

WESTERN AUSTRALIA
DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Environmental Protection Act 1986

AMENDED WORKS APPROVAL

WORKS APPROVAL NUMBER: W5015/2011/1

FILE NUMBER: 2011/006353

NAME OF OCCUPIER:

Edna May Operations Pty Ltd

ADDRESS OF OCCUPIER:

22 Wolfram Street
Westonia WA6423

NAME AND LOCATION OF PREMISES:

Edna May Gold Mine
M77/88, M77/110, M77/124 and L77/18
Westonia WA 6423
(as depicted in Attachment 1)

Environmental Protection Regulations 1987

CLASSIFICATION(S) OF PREMISES:

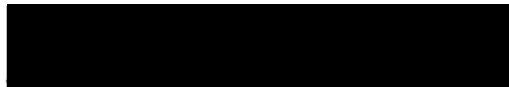
Category : 5 Processing beneficiation of metallic or non metallic ore

COMMENCEMENT DATE OF WORKS APPROVAL: Friday, 4 November 2011

EXPIRY DATE OF WORKS APPROVAL: Saturday, 4 November 2017

CONDITIONS OF WORKS APPROVAL:

Subject to the conditions of works approval set out in the attached pages



Officer delegated under Section 20
of the *Environmental Protection Act 1986*

Date of Issue: Sunday 4 November 2011

Date of Amendment: Thursday 2 February 2012

WESTERN AUSTRALIA
DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Environmental Protection Act 1986

WORKS APPROVAL NUMBER: 5015/2011/1

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CONDITIONS OF WORKS APPROVAL

DEFINITIONS

In these conditions of Works Approval, unless inconsistent with the text or subject matter:

"Director" means Director, Environmental Regulation Division of the Department of Environment and Conservation for and on behalf of the Chief Executive Officer as delegated under Section 20 of the *Environmental Protection Act 1986*;

"Director" for the purpose of correspondence means-

Regional Manager, Wheatbelt Region
Department of Environment and Conservation
PO Box 100
Narrogin WA 6312

Telephone: (08) 9621 3401
Facsimile: (08) 9621 3410

GENERAL CONDITIONS

GENERAL CONSTRUCTION AND OPERATIONAL DESCRIPTION

- 1 The works approval holder shall construct the works in accordance with the works approval application form dated 3 March 2011 and the following documentation:
 - (i) *Edna May Operations Pty Ltd, Edna May Gold Project (L8422/2010/1) Application for a Works Approval under Part V of the Environmental Protection Act 1986, July 2011.*

Where the details and commitments of the documents listed in condition 1 above are inconsistent with any other condition of this Works Approval, the latter shall prevail.

SUBMISSION OF COMPLIANCE DOCUMENT

- 2 Subject to condition 1, the works approval holder shall submit a compliance document to the Director following the construction of the works outlined in the Works Approval application and supporting documentation, and prior to commissioning of the same. The Compliance Document shall certify that the works were constructed in accordance with the conditions of Works Approval and documentation supporting the application to construct the works, and shall be signed by an authorised officer of Edna May Operations Ltd, Edna May Gold Project with the printed name and position of that person within the company, and preferably will contain the company seal.



Officer delegated under Section 20
of the *Environmental Protection Act 1986*

WESTERN AUSTRALIA

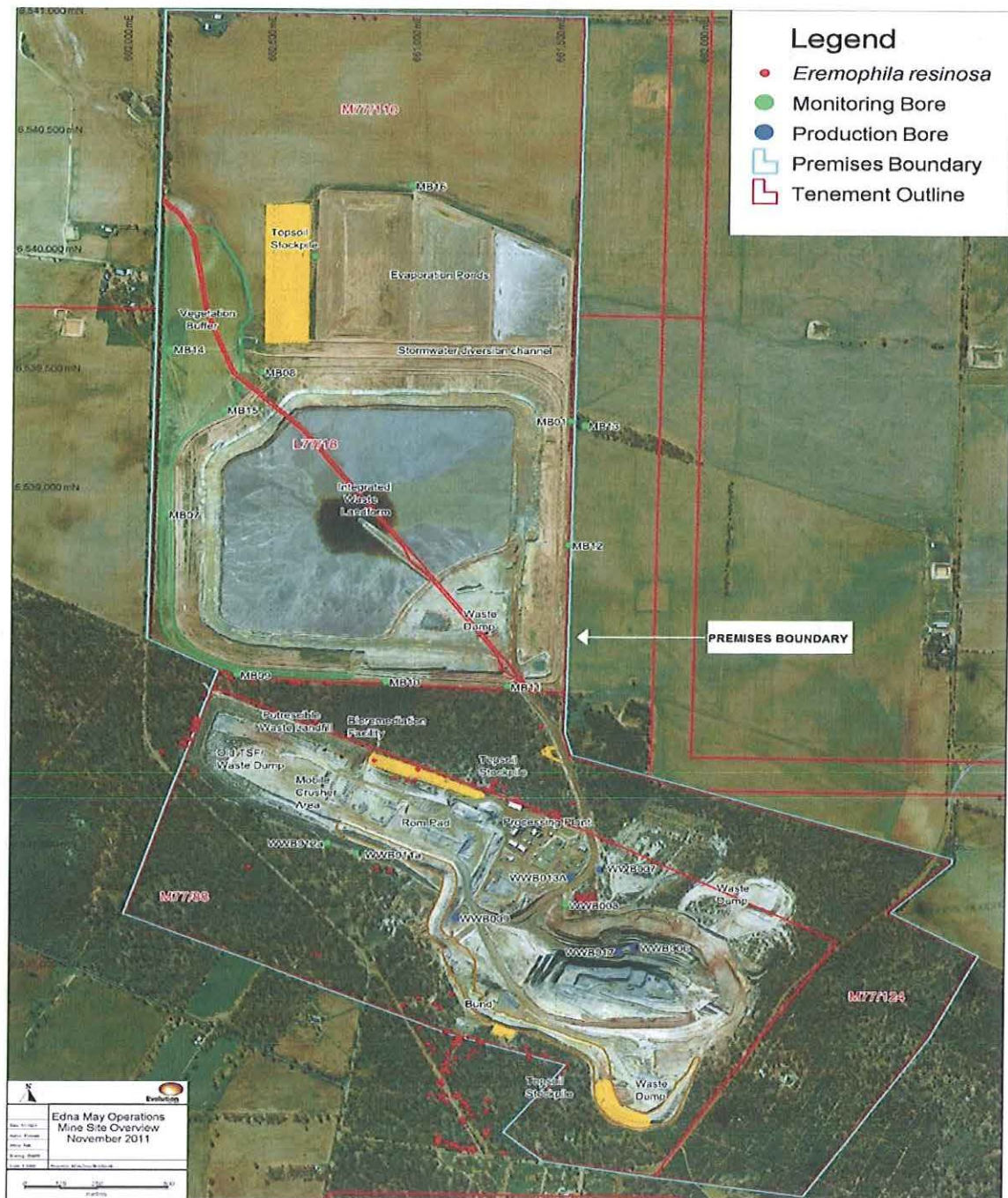
DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Environmental Protection Act 1986

