Government of Western Australia
Department of Environment Regulation

# Licence

## *Environmental Protection Act 1986,* Part V

## Licensee: FMG Solomon Pty Ltd

## Licence: L8464/2010/2

**Registered office:** 87 Adelaide Terrace
EAST PERTH WA 6004

**ACN:** 128 959 179

**Premises address:** Solomon Mine
M47/1409, M47/1413, M47/1431, L47/293, L47/294, L47/360, L47/363, L47/392 and portion of L47/296, L47/361, and L47/381
MT SHEILA WA 6751
As depicted in Schedule 1

**Issue date:** Thursday, 15 October 2015

**Commencement date:** Sunday, 18 October 2015

**Expiry date:** Friday, 17 October 2025

**Prescribed premises category**
Schedule 1 of the *Environmental Protection Regulations 1987*

| Category number | Category description | Category production or design capacity | Approved premises production or design capacity |
|---|---|---|---|
| 5 | Processing or beneficiation of metallic or non-metallic ore | 50,000 tonnes or more per year | Not more than 95,300,000 tonnes per annual period |
| 54 | Sewage facility | 100 cubic metres or more per day | Not more than 1,178 cubic metres per day |
| 57 | Used tyre storage (general) | 100 tyres or more | 1,500 tyres |
| 61 | Liquid waste facility | 100 tonnes or more per year | 110,000 tonnes per annual period |
| 64 | Class II putrescible landfill site | 20 tonnes or more per year | 10,000 tonnes per annual period |
| 73 | Bulk storage of chemicals | 1,000 cubic metres in aggregate | Not more than 9,200 cubic metres in aggregate |

**Conditions**
This Licence is subject to the conditions set out in the attached pages.

Date signed: 15 October 2015
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Alana Kidd
Manager Licensing – (Resources Industries)
Officer delegated under section 20
of the *Environmental Protection Act 1986*

# Contents



# Introduction

This Introduction is not part of the Licence conditions.

**DER's industry licensing role**
The Department of Environment Regulation (DER) is a government department for the state of Western Australia in the portfolio of the Minister for Environment. DER's purpose is to advise on and implement strategies for a healthy environment for the benefit of all current and future Western Australians.

DER has responsibilities under Part V of the *Environmental Protection Act 1986* (the Act) for the licensing of prescribed premises. Through this process DER regulates to prevent, control and abate pollution and environmental harm to conserve and protect the environment. DER also monitors and audits compliance with works approvals and licence conditions, takes enforcement action as appropriate and develops and implements licensing and industry regulation policy.

**Licence requirements**
This licence is issued under Part V of the Act. Conditions contained within the licence relate to the prevention, reduction or control of emissions and discharges to the environment and to the monitoring and reporting of them.

Where other statutory instruments impose obligations on the Premises/Licensee the intention is not to replicate them in the licence conditions. You should therefore ensure that you are aware of all your statutory obligations under the Act and any other statutory instrument. Legislation can be accessed through the State Law Publisher website using the following link:
http://www.slp.wa.gov.au/legislation/statutes.nsf/default.html

For your Premises relevant statutory instruments include but are not limited to obligations under the:

- *Environmental Protection (Unauthorised Discharges) Regulations 2004* – these Regulations make it an offence to discharge certain materials such as contaminated stormwater into the environment other than in the circumstances set out in the Regulations.

- *Environmental Protection (Controlled Waste) Regulations 2004* - these Regulations place obligations on you if you produce, accept, transport or dispose of controlled waste.

- *Environmental Protection (Noise) Regulations 1997* – these Regulations require noise emissions from the Premises to comply with the assigned noise levels set out in the Regulations.

You must comply with your licence. Non-compliance with your licence is an offence and strict penalties exist for those who do not comply.

Licence holders are also reminded of the requirements of section 53 of the Act which places restrictions on making certain changes to prescribed premises unless the changes are in accordance with a works approval, licence, closure notice or environmental protection notice.

**Licence Fees**
If you have a licence that is issued for more than one year, you are required to pay an annual licence fee prior to the anniversary date of issue of your licence. Non payment of annual licence fees will result in your licence ceasing to have effect meaning that it will no longer be valid and you will need to apply for a new licence for your Premises.

**Ministerial conditions**
If your Premises has been assessed under Part IV of the Act you may have had conditions imposed by the Minister for Environment. You are required to comply with any conditions imposed by the Minister.

**Premises description and Licence summary**
FMG Solomon Pty Ltd (FMG) currently operate the Solomon Project, located approximately 54 km north of Tom Price and 12 km north west of Karijini National Park, in the Pilbara region of Western Australia. Figure 1 depicts the regional location of the Solomon Project.

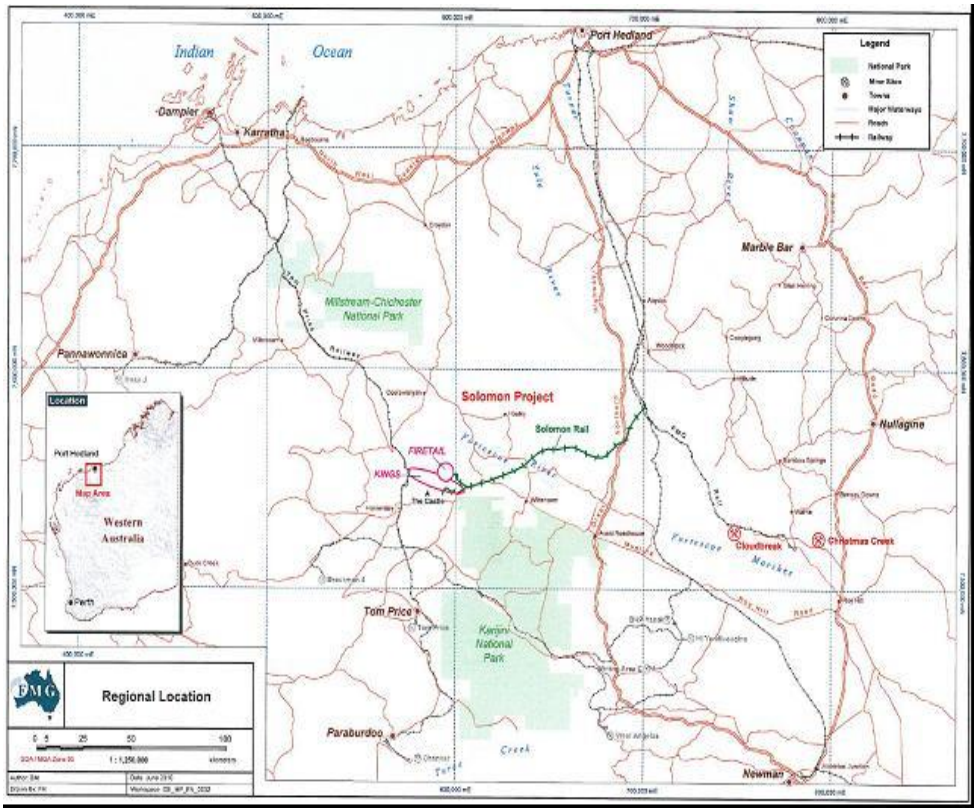


**Figure 1. Regional location of the Solomon Project**

The Solomon Project is a greenfield iron ore mine which comprises of the following infrastructure:

- two operating open pit mines Kings and Firetail;
- Direct Shipping Ore Processing Plant (DSSOP) with a design capacity of 3.6 Mtpa;
- Kings Mobile Crushing Facility (MCF) with a design capacity of 3.6 Mtpa;
- Firetail MCF with a design capacity of 2.5 Mtpa;
- Firetail Ore Processing Facility (OPF) with a design capacity of 25 Mtpa;
- Kings OPF (wet and dry processing circuits) with a design capacity of 48 Mtpa;
- two Additional MCFs with a combined design capacity of 12.6 Mtpa;
- Kings Sizing Hub;
- Tailings Storage Facility 1 (TSF1);
- Castle/Dally and Kangi wastewater treatment plants (WWTP);
- bulk fuel storage and satellite fuel storage facilities;
- train load out facility and stockyards;
- bioremediation facility to treat hydrocarbon contaminated soils;

- used tyre storage areas;
- administration buildings; and
- workshops.

The main emissions include:

- deposition of tailings;
- irrigation discharges to land from wastewater treatment plants; and
- fugitive dust emissions.

Risks that are associated with the Premises' operations include:

- contaminated stormwater discharge to surrounding land and surface water, impacting on water quality and ecosystem health;
- seepage from the TSF raising the local groundwater level and subsequently impacting on local vegetation; and
- hydrocarbon contamination to land and/or groundwater from fuel facilities, workshops and/or the bioremediation area.

FMG also accepts liquid waste from the Solomon Power Station, occupied by TEC Pipe Pty Ltd. This liquid waste comprises of treated wastewater from a reverse osmosis plant, oil water separator and cooling tower blowdown. FMG reuses this treated wastewater for dust suppression across the Solomon Project.

This Licence is the successor to Licence L8464/2010/1. The Licence has been updated to the latest licence template 2.9 and the following amendments, sought by the Licensee, assessed:

- upgrades to the Dally Camp WWTP;
- include discharges from oily water separators as emissions to land;
- change the TSF monitoring requirements; and
- update the prescribed premises boundary.

The licences and works approvals issued for the Premises are:

| **Instrument log** | | |
|---|---|---|
| **Instrument** | **Issued** | **Description** |
| W4645/2010/1 | 22 April 2010 | Works approval for construction of Castle Camp WWTP |
| L8464/2010/1 | 14 October 2010 | New licence for Castle Camp WWTP |
| W4846/2010/1 | 3 March 2011 | Works approval for Castle Camp upgrade to category 54 |
| W4881/2011/1 | 3 November 2011 | Works approval for Dally Camp WWTP |
| W4900/2011/1 | 23 June 2011 | Works approval for Direct Shipping Ore Processing Plant |
| W4930/2011/1 | 4 August 2011 | Works approval for Mobile Crushing Plant |
| W4932/2011/1 | 4 August 2011 | Works approval for Stockyard Mobile Crushing Plant |
| W4940/2011/1 | 4 August 2011 | Works approval for Ellie Camp WWTP |
| W5088/2011/1 | 9 February 2012 | Works approval for Kangi Camp WWTP and waste transfer station |
| L8464/2010/1 | 9 February 2012 | Licence amendment increase capacity |
| W5110/2011/1 | 3 November 2011 | Works approval for Processing plant and tailings facility |
| L8464/2010/1 | 14 June 2012 | Licence amendment increase capacity |
| W5192/2012/1 | 19 July 2012 | Works approval for Bulk fuel facility |
| W5246/2012/1 | 1 November 2012 | Works approval for Central Facilities Infiltration trench |
| L8464/2010/1 | 21 February 2013 | Licence amendment add category 5, 12 and 73 |
| W5407/2013/1 | 7 July 2013 | Works approval for an additional Ore Mobile Crushing Facility |
| W5429/2013/1 | 29 August 2013 | Landfill and Waste Transfer Station |
| L8464/2010/1 | 5 December 2013 | Licence amendment increase capacity category 5 and REFIRE |
| W5690/2014/1 | 25 September 2014 | Works approval for construction of three OPFs (two at Kings and one at Firetail) |
| L8464/2010/1 | 12 February 2015 | Licence amendment to increase capacity of categories 5 and 73, and add category 64 |
| L8464/2010/1 | 23 April 2015 | Licence amendment to include categories 57 and 61 |

| | | |
|---|---|---|
| L8464/2010/2 | 15 October 2015 | Licence renewal and amendment to upgrade Dally Camp WWTP, include discharges from oily water separators as emissions to land, change the TSF monitoring requirements and update the prescribed premises boundary |

**Severance**

It is the intent of these Licence conditions that they shall operate so that, if a condition or a part of a condition is beyond the power of this Licence to impose, or is otherwise *ultra vires* or invalid, that condition or part of a condition shall be severed and the remainder of these conditions shall nevertheless be valid to the extent that they are within the power of this Licence to impose and are not otherwise *ultra vires* or invalid.

**END OF INTRODUCTION**

# Licence conditions

## 1 General

### 1.1 Interpretation

1.1.1 In the Licence, definitions from the *Environmental Protection Act 1986* apply unless the contrary intention appears.

