment to the CCGIPP site boundary

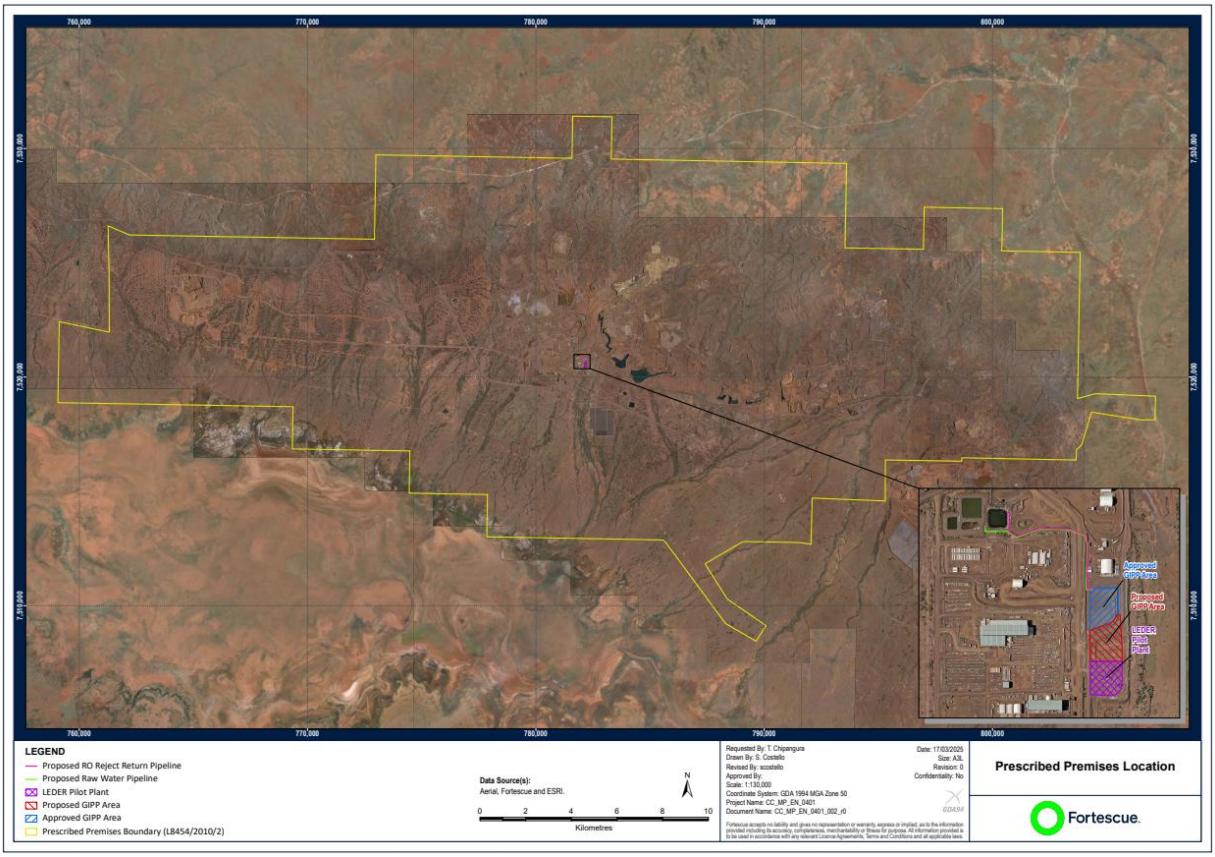

Figure 2: Prescribed Premises location

2.2.2 Amendment to the CCGIPP estimated water usage:

The CCGIPP water usage requirements have been estimated to increase from 2.2 ML/a to 146 ML/a. This is based on the CCGIPP increasing the plant operating to 24 hours a day, seven days a week, 365 days per year. The licence holder is proposing to meet the additional water requirements using the Elvis Turkey's Nest (Elvis TN) that contains 'saline or brackish water' and has sufficient capacity and water quality to support the CCGIPP. The Elvis TN has brackish water quality, requiring two-stage RO to meet the treated water quality for the plant.

Proposed Additional Infrastructure:

The licence holder is proposing to construct, install and commission additional pipelines and/or associated saline infrastructure to facilitate the transport of water from the Elvis TN to the CCGIPP.

The proposed location of the infrastructure is shown in Figure 3. The additional infrastructure proposed includes:

- RO reject pipeline from the CCGIPP to the Elvis TN.
- Raw water pipeline from the Elvis TN to the CCGIPP.

The Licence Holder has requested some flexibility in conditioning, and they have stated that if additional pipelines are required these will be reported as deviations in the Environmental Compliance Report.

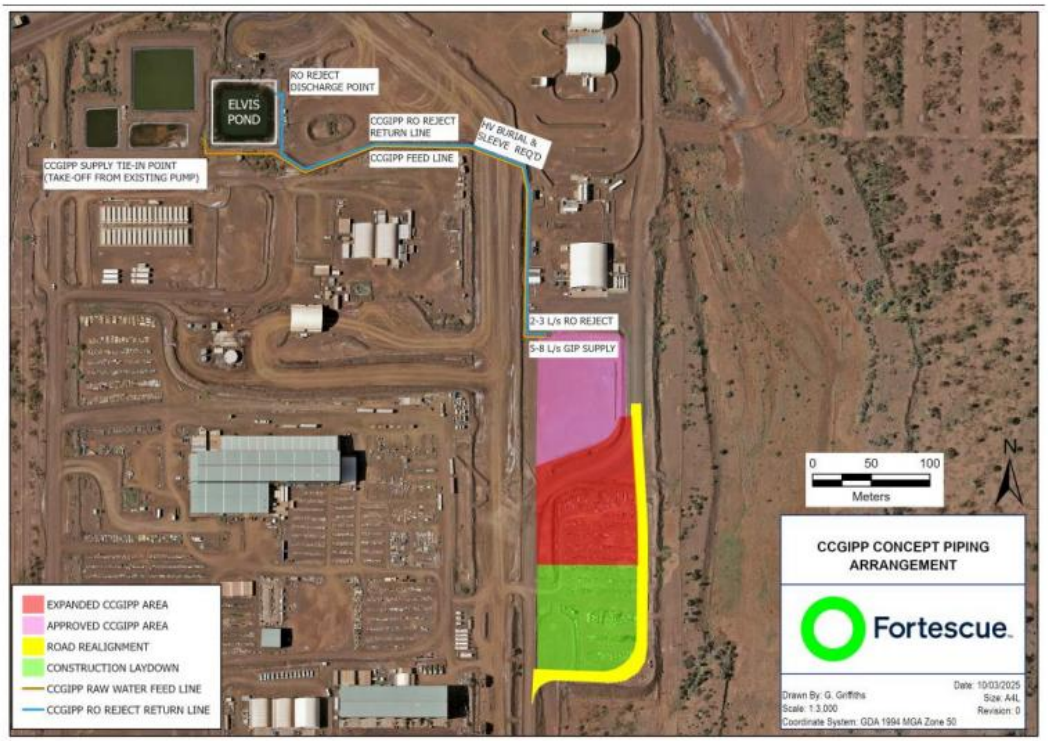

Figure 3: Indicative layout of the proposed pipelines

2.2.3 Amendment to emissions to land from the transfer and disposal of RO Reject water from the CCGIPP to the Elvis TN:

The licence holder is requesting an amendment to existing conditions (C16, Emissions to land, Table 11) that currently allows reuse of RO reject water from the Codgers Transfer Pond and Hydrogen Refuelling Station (HRS) output water for dust suppression and/or other sources. The licence holder is proposing to transfer green iron reject process water (RO brine and cooling tower blowdown) back to the Elvis TN for dilution and reuse. RO reject water from the CCGIPP will be processed through the RO and cooling tower units within the plant. Water from the Elvis TN will be reused within the process or for dust suppression.

2.2.4 LEDER Plant

The LEDER plant is a small-scale trial production of converting iron ore to green iron that will be located within mining tenement M46/328, which is entirely within the Licence prescribed premises boundary and the MS 1033 Christmas Creek Mine Development Envelope. The LEDER plant will be located immediately south of the approved CCGIPP.

The LEDER plant will have a maximum design throughput of up to 150 tonnes per annum of iron ore and will be operated intermittently on a batched basis. Due to the small-scale nature of the LEDER trial plant, only 150 tonnes per annum of green iron will be produced to understand the technical viability of the plant within the existing Category 44 (Metal smelting or refining) maximum design or capacity on the licence.

2.2.5 Increase in groundwater reinjection limit

Groundwater is currently abstracted and reinjected at the Premises to allow for open pit mining below water table mining, where up to 43 GL per annum is approved. In accordance with Attachment 3 of MS 1033, the licence holder has approval to abstract and reinject up to 110 GL/a of groundwater at the Christmas Creek Mine Site under section 45C of the EP Act. The licence holder indicated that extensive studies were undertaken under MS 1033 to determine

that the proposed increase in groundwater abstraction and reinjection to 110 GL/a would not have a significant detrimental effect on the environment.

Potential environmental impacts

The licence holder anticipates that any potential drawdown for the increased abstraction will be offset by the reinjection of the abstracted water that will go back into the Oakover aquifer. The potential environmental impacts that may be impacted by the increase are flora and vegetation, groundwater quantity and quality, and groundwater level drawdown and mounding.

Under MS 1033, Condition 12 requires a Vegetation Health Monitoring and Management Plan (100-PL-EN-1020 Rev 1) to be implemented to ensure that direct and indirect impacts on flora, vegetation and fauna from activities associated with the management of surface water, including but not limited to modifications to surface water drainage. The licence holder has indicated that from the extensive vegetation health monitoring to date, there has been no significant changes to vegetation health from the operational abstraction and reinjection of groundwater and groundwater activities. The licence holder expects that there will be no changes to the conservation significant vegetation communities as the health is not relied upon access to the Oakover aquifer, and any potential groundwater drawdown is likely to have minimal impact.