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Attachment 1 - Plan of Premises





WORKS APPROVAL NUMBER: W5015/2011/1
WORKS APPROVAL FILE NUMBER: 2011/006353
APPLICATION DATE: 13 July 2011
EXPIRY DATE: Sunday 13 November 2012

PREMISES DETAILS

OCCUPIER

Edna May Operations Pty Ltd
22 Wolfram Street
Westonia WA 6423
ACN: 740 8466 9036

PREMISES

Edna May Gold Mine
M77/88, M77/110, M77/124 and L77/18
Westonia WA 6423

PRESCRIBED PREMISES CATEGORY

Table 1: Prescribed Premises Category from Schedule 1 of the Environmental Protection Regulations 1987

Category number	Description	Production or Design Capacity	Nominated Rate of Throughput	Throughput Classification *
5	Processing or beneficiation of metallic or non-metallic ore	3 200 000 tonnes per year	2 800 000 tonnes per year	50 000 tonnes or more per year
6	Mine dewatering	3 200 000 tonnes per year	714 000 tonnes per year	50 000 tonnes or more per year
64	Class II putrescible landfill site	5000 tonnes per year	700 tonnes per year	Not more than 5000 tonnes per year

* From Schedule 4 of the Environmental Protection Regulations 1987

This Environmental Assessment Report (EAR) has been drafted for the purposes of detailing information on the management and mitigation of emissions and discharges from the prescribed premises. The objective of the EAR is to provide a risk assessment of emissions and discharges, and information on the management of other activities occurring onsite which are not related to the control of emissions and discharges from the prescribed premises activity. This does not restrict DEC to assessing only those emissions and discharges generated from the activities that cause the premises to become prescribed premises.

Basis of Assessment

The Edna May Gold Mine which has been assessed as "prescribed premises" category number 5, under Schedule 1 of the Environmental Protection Regulations 1987.

This EAR only considers the Integrated Waste Landform (IWL), not the whole mine facility. The IWL was originally approved in November 2009 to replace the original tailings storage facility (TSF) at the mine. An IWL is defined as a TSF that is located inside a Mine waste dump. It is formed by placing controlled, compacted earthworks to form a containment embankment around the inside of



the mine waste dump to retain the tailings. The IWL TSF and evaporation ponds are located entirely within M77/110.

This EAR looks at changes to the original proposal.

1.0 BACKGROUND

1.1 GENERAL COMPANY DESCRIPTION

Edna May Operations Pty Ltd is a wholly owned subsidiary of Evolution Mining Ltd (Evolution); a Perth-based gold company. The merger of Conquest Mining and Catalpa Resources to form Evolution took place in October 2011 and was joined by Newcrest Mining Limited's Cracow and Mt Rawdon operations in November 2011. Edna May Gold Project ("the Project") was formally owned by Catalpa Resources and is located 300 kilometres east of Perth.

The Project is a new mining development in an area with a long history of mining and exploration activity. The Project comprises four tenements over an old open pit gold mine, previously operated by Australian Consolidated Minerals Ltd (ACM Gold Ltd) during the period 1985 – 1991 and by other companies including Posgold between 1991 - 1994. Westonia Mines Ltd (now Evolution) acquired the project in 1994 and has been evaluating options for the recommencement of mining since this time.