1.1.2 For the purposes of this Licence, unless the contrary intention appears:

**'Act'** means the *Environmental Protection Act 1986;*

**'annual period'** means the inclusive period from 1 January to 31 December in the same year;

**'AS/NZS 2031'** means the Australian Standard AS/NZS 2031 Selection of containers and preservation of water samples for microbiological analysis;

**'AS/NZS 5667.1'** means the Australian Standard AS/NZS 5667.1 *Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples;*

**'AS/NZS 5667.10'** means the Australian Standard AS/NZS 5667.10 *Water Quality – Sampling – Guidance on sampling of waste waters;*

**'AS/NZS 5667.11'** means the Australian Standard AS/NZS 5667.11 *Water Quality – Sampling – Guidance on sampling of groundwaters;*

**'averaging period**' means the time over which a limit or target is measured or a monitoring result is obtained;

**'cfu/100mL'** means colony forming units per 100 millilitres;

**'CEO'** means Chief Executive Officer of the Department of Environment Regulation*;*

**'CEO'** for the purpose of correspondence means;
Chief Executive Officer
Department Administering the Environmental Protection Act 1986
Locked Bag 33
Cloisters Square
PERTH WA 6850
Telephone: (08) 9333 7510
Facsimile: (08) 9333 7550
Email: info@der.wa.gov.au;

**'freeboard'** means the distance between the maximum water surface elevations and the top of retaining banks or structures at their lowest point;

**'HDPE'** means high density polyethylene;

**'Inert Waste Type 1'** has the meaning defined in Landfill Definitions;

**'Inert Waste Type 2'** has the meaning defined in Landfill Definitions;

**'Landfill Definitions'** means the document titled "Landfill Waste Classification and Waste Definitions 1996" published by the Chief Executive Officer of the Department of Environment as amended from time to time;

**'Licence'** means this Licence numbered L8464/2010/2 and issued under the Act;

**'Licensee'** means the person or organisation named as Licensee on page 1 of the Licence;

**'NATA'** means the National Association of Testing Authorities, Australia;

**'NATA accredited'** means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis;

**'Premises'** means the area defined in the Premises Map in Schedule 1 and listed as the Premises address on page 1 of the Licence;

**'Putrescible Waste'** has the meaning listed in Landfill Definitions;

**'quarterly period'** means the 4 inclusive periods from; 1 January to 31 March, 1 April to 30 June, 1 July to 30 September and 1 October to 31 December;

**'Schedule 1'** means Schedule 1 of this Licence unless otherwise stated;

**'Schedule 2'** means Schedule 2 of this Licence unless otherwise stated;

**'spot sample'** means a discrete sample representative at the time and place at which the sample is taken;

**'TSF'** means tailings storage facility;

**'usual working day'** means 0800 – 1700 hours, Monday to Friday excluding public holidays in Western Australia; and

**'WWTP'** means wastewater treatment plants.

1.1.3 Any reference to an Australian or other standard in the Licence means the relevant parts of the standard in force from time to time during the term of this Licence.

1.1.4 Any reference to a guideline or code of practice in the Licence means the version of that guideline or code of practice in force from time to time, and shall include any amendments or replacements to that guideline or code of practice made during the term of this Licence.

1.1.5 The Licensee shall operate and maintain all pollution control and monitoring equipment to the manufacturer's specification or any relevant and effective internal management system.

### 1.2 General conditions

1.2.1 Nothing in the Licence shall be taken to authorise any emission that is not mentioned in the Licence, where the emission amounts to:
- (a) pollution;
- (b) unreasonable emission;
- (c) discharge of waste in circumstances likely to cause pollution; or
- (d) being contrary to any written law.

1.2.2 The Licensee shall immediately recover, or remove and dispose of spills of environmentally hazardous materials outside an engineered containment system.

1.2.3 The Licensee shall:
- (a) implement all practical measures to prevent stormwater run-off becoming contaminated by the activities on the Premises; and
- (b) treat contaminated or potentially contaminated stormwater as necessary prior to being discharged from the Premises.[1]

Note1: The *Environmental Protection (Unauthorised Discharges) Regulations 2004* make it an offence to discharge certain materials into the environment.

### 1.3 Premises operation

1.3.1 The Licensee shall ensure that all pipelines (or sections of pipelines) containing environmentally hazardous materials are either:
(a) equipped with telemetry; or
(b) equipped with automatic cut-outs in the event of a pipe failure; and/or
(c) provided with secondary containment sufficient to contain any spill for a period equal to the time between routine inspections.

1.3.2 The Licensee shall ensure that waste material is only stored and/or treated within vessels or compounds provided with the infrastructure detailed in Table 1.3.1.

**Table 1.3.1: Containment infrastructure**

| Containment cell or dam number(s) | Material | Infrastructure requirements |
|---|---|---|
| TSF1 | Tailings | • Valley-fill tailings storage facility with an estimated floor permeability of 1 x $10^{-5}$ m/s to 1 x $10^{-9}$ m/s<br>• Maintain a minimum freeboard of 500mm as measured from the operational pond surface to lowest elevation of perimeter embankment<br>• Provide additional sufficient freeboard to minimise the likelihood of erosion of the embankments by wave action<br>• Install and maintain a seepage collection and recovery system |
| TSF1 Gravity Decant Water Storage Pond | Tailings supernatant liquor/ decant liquor/ tailings leachate/seepage | • HDPE Liner<br>• Maintain vertical freeboard of 300mm |
| Treated Wastewater Storage Tanks – Castle WWTP, Kangi WWTP, Castle/Dally WWTP | Wastewater | • Maintain vertical freeboard of 1200 mm<br>• Wastewater tanks fitted with high-water audible and visual alarm systems |
| Sumps or ponds used to store stormwater | Potentially contaminated stormwater | • HDPE liner or concrete with a permeability of 1 x $10^{-9}$ m/s or less<br>• Maintain vertical freeboard of 300mm (for infrastructure which is 1,000mm or deeper). |
| Heavy Machinery or Vehicle Wash-down Facilities (HMWF) treatment ponds | Hydrocarbon contaminated water (yet to be processed by oil water separator) | • HDPE liner or concrete with a permeability of 1 x $10^{-9}$ m/s or less<br>• Maintain vertical freeboard of 300mm (for infrastructure which is 1,000mm or deeper). |
| Bioremediation treatment cells | Hydrocarbon contaminated soil | • Clay liner (or equivalent) with a permeability of $10^{-9}$ m/s or less<br>• Any contaminated runoff from the treatment cells is contained |
| Power station treated wastewater storage tanks | Treated wastewater accepted from the Solomon | • Storage tank made of impermeable material<br>• Maintain vertical freeboard of 300mm |

| | | |
|---|---|---|
| | Power Station | |

1.3.3 The Licensee shall ensure that where wastes produced on the Premises are not taken off-site for lawful use or disposal, they are managed in accordance with the requirements in Table 1.3.2.

**Table 1.3.2: Management of waste**

| Waste type | Management strategy | Requirements[1,2] |
|---|---|---|
| Sewage | Biological and physical | Not to exceed 1,178 $m^3$/ day |
| Treated wastewater | Chemical treatment (disinfection) prior to onsite irrigation | Not applicable |
| Sewage sludge | Storage (enclosed tanks) | Not applicable |
| Inert Waste Type 1 (concrete)<br><br>Inert Waste Type 2 (Used Tyres and Conveyor Belts) | Receipt, handling and disposal by landfilling | • No more than 10,000 tonnes per year (combined with putrescible waste) shall be disposed of by landfilling<br>• Disposal of concrete by landfilling shall only take place within the prescribed premises in the locations as shown in the Map of disposal points in Schedule 1<br>• No untreated wood shall be disposed of with these waste types<br>• Waste shall be placed in a defined trench or within an area enclosed by earthen bunds<br>• All disposal locations are to be recorded<br>• The separation distance between the base of the landfill and the highest groundwater level shall not be less than 2m<br>• Not more than 1,500 used tyres shall be stored at the premises at any one time<br>• Used tyre stacks shall not exceed 100$m^2$ in area and 4m in height<br>• Used tyres stacked on their side walls or if stored on treads, the area shall be baled with a securing device made of non-combustible material<br>• Used tyres shall not be stored closer than 6m from any other tyre stack |
| Putrescible waste (Untreated Wood) | Receipt, handling and disposal of untreated waste wood by landfilling | • No more than 10,000 tonnes per year (combined total with Inert Waste Types 1 and 2) shall be disposed of by landfilling<br>• The separation distance between the base of the landfill and the highest groundwater level shall not be less than 2m<br>• Disposal of Untreated Wood is to be to the Firetail North Waste Dump and the Firetail Waste Wood Disposal Area only (as depicted in the map of disposal Points in Schedule 1) |

Note 1: Requirements for landfilling tyres are set out in Part 6 of the *Environmental Protection Regulations 1987*.
Note 2: Additional requirements for the acceptance and landfilling of controlled waste (including asbestos and tyres) are set out in the *Environmental Protection (Controlled Waste) Regulations 2004*.

1.3.4 The Licensee shall ensure that the irrigation of treated wastewater meets the following:
(a) no irrigation generated run-off, spray drift or discharge occurs beyond the boundary of the designated irrigation areas, as identified in the map of emissions points (L1 and L2) depicted in Schedule 1;
(b) wastewater is evenly distributed over the irrigation area;
(c) no soil erosion occurs;
(d) irrigation does not occur on land that is waterlogged; and
(e) a healthy vegetation cover is maintained over the wastewater irrigation areas.

1.3.5 The Licensee shall ensure that cover is applied and maintained on landfilled wastes in accordance with Table 1.3.3 and that sufficient stockpiles of cover are maintained on site at all times.

**Table 1.3.3: Cover requirements** [1]

| Waste Type | Material | Depth | Timescales |
|---|---|---|---|
| All waste | Inert and incombustible material | 1,000mm | Within three months of the final waste load in each trench |

Note 1: Additional requirements for the covering of tyres are set out in Part 6 of the *Environmental Protection Regulations 1987.*

1.3.6 The Licensee shall:
(a) undertake inspections as detailed in Table 1.3.4;
(b) where any inspection identifies that an appropriate level of environmental protection is not being maintained, take corrective action to mitigate adverse environmental consequences as soon as practicable; and
(c) maintain a record of all inspections undertaken.

**Table 1.3.4 Inspection of infrastructure**

| Scope of inspection | Type of inspection | Frequency of inspection |
|---|---|---|
| Tailings pipelines | Visual integrity | Daily |
| Tailings return water lines | Visual integrity | Daily |
| TSF 1 embankment freeboard | Visual to confirm required freeboard capacity is available | Daily |

1.3.7 The Licensee shall undertake an annual water balance for the TSF. The water balance shall as a minimum consider the following:
(a) site rainfall;
(b) evaporation;
(c) tailings return water recovery volumes;
(d) seepage recovery volumes; and
(e) volumes of tailings deposited.

1.3.8 The Licensee shall ensure that the construction and operation of the mobile crushing and screening facilities is undertaken in accordance with the provisions outlined in the document “Solomon Manage Environmental Impacts of Mobile Crushing” (Leighton Contractors, 2013).

1.3.9 The Licensee shall construct the Dally Camp WWTP upgrade works in accordance with the document “Licence Amendment Application, Solomon Mine Site” (Fortescue Metals Group Limited, September 2015, SO-AP-EN-0063).

1.3.10 The Licensee shall commission the upgraded Dally Camp WWTP for a period not exceeding 3 months.

1.3.11 The Licensee shall ensure the limits specified in Table 1.3.5 are not exceeded.

**Table 1.3.5 Production or design capacity limits**

| Category[1] | Category description[1] | Premises production or design capacity limit |
|---|---|---|
| 5 | Processing or beneficiation of metallic or non-metallic ore | 95,300,000 tonnes of ore per annual period |
| 61 | Liquid waste facility | 110,000 tonnes per annual period |
| 73 | Bulk storage of chemicals | 9,200 $m^3$ in aggregate |

Note 1: *Environmental Protection Regulations 1987,* Schedule 1.

# 2 Emissions

## 2.1 General

2.1.1 The Licensee shall record and investigate the exceedance of any descriptive or numerical limit specified in any part of section 2 of this licence.

## 2.2 Emissions to land

2.2.1 The Licensee shall ensure that where waste is emitted to land from the emission points in Table 2.2.1 (and identified on the map of emission points in Schedule 1) it is done so in accordance with the conditions of this licence.

