



# Decision Report

## Application for Works Approval

### Division 3, Part V *Environmental Protection Act 1986*

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<b>Licence Number</b>	W6173/2018/1
<b>Applicant</b>	Mineral Resources Limited (MRL)
<b>ACN</b>	118 549 910
<b>File Number</b>	DWER2018/001447
<b>Premises</b>	<p>Mineral Resources Pilot Graphite Plant 2 Thorpe Way Kwinana Beach</p> <p>Legal description - Part Lot 16 on Deposited Plan 12662 Certificate of Title Volume 2179 Folio 93 As defined by the coordinates in Appendix 2 and shown in the Premises maps in Appendix 1</p>
<b>Date of Report</b>	8 October 2018

## The application

MRL (the Applicant) lodged an application on 10 September 2018 for construction and subsequent operation of two small graphite manufacturing plants to be located in Kwinana. The application documents are listed in Appendix 3.

The plants are to be constructed at 2 Thorpe Way Kwinana Beach within the Kwinana Industrial Area as shown in Appendix 1.

The plants are designed to treat natural gas and reduce it to carbon (graphite) and hydrogen. The proposed activity is within Category 72 of schedule 1 to the *Environmental Protection Regulations 1987* (as detailed below) as the proposed processes involve decomposition of methane to carbon and hydrogen using a chemical process. The proposed scale of operation is less than the threshold of Category 31 premises and below the threshold of Category 72 premises. As such, the premises require a works approval prior to construction and are likely to be registered at the operational stage.

**Table 1: Prescribed premises classification**

Classification of Premises	Description	Approved Premises production or design capacity or throughput
72	Chemical manufacturing: premises on which chemical products are manufactured by a chemical process	Less than 100 tonnes per annual period

## Overview of premises

### Description of proposed activity

The Applicant intends to bring two plants to the premises for the purpose of trialing the production of graphite. The process uses natural gas to produce graphite using a catalyst.

There are two separate plants, the Hazer pilot plant and the MRL pilot plant. The Hazer plant has been in operation in Queensland for 1.5 years. The MRL plant operates at approximately 20 percent of the capacity of the Hazer plant. Tail gases from the process are emitted to atmosphere via 10m stacks that are fitted with particulate filters.

The solid by-product from the process is collected and disposed of to landfill.

There are no liquid wastes produced by the process.

**Table 2: Applicant proposed works and specifications**

Infrastructure	Specifications
Hazer and MRL Pilot Graphite Plants	10m Stack fitted with sintered metal filters Plant generally located as per the Premises Map in Appendix 1
Infrastructure shed	12m by 10m and 7.5m high

## Emissions and discharges

All emissions to air are via 10m high stacks. The emission rates from the stacks are 0.0009m<sup>3</sup>/s for the Hazer plant and 0.0003m<sup>3</sup>/s for the MRL plant.

Table 3 shows the emission rates to air for the tail gas from the process.

**Table 3: Emission to air table**

Stack	Emission type	Stack Height	Vent Diameter	Gas temp	Emission rate
		m	mm	°C	g/s
MRL Pilot Plant stack (A1)	Methane	10 m	Two vents of 25 mm (tail gas and PRV) and one vent of 20 mm (purge gas)	50 - 150	3.22E-01
	Hydrogen				8.80E-02
	Graphite (Particulates)				2.59E-09
	Nitrogen (purge vent)				7.01E-03
	Carbon dioxide				1.57E-04
	Water				3.11E-03
	Carbon monoxide				2.88E-02
	Iron (Particulates)				4.57E-10
Hazer Pilot Plant stack (A2)	Methane	10 m	Two vents of 25 mm (purge gas and PRV) and one vent of 50 mm (tail gas)	50	1.15E+00
	Hydrogen				3.14E-01
	Graphite (Particulates)				9.25E-09
	Nitrogen (purge vent)				2.50E-02
	Carbon dioxide				5.61E-04
	Water				1.11E-02
	Carbon monoxide				1.03E-01
	Iron (Particulates)				1.63E-09

Note: emissions from PRV vent will only occur from a valve lift, which is an unlikely event

The emissions of carbon dioxide and nitrogen are not considered to be significant as the concentrations are low and emitted from a 10m stack. The concentration of these gases in air are carbon dioxide 0.04%, and nitrogen 78%.