1.2 LOCATION OF PREMISES

The Project area is located in the northern extremity of the Westonia Greenstone Belt, and lies less than one kilometre north of the Westonia town site, in the Shire of Westonia (figure 1). Tenements total approx 770 ha and are located on Crown Reserve 14983 and a freehold lot owned by Edna May Operations Pty Ltd. The tenements border other freehold farmland lots used for cereal cropping.

The Westonia area is dominated by a gently undulating landscape averaging about 340 m above sea level. It is predominantly covered by highly weathered rocks, laterite, drift sand soils, and in the salt lake areas, by calcrete and thin evaporite deposits. Soils in the area are moderately to strongly alkaline and variable in salinity.

The geological stratigraphy is dominated by an extensive high magnesium mafic-ultramafic volcanic sequence, intruded by the locally termed Edna May Gneiss (EMG) within the Project area. The EMG is an irregular, but broadly conformable body, which has been traced over 1 400 m and averages 100 m in thickness. The EMG is composed of quartzo-feldspathic gneiss and holds most of the gold mineralisation. An alluvial channel filled with mineralized basal conglomerate infill material was located in the area of the previous open pits and this material has now been exploited.

The climate at Westonia is characterised by low to moderate winter rainfall and hot dry summers. Average annual rainfall is 327 mm. Winds are moderate and follow a seasonal in pattern.

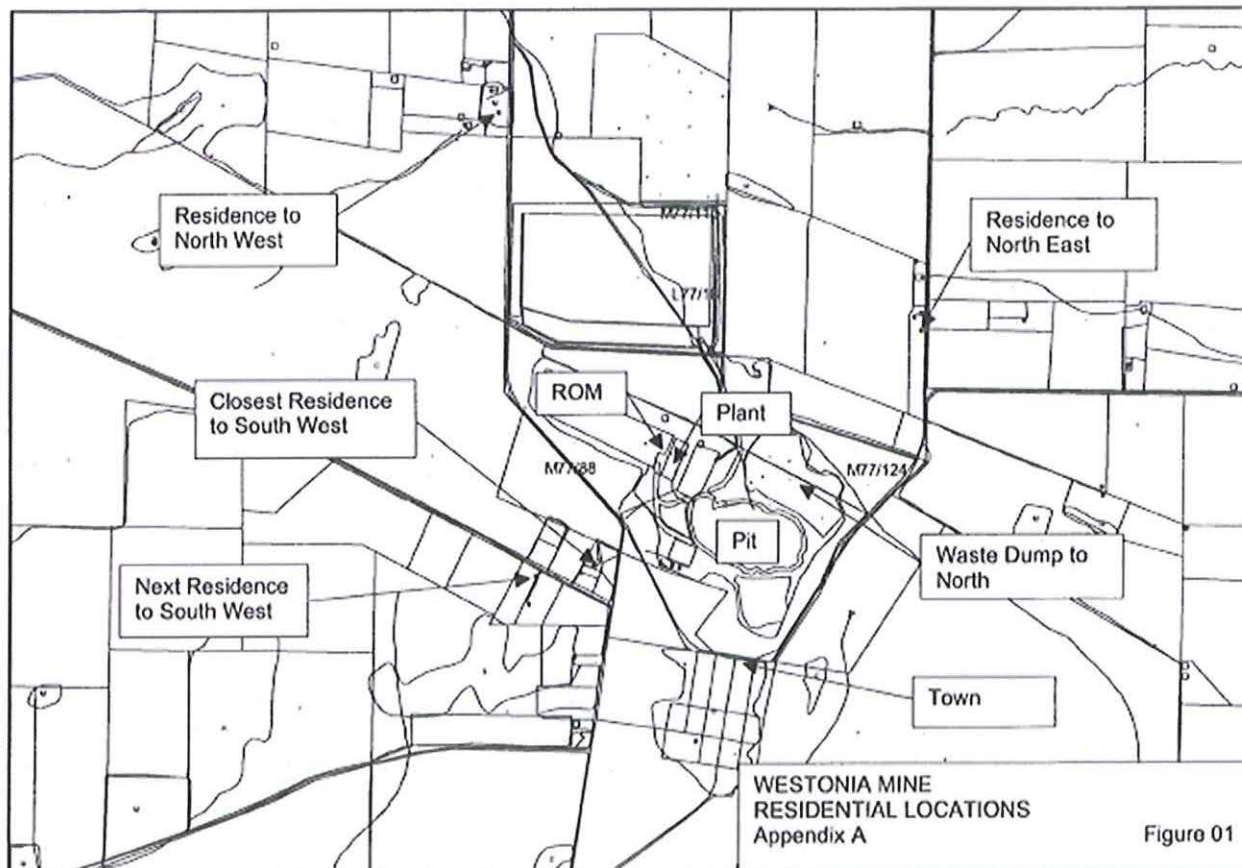


Figure 1: Location of Premises

Groundwater in the Westonia area occurs in weathered and fractured bedrock aquifers, with depth to groundwater varying between 28 – 40 metres below ground level (mbgl). Salinity averages around TDS 25 000 mg/L; groundwater within the expected impact zone of the Project area has been confirmed to be saline.

There are no permanent surface water bodies or seasonal wetlands near the Project area. Ephemeral creeks in the general area drain into a number of salt lakes; the nearest of which is Lake Mount Brown, located approximately 50km north of the Project area.