**Table 2.2.1: Emissions to land**

| Emission point reference and location on Map of emission points | Description | Source including abatement |
|---|---|---|
| L1 | Discharge of treated wastewater to irrigation field | Effluent from Castle/Dally Camp WWTP |
| L2 | Discharge of treated wastewater to irrigation field, onsite dust suppression and landscape irrigation | Effluent from Kangi Camp WWTP |
| L3 | Discharge of treated wastewater | Bulk Fuel Facility oily water separator |
| L5 | Discharge of treated wastewater | Rail Fuel Siding oily water separator |
| L7 | Discharge of treated wastewater | Castle Camp Washdown Bay oily water separator |
| L8 | Discharge of treated wastewater | Trinity Fuel Farm oily water separator |
| L9 | Discharge of treated wastewater | Kings Fuel Farm oily water separator |
| L10 | Discharge of treated wastewater | Firetail Fuel Farm oily water separator |
| L11 | Discharge of treated wastewater | Kings ore processing facility oily water separator |

2.2.2 The Licensee shall not cause or allow emissions to land greater than the limits listed in Table 2.2.2.

| Table 2.2.2: Emission limits to land | | | |
|---|---|---|---|
| **Emission point reference** | **Parameter** | **Limit (including units)** | **Averaging period** |
| L3, L5, L7, L8, L9, L10 and L11 (Oily water separator emissions to land) | Total Recoverable Hydrocarbons | 15 mg/L | Spot sample (when flowing) |
| | Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) | 10 µg/L | |

# 3 Monitoring

## 3.1 General monitoring

3.1.1 The Licensee shall ensure that:
(a) all water samples are collected and preserved in accordance with AS/NZS 5667.1 unless otherwise indicated;
(b) all wastewater sampling is conducted in accordance with AS/NZS 5667.10;
(c) all groundwater sampling is conducted in accordance with AS/NZS 5667.11;
(d) all microbiological samples are collected and preserved in accordance with AS/NZS 2031; and
(e) all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured unless indicated otherwise in the relevant table.

3.1.2 The Licensee shall ensure that:
(a) monthly monitoring is undertaken at least 15 days apart;
(b) quarterly monitoring is undertaken at least 45 days apart; and
(c) annual monitoring is undertaken at least 9 months apart.

3.1.3 The Licensee shall record production or throughput data and any other process parameters relevant to any non-continuous or continuous monitoring undertaken.

3.1.4 The Licensee shall ensure that all monitoring equipment used on the Premises to comply with the conditions of this Licence is calibrated in accordance with the manufacturer's specifications.

3.1.5 The Licensee shall, where the requirements for calibration cannot be practicably met, or a discrepancy exists in the interpretation of the requirements, bring these issues to the attention of the CEO accompanied with a report comprising details of any modifications to the methods.

## 3.2 Monitoring of emissions to land

3.2.1 The Licensee shall undertake the monitoring in Table 3.2.1 according to the specifications in that table.

| Table 3.2.1: Monitoring of emissions to land | | | | |
|---|---|---|---|---|
| **Monitoring point reference** | **Parameter** | **Units** | **Averaging period** | **Frequency** |
| L1 - L2 | Cumulative volume of treated wastewater discharged from each WWTP | $m^3$ | Cumulative monthly | Continuous |
| | pH[1] | - | Spot sample | Quarterly |
| | 5-Day Biochemical Oxygen | mg/L | | |

| | | | | |
|---|---|---|---|---|
| | Demand | | | |
| | Total Suspended Solids | | | |
| | Total Nitrogen | | | |
| | Total Phosphorus | | | |
| | *E.coli* | cfu/100ml | | |
| L3, L5, L7, L8, L9, L10 and L11 | Total recoverable hydrocarbons | mg/L | Spot sample (when flowing) | Quarterly |
| | Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) | µg/L | | |
| | Polycyclic aromatic hydrocarbons | µg/L | | |

Note 1: In-field non-NATA accredited analysis permitted.

### 3.3 Monitoring of inputs and outputs

3.3.1 The Licensee shall undertake the monitoring in Table 3.3.1 according to the specifications in that table.

**Table 3.3.1: Monitoring of inputs and outputs**

| Input/Output | Parameter | Units | Averaging Period | Frequency |
|---|---|---|---|---|
| Waste Inputs | Volume of Inert Waste Type 1 (concrete), Inert Waste Type 2 (tyres and conveyor belts) and Putrescible Waste (untreated wood) | tonnes | Each load | Cumulative monthly total |

### 3.4 Process monitoring

3.4.1 The Licensee shall undertake the monitoring in Table 3.4.1 according to the specifications in that table.

**Table 3.4.1: Process monitoring**

| Monitoring point reference | Process description | Parameter | Units | Limit | Frequency | Method |
|---|---|---|---|---|---|---|
| TSF1 | Tailings delivery to TSF | Volume and mass of tailings deposited into the TSF | $m^3$ and Tonnes | N/A | Continuous | None specified |
| | TSF return line | Volumes of water recovered from the TSF | $m^3$ and kL | | | None specified |
| | Gravity decant return line | Volume of water recovered from the TSF | $m^3$ and kL | | | None specified |
| L3, L5, L6, L7, L8, L9, L10 and L11 (Treated wastewater holding tanks) | Treated wastewater from oily water separators used for dust suppression | pH[1] | pH units | N/A | Quarterly | None specified |
| | | Total Dissolved Solids | mg/L | N/A | | |
| | | Total Recoverable Hydrocarbons | mg/L | 15 | | |
| | | Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) | µg/L | 10 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Polycyclic aromatic hydrocarbons | µg/L | N/A | | |
| L4 (Power Station treated wastewater storage tanks) | Treated wastewater accepted on site and used for dust suppression | Flow rate | $m^3$ | N/A | Quarterly | None specified |
| | | pH[1] | pH units | N/A | | |
| | | Total Dissolved Solids | mg/L | <5,000 | | |
| | | Total Recoverable Hydrocarbons | mg/L | <15 | | |

Note 1: In-field non-NATA accredited analysis permitted.

### 3.5 Ambient environmental quality monitoring

3.5.1 The Licensee shall undertake the monitoring in Table 3.5.1 according to the specifications in that table.

**Table 3.5.1: Monitoring of ambient groundwater quality**

| Monitoring point reference | Parameter | Units | Averaging period | Frequency |
|---|---|---|---|---|
| GQ1 and GQ2 (Bulk Fuel Facility groundwater monitoring bores) | Standing water level | m(AHD) | Spot sample | Quarterly |
| | Total Recoverable Hydrocarbons | mg/L | | |
| GQ3-GQ6 (TSF1 groundwater monitoring bores) | Standing water level | m(AHD) | | |
| | pH[1] | pH units | | |
| | Electrical conductivity | µS/cm | | |
| | Total Dissolved Solids | mg/L | | |
| | Major cations and anions - Na, K, Ca, Mg, Cl, $SO_4$ | mg/L | | |
| | Dissolved metals – As, Cd, Co, Cr, Cu, Hg, Ni, Pb, Se, Zn | mg/L | | |

Note 1: In-field non-NATA accredited analysis permitted.

# 4 Information

### 4.1 Records

4.1.1 All information and records required by the Licence shall:
- (a) be legible;
- (b) if amended, be amended in such a way that the original and subsequent amendments remain legible or are capable of retrieval;
- (c) except for records listed in 4.1.1(d) be retained for at least 6 years from the date the records were made or until the expiry of the Licence or any subsequent licence; and
- (d) for those following records, be retained until the expiry of the Licence and any subsequent licence:
  - (i) off-site environmental effects; or
  - (ii) matters which affect the condition of the land or waters.

4.1.2 The Licensee shall ensure that:
- (a) any person left in charge of the Premises is aware of the conditions of the Licence and has access at all times to the Licence or copies thereof; and
- (b) any person who performs tasks on the Premises is informed of all of the conditions of the Licence that relate to the tasks which that person is performing.

4.1.3 The Licensee shall complete an Annual Audit Compliance Report indicating the extent to which the Licensee has complied with the conditions of the Licence, and any previous Licence issued under Part V of the Act for the Premises for the previous annual period.

4.1.4 The Licensee shall implement a complaints management system that as a minimum records the number and details of complaints received concerning the environmental impact of the activities undertaken at the Premises and any action taken in response to the complaint.

4.1.5 The Licensee shall record and maintain a permanent record of all disposal sites authorised under condition 1.3.3. These records are to be made available to Department of Environment Regulation staff upon request.

### 4.2 Reporting

4.2.1 The Licensee shall submit to the CEO an Annual Environmental Report by the 31 March each year. The report shall contain the information listed in Table 4.2.1 in the format or form specified in that table.

**Table 4.2.1: Annual Environmental Report**

| Condition or table (if relevant) | Parameter | Format or form[1] |
|---|---|---|
| - | Summary of any failure or malfunction of any pollution control equipment or any incidents that have occurred during the annual period and any action taken | None specified |
| Tables 1.3.2, 1.3.5, 2.2.2 and 3.4.1 | Limit exceedances | EL1 |
| 1.3.7 | TSF annual water balance | None specified |
| Table 3.2.1 | Discharge points L1 and L2 – Volumetric flow rate, pH, BOD, TSS, TN, TP, *E.coli* | None specified |
| | Discharge points L3, L5, L7, L8, L9, L10 and L11 – Total recoverable hydrocarbons, benzene, toluene, ethylbenzene, xylenes and polycyclic aromatic hydrocarbons | |
| Table 3.3.1 | Monitoring of inputs and recording of quantities waste disposed of at each site. | None specified |
| Table 3.4.1 | Mass of tailings deposited into TSF1, recovered water and recovered seepage water. | None specified |
| | Discharge point L3, L5, L6, L7, L8, L9, L10 and L11 – Total Dissolved Solids, Total Recoverable Hydrocarbons, pH, Benzene, Toluene, Ethylbenzene, Xylenes and Polycyclic aromatic hydrocarbons | |
| | Discharge point L4 – flow rate, pH, Total Dissolved Solids, Total Recoverable Hydrocarbons | |
| Table 3.5.1 | Standing water level, pH, total dissolved solids, electrical conductivity, total recoverable hydrocarbons; Major cations and anions - Na, K, Ca, Mg, Cl, $SO_4$; and Dissolved metals - As, Cd, Co, Cr, Cu, Hg, Ni, Pb, Se, Zn | None specified |
| 4.1.3 | Compliance | Annual Audit Compliance Report (AACR) |
| 4.1.4 | Complaints summary | None specified |

Note 1: Forms are in Schedule 2

4.2.2 The Licensee shall ensure that the Annual Environmental Report also contains:

(a) any relevant process, production or operational data recorded under Condition 3.1.3; and

(b) an assessment of the information contained within the report against previous monitoring results and Licence limits and/or targets.

4.2.3 The Licensee shall submit the information in Table 4.2.2 to the CEO according to the specifications in that table.

**Table 4.2.2: Non-annual reporting requirements**

| Condition or table (if relevant) | Parameter | Reporting period | Reporting date (after end of the reporting period) | Format or form |
|---|---|---|---|---|
| - | Copies of original monitoring reports submitted to the Licensee by third parties | Not Applicable | Within 14 days of the CEO's request | As received by the Licensee from third parties |

### 4.3 Notification

4.3.1 The Licensee shall ensure that the parameters listed in Table 4.3.1 are notified to the CEO in accordance with the notification requirements of the table.

**Table 4.3.1: Notification requirements**

| Condition or table (if relevant) | Parameter | Notification requirement[1] | Format or form[2] |
|---|---|---|---|
| Table 1.3.2, 2.2.2 and 3.4.1 | Breach of any limit specified in the Licence | Part A: As soon as practicable but no later than 5pm of the next usual working day.<br><br>Part B: As soon as practicable | N1 |
| 1.3.9 | The Licensee shall submit a compliance document to the CEO, following the construction of the Dally Camp WWTP upgrade works. The compliance document shall:<br>(a) certify that the works were constructed in accordance with the document "Licence Amendment Application, Solomon Mine Site" (Fortescue Metals Group Limited, September 2015, SO-AP-EN-0063); and<br>(b) be signed by a person authorised to represent the Licensee and contain the printed name and position of that person within the company. | Prior to commencement of commissioning | None specified |
| 1.3.10 | The Licensee shall, prior to commencing commissioning of the Dally Camp WWTP upgrade submit a commissioning plan to the CEO. The commissioning plan shall include details relating to:<br>(a) the commissioning | One month prior to the commencement of commissioning | None specified |