Methane and Hydrogen have a lower density than air and are emitted at temperatures above 50 degrees from the 10m stack.

The gas mixture is expected to rise and rapidly mix with air and be below the lower explosive limit after emission from the stack.

Table 4 below shows the estimated concentration of carbon dioxide and particulates at ground level and compares them to the National Environmental Protection (Ambient Air Quality) Measure (NEPM).

**Table 4: Ground level concentrations**

Parameter	Air quality standard	Time average	Maximum GLC at nearest location µg/m <sup>3</sup>	
	µg/m <sup>3</sup>		MRL Plant	Hazer Plant
CO	10 300	8-hour	0.02	0.07
PM as TSP	90	24-hour	1.74E-09	6.21E-09
PM as PM <sub>10</sub>	50	24-hour	8.70E-10	3.10E-09
PM as PM <sub>2.5</sub>	25	24-hour	2.18E-10	7.76E-10

The emissions shown in Table 4 are many orders of magnitude below the air quality standards for CO and particulate matter.

## Environmental siting

The proposed site is in an industrial area as show in the Receptor Map in Appendix 1.

### Residential and sensitive receptors and distance from activity boundary

**Table 5: Separation distance to receptors**

Residential and sensitive premises	Distance from Prescribed Premises
Residential receptors	1.2 KM
Kwinana beach	1.6 KM
Park and Recreation Reserve	0.9KM

## Risk assessment

**Table 6: Risk assessment – construction**

Risk Event					Applicant controls	Detailed Risk Assessment required	Reasoning
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential impact			
Construction and assembly of plant infrastructure	Dust: associated with construction activities	Residential premises 1.2KM from premises Air	Air / wind dispersion	Amenity	Limited construction period due to small size of plant	No	<p>The limited construction works will generate low quantities of dust and noise.</p> <p>The Delegated Officer considers the levels of dust and noise emissions likely to be generated will not impact on the nearest receptor due to separation distance. No further risk assessment is required.</p> <p>The <i>Environmental Protection (Noise) Regulations 1997</i> apply</p>
	Noise: associated with construction activities						

**Table 7: Risk assessment – operation**

Risk Event					Applicant controls	Detailed Risk Assessment required	Reasoning
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential impact			
Operation of the Hazer and MRL Graphite plants	Air emissions of tail and purge gasses	Residential premises 1.2Km from premises	Air / wind dispersion	Amenity	<ul style="list-style-type: none"> <li>10m Stack</li> <li>Particulate filter</li> <li>Located in industrial area</li> </ul>	No	<p>The Delegated Officer considers the concentration of emissions likely to be generated will not impact on the nearest receptor due to separation distance and low level of emissions. No further risk assessment is required.</p> <p>The <i>Environmental Protection (Noise) Regulations 1997</i> apply</p>
	Noise	Residential premises 1.2Km from premises	Air / wind dispersion	Amenity	Located in industrial area.	No	

## Risk assessment overview

The operations are considered to be low risk with limited emissions. The premises are located within an industrial area with a 1.6km separation distance to the nearest residential receptor. There are no liquid emissions proposed from the operations.

The premises are also regulated by the Department of Mines, Industry Regulation and Safety.

At the operational stage, the plants are likely to be registered (no specific conditions) rather than, licenced.

## Consultation

The works approval application was advertised on the Department's website on 24 September 2018.

A draft works approval and decision report were provided to the applicant on 21 September 2018. One comment was received regarding a minor typographical error that has been updated.