A small ephemeral drainage line, which carries surface water, is located to the north of the pit and runs in a north-westerly direction. This area is gazetted under the Public Plan for Warralakin and Westonia (Drainage Reserve 18796), and was created in the 1930s for the purpose of disposing of pit water from the then-Westonia mine. The drain terminates over a low yield unconfined aquifer, and is estimated to be active for a 1:20 year rainfall event. Most surface water flows are expected to occur as broad, shallow sheet flows as a result of rainfall.

The mining tenements impacted by the Project have been extensively cleared in the past for agricultural or mining purposes. There is no vegetation in the area where material is to be taken to build the IWL.

The adjacent land use is agriculture. There are three farming residences located 600 m to the west-southwest of the pit bund, 500 m to the northwest of the IWL, and approximately 1 km northeast of the magazine and waste dump. The northern boundary of the Westonia town site is approximately 400 m to the south of the proposed waste dump but there are no residences in the



northern part of the town site. The nearest residence in the town site is approximately 600 m south of the proposed waste dump.

Ethnographic and archaeological surveys have been undertaken and no sites of cultural significance were identified. There are a number of sites in Westonia with heritage interest but these relate to the mining history of the area it is not expected that they will be impacted by the Project.

1.3 PROPOSAL DESCRIPTION

Tailings from the project will be deposited into an integrated waste landform, consisting of one large cell constructed from waste rock (Figure 2). The final IWL footprint will be approximately 152 ha, comprising 77 ha of land under tailings with the remainder consisting of the embankments constructed from waste rock. At final design height, tailings will have a surface area of approximately 96 ha. The final depth of tailings will range from 23 m to 29 m and the final embankment crest level will be RL362m. The final design storage life of the IWL is 9 years, estimated on a peak production rate of 3.2 Mtpa and a tailings in situ density of 1.3 t/m³. The maximum tailings storage is estimated at 22 x10⁶ m³.

Base and Embankment Construction

The IWL has been constructed on a natural clay substrate of relatively low permeability, without engineered floor liners. Permeability of the substrate within the IWL was approximately 1x10⁻⁸ m/s prior to construction. No near-surface gravels or sand layers were encountered during construction. The IWL has been constructed with a compacted clay cut-off wall and a compacted clay zone within the perimeter embankment. Appropriate soil compliance testing was conducted during construction and results submitted to DEC in the works approval compliance certificate.

Starter embankments were constructed from mine waste obtained from the pit during the pit cut-back. The embankments have been constructed to RL340 m, with embankment heights ranging from 3 m to 10 m.

The IWL is located within a surface drainage diversion berm adequate to contain at least 1:100 ARI flood event. Drainage within the berm passes through settlement ponds before it is diverted to an existing drainage line west of Warrachoppin Rd.

This second stage embankment lift of the TSF will be constructed in the third and fourth quarter of 2011. The staged embankment construction has been designed to utilise the downstream construction method as defined in the *Edna May Gold Project Integrated Waste Landform- Tailings Storage facility Mining Proposal* (Coffey Mining, 2009). The staged construction aims to provide additional capacity on an as required basis, generally aimed at providing an additional 1.5 to 2 years storage capacity with each lift.

The original mining proposal specified that clayey mine waste would be used in the roller compacted zone of each embankment lift. Due to a reduction in mine waste production rates and time constraints, the starter embankment was only partially completed by April 2010, with the starter embankment crest elevation being reduced from RL 342m to RL 340m.

Due to the potential limitation in available mine waste material, Edna May propose to excavate material from the evaporation ponds as an alternative material source to construct the inner wall liner of the IWL. The evaporation ponds will only be used in the event that mine waste material is not available or suitable to complete the construction of the next embankment lift. Coffey Mining were engaged to undertake geotechnical investigations on the proposed borrow material from the excavation ponds (Coffee Mining 2011) and considered that the borrow material will be adequate for the construction of the compacted zone. They also considered embankment stability and



concluded the change in elevation had no impact on the embankment stability but did result in a decrease in storage capacity with each lift (final storage capacity is unchanged).

Edna May also propose to change the number of interim raises of the perimeter embankment of the IWL to reach the final height. The final approved height and design of the lifts will not change, with a number of smaller, more frequent rises will be undertaken to reach the final height. Edna May propose to raise the perimeter embankment in September 2011 by 3m in accordance with the design requirements.

Underdrainage and Decant System

The IWL has been constructed with two seepage control systems in place. A continuous upstream perimeter drain in the form of a cut-off trench has been constructed under the main embankment adjacent to the upstream toe drain to intercept horizontal seepage through the near surface foundation. The cut-off trench was excavated to 1 m and is founded in suitable clay.

A decant underdrainage system has been installed, designed to recover water and assist with the consolidation of the tailings. The decant system comprises a decant access way constructed from mine waste, and central decant structure constructed from slotted concrete well sections (1.8 m in diameter) stacked vertically and surrounded by filter rock material. Reclaim water collecting within the decant structure is pumped back to the process plant directly from the decant tower by submersible pump located within the decant tower structure. Underdrainage consisting of slotted pipe, geotextile and aggregate was constructed to cover an area in the base of the IWL equivalent to that of a normal expected operating decant pond (nominal radius 90 m). The underdrainage pipe system conveys seepage water through the outfall pipe in the embankment via cement-bentonite collar to a seepage collection pond at the northwest corner of the IWL. Water is pumped from the seepage collection pond back to the process plant by pump located at the seepage collection pond.