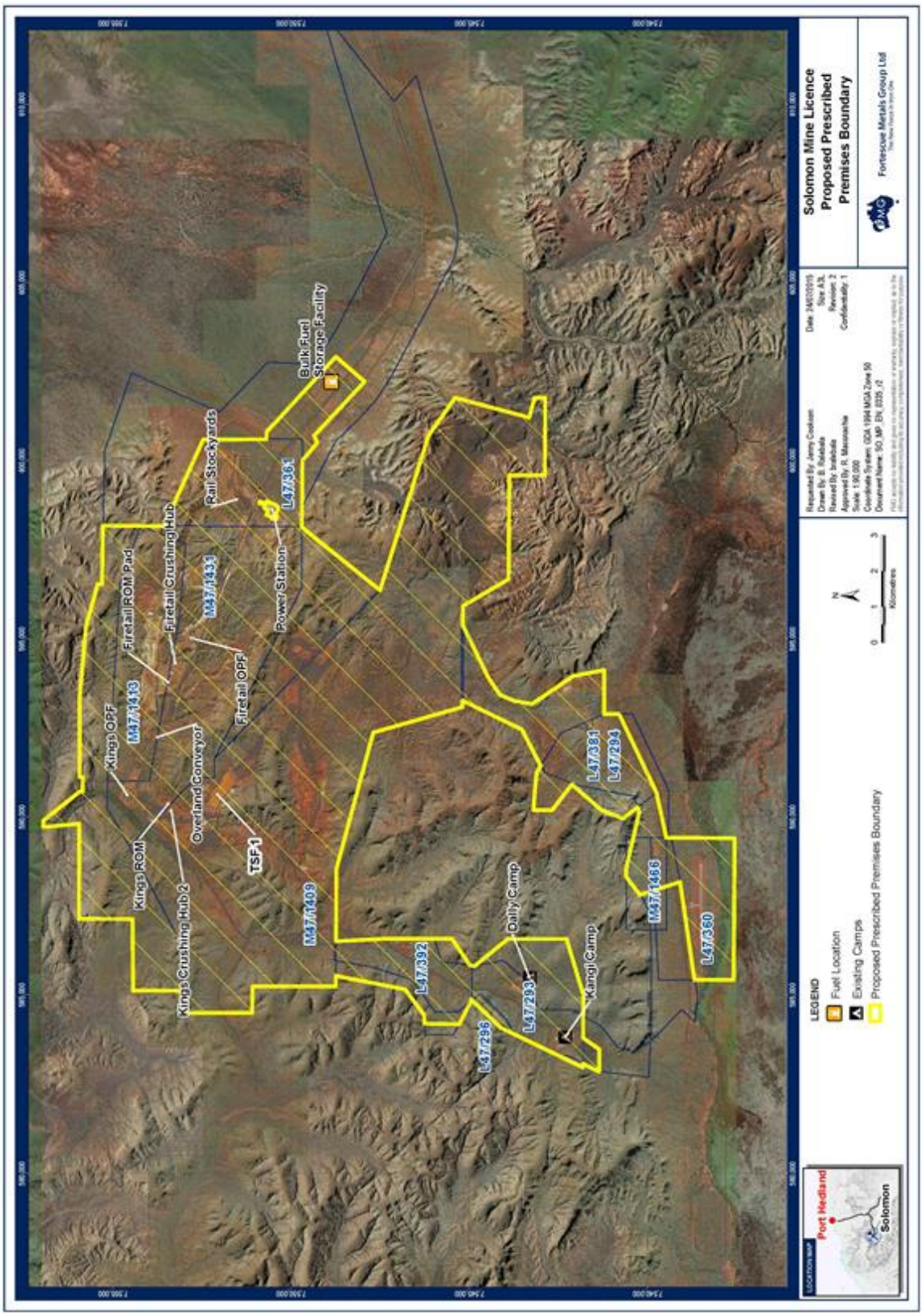
| | | | |
|---|---|---|---|
| | stages and expected timescales for commissioning;<br>(b) expected emissions and discharges during commissioning and the environmental implications of the emissions;<br>(c) how emissions and discharges will be managed during commissioning;<br>(d) the monitoring that will be undertaken during the commissioning period;<br>(e) how accidents or malfunctions will be managed;<br>(f) start up and shut down procedures; and<br>(g) reporting proposals including accidents, malfunctions and reporting against the commissioning plan.<br><br>Commissioning shall be carried out in accordance with the commissioning plan. | | |
| 3.1.5 | Calibration report | As soon as practicable. | None specified |

Note 1: Notification requirements in the licence shall not negate the requirement to comply with s72 of the Act
Note 2: Forms are in Schedule 2

# Schedule 1: Maps

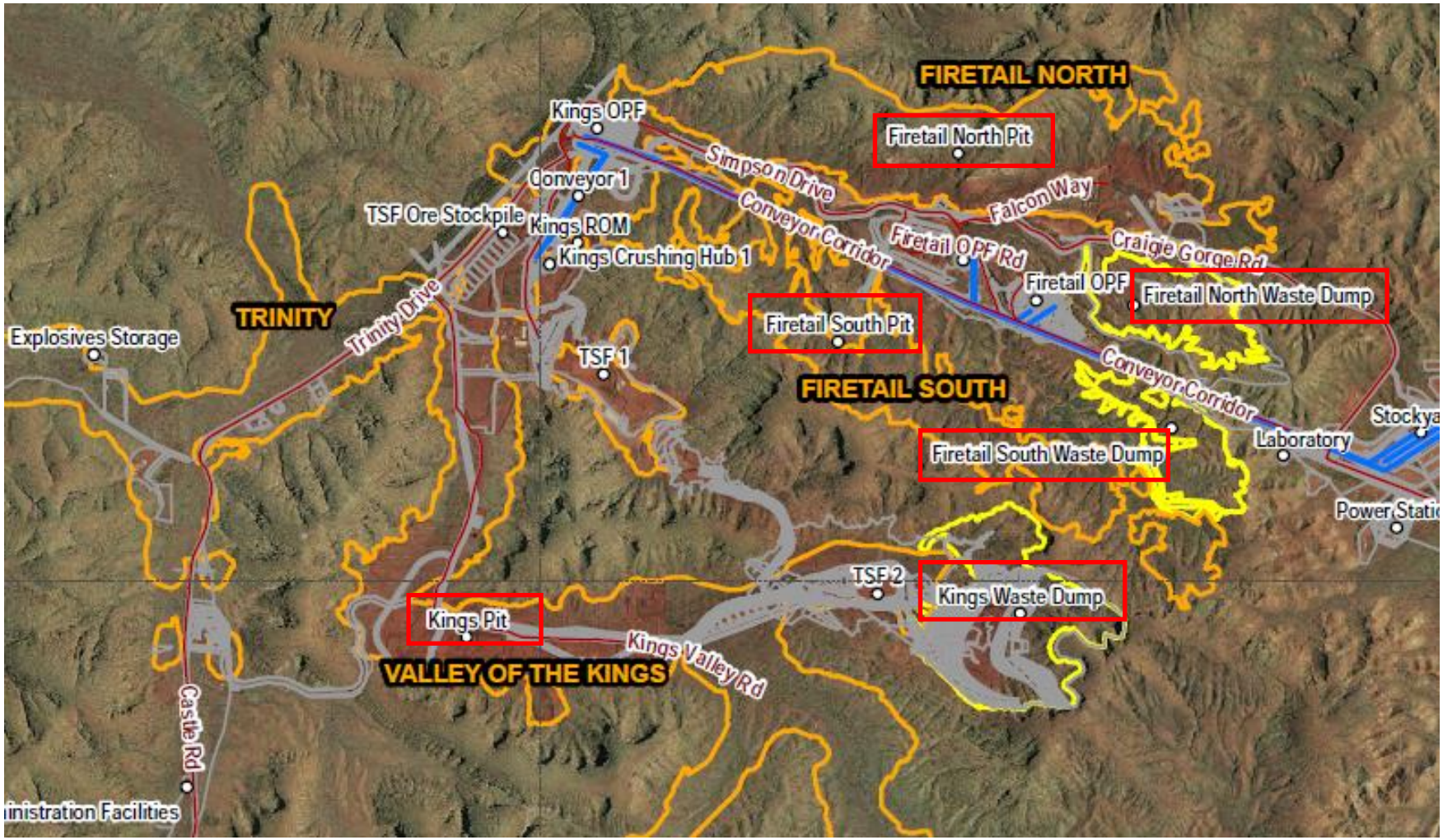
**Premises map**

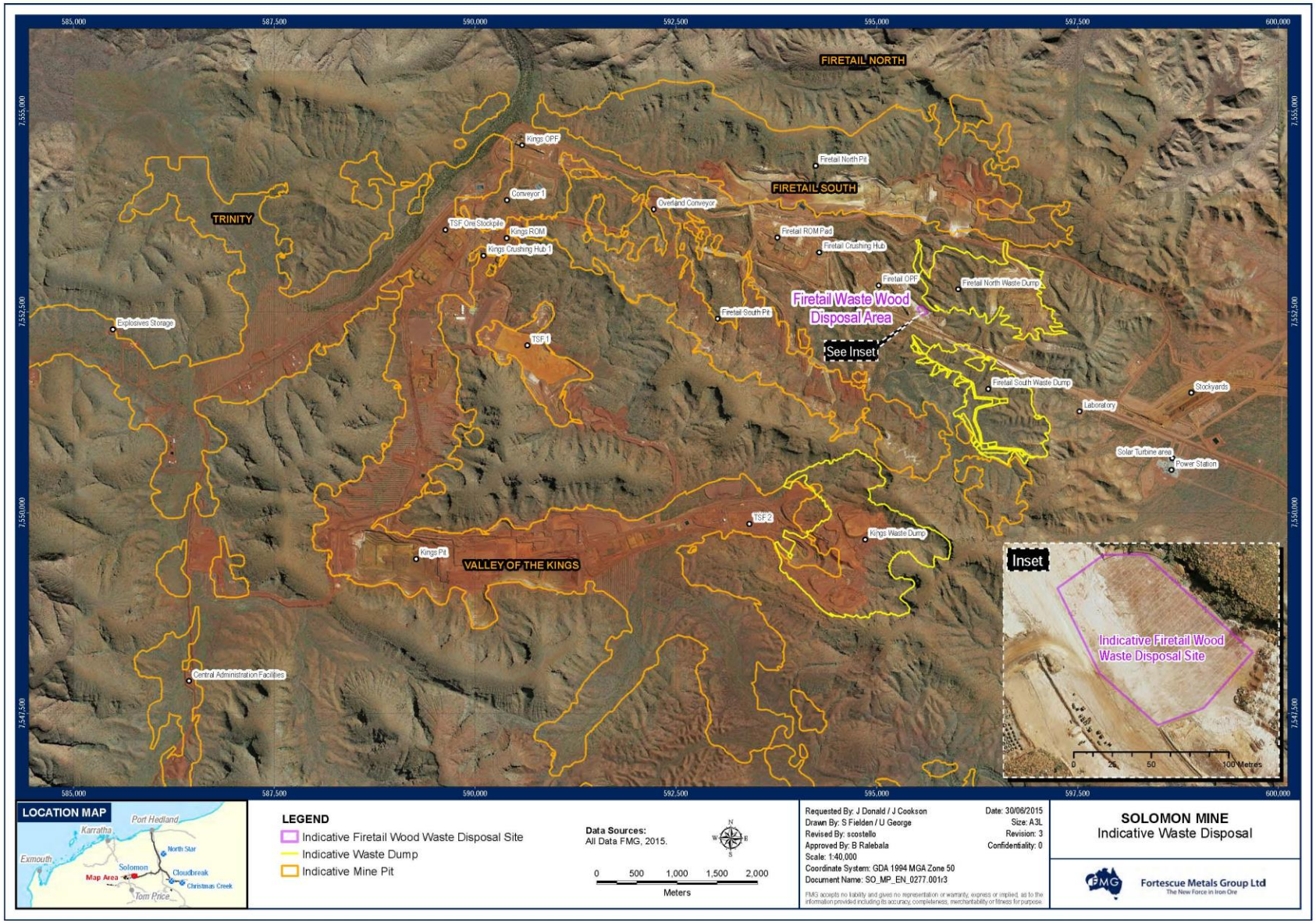
The Premises is shown in the map below. The yellow line depicts the Premises boundary