## Decision

This assessment of the risks of activities on the premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this decision report (summarised in Appendix 3).

Based on this assessment, it has been determined that the issued works approval will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

DWER notes that it may review the appropriateness and adequacy of controls at any time and that, following a review, DWER may initiate amendments to the approval under the EP Act.

Paul Byrnes  
MANAGER, PROCESS INDUSTRIES  
REGULATORY SERVICES

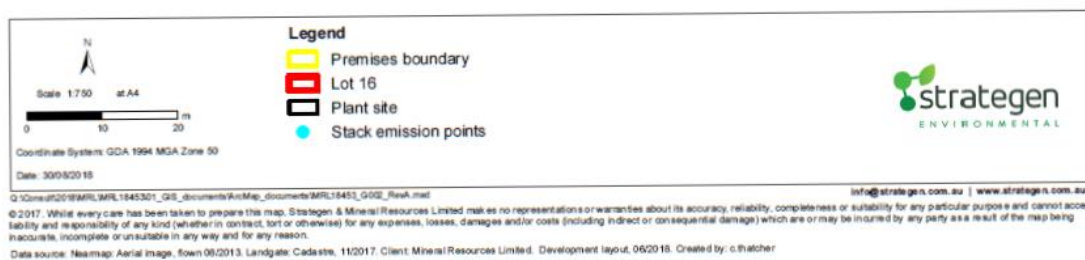
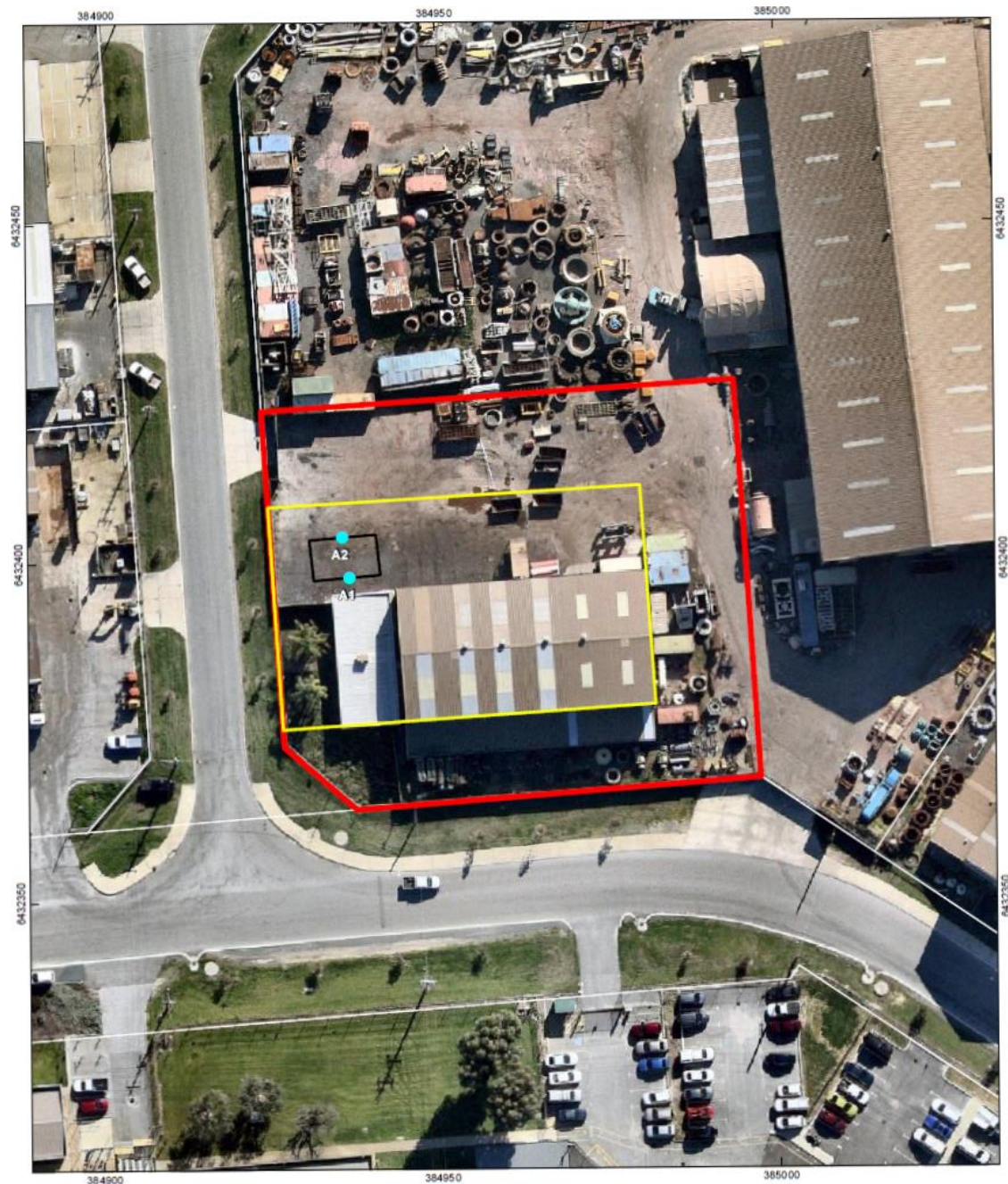
Delegated Officer under section 20 of the *Environmental Protection Act 1986*