Tailings are pumped through polyethylene pipe to the IWL for permanent disposal. The pipeline is located within bunded works of compacted clay, designed to contain spillage from a failure in the pipeline. The discharge of tailings into the IWL will be conducted in accordance with the operating manuals produced by Coffey Mining Pty Ltd and submitted to DEC as required by W4546/2009/1. The manuals describe the design and operation of the IWL with a focus on maximising consolidation of tailings through removal of water from the tailings.

Tailings are deposited sub aerially and spirally around the IWL, through active discharge points located at manually controlled spigots on a perimeter discharge line. Tailings are deposited in discrete layers at approx 45% solids to promote low velocity discharge. Discharge points are moved regularly to ensure even tailings beach is developed and maintained and the length of time between tailings deposition cycles is maximised to allow for drying time. Sloped beaches ensure that a surface water pond is maintained around the central decant structure. The supernatant pond are kept away from the containment embankments at all times.

The IWL will be able to contain a considerable body of water during a rainstorm. The compliance documentation states that a minimum operational (wall) freeboard is 300 mm and the minimum total (beach + wall) freeboard is 500 mm, and that a minimum freeboard of 663 mm above normal



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decant pond operating level will be adequate to contain a 1 in 100 year Annual Exceedance Probability 72-hour rainfall event.

Groundwater Monitoring

Edna May Operation Pty Ltd currently undertakes groundwater monitoring in accordance with conditions of the groundwater well licence issued by the Department of Water (refer to section 1.4.4), the Works Approval W4546/2009/1 issued by DEC and the Licence L8422 issued by DEC. Table 2 summarises the groundwater monitoring requirements of the licence L8422. Results of groundwater monitoring provide some information that can be used to determine background groundwater levels and quality. Results also indicate that groundwater has historically been impacted by mining activity at the site.

Table 2: Groundwater monitoring requirements

Monitoring Locations	Sampling Frequency	Parameters	Targets	Limits
MB01	Monthly	Standing Water Level (SWL) ^a	Rise of 8m	
MB02	Quarterly	Total Dissolved Solids (TDS)	89 540 mg/L	0.5 mg/L
MB07		Electrical Conductivity (EC)	97 130 uS/cm	
MB08		pH	3.0 – 9.0 ^b	
MB09			5.0 – 9.0 ^c	
MB11		WAD cyanide	0.011 mg/L	
MB12			0.566 mg/L	
MB13		Total cyanide		
MB14		Aluminium		
MB15		Arsenic	0.022 mg/L	
MB16		Barium		
		Boron		
		Cadmium		
		Calcium		
		Copper		
		Chromium		
		Chromium VI		
		Fluoride (as F)		
		Iron		
		Lead	0.330 mg/L	
		Magnesium		
		Manganese		
		Mercury	0.015 mg/L	
		Molybdenum	0.020 mg/L	
		Nickel		
		Selenium		
		Silver	0.028 mg/L	
		Sodium		
		Sulphate		
		Tin		
		Vanadium		
		Zinc		

Notes

- a SWL shall be determined prior to collection of water samples
- b a target pH range of 3.0 – 9.0 shall apply to bores MB01, MB12, MB13 and MB16
- c a target pH range of 5.0 – 9.0 shall apply to all other bores



1.4 REGULATORY CONTEXT

1.4.1 Part IV Environmental Protection Act 1986, Environmental Impact Assessment

The Project was referred to the Environmental Protection Authority (EPA) in July 2003, who made the decision *Not Assessed – Managed Under Part V (Works Approval)* in August 2003. This decision was appealed, and was subsequently dismissed in December 2003 by the Minister for Environment.

Pursuant to Section 38 (5j) of the EP Act, a proposal cannot be referred to the EPA more than once, unless the Minister and any decision-making authority agree that major changes have been made. Given the only change to this proposal relates to an increase in IWL (i.e. the proposal definition has not changed); the proposal is not required to be reassessed by the EPA.

1.4.2 Part V Environmental Protection Act 1986, Environmental Management

The Project has been assessed as a "prescribed premises", category 5 (Processing or beneficiation of metallic or non-metallic ore) and 6 (Mine dewatering), under Schedule 1 of the EP Regulations 1987. The project required works approval for construction of the dewatering discharge ponds, processing plant and IWL, and a subsequent licence to operate.

Legislation administered by DEC relevant to this proposal includes:

- EP (Noise) Regulations 1997;
- EP (NEPM-NPI) Regulations 1998;
- EP (Rural Landfill) Regulations 2002;
- EP (Controlled Waste) Regulations 2004;
- EP (Unauthorised Discharges) Regulations 2004;
- EP (Clearing of Native Vegetation) Regulations 2004; and
- *Contaminated Sites Act 2003*.

1.4.1.1 Other DMA's Legislation which applies

Department of Mines and Petroleum (DMP) DMP administers the *Mining Act 1978*, where all holders of a Mining Tenement are subject to Sections 46A, 63AA, 70I and 84 of that Act.