The licence holder does not expect any additional detrimental impacts to groundwater quality and quantity with the increase based on the groundwater modelling undertaken to support the Christmas Creek under s45C of the EP Act, as approved on 08 July 2019. The modelling predicted minimal drawdown across all monitoring locations and no mounding of the water table above baseline conditions.

The licence holder states that "*water levels at the Fortescue Marsh will continue to be monitored in accordance with the Groundwater Operating Strategy (GWOS) to efficiently manage saline reinjection and maintain water levels that prevent any potential drawdown or mounding impacts.*"

MS 1033

The monitoring and management for groundwater level changes from the injection of surplus water is required under MS 1033, Condition 16-1 and 16-2, as follows:

> *"16 Hydrological Processes and Inland Waters Environmental Quality – groundwater levels and quality*
>
> *16-1 The proponent shall manage the abstraction of groundwater for dewatering and the disposal of surplus dewater to meet the following environmental outcome:*
>
> *(1) maintain groundwater levels and groundwater quality within a defined range, based on the results of the Baseline Survey required by condition 15-3 having regard for climatic trends and seasonal variation.*
>
> *16-2 The proponent shall consult with the DoW in the preparation of the plan/s required by condition 5-1 that satisfies the requirements of condition 5-2, to meet the outcome required by condition 16-1."*

To ensure consistency and align with MS 1033, the licence holder requests for the category 6 production capacity to be amended to 110 GL/a (reinjected). The licence holder has indicated that no additional changes are required, as the existing category 6 infrastructure is deemed sufficient to support the increased production capacity of 110 GL/a.

2.3 Department's technical advice

2.3.1 Contaminated sites branch (Principal Hydrogeologist)

Technical advice was sought from DWER's Contaminated Sites Branch on the increase in injection rate at which brackish to saline mine dewatering effluent at the premises is disposed of by reinjection into the Oakover aquifer.

The Principal Hydrogeologist has indicated that the distribution of the groundwater monitoring bore network in the Oakover aquifer should be initially adequate to assess the hydrological effects of the proposed increase in the reinjection rate of mine dewatering discharge into the aquifer.

However, it should be noted that the hydrological influence of the artificial recharge scheme in the Oakover aquifer is likely to progressively expand over time. It is recommended that installation of additional monitoring bores may be required in the aquifer to adequately assess how the area of influence of the recharge scheme will alter over time. However, determination of the area of influence for the artificial scheme in the aquifer may be difficult. This is due to the overall chemical compositions of the recharge water and of the natural background brackish to saline groundwater are very similar.

To resolve this issue, the Licence Holder would have to consider periodic measurements of the stable isotopes of hydrogen and oxygen in mine dewater and in groundwater for inclusion in the monitoring program for the recharge scheme. The recommended methodologies for doing this are discussed below.

Recommended inclusion of stable isotope measurements in the water quality monitoring program

Water molecules are composed of oxygen and hydrogen atoms that both have two stable isotopes that are relatively common in natural systems: ^{16}O and ^{18}O; and ^{1}H and ^{2}H, respectively. The relative proportions of these isotopes in a particular surface water or groundwater body depend on the degree to which water molecules are exchanged between liquid and vapour phases.

When a water body is subjected to a stress, such as intense evaporation of water at the land surface, or through the degassing of pumped groundwater, the vapour that is removed from the water is enriched in the lighter isotopes of oxygen and hydrogen. The residual liquid water then becomes enriched in the heavier isotopes of these elements. Therefore, the measurement of the isotopic composition of oxygen and hydrogen in a water sample can give an indication of the processes that the water has been subjected to, and can be used to "fingerprint" water from different sources that otherwise have similar chemical compositions.

The extent to which the isotopic composition of a water sample deviates from a standard composition is usually measured by the parameters $\delta^{2}H$ and $\delta^{18}O$, which are expressed in the units of per mille (‰).

Provided that there is a sufficiently strong contrast between the isotopic composition of the reinjected dewatering effluent and the natural background composition of the groundwater in the Oakover aquifer, the mixing ratio between the two water composition end members can be defined by the following equation (Negev *et al*., 2017):

$$MR(\%) = \frac{\delta - \delta_{NW}}{\delta_{eff} - \delta_{NW}} * 100$$

Where: δ = the measured δ^2H or $\delta^{18}O$ in each sampled bore;

δ_{NW} = the measured δ^2H or $\delta^{18}O$ in the aquifer that has been unaffected by the recharge (*i.e.*, from a background monitoring bore); and

δ_{eff} = the measured δ^2H or $\delta^{18}O$ of the dewatering effluent.

Recommended sampling program

The methodology that is described above will only be effective at Christmas Creek if there is a sufficiently large contrast between the stable isotopic signature of the mine dewatering effluent and the natural background groundwater near the recharge area. Consequently, this would need to be assessed first before the licence for the scheme is amended to require this testing to be undertaken on an ongoing basis as part of the monitoring program for the recharge scheme.

However, if this preliminary testing were to indicate that the stable isotopic signature of the dewatering effluent can be clearly distinguished from natural background groundwater, it is recommended that stable isotope measurements are made in all monitoring bores on a three-yearly basis. Values of the mixing ratios for ^2H and ^{18}O should then be plotted as a function of distance from the reinjection bores to determine the area of influence of the artificial recharge scheme.

This is recommended to determine how the areal extent of influence of the recharge scheme would change over time, and to assess whether the expansion of this area would pose a threat to environmental receptors

Note 1: Negev, I., Guttman, J. and Kloppmann, W., 2017. The use of stable water isotopes as tracers in soil aquifer treatment (SAT) and in regional water systems. *Water*, **9**, 73. The paper is available from the following website: https://www.mdpi.com/2073-4441/9/2/73.

2.3.2 North West Region Advice (Water Licensing)

The department's North West Region initially provided advice on the proposal on 20 May 2025 in relation to the existing groundwater monitoring program. The Region's Principal Hydrogeologist advised that a detailed review of the proposal has been undertaken which included a review of the Part V application supporting documents, the updated FEFLOW groundwater model, 2024 Groundwater Operating Strategy (GWOS), and 2025 H3 Hydrogeological Assessment.

North West Region advised that the existing groundwater monitoring network at Christmas Creek was designed to support the operations under the current abstraction and injection limits. However, in light of the proposed increase in reinjection from 43 GL/a to 110 GL/a and abstraction from 50 GL/a to 110 GL/a, refinement and clarification on information from the Licence Holder is necessary to ensure the groundwater modelling, monitoring and management framework is robust, transparent and aligned with relevant guidelines and policies.

In regard to the Appendix 1: Assessment of Groundwater Mounding and Water Quality provided as part of the licence amendment application (APP-0026542), the North West Region found that the rationale for the regulatory driver behind the delineation of monitoring zones and associated bores is unclear. As outlined in the EPA Service Advice (A2168775), the Ministerial Statement 1033 and its associated management plans are not considered sufficient to manage/monitor groundwater impacts at Christmas Creek.

While the RWIW Act regulates the take of groundwater it provides no authority to regulate impacts arising from reinjection, such as groundwater mounding.

Although mounding triggers are included in the GWOS and are useful from a groundwater management perspective, the RIWI Act does not provide the regulatory basis for enforcement of these triggers in the context of injection-related impacts.

Accordingly, the management framework, including associated monitoring bores that are used to assess and manage the impacts of reinjection activities at Christmas Creek – including those associated with mounding, water quality changes and pressure build-up – are expected to be regulated under Part V of the *Environmental Protection Act 1986* (in line with EPA Report 1567). This will ensure appropriate oversight, enforceability of conditions and alignment with the environmental protection objectives of the broader regulatory framework.

With respect to the 5C licence application for increase in groundwater abstraction, DWER's North West Region sought additional information from the Licence Holder to clarify some of the above matters. A summary of related matters is outlined below:

- Clarification regarding salinity migration predictions (solute transport modelling outputs have not been provided).
- Clarification on how water quality triggers were derived and justified.
- Clarification of rationale behind some mounding and drawdown trigger values.
- The need to update GWOS and attachments, ensuring trigger values and monitoring bore coverage reflect the latest groundwater model predictions, current operational conditions and most recent information on receptors susceptibility.

In consideration of the responses from the Licence Holder (to the above request for information), DWER's North West Region provided additional advice on 15 October 2025 as outlined below.

Updated groundwater model

The updated Christmas Creek groundwater model generally reproduces regional behaviour, especially along the Fortescue Marsh fringe where receptors are most sensitive. Calibration performance is consistent with a Class-2 impact model, and the prediction framework provides a reasonable basis for assessing drawdown and mounding against the established triggers and thresholds. It remains a regional tool, so continued monitoring against triggers and periodic re-calibration are important to keep uncertainty bounded as operations and climate vary.

The model's predictions are contingent on the suitability of the trigger/threshold set used to interpret them; the model is generally sound, but the department should be satisfied that triggers are appropriate and their rationale clearly documented. With that in place, the model is a suitable tool to inform impact assessment and ongoing water management over the water licensing period.

H3 Hydrogeological assessment

The updated H3 is broadly fit for purpose as an impact-assessment tool. It consolidates a long operational record, calibrated model to 2023 and present results of model predictions - Base Case plus sensible sensitivities.

Predicted responses by zone (A–D) sit within current trigger headroom in the Base Case; the few exceedances occur in wet/dry or boundary stress-tests and are presented by Fortescue as short-lived or conservative.