**Map of Inert and Putrescible Waste Disposal Pits**

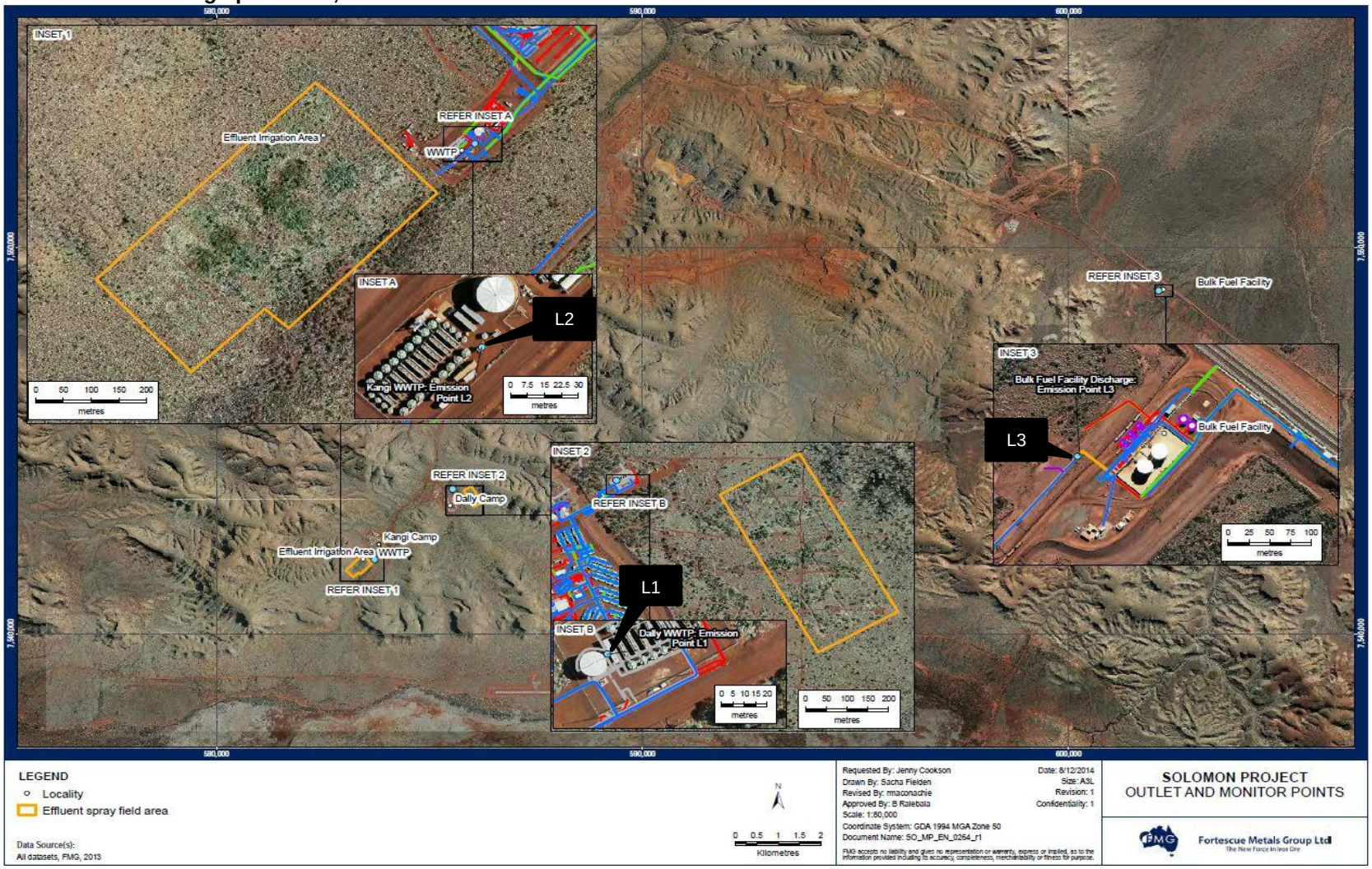
The waste disposal sites as per Table 1.3.2 are depicted within the red boundary in the map below. Firetail North Waste Dump and Firetail Waste Wood Disposal Area are for putrescible waste.



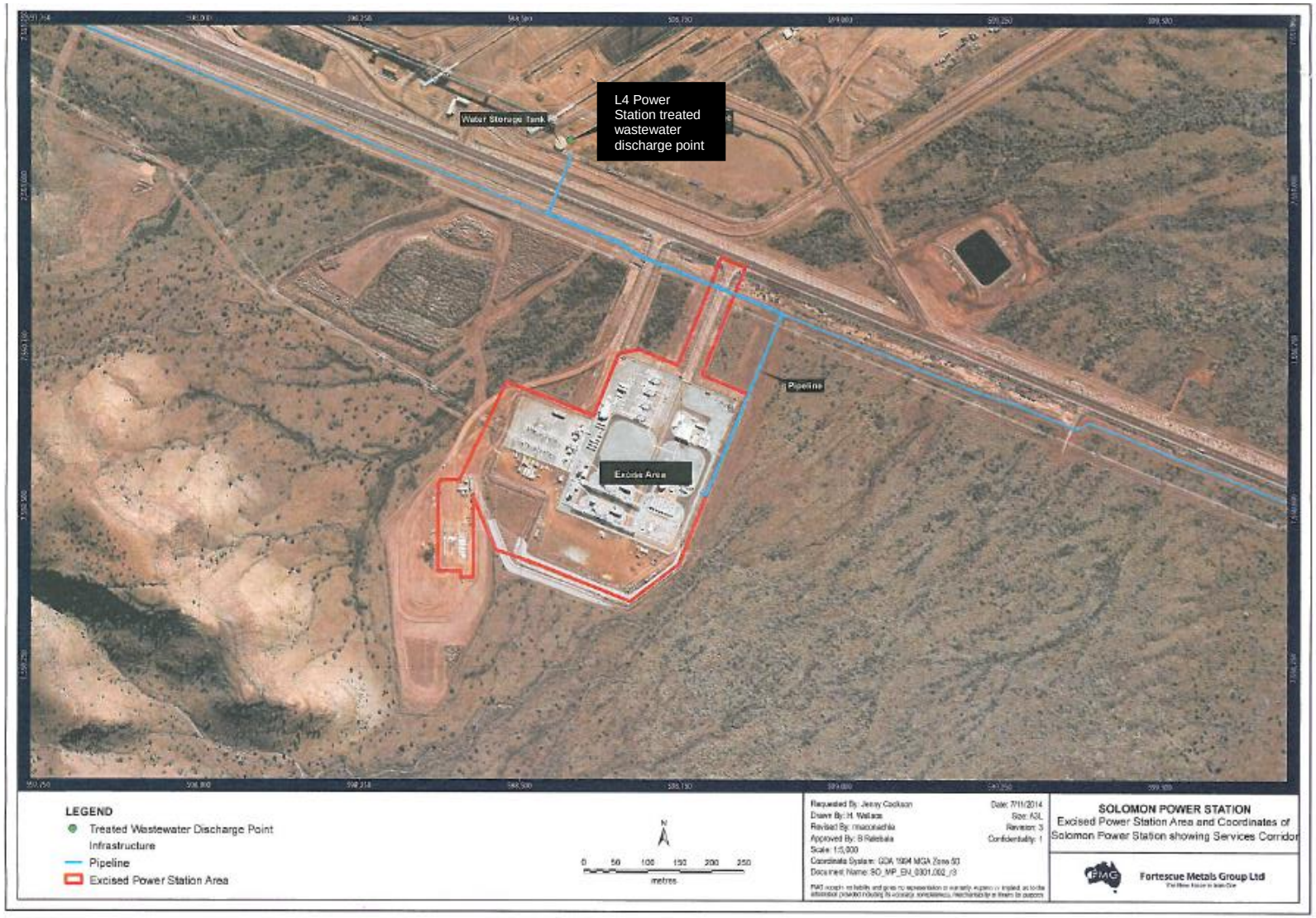

585,000
587,500
590,000
592,500
595,000
597,500
600,000
7,555,000
7,552,500
7,550,000
7,547,500
FIRETAIL NORTH
FIRETAIL SOUTH
TRINITY
VALLEY OF THE KINGS
Kings OPF
Firetail North Pit
Conveyor 1
Overland Conveyor
TSF Ore Stockpile
Kings ROM
Kings Crushing Hub 1
Firetail ROM Pad
Firetail Crushing Hub
Firetail OPF
Firetail North Waste Dump
Firetail Waste Wood Disposal Area
See Inset
Firetail South Pit
Explosives Storage
TSF 1
Firetail South Waste Dump
Stockyards
Laboratory
Solar Turbine area
Power Station
TSF 2
Kings Waste Dump
Kings Pit
Central Administration Facilities
Inset
Indicative Firetail Wood Waste Disposal Site
0
25
50
100 Metres
LOCATION MAP
Port Hedland
Karratha
Exmouth
North Star
Solomon
Map Area
Cloudbreak
Christmas Creek
Tom Price
LEGEND
Indicative Firetail Wood Waste Disposal Site
Indicative Waste Dump
Indicative Mine Pit
Data Sources:
All Data FMG, 2015.
0
500
1,000
1,500
2,000
Meters
Requested By: J Donald / J Cookson
Drawn By: S Fielden / U George
Revised By: scostello
Approved By: B Ralebala
Scale: 1:40,000
Coordinate System: GDA 1994 MGA Zone 50
Document Name: SO_MP_EN_0277.001r3
Date: 30/06/2015
Size: A3L
Revision: 3
Confidentiality: 0
FMG accepts no liability and gives no representation or warranty, express or implied, as to the information provided including its accuracy, completeness, merchantability or fitness for purpose.
SOLOMON MINE
Indicative Waste Disposal
Fortescue Metals Group Ltd
The New Force in Iron Ore

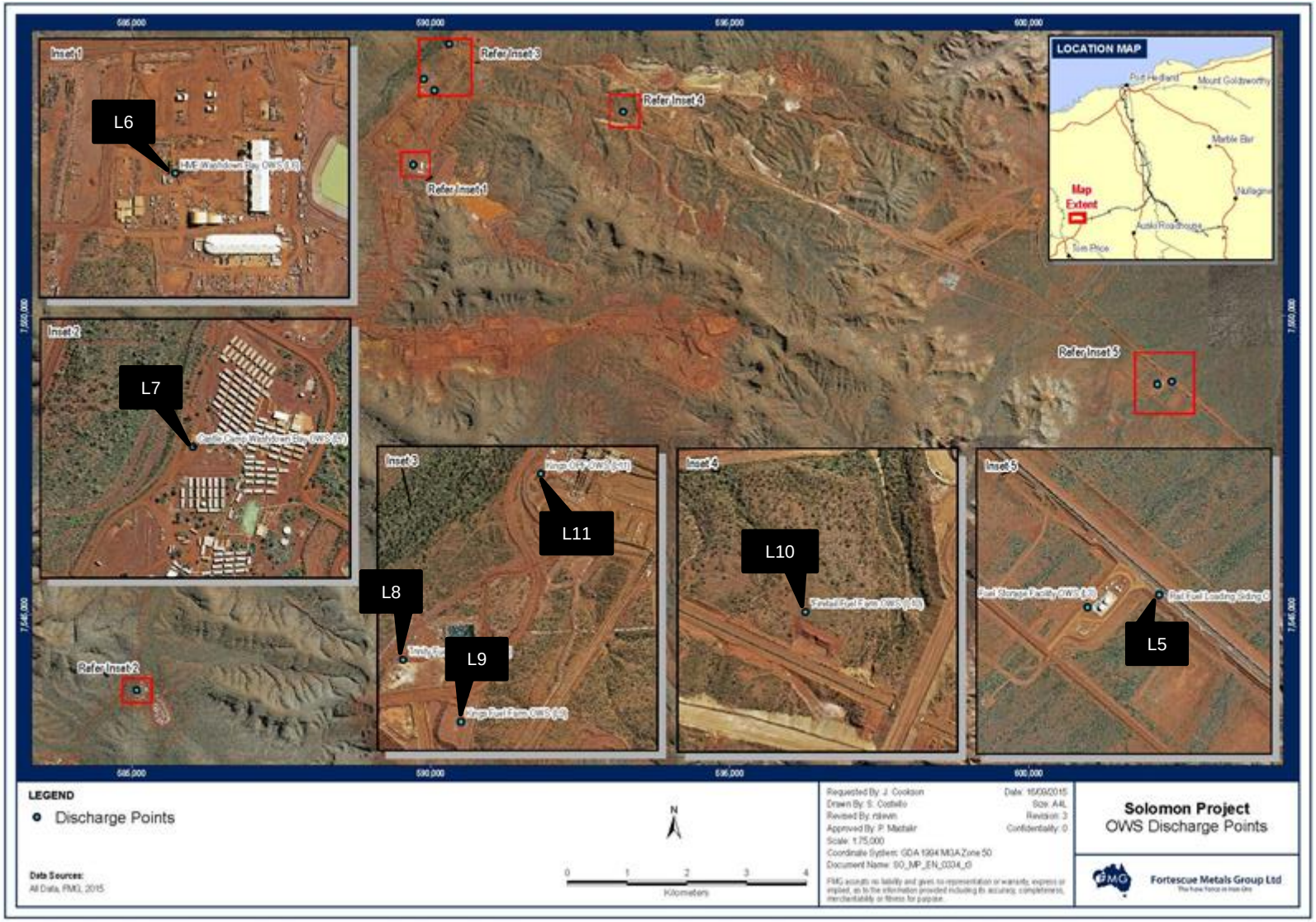
The location of the emission and monitoring points defined in Table 2.5.1 and 3.7.1 are shown in the figures below:

**Location of discharge points L1, L2 and L3**

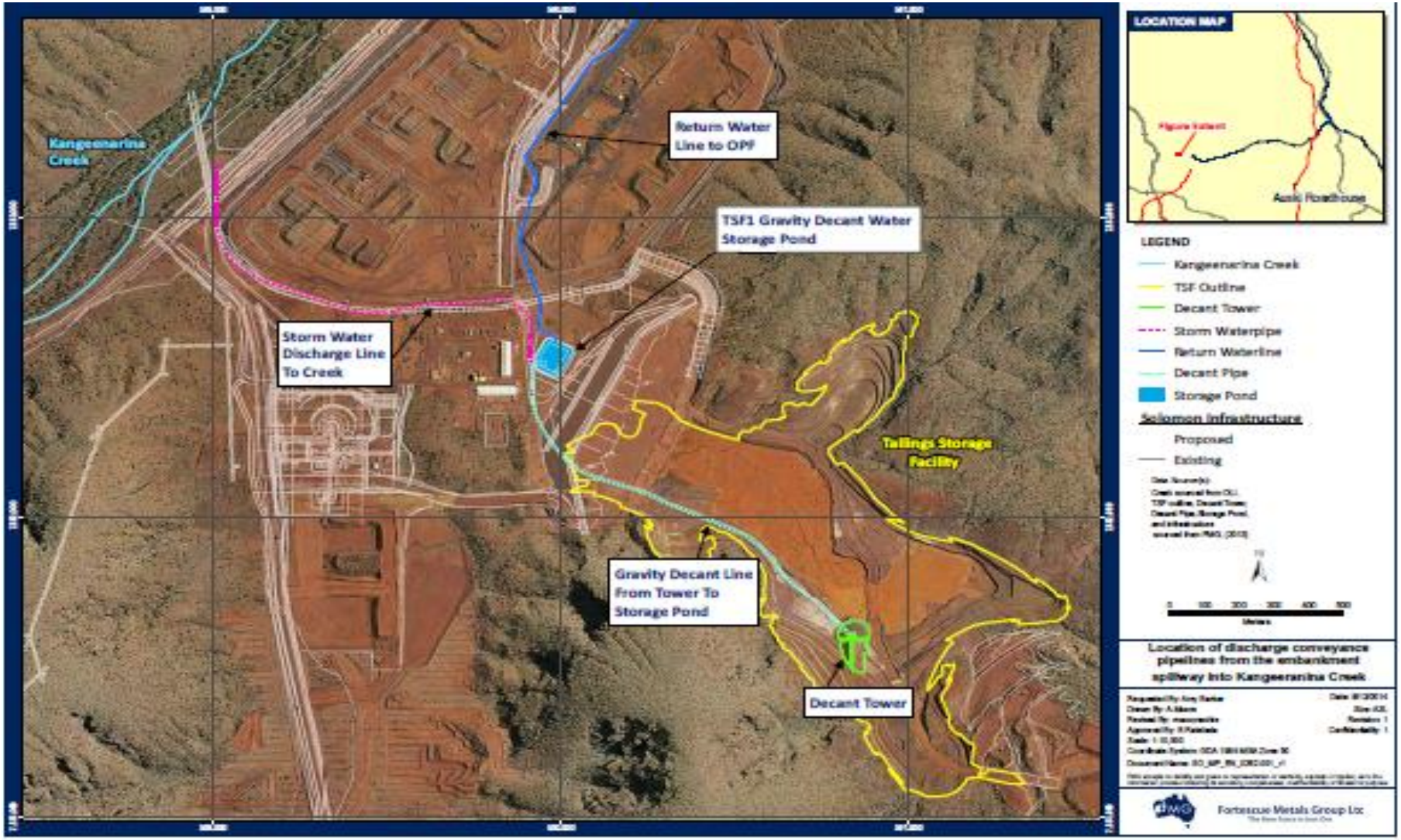


**Location of monitoring point L4**

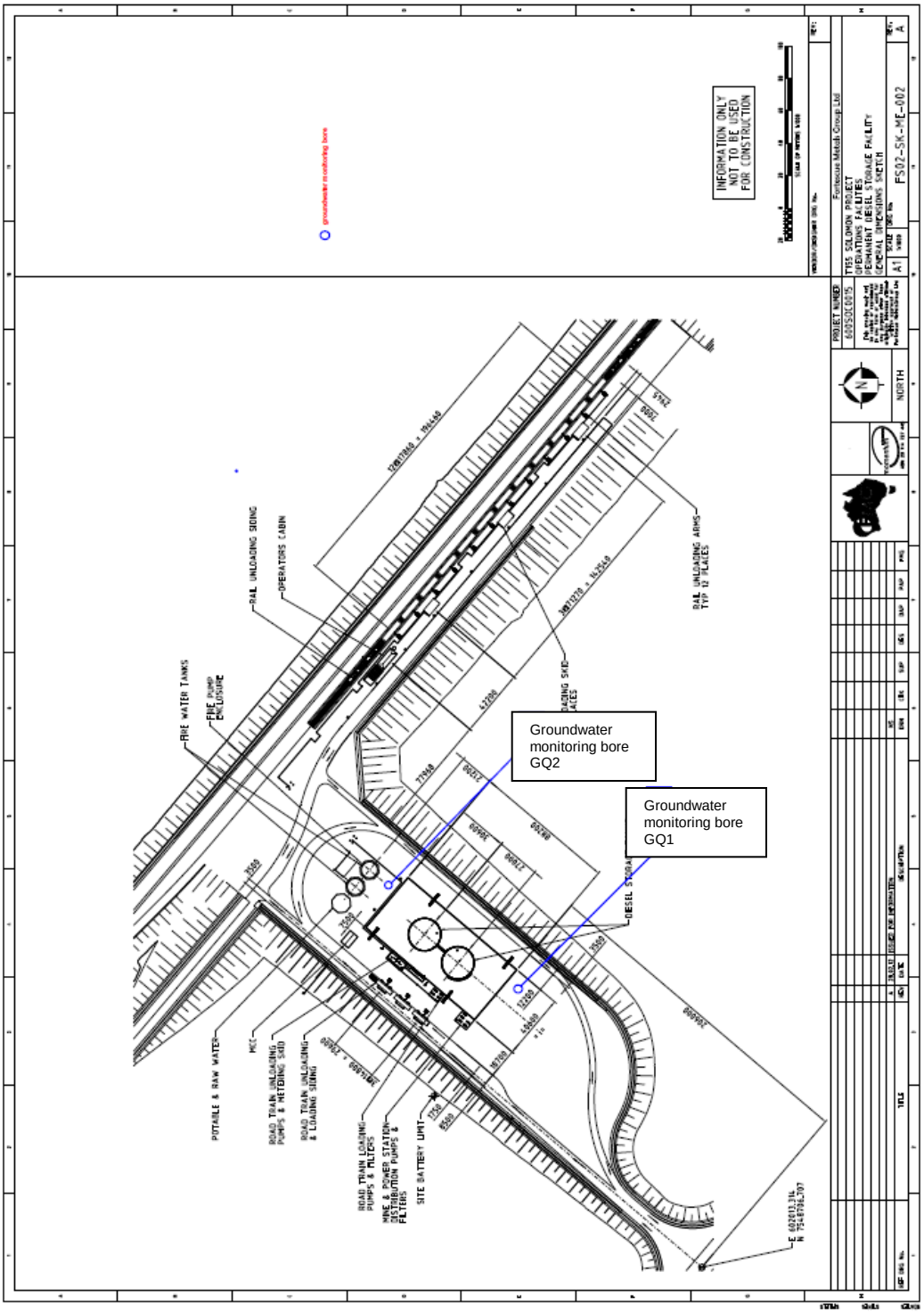



Inset 1
Inset 2
Inset 3
Inset 4
Inset 5
Refer Inset 1
Refer Inset 2
Refer Inset 3
Refer Inset 4
Refer Inset 5
L5
L6
L7
L8
L9
L10
L11
LOCATION MAP
Map Extent
Port Hedland
Mount Goldsworthy
Marble Bar
Nullagine
Auski Roadhouse
Tom Price
LEGEND
Discharge Points
Data Sources:
All Data, FMG, 2015
Kilometers
Solomon Project
OWS Discharge Points
Fortescue Metals Group Ltd

The tailings decant infrastructure as defined in Table 1.3.1 are shown below



The locations of the monitoring points defined in Table 3.8.1 are shown in the two following figures.




GQ3
GQ4
GQ6
GQ5
Location Overview
Project Area
Christmas Creek
LEGEND
TSF 1 GroundWater Monitor Bore Locations
Locality
Kangeenarina Creek
TSF 1 Proposed Design
Kings OPF Tailings Pipeline Proposed Design
TSF 1 Spillway Proposed Design
TSF Bund Wall Proposed Design
FMG Tenement
SOLOMON PROJECT
TSF 1 Monitor Bore Locations

# Schedule 2: Reporting & notification forms

These forms are provided for the proponent to report monitoring and other data required by the Licence. They can be requested in an electronic format.

---

## ANNUAL AUDIT COMPLIANCE REPORT PROFORMA

## SECTION A

**LICENCE DETAILS**

| | |
|---|---|
| Licence Number: | Licence File Number: |
| Company Name:<br><br>Trading as: | ABN: |
| Reporting period:<br><br>_____ to _____ | |

**STATEMENT OF COMPLIANCE WITH LICENCE CONDITIONS**

1. Were all conditions of the Licence complied with within the reporting period? (please tick the appropriate box)

Yes ☐ Please proceed to Section C

No ☐ Please proceed to Section B

Each page must be initialled by the person(s) who signs Section C of this Annual Audit Compliance Report (AACR).

Initial:

# SECTION B
## DETAILS OF NON-COMPLIANCE WITH LICENCE CONDITION.

Please use a separate page for each licence condition that was not complied with.

| a) Licence condition not complied with: | |
|---|---|
| | |
| b) Date(s) when the non compliance occurred, if applicable: | |
| | |
| c) Was this non compliance reported to DER?: | |
| ☐ Yes ☐ Reported to DER verbally<br>Date _____<br>☐ Reported to DER in writing<br>Date _____ | ☐ No |
| d) Has DER taken, or finalised any action in relation to the non compliance?: | |
| | |
| e) Summary of particulars of the non compliance, and what was the environmental impact: | |
| | |
| f) If relevant, the precise location where the non compliance occurred (attach map or diagram): | |
| | |
| g) Cause of non compliance: | |
| | |
| h) Action taken, or that will be taken to mitigate any adverse effects of the non compliance: | |
| | |
| i) Action taken or that will be taken to prevent recurrence of the non compliance: | |
| | |

Each page must be initialled by the person(s) who signs Section C of this AACR

Initial:

# SECTION C

## SIGNATURE AND CERTIFICATION

This Annual Audit Compliance Report (AACR) must only be signed by a person(s) with legal authority to sign it. The ways in which the AACR must be signed and certified, and the people who may sign the statement, are set out below.

Please tick the box next to the category that describes how this AACR is being signed. If you are uncertain about who is entitled to sign or which category to tick, please contact the licensing officer for your premises.

| If the licence holder is | | The Annual Audit Compliance Report must be signed and certified: |
|---|---|---|
| An individual | □<br>□ | by the individual licence holder, or<br>by a person approved in writing by the Chief Executive Officer of the Department of Environment Regulation to sign on the licensee's behalf. |
| A firm or other unincorporated company | □<br>□ | by the principal executive officer of the licensee; or<br>by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation. |
| A corporation | □<br>□<br>□<br>□<br>□<br>□ | by affixing the common seal of the licensee in accordance with the *Corporations Act 2001*; or<br>by two directors of the licensee; or<br>by a director and a company secretary of the licensee, or<br>if the licensee is a proprietary company that has a sole director who is also the sole company secretary – by that director, or<br>by the principal executive officer of the licensee; or<br>by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation. |
| A public authority (other than a local government) | □<br>□ | by the principal executive officer of the licensee; or<br>by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation. |
| a local government | □<br>□ | by the chief executive officer of the licensee; or<br>by affixing the seal of the local government. |

It is an offence under section 112 of the *Environmental Protection Act 1986* for a person to give information on this form that to their knowledge is false or misleading in a material particular. There is a maximum penalty of $50,000 for an individual or body corporate.

I/We declare that the information in this annual audit compliance report is correct and not false or misleading in a material particular.