A Mining Proposal was submitted to DMP on March 2007; however was withdrawn prior to approval, due to further changes to the project definition. An amended Mining Proposal was submitted in May 2009 and approved. The fundamental changes to the Project since the previous Mining Proposal include:

- Increase in life of project from 6 to 7 years;
- Increase in area required for the pit from 31.3 to 45.8ha;
- Increase in volume of ore processing from 2.2 to 2.8 Mtpa;
- Increase in gold bearing ore from 14 to 19.1 Mt over life of project;
- Increase in mine waste from 23 to 39 Mt; and
- Increase in storage capacity of TSF from 15 to 19.2 Mt (within same footprint).

Further embankment raises in the IWL will be managed through Works Approval and DMP assessment.

DMP also administers the *Mines Safety and Inspection Act 1994*, Mines Safety and Inspection Regulations 1995 and Mines Safety and Inspection Amendment Regulations 2009. Exposure of employees to hazards including dust, fumes and noise are managed through this legislation.



Guidelines / Codes of Practice

- Best Practice Environmental Management in Mining – Dust control (Environment Australia, 1998);
- International Cyanide Management Code for the Manufacture, Transport and Use of Cyanide in the Production of Gold (International Cyanide Management Institute, 2009).
- Water Quality Protection Notes:
 - Liners for containing pollutants, using engineered soils – Draft (July 2005);
 - Toxic and hazardous substances – Storage and use (March 2002);
 - Mining and mineral processing – Tailings storage facilities (2000);
 - Mining and mineral processing – Installation of minesite groundwater monitoring bores (2000);
 - Mining and mineral processing – Minesite water quality monitoring (2000);
 - Mining and mineral processing – Minesite stormwater (2000)

1.4.3 1.4.4 Rights in Water Irrigation Act 1914

A groundwater licence (GWL 156328 (1)) was issued to Catalpa in March 2005 and allows groundwater abstraction to be undertaken for ore processing, dust suppression and dewatering purposes. The groundwater licence was amended in January 2010 to allow for an increase in pit dewatering volumes from 1.41 Mtpa (1.41 GL/annum) to 3.2 Mtpa (3.2 GL/annum), in response to an increase in processing from 2.2 Mtpa to 3.2 Mtpa (GWL 156328 (2)). The current groundwater licence GWL 156328(3) was issued in January 2011 for the same allocation and expires in January 2013.

1.4.5 Local Government Authority

The Project area is located within the Shire of Westonia, who support the proposal.

2.0 STAKEHOLDER AND COMMUNITY CONSULTATION

SUBMISSIONS RECEIVED DURING 21 DAY PUBLIC COMMENT PERIOD

The Application for Licence details for this facility were advertised in the West Australian newspaper on 29/08/2011 as a means of advising stakeholders and to seek public comments. No submissions were received.

3.0 EMISSIONS AND DISCHARGES RISK ASSESSMENT

DEC considers that conditions should focus on regulating emissions and discharges of significance. Where appropriate, emissions and discharges which are not significant should be managed and regulated by other legislative tools or management mechanisms.

The following section assesses the environmental risk of potential emissions from the Edna May Gold Mine IWL raise. In order to determine the site's appropriate environmental regulation, an emissions and discharges risk assessment was conducted of the Edna May Gold Mine IWL raise using the environmental risk matrix outlined in Appendix B. The results of this are summarized in Table 2.



Table 2: Risk assessment and regulatory response summary table.

Risk factor	Significance of emissions	Socio-Political Context of Each Regulated Emission	Risk Assessment	DEC Regulation (EP Act - Part V)	EAR Reference	Other management (legislation, tools, agencies)
Air emissions (point source)	N/A					Air EMP and EMS procedures
Dust emissions	1. Some dust may occur during construction. Dust will be managed in accordance with the projects Air Emission Management Plan.	Medium No submissions received; however concerns expressed by nearby resident. Town site is <1km from pit. Dust complaints may be received.	B Licence conditions	WA – no conditions LIC – conditions		General provisions of the <i>EP Act 1986</i> ; <i>Mine Safety and Inspection Act 1994</i>
Odour emissions	N/A					Code of Practice, State Guidelines, EMP or EMS
Noise emissions		Medium No submissions received; however concerns expressed by nearby resident. Town site is <1km from pit. Dust complaints may be received.	B Licence conditions	WA- Nil LIC- Licence conditions		EP Noise Regulations, Code of Practice, EMP or EMS
Light emissions	1. Two mobile light towers will be positioned behind the IWL rock embankment and the 4m high topsoil pile	Low	E = No regulation, other management mechanisms	WA- Nil LIC- Nil		CALM, EMP or EMS, General provisions of the EP Act
Discharges to water	N/A			WA – LIC –		UD Regulations, Code of Practice EMP or EMS
Discharges to land	N/A			WA LIC –		UD Regulations, Code of Practice EMP or EMS
Solid / liquid wastes	4 Tailings will be discharged into the IWL from the Processing Plant. Groundwater has evidence of impacts from past mining activities. Seepage into groundwater from TSF walls/base has the potential for further impacts on groundwater quality and mounding may impact on nearby vegetation (i.e. DRF) near the southern boundary if seepage and groundwater are not managed appropriately. Cyanide concentration in tailings dam may impact on fauna if not managed appropriately. Applicant has developed an Operating Strategy for the IWL, including monitoring	Medium -No submissions received; however concerns expressed by nearby resident. Town site is <1km from pit.	B – Licence conditions	WA – LIC –Licence Conditions		EP (Unauthorised Discharges) Regulations 2004 EP (Controlled Waste) Regulations 2004 <i>Mining Act 1978</i> DMP's Mining Environmental Management Guidelines, Mining Proposals in WA 2006 and Guidelines on the Safe Design and Operating Standards for Tailings Storage 1999 DoW Water Quality Protection Notes – Mining and Mineral Processing 2000