Pools (Moori, Kulbee) are treated as surface-water features with low groundwater-driven risk; pastoral drawdown is modest and stated as managed operationally; boundary deep heads remain within surveillance limits with effects mainly operational.

GWOS – Groundwater Operating Strategy and Part V licence

For Part V, as discussed as part of previous advice, it is recommended that the key elements currently described in the H3 and GWOS related to groundwater injection and mounding are considered in the Part V assessment/licence so they are managed under that instrument.

2.4 Part IV of the EP Act

The Christmas Creek Iron Ore Mine Expansion was approved on 08 August 2016 by MS 1033, which authorised the expansion of the existing mining footprint, permanent waste landforms, tailings disposal, conveyors, roads, drainage and other associated mine infrastructure.

The Environmental Protection Authority (EPA) identified in its Report No: 1567 the following factors as the key environmental factors during its assessment of the proposal and set the conditions relevant to this assessment:

- **Hydrological Processes / Inland Waters Environmental Quality** – potential impacts from drawdown and mounding of groundwater, potential changes in surface flow regimes and potential changes in water quality;
- **Flora and Vegetation** – direct impacts from the clearing of flora and vegetation and indirect impacts on vegetation from groundwater drawdown and mounding, and changes to surface water flows;
- **Subterranean Fauna** – potential impacts from loss of habitat due to dewatering and excavation of mine pits;
- **Rehabilitation and Decommissioning (Integrating Factor)** – potential long-term impacts to vegetation and fauna habitat if rehabilitation is unsuccessful, and potential long-term impacts to aquifer water quality once dewatering and injection ceases; and
- **Offsets (Integrating Factor)** – to counterbalance the significant residual impacts to native in 'Good to Excellent' condition, including habitat for conservation significant fauna species; and vegetation in the proposed Fortescue Marsh Conservation Reserve and Fortescue Marsh management zone 1a.

The licence holder advised that potential impacts to conservation significant flora species and fauna species, and vegetation are regulated under MS 1033 including the implementation of several environmental management plans to further mitigate against potential impacts.

2.5 Rights in Water and Irrigation Act 1914 (RIWI Act)

The licence holder currently has approval to abstract up to 50 GL/annum at the Christmas Creek Mine Site through licence to take water GWL167593(7), under the *Rights in Water and Irrigation Act 1914* (RIWI Act). The licence holder has submitted a request for an increase in groundwater abstraction to 110 GL/annum managed under s5C of the RIWI Act.

While the RIWI Act regulates the take of groundwater it provides no authority to regulate impacts arising from reinjection, such as groundwater mounding.

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk assessments* (DWER 2020).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this Amendment Report are detailed in Table 2. Table 2 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 2: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Construction of the LEDER Plant, extension to the CCGIPP and use of RO water for dust suppression (Category 44)			
Dust	Construction of the LEDER Plant and the additional infrastructure to extend the CCGIPP Operation of the LEDER Plant.	Air/ windborne	Use of water sprays and /or water trucks (as required). Application of dust suppression agents in high-traffic areas. Applicant will enforce speed limits in works areas to reduce dust generation during construction and operation of the LEDER Plant. Engineering controls on emissions from the LEDER pilot plant are focused on potential dust emissions during the ore preparation and reduction process (where iron ore is input) and controls incorporated in the design to mitigate the impacts are required. These may include but not limited to water sprays, foggers, and dust collection systems. In addition to the management plan, any dust emissions from the crushing and screening activity will be managed in accordance with the Mobile Crushing and Screening Environmental Management Procedure.
Contaminated stormwater	Construction of the LEDER Plant and the additional infrastructure to extend the CCGIPP. Operation of the LEDER Plant.	Direct discharge to land.	Stormwater sumps and drains will be constructed as necessary within the footprint of the LEDER Pilot Plant to enable the sufficient containment of stormwater (and prevent discharge to the environment), following the existing practices for site stormwater management. Stormwater drainage controls around the LEDER pilot plant and its associated infrastructure will include but not limited to: • Use of hardstands; • Bunding; and • Windrows to divert and segregate stormwater within and externally to the plant. LEDER Emergency Storage Tank will be constructed as a contingency in the unlikely event of a pipeline failure and / or malfunction of the LEDER Pilot Plant. No sources of potential contamination of stormwater outside of what currently exists at site processing facilities (i.e. elemental composition unchanged) are expected to be present, and as

Emission	Sources	Potential pathways	Proposed controls
			such, similar management practices will be deployed in accordance with the SWMP. During construction and operation of the LEDER Pilot Plant the following controls will be in place: • Minimise the disruption of the natural surface water flow by avoiding excessive ponding against structures. • Protect natural drainage lines. • Contain and appropriately manage contaminated stormwater prior to release to the environment; and Keep clean and potentially contaminated stormwater separate.
Saline water	Operation of the Elvis Turkey's Nest for dust suppression. RO reject pipeline from the CCGIPP to the Elvis TN Pipeline from the Elvis TN to the CCGIPP	Direct discharge to land.	Existing requirements for Elvis Turkey's Nest: • HDPE Liner • Minimum vertical freeboard of 200mm Additional infrastructure: • RO reject pipeline from the CCGIPP to Elvis TN; and • Raw water pipeline from the Elvis TN to the CCGIPP. Visual daily inspection of saline water infrastructure.
Chemical and hydrocarbon spills and leaks	Operation of the LEDER Plant	Direct discharge to land through infiltration to soil to groundwater.	Chemicals and hydrocarbons used will be managed under the Chemical and Hydrocarbon Management Plan and Chemical and Hydrocarbon Storage Procedure. Any chemical or hydrocarbon spills that arise from the proposed activities will be managed in accordance with the measures identified in the Environmental Spills Procedure. Chemical wastes and solids waste generated from the LEDER process will be stored in suitably sealed tanks and trucked off site for disposal by an appropriately licensed chemical disposal facility. Solid wastes generated from the facility will be appropriately contained, stored and disposed of in line with the existing requirements of the licence. LEDER Emergency Storage Tank will be constructed as a contingency in the unlikely event of a pipeline failure and / or malfunction of the LEDER Pilot Plant.

Emission	Sources	Potential pathways	Proposed controls
Tailings	Operation of the LEDER Plant		Stored in suitable storage tanks (IBCs) on-site before being periodically removed off-site for further evaluation and subsequent disposal.
Increase in groundwater reinjection limit (Category 6)			
Increased production capacity of 110 GL/a for the injection of mine dewater to the environment (Oakover Formation, the target aquifer for injection) via injection bores	Mine dewater (saline)	Direct injection of mine dewater via injection bores	The Existing controls apply under the following conditions of the Licence L8454/2010/2: • Condition 14 (point source emissions to groundwater); • Condition 22 (monitoring of point source emissions to groundwater); and • Condition 25 (ambient groundwater quality monitoring). **Christmas Creek Groundwater Operation Strategy 2025:** Potential impacts to groundwater dependent vegetation through changes in shallow groundwater level and groundwater quality change are managed by a trigger limit system. Potential impacts to Samphire and Mulga vegetation through changes in shallow groundwater level (mounding) and groundwater quality change are currently managed by a trigger limits system. Monitoring: Fortescue undertakes regular monitoring of operational dewatering and injection areas. Monitoring includes flow rates, water levels, pressures and salinity. All bores shown on Figure 4. Flow meter inspected. Flow meters and pressure gauges are located at key location on transfer pipelines and storage ponds, to allow Fortescue to undertake water balance calculations and checks. The location of these vary. They are installed in accordance with DoW Guidelines, Water Meter Installation (DoW, 2009a). Leak detection – visual inspections. Comparison meter readings. Fortescue undertake regular aquifer monitoring to assess the impact of the dewatering and injection on the groundwater system, pastoral abstraction and vegetation communities. Aquifer monitoring is undertaken via the collection and interpretation of appropriate water level, EC (salinity) and water chemistry data.

Emission	Sources	Potential pathways	Proposed controls
			Management zones: Zone A Near-Marsh: Extends from the northern fringe of Fortescue Marsh and extends 500m to the north. This buffer zone captures the limit of Samphire vegetation. Management objectives for Zone A: • No adverse impact to the Samphire vegetation community due to groundwater mounding at the water table. • Ensure pressurisation and depressurisation of Oakover aquifer is managed so as not to impact water table conditions and associated impact to vegetation communities. Zone B Saline reinjection: includes the saline injection area and the saline injection region of influence. This area is defines predominantly by the presence of Mulga vegetation and extends northwards from Zone A towards the mining area. The primary objective of groundwater monitoring in this zone is to ensure injection of saline water in the Oakover Formation does not cause mounding of the shallow aquifer which may impact Mulga and other groundwater sensitive vegetation. Management objectives for Zone B: • No adverse impact to vegetation community or Mulga and associated Acacia vegetation communities due to groundwater mounding at the water table. • Ensure pressurisation and depressurisation of Oakover aquifer is managed so as not to impact water table conditions and associated impact to vegetation communities. Zone C Brackish reinjection: Includes the brackish injection or supply area and the surrounding region of influence. This zone is within areas of future mining areas and is defined by the current area of influence from brackish injection and abstraction. Mulga vegetation is predominant through this zone. This zone is temporary and will change as mining and associated activities progress. The objective of groundwater monitoring in this zone is to ensure that brackish injection/abstraction does not adversely impact groundwater dependent vegetation prior to mining taking place and to ensure equality and levels are not significantly deteriorated prior to future dewatering activities. Management objectives for Zone C: • No adverse impact to vegetation community or Mulga and associated Acacia vegetation communities due to groundwater mounding at the water table.