8 October 2018



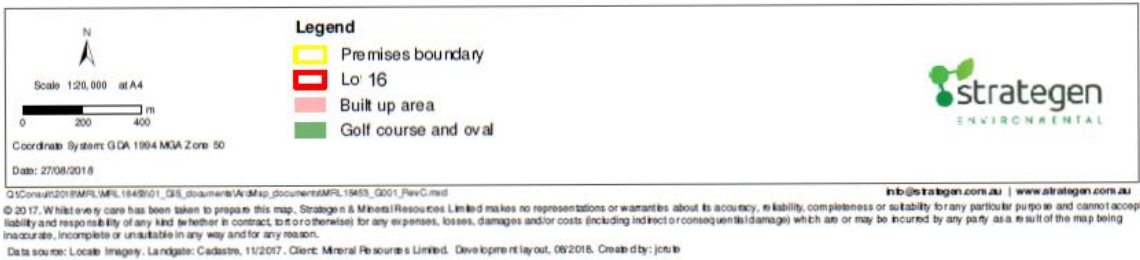
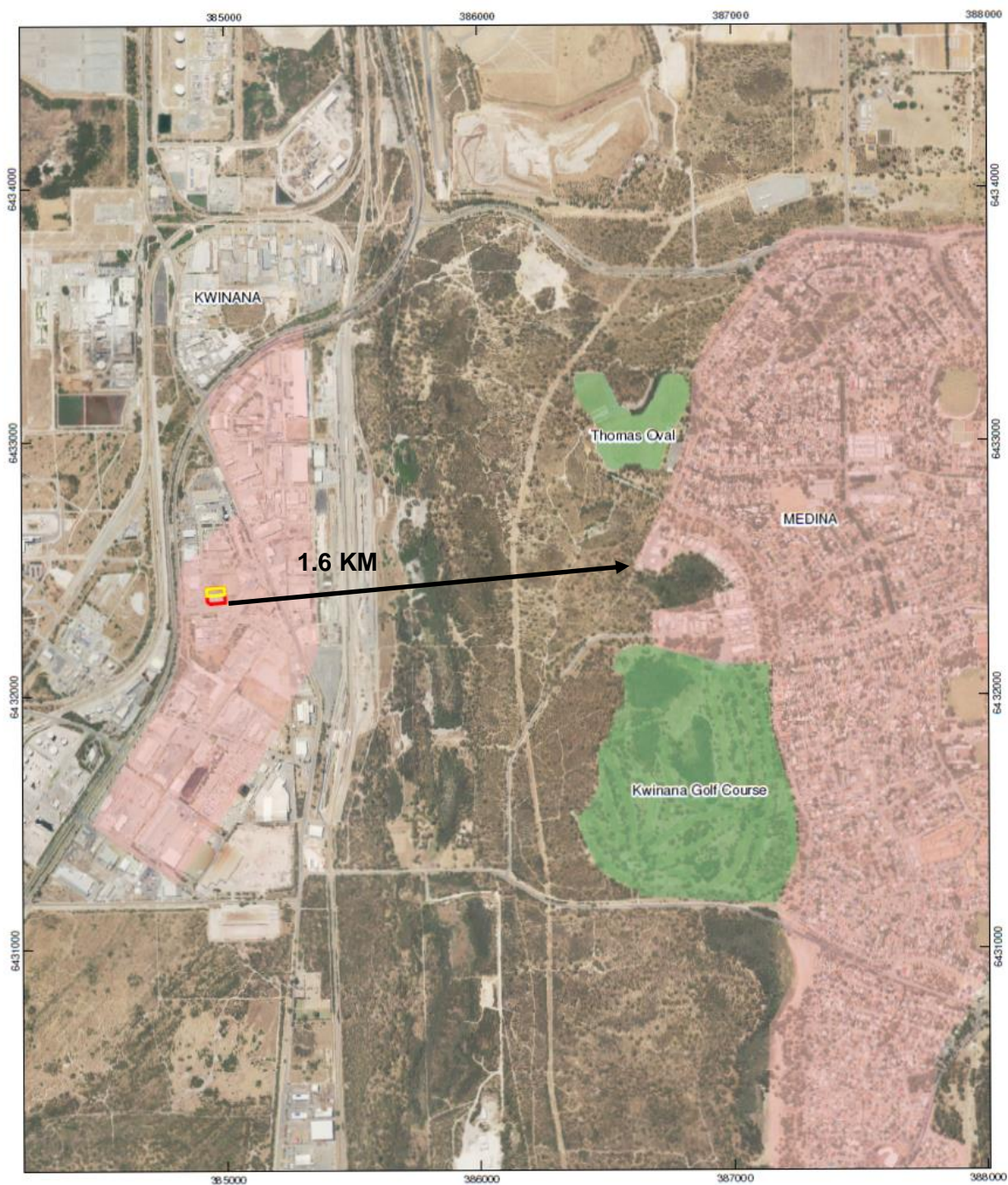
## Premises map

The Premises are shown in the map below.





# Potential Receptors





## Appendix 2: Prescribed premises coordinates

The Prescribed Premises is bound by the coordinates in Table 8.

**Table 8: Premises co-ordinates**

GDA94 Z50	
384924E	6432408N
384979E	6432411N
384982E	6432378N
384926E	6432375N

## Appendix 3: Key documents

	Document Title	Availability
1	Works Approval Application - Mineral Resources Limited Pilot graphite plant – Dated 10 September 2018 (Amended 13 September 2018)	DWER Reference: A1719929 and A1719932
2	DER, July 2015. <i>Guidance Statement: Regulatory principles</i> . Department of Environment Regulation, Perth.	accessed at <a href="http://www.dwer.wa.gov.au">http://www.dwer.wa.gov.au</a>
3	DER, October 2015. <i>Guidance Statement: Setting conditions</i> . Department of Environment Regulation, Perth.	
4	DER, November 2016. <i>Guidance Statement: Environmental siting</i> . Department of Environment Regulation, Perth.	
5	DER, November 2016. <i>Guidance Statement: Risk Assessments</i> . Department of Environment Regulation, Perth.	
6	DER, November 2016. <i>Guidance Statement: Decision making</i> . Department of Environment Regulation, Perth.	