	of groundwater and seepage and contingency plans.					
Hydrocarbon/chemical storage	1 Fuel will be stored in a bunded area behind the workshop in accordance with AS 1940-2001.			WA – No conditions LIC – no conditions		Dangerous Goods storage licence and relevant legislation (DOCEP), EMS
Native vegetation clearing	N/A			WA – LIC –		Clearing permit pending (DOIR), EMS
Contaminated site identification	1 The site has been reported to DEC as appropriate.	No submissions received; however concerns expressed by nearby resident. Town site is <1km from pit.		WA – E No regulation, other management mechanisms LIC – E No regulation, other management mechanisms		Contaminated Sites Branch (DoE), Tenement Conditions and Closure Plan (DOIR), EMS

4.0 GENERAL SUMMARY AND COMMENTS

Noise, dust and liquid and solid wastes are the main emissions for this proposal. The Mine is rated as a medium- high priority and is inspected each year.

OFFICER PREPARING REPORT

Position: Margaret Redfern
Environmental Officer
Wheatbelt Regional Office
Department of Environment and Conservation

08 9621 3401

27/7/2011

ENDORSEMENT

Position: Alan Kietzmann
Regional Leader: Industry Regulation
Wheatbelt Regional Office
Department of Environment and Conservation

08 9621 3403

2 November 2011



APPENDIX A: EMISSIONS AND DISCHARGES OF SIGNIFICANCE

1.1 DUST EMISSIONS

Operations at the Edna May Gold Project generate point source dust emissions at the primary crusher. Fugitive dust will also result from vehicle movement, pit blasting and materials handling. Dust emissions will vary depending on blasting operations, processing operations and placement of mine waste, as well as weather conditions.

The construction of the IWL is not expected to significantly add to dust generation as water carts will be used and Edna May will be constructing the IWL in winter.

1.2 DUST EMISSIONS RISK ASSESSMENT

The risk of dust emissions is considered to be significant. Catalpa has committed to basic dust management measures and the premises is located approximately one kilometre from the Westonia town site. A buffer of native vegetation may be effective in managing the impacts of dust on the town site. If dust is significant, dust may impact the town of Westonia and the health of this vegetation buffer may be impacted.

In accordance with the criteria set out in Appendix B, the significance of dust emissions is considered as (B) – licence condition (setting limits + EMPs – short timeframes), given:

- Under worst case conditions the dust is likely to cause a significant nuisance to the Westonia town site; and
- Under normal operations conditions, the impact on the receiving environment is expected to be minimal.

1.3 RECOMMENDED STRATEGY FOR MANAGING DUST EMISSIONS

In accordance with Table 5 of Appendix B, the issue of noise emissions is suitable for management by licence conditions.

Catalpa have committed to implementing standard practices to manage and mitigate particulate emissions so that they do not cause environmental or health problems as outlined in the "Edna May Gold Project Air Emissions Management Plan". Dust control measures include:

- Use of a water cart, which will be on site at all times, to aid dust suppression on all haulage and access roads;
- Skirts on conveyor transfer points;
- Water sprays at the crusher and ore conveyors; and
- The surface of the IWL can be wetted if dust is generated from drying tails.

2.1 NOISE EMISSIONS

Noise will be generated during operation from mining machinery (i.e. excavators, bulldozers, haul trucks, etc.), blasting, crushing and the processing plant. Noise emissions are likely to be continuous and to be variable in nature.

Herring Storer Acoustics have undertaken acoustic studies of the mining operations at the project. Four rounds of noise assessments have taken place with the last in May 2011. Exceedances were measured at the northwest and north east of the project in some circumstances. Investigations of the source of the noise emissions indicated that the intermittent impact of ore through the crusher was the main activity contributing to the exceedance. The other monitoring locations were



compliant. The residents of the house to the north east of the project have requested that a noise bund not be constructed.

All construction will take place between the hours of 06:00 to 18:00. The excavation activities will be protected by a 4m tall stockpile, located to the east of the evaporation ponds. This topsoil stockpile will help to reduce the noise impacts to the nearest sensitive receptor.

2.2 NOISE EMISSIONS RISK ASSESSMENT

The risk of noise emissions is considered to be significant. There are a number of noise-sensitive residences in the vicinity of the mine, in which modelling of operational noise emissions during the worst case scenario predicted the noise regulations will be exceeded during the evening and night periods.

In accordance with the criteria set out in Appendix B, the significance of dust emissions is considered as (B) – licence condition (setting limits + EMPs – short timeframes), given:

- Under worst case conditions, noise emissions exceed the EP (Noise) Regulations 1997; and
- Under normal operations conditions, specific management is required to ensure noise exceedances do not occur.