Emission	Sources	Potential pathways	Proposed controls
			Zone D Phreatophytic: is comprised of several locations along creek lines. Most of these locations are within the future mining area and within the Part IV clearing boundary. Two locations are located outside of the Part IV clearing boundary (Figure 4). The objective of groundwater monitoring in this zone is to ensure groundwater level and quality change does not adversely impact on and *E. victrix* along creek lines. Management objectives for Zone D: • Zones within the area of approved clearing: monitor groundwater levels and salinity and provision of data in alignment with the Christmas Creek Vegetation Monitoring and Management Plan. • Zones outside he area of approval clearing: monitor groundwater levels and salinity to ensure dewatering operations does not create excessive drawdown over and above that which will be tolerable to vegetation types which access groundwater via their root systems. Mining Zone: defined by the remainder of the site not covered by the above management zones. Extends northwards from Zone B and is bounded to the west by the brackish injection/supply area (Zone C). Objective for this area is to ensure that operational facilities and inactive mine pits do not adversely impact groundwater level, quality and chemistry that limits future dewatering/injection or generate sources of potential contamination. **Trigger levels and contingency programs:** Fortescue has developed a trigger levels framework for the site that takes into consideration the spatial extent of the project and operations, environmental receptors and future beneficial water use. A summary of the framework is presented in Table 3. The distribution of trigger monitoring bores is presented in Figure 4 in this report (and Appendix H in the GWOS). It should be noted that, Appendix H includes bores that do not have trigger levels assigned as they are monitored for other regulatory approvals. Monitoring in the Mining Zone is mostly for operational monitoring; hence most bores have not been assigned impact environmental trigger values. **Class I** trigger levels are an internal early warning for potential unexpected groundwater level, water quality and water chemist changes which may required operational changes. **Class II** trigger levels are aligned with unexpected groundwater level changes that may potentially impact upon the environment and future beneficial use of the aquifer which required operational

Emission	Sources	Potential pathways	Proposed controls
			changes. Class II triggers are required to be externally reported. **Trigger Level Response:** **Class I trigger level is exceeded:** Initiate a hydrogeological assessment with the objective of determining the reason(s) for the divergence and if necessary, increase monitoring frequency or extent; if necessary, implement changes to the water management system. This includes but not limited to: • Implement alternative water management methodology; • Adjust abstraction volume and/or injection volumes in impacted area; • Adjust volumes of water piped to the affected area by redirecting water to other injection areas; • Redirect disposal to void mine pits (where available); • Explore improvements in the trigger levels based on new data; and • Report exceedance as part of the aquifer review process. **Class II trigger levels is exceeded:** Initiate a hydrogeological assessment with objective of determining the reason(s) for the trigger level breach; Modify operational activities to ensure that groundwater level and/or salinity changes do not continue to breach the trigger value. This includes but not limited to; • Adjust abstraction volumes and/or injection volumes in impacted aeras; • Adjust volumes of water piped to the affected area by redirecting water to other injection areas; • Redirect water from the appropriate transfer pond and other injection areas where drawdown exceeds the trigger in the phreatophytic areas (Zone D); • Redirect disposal to void mine pits (where available); and • Implement the Dewatering Discharge Contingency Procedure allowing the discharge of up to 20,000 kL per day (FMG, 2014b).

Emission	Sources	Potential pathways	Proposed controls
			Trigger details: <u>Zone A:</u> Aquifer – Watertable – Class 2 threshold criteria are set at +- 1.5 m from Baseline values for CCFMM01_S and 1 m for other shall Zone A locations. Aquifer - Oakover Formation – Class 1 trigger criteria are set at 0.8 m from Baseline values. <u>Zone B:</u> Aquifer – Watertable – Class 2 threshold criteria are set at 2.2 mbgl and trigger values are set to 3 mbgl and align with L8454/2010/2. Aquifer – Oakover Formation – Class 1 trigger criteria set to 0.5 mbgl <u>Zone C:</u> Aquifer – Watertable – Class 2 threshold criteria are set at 2.2 mbgl and trigger values are set to 3 mbgl and align with L8454/2010/2. Aquifer – Marra Manba Formation – Class I trigger criteria are set to 3 mbgl. <u>Zone D:</u> Aquifer – Watertable – Class 2 threshold criteria are set to 20 mbgl for bores outside of approved clearing area. Class I trigger criteria are set to 18 mbgl for all Zone D bores (Plate 19). The Licence Hodler has indicated that Zone A bores are key to meeting management objectives at Christmas Creek as they are the closest monitoring bores to the Fortescue Marsh. The bores at these locations have shown some exceedance of their Class I early warning trigger values and declining trends. All other zones have rarely shown Class I early warning exceedances over the dataset.

Table 3: Trigger and Threshold Criteria (GWOS, 2025)

Groundwater Management Area	Monitoring Area	Aquifer	Groundwater level trigger		Groundwater Quality (salinity) trigger	Groundwater Chemistry trigger	Trigger Basis
			Trigger Criteria	Threshold Criteria	Trigger Criteria	Trigger Criteria	
Mining Zone	Tailings	Multiple	N/A	N/A	N/A	Site Specific Trigger values for key parameters have been defined as part of the Life of Mine Geochemistry Programme (FMG 2015c).	• Class 1 groundwater chemistry trigger to provide early warning of potential change.
	Landfill	Multiple	N/A	N/A	N/A		• Class 1 groundwater chemistry trigger to provide early warning of potential change.
	AMD	Multiple	N/A	N/A	N/A		• Class 1 groundwater chemistry trigger to provide early warning of potential change.
	Inactive Pits	Marra Mamba Formation	>410mAHD	N/A	95,000 µS/cm		• Class 1 groundwater level trigger to prevent rebound above pre-mining groundwater levels. Baseline water levels in the Marra Mamba Formation are approximately 410 mAHD across the ore body at Christmas Creek. • Class 1 EC trigger assigned to ensure water is of suitable quality for future disposal via saline injection infrastructure (95,000 µS/cm equates to average observed Oakover Formation salinity) and to prevent contamination to the aquifer through evapotranspiration potentials. Monitoring will be located at the surface of the water body). Salinity trigger for each pit will be revised as the water develops in that specific pit.
Zone A	Near-marsh	Watertable	Change of ±0.65 m (±1.0 m at CCFMM01_S) with regard for climatic trends and seasonal variation.	Change of ±1 m (±1.5 m at CCFMM01_S) with regard for climatic trends and seasonal variation.	If baseline is greater than 9,000 µS/cm then no trigger level applies. If baseline is greater than 6,000 µS/cm but less than 9,000 µS/cm, then trigger is set at 50% above baseline. If baseline is less than 6,000 µS/cm, then trigger is set at 9,000 µS/cm.	Site Specific Trigger values for key parameters have been defined as part of the Life of Mine Geochemistry Programme (FMG 2015c).	• Class 1 groundwater level trigger to provide early warning and to signal potential future Class 2 conditions. • Class 2 groundwater level trigger to minimise risk to vegetation.
		Oakover Formation	Change of ±0.8 m from the observed maximum and minimum piezometric heads	N/A			• Class 1 groundwater level trigger to provide early warning against over pressurisation[3] of the deep aquifer due to saline injection and excessive drawdown due to abstraction.
Zone B	Saline injection	Watertable	Increase to within 3 m below ground level	Increase to within 2.2 m below ground surface			• Class 1 groundwater level trigger to provide early warning and to signal potential future Class 2 conditions. • Class 2 groundwater level trigger to minimise risk to vegetation.
		Oakover Formation	Increase in the monitoring bore to within 0.5 m below ground level [7]	N/A			
Zone C	Brackish injection	Watertable	Increase to within 3 m below ground level	Increase to within 2.2 m below ground surface			• Class 1 groundwater level trigger to provide early warning and to signal potential future Class 2 conditions. • Class 2 groundwater level trigger to minimise risk to vegetation. • Class 1 EC trigger assigned to ensure baseline aquifer water quality is maintained.
		Marra Mamba Formation	Increase to within 3 m below ground level	N/A			
		Bulk Flow	N/A	N/A	9,000 µS/cm		
Zone D	Phreatophytic	Watertable	Decrease to 18 m below ground level	Decrease to 20 m below ground level (only applicable to outside the area of approved clearing)	If baseline is greater than 9,000 µS/cm then no trigger level applies. If baseline is greater than 6,000 µS/cm but less than 9,000 µS/cm, then trigger is set at 50% above baseline. If baseline is less than 6,000 µS/cm, then trigger is set at 9,000 µS/cm.		• Class 1 groundwater level trigger to provide early warning and to signal potential future Class 2 conditions. • Class 2 groundwater level trigger only in zone which is outside Part IV clearing boundary. • Groundwater level where phreatophytic vegetation may be susceptible to drawdown of the groundwater level of more than 20m below the ground surface. Ecoscape's impact assessment for dewatering (Ecoscape, 2009). • Class 1 E.C. trigger assigned to ensure baseline aquifer water quality is maintained.