SIGNATURE: _____

NAME:
(printed) _____

POSITION: _____

DATE: _____/_____/_____

SIGNATURE: _____

NAME:
(printed) _____

POSITION: _____

DATE: _____/_____/_____

SEAL (if signing under seal)

Licence: L8464/2010/1
Form: EL1
Name: Limit exceedances

Licensee: FMG Solomon Pty Ltd
Period:

| **Form EL1: Limit exceedances** |
| --- |
| Please provide an analysis of the Limit exceedances for the reporting period, including but not limited to:<br>(a) the emission point<br>(b) the root cause analysis for the exceedances;<br>(c) any common or contributory factors;<br>(d) a description of remedial measures taken or planned to be taken, including those taken to prevent recurrence of the exceedances; and<br>(e) complaints received that may have been caused by this exceedance. |
| |

Licence: L8464/2010/1 Licensee: FMG Solomon Pty Ltd
Form: N1 Date of breach:

**Notification of detection of the breach of a limit**

These pages outline the information that the operator must provide.
Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

## Part A

| | |
|---|---|
| Licence Number | |
| Name of operator | |
| Location of Premises | |
| Time and date of the detection | |

| **Notification requirements for the breach of a limit** | |
|---|---|
| Emission point reference/ source | |
| Parameter(s) | |
| Limit | |
| Measured value | |
| Date and time of monitoring | |
| Measures taken, or intended to be taken, to stop the emission | |

## Part B

| | |
|---|---|
| Any more accurate information on the matters for notification under Part A. | |
| Measures taken, or intended to be taken, to prevent a recurrence of the incident. | |
| Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission. | |
| The dates of any previous N1 notifications for the Premises in the preceding 24 months. | |

| | |
|---|---|
| Name | |
| Post | |
| Signature on behalf of<br>FMG Solomon Pty Ltd | |
| Date | |

Government of Western Australia
Department of Environment Regulation

# Partial Decision Document

## *Environmental Protection Act 1986,* Part V

## Proponent: FMG Solomon Pty Ltd

## Licence: L8464/2010/2

| | |
|---|---|
| **Registered office:** | 87 Adelaide Terrace<br>EAST PERTH WA 6004 |
| **ACN:** | 128 959 179 |
| **Premises address:** | Solomon Mine<br>M47/1409, M47/1413, M47/1431, L47/293, L47/294, L47/360, L47/363, L46/392 and portion of L47/296, L47/361 and L47/381<br>MT SHEILA WA 6751 |
| **Issue date:** | Thursday, 15 October 2015 |
| **Commencement date:** | Sunday, 18 October 2015 |
| **Expiry date:** | Friday, 17 October 2025 |

**Decision**

Based on the assessment detailed in this document the Department of Environment Regulation (DER), has decided to issue an amended licence. DER considers that in reaching this decision, it has taken into account all relevant considerations.

| | |
|---|---|
| Decision Document prepared by: | Haley Brunel<br>Licensing Officer |
| Decision Document authorised by: | Alana Kidd<br>Manager Licensing – (Resources Industries) |

# Contents



# 1 Purpose of this Document

This decision document explains how DER has assessed and determined the application and provides a record of DER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DER's assessment and decision making under Part V of the *Environmental Protection Act 1986.* Other approvals may be required for the proposal, and it is the proponent's responsibility to ensure they have all relevant approvals for their Premises.

**Works approval and licence conditions**
DER has three types of conditions that may be imposed on works approvals and licences. They are as follows;

# 2 Administrative summary

| **Administrative details** | | |
|---|---|---|
| Application type | Works Approval ☐<br>New Licence ☒<br>Licence amendment ☐<br>Works Approval amendment ☐ | |
| Activities that cause the premises to become prescribed premises | **Category number(s)** | **Assessed design capacity** |
| | 5 | Not more than 95,300,000 tonnes per annual period |
| | 54 | Not more than 1,178 cubic metres per day |
| | 57 | 1,500 tyres in total |
| | 61 | 110,000 tonnes per annual period |
| | 64 | 10,000 tonnes per annual period |
| | 73 | Not more than 9,200 cubic metres in aggregate |
| Application verified<br>Application fee paid | Date: 11 August 2015<br>Date: 24 August 2015 | |

| | | |
|---|---|---|
| Works Approval has been complied with<br>Compliance Certificate received | Yes☐ No☐ N/A☒<br>Yes☐ No☐ N/A☒ | |
| Commercial-in-confidence claim | Yes☐ No☒ | |
| Commercial-in-confidence claim outcome | N/A | |
| Is the proposal a Major Resource Project? | Yes☒ No☐ | |
| Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986*? | Yes☒ No☐ | Referral decision No:<br>Managed under Part V ☒<br>Assessed under Part IV ☐ |
| Is the proposal subject to Ministerial Conditions? | Yes☒ No☐ | Ministerial statement No: 862<br>EPA Report No: 1841 |
| Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the *Environmental Protection Act 1986*)? | Yes☐ No☒<br>Department of Water consulted Yes ☐ No ☒ | |
| Is the Premises within an Environmental Protection Policy (EPP) Area Yes☐ No☒<br>If Yes include details of which EPP(s) here. | | |
| Is the Premises subject to any EPP requirements? Yes☐ No☒<br>If Yes, include details here, eg Site is subject to $SO_2$ requirements of Kwinana EPP. | | |

# 3 Executive summary of proposal and assessment

FMG Solomon Pty Ltd (FMG) operates the Solomon Project located in the Pilbara region of Western Australia, approximately 54 km north of Tom Price and 12 km north west of Karijini National Park.

The Solomon Project is located within a landscape of steep hills and ridges. Much of the project area is covered with stony soils with shallow loams and some red brown non-cracking clays and red loamy earths. The mine lies in the Lower Fortescue River Watershed, which has an intermittent flow pattern resulting in rivers and creeks being dry for most of the year.

There are three ephemeral streams that traverse the operational areas of the Solomon Project, however, there are no significant drainage lines within or in proximity to the prescribed activities carried out on site. The average depth to groundwater across the site is approximately 50m below ground level and is generally fresh in quality.

The current mining operations include:

- Temporary crushing facilities – Firetail and Kings Mobile Crushing Facilities (MCFs), the Direct Shipping Ore Processing Plant (DSOPP) and the Additional Mobile Crushing Facilities;
- Permanent ore processing facilities (OPFs) – the Firetail OPF, Kings OPFs, Kings and Firetail Sizing Hubs;
- Tailings Storage Facility 1 (TSF1);
- Stockyards and train loading facility;
- Bulk Fuel Storage Facility – 2 x 3,500 kL tanks (total capacity 7000kL);
- Additional satellite fuel storage facilities – total capacity 2,000kL;
- Castle/Dally Camp and Kangi Camp wastewater treatment plants (WWTPs);

- Category 64 Class II putrescible landfill to allow inert waste (used tyres, concrete and conveyor belts) and putrescible waste (untreated wooden pallets) to be disposed in mine out pits and waste rock dumps;
- Heavy machinery and vehicle wash-down facilities and wastewater storage ponds;
- Bioremediation facility to treat hydrocarbon contaminated soils;
- Used tyre storage areas;
- Administration buildings; and
- Workshops.

At the time of this renewal the Licence has been updated to the latest licence template version 2.9.

The following amendments have also been considered at the time of this Licence renewal:

- Upgrade works to the Dally Camp WWTP;
- Inclusion of additional discharge points associated with the oily water separators currently located on site;
- Minor change to the TSF monitoring condition to reflect that the gravity decant captures supernatant water rather than seepage; and
- Amendment to the prescribed premises to align the boundary with the boundary approved under Ministerial Statement 862.

The changes resulting from the Licence update and DER's assessment of the amendments sought by the Licensee are described in the Decision Table in Section 4.

# 4 Decision table

All applications are assessed in line with the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987* and DER's Operational Procedure on Assessing Emissions and Discharges from Prescribed Premises. Where other references have been used in making the decision they are detailed in the decision document.

| DECISION TABLE | | | |
|---|---|---|---|
| **Works Approval / Licence section** | **Condition number W = Works Approval L= Licence** | **Justification (including risk description & decision methodology where relevant)** | **Reference documents** |
| **Premises operation** | 1.3.9 | The Licensee is proposing to upgrade the existing Dally Camp WWTP to improve the efficiency of the facility.<br><br>Condition 1.3.9 has been included in the Licence, requiring the Licensee to undertake the Dally Camp WWTP upgrade works in accordance with the Licence amendment application supporting documentation. Condition 1.3.10 has been included an allows the Licensee a three month commissioning period. Condition 4.3.1 requires the Licensee to submit compliance documentation to DER, confirming that the works have been completed in accordance with the specifications in the supporting documentation and a commissioning plan one month prior to the commencement of commissioning.<br><br>Once complete, the upgraded Dally Camp WWTP will operate under the existing conditions of the Licence. Further details of the proposed upgrade works, including an assessment of the emissions and discharges, is described further in Appendix A (Emissions to land including monitoring).<br><br>Condition 1.3.11 has been added to the Licence to set limits for the production capacity for categories 5, 61 and 73. | Application supporting documentation |
| **Emissions to land including monitoring** | L2.2.1 and L3.2.1 | The Licensee has requested that emissions points, from which treated wastewater from OWSs is discharged, are included on the Licence.<br><br>The Licensee is also proposing to upgrade the existing Dally Camp WWTP, from which treated wastewater is discharged to a designated irrigation field. | Application supporting documentation |

| DECISION TABLE | | | |
|---|---|---|---|
| **Works Approval / Licence section** | **Condition number W = Works Approval L= Licence** | **Justification (including risk description & decision methodology where relevant)** | **Reference documents** |
| | | DER's assessment and decision making with respect to these emissions is described in Appendix A. | |
| **Fugitive emissions** | N/A | The fugitive dust emissions associated with the operation of the mine have been reassessed at the time of this Licence renewal.<br><br><u>Emission Description</u><br>*Emission:* Dust emissions are produced by the transport, processing, movement and storage of iron ore.<br>*Impact:* Deterioration of local air shed, including potential health impacts to residents. Dust emissions can be harmful to human health and the environment. Elevated total suspended particulates (TSP) can impact ambient environmental quality resulting in amenity impacts and can smother vegetation. Particulate matter that is less than 10 ($PM_{10}$) or 2.5 ($PM_{2.5}$) micrometres in diameter can be drawn deep into the lungs causing human health impacts. The chemical and physical properties of the particles, the size of the particles and the duration of exposure are all factors which may affect human health impacts.<br>*Controls:* The following measures are implemented at the Solomon Mine to minimise dust emissions:<br>• sprays or water trucks are used on run of mine stockpiles to control fugitive dust;<br>• dust suppression sprays have been fitted to crushers and conveyors;<br>• water fogging sprays on the Sizing Hubs;<br>• dry baghouse dust collection and ducting connected at all ore transfer points at the Firetail OPF;<br>• water sprays are used at transfer points;<br>• dust suppression sprays have been fitted to the screen to control fugitive dust emissions from product screening;<br>• crushed material stockpiles (fines <12mm) are sprayed (sprinklers and water | General provisions of the *Environmental Protection Act 1986* |

| DECISION TABLE | | | |
|---|---|---|---|
| **Works Approval / Licence section** | **Condition number W = Works Approval L= Licence** | **Justification (including risk description & decision methodology where relevant)** | **Reference documents** |
| | | trucks);<br>• in extreme conditions (high wind) the processing at the crushing facilities will cease until conditions improve;<br>• water is added to the ore during processing and the final product will contain a moisture content of 6 – 8 % moisture; and<br>• a dust suppressant (e.g. Soiltac) is applied to the stockpiles to prevent windblown dust.<br><br>The Licensee has set the following objectives with respect to dust emissions during operation of the Solomon Project:<br>• that implementation of the Solomon Project does not lead to community complaints regarding dust emissions or their impacts; and<br>• the operations do not cause National Environmental Protection Management (NEPM) standards to be exceeded at the Solomon Project boundary.<br><br>The Licensee has implemented a dust monitoring program for the greater Solomon Project which includes the installation of at least 5 dust monitoring stations (and 1 background station) at varying locations around the Solomon Project to quantify the significance of dust emissions during operation and effectively monitor ambient dust concentrations. $PM_{10}$ concentrations are monitored continuously from monitors located around the Solomon Project area whilst visible dust from the crushing facilities is monitored daily and as the opportunity arises.<br><br>FMG addressed dust management in the Public Environmental Review for the project, with proposed management including the implementation of a dust management plan. FMG has prepared an overarching dust management plan which applies across it's mine and rail sites and continues to implement this plan.<br><br>Each of FMG's tenements issued under the *Mining Act 1978* for the Solomon Project | |

| DECISION TABLE | | | |
|---|---|---|---|
| **Works Approval / Licence section** | **Condition number W = Works Approval L= Licence** | **Justification (including risk description & decision methodology where relevant)** | **Reference documents** |
| | | also include conditions related to dust management. Further to this, conditions of the tenements require that the construction and operation of the project, and measures to protect the environment, are carried out generally in accordance with the submitted Mining Proposals. Each of the submitted Mining Proposals for the Solomon Project has required dust management in accordance with the approved management plan.<br><br>Risk Assessment<br>*Consequence:* Minor<br>*Likelihood:* Rare<br>*Risk Rating:* Low<br><br>Regulatory Controls:<br>The Licensee has implemented a range of dust suppression measures across the Solomon mine which is effectively managing fugitive dust emissions to minimise environmental and human health impacts. In addition, a comprehensive dust monitoring network has been established to monitor ambient dust concentrations and visible dust from the crushing facilities is monitored daily. The regulation of dust from the project is also addressed under the mining tenement conditions. Dust emissions associated with the project have been assessed as a low risk and no dust complaints have been received.<br><br>Given the controls currently in place, conditions 2.3.1 and 2.3.2 pertaining to fugitive dust emissions have been removed from the Licence.<br><br>The Solomon Mine will be subject to regular DER inspections during which fugitive dust emissions and the effectiveness of existing dust mitigation measures will be assessed. If unreasonable dust emissions are identified, DER may require the implementation of a dust management plan through conditions of the Licence. The general provisions of the *Environmental Protection Act 1986* also apply.<br><br>Residual Risk | |