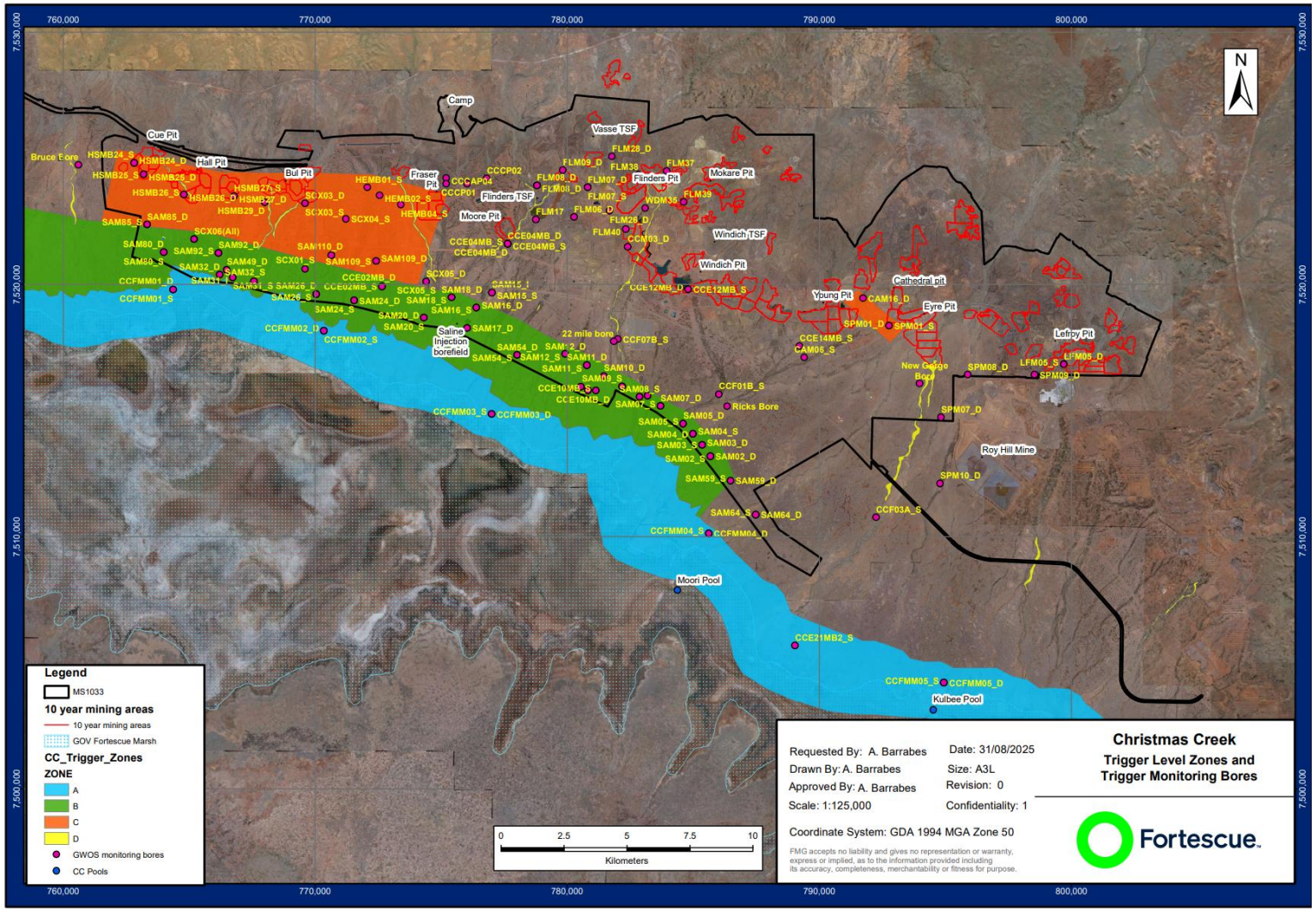

Figure 4: Cristmas Creek Trigger Level Zones and Monitoring Bores

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3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder's from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 4 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental siting* (DWER 2020)).

Table 4: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	**Distance from prescribed activity**
Townsites and Homesteads	Nullagine is the nearest town, located over 60 km away from the prescribed premise boundary. Roy Hill Station is located 30 km away. Marillana Homestead is located more than 40 km away. These potential receptors have been screened out from the assessment given the distance is considered sufficient to avoid impacts from emissions and discharges from the premises.
Environmental receptors	**Distance from prescribed activity**
Fortescue Marsh	Fortescue Marsh intersects the premises southern boundary and is about 1 km from the nearest proposed injection bore (e.g. proposed bores SAI45-47). Fortescue Marsh is a nationally important and the largest ephemeral wetland in the Pilbara region, a Priority Ecological Community, and is listed on the Directory of Important Wetlands of Australia as a wetland of national significance.
Flora and Vegetation	There is no Threatened flora species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or Declared Rare Flora (DRF) listed under the Biodiversity Conservation Act 2016 (BC Act) recorded within the premises boundary. Groundwater sensitive vegetation within or near the premises includes Mulga, Samphire and Coolibah / River Red Gum.
Livestock bores	Three livestock bores are located within the premises boundary, 22 Mile Bore, Rick's Bore and Gorge Bore. A fourth bore is over 3 km outside of the premises.
Surface water	Numerous surface water lines are present throughout the mine dewater injection area (DWER Geocortex). Premises is located within the Pilbara Surface Water Area proclaimed under *Rights in Water and Irrigation Act 1914* (RiWI Act).
Pools	Two pools exist in the Christmas Creek mine area – Moorimoordinina (Moori) and Ngawarmkuranha (Kulbee). These pools are seasonal.
Groundwater	Premises is located within the Pilbara Groundwater Area proclaimed under RiWI Act. Groundwater is considered marginal to brackish with a total dissolved solids (TDS) concentration ranging from 500 to 6,000 mg/L within the shallow aquifer

	zones of the Marra Mamba Formation. Saline to hypersaline (6,000 – 150,000 mg/L) groundwater is encountered further south within the premises and at greater depth. The aquifer within the Oakover Formation, which overlies the MMF to the south of the resource area, is entirely of saline quality (monitored up to 150,000 mg/L). Groundwater in the project area is generally brackish (>1,000 mg/L TDS) and becomes increasingly saline towards the Fortescue Marsh and with depth (>100,000 mg/L TDS). The Premises sits over three main connected aquifers, the fresh brackish Tertiary Detritals, brackish Marra Mamba formation and the hypersaline Oakover formation. The Oakover Formation is approximately 20 m thick and is confined to semi-confined by overlying clays and silts. Current injection at Christmas Creek has confirmed hydraulic disconnection between the Oakover Formation and overlying watertable.
Fauna	Significant fauna identified as potentially occurring within the premises are the Northern Quoll, Night Parrot and Greater Bilby, Pilbara Leaf nosed Bat and Pilbara Olive Python. These receptors have been screened out as the proposed amendment is not expected to alter the risks to fauna species outside that addressed within MS 1033. Subterranean Fauna: A total of 69 stygofauna and 29 troglofauna species have been recorded in the Christmas Creek Survey Area.
Native vegetation	There is native vegetation in the vicinity of the proposed activities. Priority 1 flora (conservation status under the *Biodiversity Conservation Act 2016*) is mapped within the prescribed premises boundary. Native vegetation identified throughout the proposed new injection bores is pre-European vegetation with sparse low woodland; mulga, discontinuous in scattered groups. Priority 1 flora surveyed: *Calotis squamigera* and *Eremophila spongiocarpa*. Priority 4 flora surveyed: *Eremophila youngii subsp. lepidota*

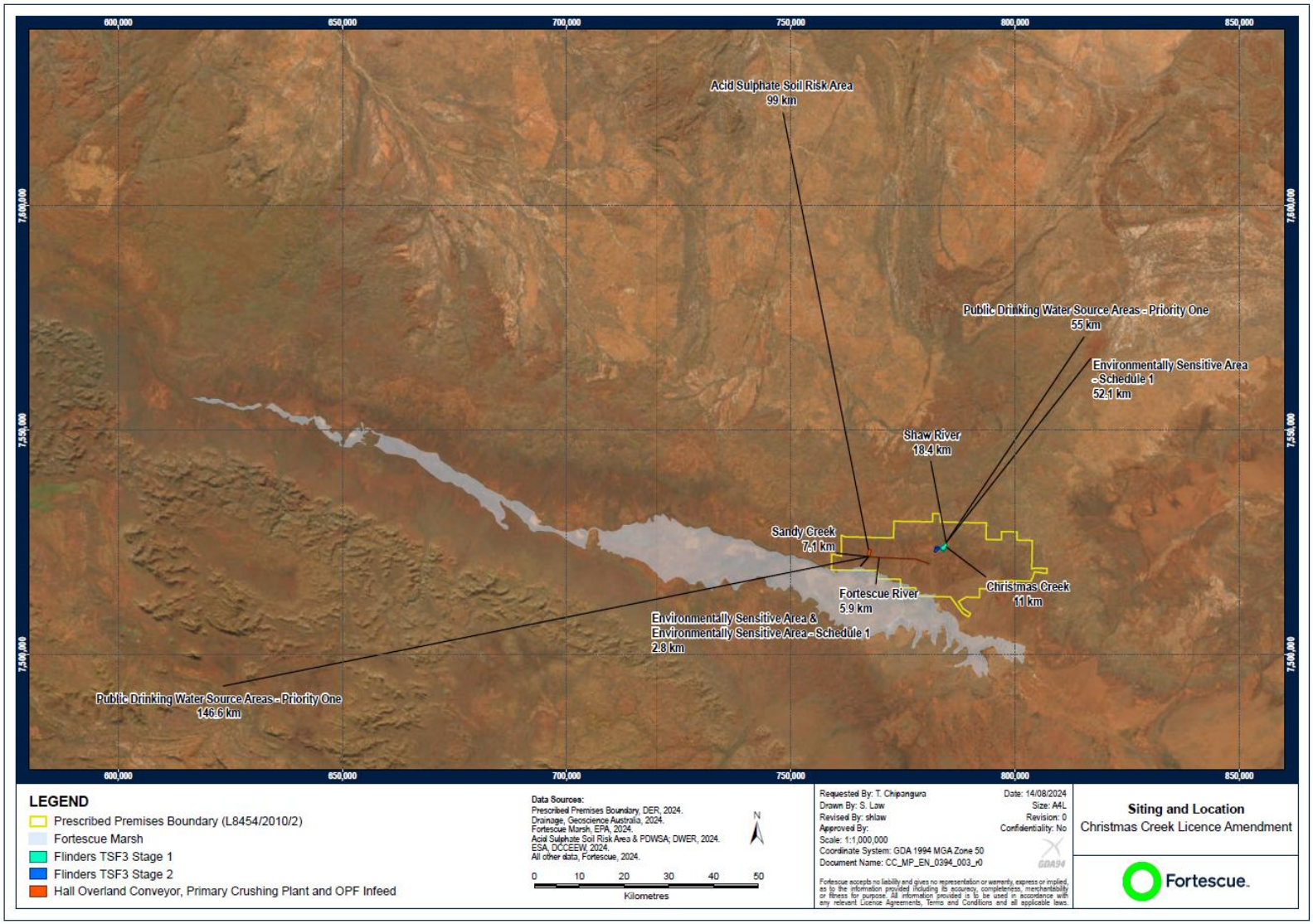

Figure 5: Distance to sensitive receptors

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3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the Licence Holder has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Licence Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 5.

The Revised Licence L8454/2010/2 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 5. Risk assessment of potential emissions and discharges from the Premises during construction, commissioning and operation

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Construction								
Construction of the LEDER Plant (Category 44)								
Construction of new infrastructure – pipelines etc.	Dust	Pathway: Air/windborne pathway **Impact:** Potential impact to vegetation health and native fauna health	Nearby native vegetation	Use of water sprays and /or water trucks (as required) Application of dust suppression agents in high-traffic areas. Applicant will enforce speed limits in works areas to reduce dust generation during construction and operation of the LEDER Plant.	C = Slight L = Possible **Low Risk**	*Y*	Condition 10, Table 7 - Design and Construction requirements	The licence holder's proposed controls for dust management have been included in Condition 10, Table 7 for the LEDER Plant. No additional conditions imposed as risk to any nearby receptors is low and the Dust Management Plan (IO-PL-EN-001) will be implemented. Vegetation Health and Monitoring Management Plan (CC-PL-EN-0017)
Construction of the LEDER Pilot Plant Construction of LEDER Emergency storage tanks	Contaminated stormwater	**Pathway:** Direct discharge to land **Impact:** Possible contamination to soil and surface water, and sedimentation buildup	Nearby native vegetation. Surface water, nearby drainage line.	Stormwater sumps and drains will be constructed as necessary within the footprint of the LEDER Pilot Plant to enable the sufficient containment of stormwater (and prevent discharge to the environment), following the existing practices for site stormwater management. LEDER Emergency Storage Tank will be constructed as a contingency in the unlikely event of a pipeline failure and / or malfunction of the LEDER Pilot Plant.	C = Slight L = Possible **Low Risk**	Y	Condition 10, Table 7 - Design and Construction requirements	The licence holders proposed controls for the construction of the LEDER emergency tank and LEDER tailings storage have been included in Condition 10, Table 7. No additional conditions imposed as risk to any nearby receptors is low and the Surface Water Management Plan (IO-PL-EN-0005 will be implemented. Environmental Spills Procedure (IO-PR-EN-00003). Standard construction requirements for pipelines have been included in Condition 10, Table 7.
Operation								
Operation of the LEDER Plant and extension to the CCGIPP (Category 44)								
Operation of Elvis Turkey's Nest for storage of saline water for CCGIPP and use of RO reject water for dust suppression	Saline water	**Pathway:** Direct discharge to land. **Impact:** Potential impact to vegetation health and surface water quality to nearby drainage line from contaminated stormwater.	Nearby native vegetation. Surface water, nearby drainage line.	Existing requirements for Elvis Turkey's Nest: • HDPE Liner • Minimum vertical freeboard of 200mm Existing licence conditions: The Elvis TN has a capacity of 6,381m^3, it is currently HDPE lined and has a 200mm freeboard as per the licence conditions. Undiluted RO reject stream will not be used for dust suppression and / or ore processing, as per the existing licence conditions. And existing Condition 5 requires that the licence holder must undertake visual inspections, daily of saline water infrastructure.	C = Minor L = Unlikely **Medium Risk**	N	Condition 3 – Pipeline requirements Condition 4, Table 3 – Containment Infrastructure Condition 7, Table 5 – Undiluted RO reject stream will not be used for irrigation **Condition 13 – dust suppression and native vegetation** **Condition 24, Table 15 – Monitoring of Emissions to land**	The licence holder currently uses the Elvis Turkey's Nest to store brackish-saline water from around the site (approximately 30-40 L/s), the licence holder is proposing to also store RO reject water (approximately 2-3L/s inputs). The Elvis TN will then supply the CCGIPP that has an increased water supply of approximately 5-8 L/s (146 Megalitres/annum) and use approximately 30 L/s for dust suppression around the site. The water quality from the Elvis Turkey's Nest currently is approximately 17,500 mg/L for TDS and the indicative CCGIPP RO Reject Water quality will be approximately 47,535mg/L for TDS. The expected TDS from the Elvis TN after dilution will be approximately 19,595 mg/L. The licence holder is expecting that the water inflow from the site to the Elvis TN outweigh the RO reject return flow by a factor of 10:1 to 20:1. The delegated officer has considered the existing licence conditions and licence holder's controls to manage the saline water in the Elvis Turkey's Nest and for that water to be used for the CCGIPP and for dust suppression around the site. Condition 13 has been included on the licence to ensure that any water used for dust suppression does not cause damage to native vegetation. Condition 23 has been updated to include Emission Point L5 RO brine discharge to the Elvis TN to monitor the potential emissions to land.
RO reject pipeline from the CCGIPP to the Elvis TN Raw water pipeline from the Elvis TN to the CCGIPP	Saline water	**Pathway:** Direct discharge to land. **Impact:** Potential impact to vegetation health and surface water quality to nearby drainage line from contaminated stormwater.	Nearby native vegetation. Surface water, nearby drainage line	Additional infrastructure: • RO reject pipeline from the CCGIPP to Elvis TN • Raw water pipeline from the Elvis TN to the CCGIPP. Existing licence conditions: Condition 5 requires that the licence holder must undertake visual inspections, daily of saline water	C = Minor L = Unlikely **Medium Risk**	Y	Condition 3 – Pipeline requirements Condition 5, Table 4 – Inspection of infrastructure	The delegated officer has considered the potential impacts from the new pipelines to transport hypersaline water from the RO reject water plant to the turkey's nest for reuse. Pipelines from the RO Reject Water would be considered hypersaline and need to be managed under Condition 3 and Condition 5.

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
				infrastructure.				
Operation of LEDER plant	Dust	**Pathway:** Air/windborne pathway **Impact:** Potential impact to vegetation health	Nearby native vegetation	Engineering controls on emissions from the LEDER pilot plant are focused on potential dust emissions during the ore preparation and reduction process (where iron ore is input) and controls incorporated in the design to mitigate the impacts are required. These may include but not limited to: • Water sprays, foggers, and dust collection systems. In addition to the management plan, any dust emissions from the crushing and screening activity will be managed in accordance with the Mobile Crushing and Screening Environmental Management Procedure.	C = Slight L = Possible **Low Risk**	Y	Condition 2, Table 2 – Infrastructure and equipment requirements	The delegated officer has considered the potential impacts from dust emissions from the operation of the LEDER plant as acceptable and has included the licence holder's proposed controls on the licence in Condition 2, Table 2.
Operation of LEDER plant	Chemical and hydrocarbon spills and leaks	**Pathway:** Direct discharge to land infiltration through soil to groundwater. **Impact:** Potentially contaminating soil, surface water (nearby drainage line) and groundwater.	Soil Groundwater Surface water, nearby drainage line.	Chemicals and hydrocarbons used will be managed under the Chemical and Hydrocarbon Management Plan and Chemical and Hydrocarbon Storage Procedure. Any chemical or hydrocarbon spills that arise from the proposed activities will be managed in accordance with the measures identified in the Environmental Spills Procedure. Chemical wastes and solids waste generated from the LEDER process will be stored in suitably sealed tanks and trucked off site for disposal by an appropriately licensed chemical disposal facility. Solid wastes generated from the facility will be appropriately contained, stored and disposed of in line with the existing requirements of the licence. LEDER Emergency Storage Tank will be constructed as a contingency in the unlikely event of a pipeline failure and / or malfunction of the LEDER Pilot Plant.	C = Slight L = Possible **Low Risk**	Y	Condition 4, Table 3 – Containment infrastructure	The licence holder's proposed controls and existing licence conditions are sufficient in managing the potential impacts from chemical and hydrocarbons spills from the operation of the LEDER plant.
Operation of LEDER plant – Tailings storage	Tailings	**Pathway:** Direct discharge to land infiltration through soil to groundwater. **Impact:** Potentially contaminating soil, surface water (nearby drainage line) and groundwater.	Soil Groundwater Surface water, nearby drainage line.	Stored in suitable storage tanks (IBCs) on-site before being periodically removed off-site for further evaluation and subsequent disposal.	C = Slight L = Possible **Low Risk**	Y	Condition 4, Table 3 – Containment infrastructure	The licence holder's proposed controls have been included on the licence and are sufficient in managing the potential impacts from tailings storage from the operation of the LEDER plant.
Operation of LEDER plant	Contaminated stormwater	**Pathway:** Direct discharge to land **Impact:** Potential impact to vegetation health and surface water quality to nearby drainage line from contaminated stormwater.	Nearby native vegetation. Surface water, nearby drainage line	Stormwater sumps and drains will be constructed as necessary within the footprint of the LEDER Pilot Plant to enable the sufficient containment of stormwater (and prevent discharge to the environment), following the existing practices for site stormwater management. No sources of potential contamination of stormwater outside of what currently exists at site processing facilities (i.e. elemental composition unchanged) are expected to be present, and as such, similar management practices will be	C = Minor L = Unlikely **Medium Risk**	Y	Condition 2, Table 2 – Infrastructure and equipment requirements	The licence holder's proposed controls and existing licence conditions are sufficient in managing the potential impacts from contaminated stormwater from the operation of the LEDER plant.