| DECISION TABLE | | | |
|---|---|---|---|
| **Works Approval / Licence section** | **Condition number W = Works Approval L= Licence** | **Justification (including risk description & decision methodology where relevant)** | **Reference documents** |
| | | *Consequence:* Minor<br>*Likelihood:* Rare<br>*Risk Rating:* Low | |
| **Process monitoring** | L3.7.1 | Emission Description<br>*Emission:* Treated wastewater (TWW) from the Bulk Fuel Facility, Rail Fuel Siding, Castle Camp, HME washdown facility and Trinity Fuel farm oily water separators, potentially containing elevated concentrations of TRH and BTEX, used on site for dust suppression<br>*Impact:* Potential contamination of surrounding land, surface water drainage systems and groundwater.<br>*Controls:* The Licensee monitors the quality of the TWW to ensure the concentration of total recoverable hydrocarbons (TRH) and BTEX are acceptable levels and concentrations of TRH in discharge water is less than 15 mg/L.<br><br>Risk Assessment<br>*Consequence:* Minor<br>*Likelihood:* Possible<br>*Risk Rating:* Moderate<br><br>Regulatory Controls:<br>Monitoring requirements have been included under Condition 2.4.1 of the Licence, including limits for concentrations of TRH and BTEX in treated wastewater discharged.<br><br>Residual Risk<br>*Consequence:* Minor<br>*Likelihood:* Rare<br>*Risk Rating:* Low | Application supporting documentation<br><br>*Environmental Protection (Unauthorised Discharges) Regulations 2004* |
| **Information** | L4.2.1 | Table 4.2.1 has been updated to include the requirement to report the treated wastewater monitoring results in the Annual Environmental Report. | N/A |
| **Licence** | N/A | This Licence has been issued for a period of 10 years, in accordance with DER's | DER Guidance |

| DECISION TABLE | | | |
|---|---|---|---|
| **Works Approval / Licence section** | **Condition number W = Works Approval L= Licence** | **Justification (including risk description & decision methodology where relevant)** | **Reference documents** |
| **Duration** | | Guidance Statement relating to Licence duration. | Statement, 'Licence Duration', Revised May 2015 |

# 5 Advertisement and consultation table

| Date | Event | Comments received/Notes | How comments were taken into consideration |
|---|---|---|---|
| 8/10/2015 | Proponent sent a copy of draft instrument. | Comment regarding the approved production or design capacity for category 73. | Noted. Approved premises production or design capacity maintained at 9,200 $m^3$ to capture the bulk fuel storage facility and satellite fuel storage areas. |
| | | Remove fugitive dust emissions as being an emission of concern from the premises description section. | Noted. Dust emissions, if not adequately managed, are a concern. FMG has demonstrated that adequate management has been implemented to minimise the impacts associated with dust emissions. The wording of this section has been changed to read 'main emissions' as opposed to 'main emissions of concern'. |
| | | **Table 1.3.2**<br>Include the Firetail Waste Wood Disposal Area as a specified disposal location for untreated wood. | Table 1.3.2 updated in line with comments. |
| | | **Condition 1.3.7**<br>This condition relating to the annual water balance for the TSF is of minimal value as there is no requirement to report the information. | Table 4.2.1 updated to include the requirement to report this information in the Annual Environmental Report. |
| | | **Table 1.3.5**<br>Specify a limit of 7,000 $m^3$ for category 73 as the bulk fuel facility is the only facility that meets the description of category 73. | Limit set at 9,200 $m^3$ to include the bulk fuel facility and satellite fuel storage areas, as category 73 applies to the storage of chemicals, in aggregate, which would include the bulk fuel storage facility and satellite storage facilities. |

| Date | Event | Comments received/Notes | How comments were taken into consideration |
|---|---|---|---|
| | | **Table 2.2.2**<br>Remove the limits associated with the discharge of treated wastewater from the Kangi and Dally/Castle Camps WWTPs. FMG will develop appropriate limits which will be addressed in a subsequent Licence amendment application, on completion of the upgrades to the Dally WWTP. | Change implemented in line with the Licensee's request. |

# 6 Risk Assessment

*Note: This matrix is taken from the DER Corporate Policy Statement No. 07 - Operational Risk Management*

### Table 1: Emissions Risk Matrix

| Likelihood | Consequence | | | | |
|---|---|---|---|---|---|
| | Insignificant | Minor | Moderate | Major | Severe |
| Almost Certain | Moderate | High | High | Extreme | Extreme |
| Likely | Moderate | Moderate | High | High | Extreme |
| Possible | Low | Moderate | Moderate | High | Extreme |
| Unlikely | Low | Moderate | Moderate | Moderate | High |
| Rare | Low | Low | Moderate | Moderate | High |

# Appendix A

**OILY WATER SEPARATORS**

Emission Description

*Emission:* Discharge of treated wastewater from the Bulk Fuel Facility, Rail Fuel Siding, Castle Camp, Trinity Fuel farm, Kings Fuel Farm, Firetail Fuel Farm and Kings OPF oily water separators with elevated concentrations of total recoverable hydrocarbons (TRH) and benzene, toluene, ethyl benzene and xylenes (BTEX).
*Impact:* Potential contamination of surrounding land, surface water drainage systems and groundwater.
*Controls:* Wastewater from fuel storage or handling facilities and machinery/vehicle washdown facilities is treated through oily water separators to prevent the discharge of wastewater containing unacceptable concentrations of hydrocarbons into the environment. The quality of the wastewater discharged to land is targeted at less than 15 mg/L of TRH.

The OWS emission points are located at least 50 m from the closest surface water drainage lines, which are ephemeral in nature, only flowing following significant rainfall events.

Risk Assessment
*Consequence:* Minor
*Likelihood:* Possible
*Risk Rating:* Moderate

Regulatory Controls:
The emission points from which treated wastewater is discharged to the environment are included under Condition 2.2.1 of the Licence. Limits for concentrations of TRH and BTEX in discharge water are specified under Condition 2.2.2. Condition 3.2.1 has been updated and requires the quarterly monitoring of treated wastewater.

Residual Risk
*Consequence:* Minor
*Likelihood:* Rare
*Risk Rating:* Low

**DALLY CAMP WWTP UPGRADE WORKS**

**Construction and operation**

Construction of the existing 400 cubic metre per day ($m^3$) capacity Dally Camp WWTP was approved in June 2011 under works approval W4881/2011/1. Water quality monitoring results for the WWTP indicate that it is not working efficiently. The Licensee proposes the following changes to improve the efficiency of the plant and the quality of the treated wastewater discharged to the irrigation area:

- decommissioning of the existing treatment units;
- installation of a 320 kilolitre (kL) capacity Sequence Batch Reactor (SBR);
- 250 kL capacity Balance Tank; and
- Retrofitted 40 foot sea container to be used as a dedicated WWTP control room.

Some components of the existing WWTP are to be retained, but may be relocated or retrofitted to meet the new layout concept, as described as follows:

- the Spirac Screen will be retained, but relocated in proximity to the new SBR balance tank;
- the seven irrigation tanks, currently used for the storage of treated water and to service the irrigation chlorination and transfer station, will be retained, but will be upgraded to create a recirculation chlorination strategy to ensure the treated wastewater is disinfected prior to discharge

- the digester tank system (five sludge tanks) will be retained, but relocated; and
- the electrical distribution board (DB) will be retained.

Operation of the WWTP is to be sustained throughout the upgrade process. This will mean that there will be a transitional WWTP layout, in which the old and new plant components are operating concurrently. On completion of integration of the new SBR, the old wastewater treatment units will be decommissioned and removed from site.

During operation of the upgraded WWTP, treated wastewater will continue to be discharged to the approved irrigation area.

Typically, 40 $m^3$ of sludge is produced annually by the WWTP. This sludge is collected in sludge tanks and has previously been collected by a licensed controlled waste carrier and taken offsite for disposal.

As part of the proposed works, the Licensee is proposing to install a sludge press to manage sludge produced from the treatment process. Installation of the press will require retrofitting one of the existing sludge tanks with a transfer pump to recirculate sludge equally through the sludge tanks. Sludge will be conveyed from the sludge tanks to the polymer preparation station comprising a 200 litre storage tank and dosing pump. The sludge will then be conveyed to the screw press, which will be located in an enclosed building to minimise odour emissions. The press is a sludge dewatering system.

As sludge enters the press, filtrate is drained and pressure is applied to the sludge to create a sludge cake. The filtrate discharged from the press is recirculated through the WWTP. Approximately 13.2 kL of filtrate will be recirculated through the WWTP per annum, which can be addressed within the current capacity of the plant and it is anticipated that it will not impact the discharge water quality. Approximately 26.8 $m^3$ of sludge cakes will be produced and require disposal per annum. The sludge cakes will be temporarily stored in a skip bin prior to disposal. The cakes meet the description of biosolids in the *Landfill Waste Classifications and Waste Definitions 1996* (as amended) and therefore suitable for disposal in Class I landfills.

**Normal operation**

Emission Description

*Emission:* Treated wastewater from the Dally Camp WWTP discharged to the irrigation area, potentially with elevated concentrations of total nitrogen, total phosphorus, biochemical oxygen demand, total suspended solids and E.Coli

*Impact:* Contamination of surrounding land and surface water drainage, potential for eutrophication of surface water due to elevated nutrients and ecosystem disruption

*Controls:* Monitoring of the WWTP will continue to be undertaken in accordance with the current requirements of the Solomon Mine operating Licence L8464/2010/1, to ensure that treated wastewater discharged to land is of acceptable quality. This monitoring will continue throughout the upgrade works and during operation of the upgraded facility

There are no sensitive wetlands or drainage features in close proximity to the WWTP. There are minor drainage lines throughout the area, with the closest approximately 170 m from the WWTP. However, these are ephemeral and only flow during significant storm events. The WWTP is located outside the 1 in 100 year floodplain.

Wastewater will continue to be treated to the low exposure risk level, as outlined in *Guideline for the Non-potable Uses of Recycled Water in Western Australia* (Department of Health, 2011).

Risk Assessment

*Consequence:* Minor

*Likelihood:* Possible

*Risk Rating:* Moderate

Regulatory Controls
Condition 1.3.4 on the existing Licence specifies requirements that need to be met with respect to the irrigation of treated wastewater. These management measures include no irrigation generated runoff, spray drift or discharge beyond the designated irrigation areas, wastewater is evenly distributed over the irrigation area, no soil erosion occurs, irrigation does not occur on land that is waterlogged and a healthy vegetation cover is maintained.

Under condition 3.2.1 the Licensee is required to undertake quarterly sampling of the treated wastewater. Condition 4.2.1 requires the Licensee to report the monitoring results in the AER, submitted to DER on an annual basis.

The Licensee has advised that appropriate limits will be developed and addressed in a subsequent Licence amendment application, to be submitted on completion of the upgrades to the Dally WWTP.

Residual Risk
*Consequence:* Minor
*Likelihood:* Rare
*Risk Rating:* Low

**Emergency operation**
Emission Description
*Emission:* Overflow of untreated and/or treated effluent from the WWTP storage, treatment and sludge tanks
*Impact:* Contamination of surrounding land and surface water drainage, potential for eutrophication of surface water due to elevated nutrients and ecosystem disruption
*Controls:* High level audible and visual alarms will be installed on the SBR and balance tanks. To further reduce the risk of discharge of untreated wastewater to the environment, the WWTP tanks have the capacity to maintain one day freeboard.

Risk Assessment
*Consequence:* Minor
*Likelihood:* Possible
*Risk Rating:* Moderate

Regulatory Controls:
Condition 1.3.2 on the existing Licence requires the Licensee to maintain a one day freeboard (1,200 mm) on the WWTP tanks and ensure all tanks are fitted with a high-water audible and visual alarm system.

Existing condition 1.3.3 limits the treatment capacity of the WWTPs on site, minimising the likelihood of overflows occurring from the treatment and storage tanks.

Residual Risk
*Consequence:* Minor
*Likelihood:* Rare
*Risk Rating:* Low