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
				deployed in accordance with the SWMP. During construction and operation of the LEDER Pilot Plant the following controls will be in place: • Minimise the disruption of the natural surface water flow by avoiding excessive ponding against structures. • Protect natural drainage lines. • Contain and appropriately manage contaminated stormwater prior to release to the environment; and Keep clean and potentially contaminated stormwater separate. Stormwater drainage controls around the LEDER pilot plant and its associated infrastructure will include but not limited to: • Use of hardstands; • Bunding; and • Windrows to divert and segregate stormwater within and externally to the plant.				
Increase in groundwater reinjection limit (Category 6)								
Increased production capacity of 100 GL/pa for the injection of mine dewater to the environment (Oakover Formation, the target aquifer for injection) via injection bores	Mine dewater (saline)	**Pathway:** Direct injection of mine dewater via injection bores **Impact:** Potential impacts to nearby vegetation (health), and contamination of soils and surface water. Potential for groundwater mounding from pressurization of the deep Oakover aquifer resulting in vertical migration through the confining clay layer into the overlying shallow aquifer.	Surface water Soils Native vegetation – mulga, samphire and coolibah / river red gum within or near the premises	Existing controls apply under the following conditions of the Licence L8454/2010/2: • Condition 14 (point source emissions to groundwater); • Condition 21 (monitoring of point source emissions to groundwater); and • Condition 24 (ambient groundwater quality monitoring).	C = Moderate L = Possible **Medium Risk**	N	Existing conditions: Condition 4 –containment infrastructure operational requirements. Condition 5 – visual inspections of infrastructure. Condition 15 – point source emissions to groundwater. Condition 26 – ambient ground water monitoring for the mine dewater reinjection bores. **Condition 27, 28, 29, 30 and 31**	Licence holder has indicated that there are no changes required to the existing infrastructure and that the extensive studies conducted under MS 1033 determined that the proposed increase in groundwater abstraction and reinjection to 110 GL/a would not present a significant detrimental effect on the environment. The existing groundwater monitoring network is considered sufficient at this time, however will need to be reviewed in the future to ensure that the groundwater modelling, monitoring and management framework is robust, transparent and aligned with relevant guidelines and policies. The licence holder may be required to consider periodic measurements of the stable isotopes of hydrogen and oxygen in mine dewater and in groundwater for inclusion in the monitoring program for the recharge scheme. This is recommended to determine the how the extent of influence of the recharge scheme would change over time, and to assess whether the expansion of this area would pose a threat to environmental receptors. The licence holder has advised that they will continue to monitor water levels at the Fortescue Marsh in accordance with the Groundwater Operating Strategy (GWOS) to efficiently manage saline reinjection and maintain water levels to prevent any potential drawdown or mounding impacts. The delegated officer has considered the existing ministerial statement and GWOS and Fortescue's Hydrological Assessment 2025, and technical advice provided by the department's contaminated sites branch and North-West Licensing branch. It has been decided that the proposed controls relating to groundwater mounding as specified in the GWOS need to be included on this licence to monitor potential impacts from groundwater injection activities. Condition 27 to 31 require the Licence Holder to manage reinjection activities to mitigate impacts from groundwater mounding in accordance with the requirements outlined in the Christmas Creek Groundwater Operating Strategy (GWOS). Condition 28 requires the Licence Holder to implement the Trigger Levels and Contingency Program as outlined in the GWOS. Conditions 29 to 31 require certain investigation and reporting actions for the purposes for Part V of the EP Act in relation to trigger level exceedances (groundwater mounding).

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020).

Note 2: Proposed Licence Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

4. Consultation

Table 6 provides a summary of the consultation undertaken by the department.

Table 6: Consultation

Consultation method	Comments received	Department response
DMPE was advised of proposal relating to the increase of groundwater abstraction on 31 January 2025	Comments were provided on 21 March 2025, no comments were received in relation to this aspect of the amendment.	Not applicable.
Department of Energy and Economic Diversification (DEED) was advised of proposal relating to the increase of groundwater abstraction on 31 January 2025	No response was provided.	Not applicable
Licence holder was provided with draft amendment on 28 October 2025	The Licence Holder provided comments on 7 November 2025. After a discussion with the department the Licence Holder provided additional comments on 24 November 2025, see Appendix 1	See Appendix 1

5. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a Revised Licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

Table 7 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

Table 7: Summary of licence amendments

Condition no.	Proposed amendments
Cover page	Amended category 6 production capacity from 43,000,000 to 110,000,000 tonnes per annual period (reinjected).
Licence history	Inclusion of this licence amendment.
Condition 1, Table 1	Amended category 6 production capacity from 43,000,000 to 110,000,000 tonnes per annual period (reinjected).
Condition 2, Table 2	Infrastructure and equipment requirements updated to include LEDER Plant

Condition no.	Proposed amendments
Condition 4, Table 3	Containment infrastructure to include 'LEDER Emergency Storage Tanks'
Condition 7, Table 5	Management of Waste updated to include 'LEDER Pilot Plant output water'
Condition 10, Table 7	Design and infrastructure requirements updated to include pipelines and LEDER Plant.
Condition 13	New condition to manage treated water for dust suppression.
Condition 17, Table 11	Emission point reference L5 has been updated to include 'and green iron'. Emission point reference to L5 to include 'And/or: Stored and used as process water in the operation of the LEDER Pilot Plant'.
Condition 24, Table 15	Updated to include L5 monitoring of emissions to land
Condition 27-31	Management of groundwater mounding from reinjection activities in accordance with the Trigger and Threshold Criteria and Contingency. Additional reporting requirements also listed for the purposes of Part V of the EP Act.
Condition 28 and 29	These conditions have been included on the licence to specify the actions the licence holder must take in the event of a trigger level or limit being exceeded in condition 26
Conditions 32 - 39	Renumbering due to the additional conditions above.
Condition 39, Table 20	Notification requirements table was updated to include reference to conditions 30 and 31
Figure 19	A new Figure showing the extended Green Iron Pilot Plant and LEDER Pilot Plant has been include in Schedule 1 Maps
Figure 20	A new Figure showing the indicative layout of the proposed pipelines and arrangement from the Elvis TN to the CCGIPP
Figure 21-24	Numbering changes in line with the addition of a new Figure.
Schedule 4	Trigger and Threshold Criteria and Contingency included as attachment on licence.

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
4. Fortescue, 13 November 2024, Licence Amendment – Attachment 3B Supporting Document, Christmas Creek Mine Site, L8454/2010/2.
5. Fortescue, 6 November 2025, Christmas Creek Groundwater Operating Strategy, CC-PH-HY-0002, Rev: 8.
6. Fortescue, 26 August 2025, Christmas Creek Mine Area Hydrogeological Assessment, CC-0000-RP-WM-001, Rev 1.
7. Fortescue, 10 April 2025, Licence Amendment, L8454/2010/2 Attachment 3B Supporting Documentation, Christmas Creek Mine Site, CC-AE-EN-0009, Rev 0.
8. Fortescue, 24 November 2025, Proposed Amendments to Conditions 27 to 31 of the Draft Licence L8454/2010/2, ELP-391, UID-216789.

Appendix 1: Summary of Licence Holder's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder's comment	Department's response
Front page	Metal melting or refining is approved under Category 44 of the Licence for the assessed production / design capacity of 5,000 tonnes per annual period (output of 2,500 tonnes per annual period (output of 2,500 tonnes of pig iron). Therefore, to remove any ambiguity in the definition of 'pig iron', Fortescue requesting that the wording in the Licence be amended to remove the reference to 'pig iron' and replace it with 'green iron' ensuring alignment with the Project naming conventions. The minor amendment of the wording will not change the department's intended purpose and outcome. Instead this will provide better compliance outcomes by ensuring that the wording is accurate and suitable for its intended purpose. Requested change: 5,000 tonnes per annual period (output of 2,500 tonnes of ~~**pig**~~ **green** iron per annual period)	The department has amended the wording as requested.
Condition 1, Table 1	As above. 5,000 tonnes per annual period (output of 2,500 tonnes of ~~**pig**~~ **green** iron per annual period)	The department has amended the wording as requested.
Condition 2, Table 2	The operational requirement for processing up to 18,396,000 tonnes of iron-bearing ore over the 180 calendar days is a condition of the time limited operation (TLO) period. This condition is no longer necessary since this infrastructure is being transferred to the Licence. Therefore Fortescue requests that his operational requirement be removed from the Licence. Requested change: • ~~**No more than 18,396 tonnes of iron bearing ore processed over the 180 calendar days;**~~	The department has amended the wording as requested.
Condition 4, Table 3	Fortescue requests that the requirements that all tanks must be double-walled be removed from the Licence, as this is inconsistent with the wording on other Fortescue Ltd operational licences. Additionally, there are sufficient controls i.e. tanks must be installed on compacted soil or a concrete hardstand and surrounded by bunding to ensure that the risks are manageable. Fortescue will ensure that all tanks are operated in accordance with the relevant Australian Standards and manufacture's specifications.	The department accepts the requested change as Fortescue has confirmed that all Australian Standards will apply as necessary and the controls will be sufficient.

Condition	Summary of Licence Holder's comment	Department's response
	Requested change: • Must be installed on a compacted soil or concrete hardstand and surrounded by bunding; ~~and~~ • ~~All tanks must be double walled.~~	
Condition 5, Table 4	Direct/indirect impacts to vegetation are sufficiently managed and regulated under Part IV of the EP Act 1986, in accordance with Ministerial Statement 1033. Vegetation health is monitored and reported in accordance with the Annual Environmental Report. Fortescue notes that the removal of this requirement from the Licence will not alter the department's intended purposes and intentions; rather this will remove any duplication in monitoring commitments. Therefore, to ensure consistency across operation while also providing some operational flexibility Fortescue requests that this new requirement be removed from the Licence.	The inspection of the vegetation health condition has been removed to prevent duplication, as requested.
Condition 10, Table 7	Fortescue has reviewed the proposed design and construction requirements for the RO Reject pipelines from the Green Iron Pilot Plant to the Elvis Turkey's Nest. Fortescue requests that the pipeline standards requirements be removed from the Licence to align with the wording on other Fortescue Ltd operational licences. Fortescue will ensure that the pipelines are constructed and installed in accordance with the relevant Australian Standards. Furthermore, Fortescue requests for operation flexibility to comply with either requirement (a) equipped with telemetry systems and pressure sensors along pipelines to allow the detection of leaks and failures, or (b) equipped with automatic cut-outs in the event of a pipe failure. Fortescue notes that the existing use of the wording 'and' in the draft Licence is operationally limiting and unfeasible from an operational perspective. Therefore, Fortescue requests that this wording be removed and substituted with the wording 'or'. Lastly, Fortescue requests that the requirement (c) for the installation of secondary containment be removed from the draft licence, as there are sufficient controls on the pipelines (telemetry system, pressure sensors and automatic cut-outs in the unlikely event of a pipe failure). The proposed changes requested above will align with the project's requirements, ensuring that the design and construction requirements are achievable and fit for purpose. This will not change the department's intended purpose and outcome. Requested changes: ~~**Pipeline required to meet the following standards;**~~ ~~**a) AS/NZS 2033:3008: Installation of polyethylene pipe systems;**~~	First component of the condition: the department has amended the wording as requested as Fortescue has confirmed that all Australian Standards will apply as necessary and the controls will be sufficient. The second component of this condition, relating to the operational conditions of the pipeline has been amended to: Pipeline to be: a) Equipped with telemetry systems and pressure sensors along pipelines to allow the detection of leaks and failures; or b) Equipped with automatic cut-outs in the event of a pipe failure; or c) Installed with secondary containment (v-drains and scour pits) sufficient to contain any spill for a period of equal to the time between routine inspections. This is inline with the existing licence condition 3 and sufficiently manages the potential risks to the environment.

Condition	Summary of Licence Holder's comment	Department's response
	~~**b) AS/NZS 4129:2008: Fittings for polyethylene (PE) pipes for pressure applications**~~ ~~**c) AS/NZS 4130:2009 Polyethylene (PE) pipes for pressure applications; and**~~ ~~**d) AS/NZS 4131:2010 Polyethylene (PE) compounds for pressure pipes and fittings.**~~ Pipeline to be: a) Equipped with telemetry systems and pressure sensors along pipelines to allow the detection of leaks and failures; ~~**and**~~/or b) Equipped with automatic cut-outs in the event of a pipe failure; ~~**and**~~ ~~**c) Installed with secondary containment (v-drains and scour pits) sufficient to contain any spill for a period of equal to the time between routine inspections.**~~	
Condition 10 Table 7	Based on the latest information from the Project (as stated in Attachment 3B, the supporting document), the Green Iron Water Pond is no longer required, as it is operationally unviable. Fortescue requests that this infrastructure be removed from Condition 10, Table 7 of the Licence. Requested changes: • ~~**HDPE liner;**~~ • ~~**Minimal vertical freeboard of 200 mm; and**~~ • ~~**Location as per Figure 18, Schedule 1 of this licence.**~~	Reference to the Green Iron Water Pond has been removed from this condition as requested.
Condition 13	The new requirement for the quarterly inspection of vegetation health condition (visual) imposed on the licence is inconsistent with other Fortescue Operational licences. Direct/indirect impacts to vegetation are sufficiently managed and regulated under Part IV of the EP Act 1986, in accordance with Ministerial Statement 1033. Vegetation health is monitored and reported in accordance with the Annual Environmental Report. Fortescue notes that the removal of this requirement from the Licence will not alter the department's intended purposes and intentions; rather this will remove any duplication in monitoring commitments. Requested changes: Removal of Condition 13	Condition 13 remains on the licence to ensure that treated saline effluent is used in a manner that does not cause damage to surrounding vegetation, this is not a duplication.
Condition 26, Table 17	Department requested additional information: Licence Holder to provide a summary of below bores against respective Management Zones as specified in the GOWS, 2025.	The department acknowledges the information regarding the Management Zones and has updated the zones on the licence.

Condition	Summary of Licence Holder's comment	Department's response
	Fortescue notes that the map in Figure 4 of the Amendment Report summarises the mine dewater reinjection monitoring bores and their respective Management Zones. This information is also reflected in the GWOS and the information is contained therein. Figure 4 of the amendment report contains a summary of the mine dewater reinjection monitoring bores and their associated management zones were provided in the GWOS. This information is also provided below: <u>Zone B:</u> SAM59_D, SAM59_S, SAM07_D, SAM07_S, SAM12_S, SAM12-D, SCX01_S, SCX06 (All), SCX06_S, SCX06_D, SAM15_I, SAM15_S, SAM18_D, SAM18_S, SAM64_D, SAM64_S, SAM85_D, SAM85_S, SAM109_S, SAM110_D, SAM110_S <u>Zone C:</u> HSMB29_D, HSMB29_S, SCX03_S	
Condition 27	Whilst the Department has stated that conditions relating to mounding and drawdown are required to be in the Licence, Fortescue has requested that the source of truth for these conditions be the Licence and not the GWOS. Fortescue has reworded the conditions to remove all reference to the GWOS and requests that the wording on the Licence be updated to refer to the Trigger and Threshold Contingency Program outlined in an attachment to the licence and referenced within the conditions. This will simplify compliance outcomes by ensuring that there are no duplications and complexities associated with dual reporting. **Requested changes 24 November 2025:** The licence holder must manage reinjection activities to mitigate impacts from groundwater mounding in accordance with the requirements outlined in ~~the Christmas Creek Groundwater Operating strategy (GWOS)~~ **Appendix X of the Licence**	DWER notes that excised Trigger and Threshold Contingency Program is generally consistent with the information outlined in the approved GWOS (November 2025). The requested changes have been made.
Condition 28	Refer to the response for condition 27 **Requested changes 24 November 2025:** The licence holder must implement the Trigger and Threshold Criteria and Contingency Program outlined in ~~the GWOS~~ **Appendix X of the Licence.**	The requested changes have been made.
Condition 29	Refer to the response for condition 27 **Requested changes 24 November 2025:** The Licence Holder must record, investigate and take corrective action for any exceedance to a ~~Class I trigger~~	The requested changes have been made.

Condition	Summary of Licence Holder's comment	Department's response
	~~level (groundwater mounding)~~ trigger criteria in accordance with the requirements outlined in ~~the GWOS~~ **Appendix X of the Licence.**	
Condition 30	Refer to the response for condition 27 Fortescue requests for an amendment to the calendar days required to report to ensure that there is sufficient time to meet the requirements of Condition 30 of the draft licence. The current timeframe of 14 calendar days is not sufficient. Therefore, to provide some operational flexibility while still meeting the requirements of the condition, Fortescue requests up to 28 calendar days to ensure sufficient time to record, investigate, take corrective action, and report to the CEO. **Requested changes 24 November 2025:** The licence holder must record, investigate, take corrective action and report to the CEO within ~~14~~ **28** calendar days for any exceedance of a **threshold criteria** ~~(groundwater mounding)~~ as defined in ~~the GWOS~~ **Appendix X of the Licence.**	The requested changes have been made.
Condition 31	**Requested changes 24 November 2025:** Fortescue requests a correction of the typo in the condition reference, as there is no condition 2927. Fortescue has assumed that this condition should refer to condition 30 of the draft licence.	The requested changes have been made.
Condition 32, Table 18	Fortescue requests that the wording in Condition 32, Table 18 of the draft licence be amended to future-proof the licence and clarify the timeframe requirements on the draft licence. The amendment will better align with the Project requirements and provide sufficient flexibility as more injection bores are constructed and developed into the Oakover aquifer in the near future. The minor amendment to the wording will not change the department's intended purpose and outcomes of the condition and will better align with the Project requirements. Requested changes: ~~**Must be constructed, developed (purged) and determined to be operational prior to the installation of 108 saline injection bores drilled into the Oakover aquifer.**~~ ~~**SAI43 – SAI151**~~ **Individual monitoring bores will be suitably constructed, developed and monitored prior to the operation of their associated injection bores.**	The department has amended the wording as requested.

Condition	Summary of Licence Holder's comment	Department's response
Condition 37, Table 19	Fortescue notes that there is a typo in the text. It appears that the word 'overall' is missing from the text. Requested changes: Management of groundwater mounding from reinjection activities: • Summary of Class I trigger level exceedances • Summary of reported Class 2 trigger exceedances • ~~**Over**~~ **Overall** summary of reinjection system performance	The department has amended the typographical error.
Condition 39, Table 20	Based on the wording, Fortescue is required to submit a compliance report following the construction and/or installation of an item of infrastructure or a requirement specified in Condition 10, Table 7. This report is to be submitted prior to the commencement of commissioning. Therefore, to reduce the administrative burden associated with reporting, Fortescue requests for some flexibility and intends to submit these documents quarterly. This change will result in fewer reports being submitted as they will be complied and submitted quarterly. Requested changes: Prior to the commencement of commissioning, **submitted quarterly.**	The requested changes have been made.
Condition 39, Table 20	Fortescue notes that there are typos in the Condition and Table references. The wording should state Condition 32, Table 18 Requested changes: Condition ~~**26**~~ **32,** Table **18** ~~**17**~~	The department has amended the typographical error.