2.3 RECOMMENDED STRATEGY FOR MANAGING NOISE EMISSIONS

In accordance with Table 5 of Appendix B, the issue of noise emissions is suitable for management by licence conditions. Noise is to be managed through a Noise Management Plan and noise monitoring. If monitoring in accordance with these conditions demonstrate that noise from the project is not being managed to within assigned levels, the licence can be reviewed to incorporate conditions requiring more extensive noise attenuation including operational limitations.

3.1 SOLID/LIQUID WASTES

Tailings will be discharged via a bunded polyethylene pipeline from the processing plant to the IWL. Approximately 2.8 Mtpa of tailings will be discharged into the IWL over a period of nine years (22 Mt). Tailings discharged into the IWL will typically contain 33 000 mg/L Total Dissolved Solids (TDS), 100 – 120 mg/L total Cyanide (CN), 50 mg/L Weak Acid Dissociable (WAD) CN and have a pH of 8.5-9. The tailings also contain low levels of molybdenum, lead, bismuth, mercury and silver. The pH of decant water within the IWL is expected to be approximately five. Catalpa does not intend on becoming a signatory to the Cyanide Code (the Code); however has committed to operating to a standard that is consistent with the Code. Operation of the IWL will occur in accordance with the documents "IWL Operations Manual Plant Staff" and "IWL Operations Manual Plant Management", produced by Coffey Mining for Catalpa Resources Ltd Edna May Gold Project. These documents describe the processes and procedures that will be undertaken by the licensee to ensure that the IWL is operated correctly. The manuals describe daily, weekly and annual inspection regimes and monitoring requirements, as well as a seepage management strategy. Cyanide reduction or detoxification has not been proposed.

Seepage of contaminants within the tailings may occur through migration across TSF walls and bed into groundwater. Contaminated groundwater then has the potential to migrate off-site and impact on groundwater quality and nearby native vegetation. The following seepage control measures have been incorporated into the TSF design to minimise seepage losses:

- Underdrainage to collect water seepage through deposited tailings;
- Upstream perimeter drain around the upstream toe of the IWL to intercept horizontal seepage through the near-surface foundation;



- Cut-off trench under the main embankment adjacent to the upstream toe drain to increase collection efficiency and reduce water flow under the embankment; and
- Installation of monitoring / recovery bores for sampling groundwater and dewatering in the event of groundwater level rises.

Catalpa is required under their current licence (L8422) to monitor groundwater quality and SWL around the existing evaporation ponds. An additional three bores have been constructed around the TSF and baseline monitoring was conducted under the Works Approval W4546. A series of vegetation monitoring points has been established around the southern perimeter of the proposed TSF to monitor the health of nearby vegetation.

Baseline water sampling around the proposed TSF has been undertaken, which indicates water levels varying from 28 to 40 metres below the ground surface. Water quality analysis indicates that pH ranges from 6.0 to 7.0 and salinity averages 25 000mg/L TDS.

If seepage is detected in the monitoring bores around the TSF during operation, Catalpa will be required to implement a seepage recovery and management plan. A plan has been proposed in the operations manuals submitted to DEC and will be adopted as licence conditions.

With consideration of background water levels and the rate of rise of the water table, action would be expected to commence if a rise in SWL exceeds 8 metres. Should SWL rise exceed 10 metres, recovery actions would be required to commence. As a limit, SWL are not to rise above 12 metres from background levels.

If an increase in contaminants within the groundwater monitoring area is detected during operation, Catalpa will be required to implement a strategic plan outlining measures to be taken to contain groundwater flows. With consideration of background water quality and the nature of contaminants in the tailings, action would be expected to commence if levels of contaminants increase by more than 10% of the established background concentrations. In addition, a limit of 0.5 mg/L will be applied to WAD cyanide levels in groundwater.

Saline mine dewater will also be discharged via a bunded polyethylene pipeline to dedicated evaporation/recharge ponds. This activity has previously occurred under L8033. Following the issue of licence L8422, licence L8033 has become inactive and dewatering is managed under licence L8422. Dewatering of the pit will involve discharge of 1.4 million m³ of water with a TDS of approximately 37,000 mg/L.

3.2 SOLID/LIQUID WASTES RISK ASSESSMENT

The risk of seepage from the disposal of tailings and saline mine dewater is considered to be significant. In accordance with the criteria set out in Appendix B, the significance of solid and liquid waste emissions is considered as (B) – licence condition (setting limits + EMPs – short timeframes), given:

- Under worst case conditions, seepage may cause water quality to deteriorate beyond National Water Quality Management Strategy guidelines; and
- Under normal operations conditions, specific management is required to ensure seepage of contaminated water from holding facilities does not occur.



3.3 RECOMMENDED STRATEGY FOR MANAGING SOLID/LIQUID WASTES

In accordance with Table 5 of Appendix B, the issue of solid/liquid wastes is suitable for licence conditions. Management strategies include:

- Retaining matter containing saline or alkaline, or cyanide constituents within holding facilities in a manner which prevents pollution.
- Manage and maintaining the meter(s) in the dewatering discharge line in order to determine the cumulative quantity of Mine Dewater discharged into the evaporation/recharge ponds
- Conducting the discharge of tailings into the Integrated waste landform in accordance with the procedures outlined in the document "Integrated Waste Landform Tailings Storage Facility Operations Manual – Plant Management Catalpa Resources Limited Edna May Gold Project" produced by Coffey Mining, document reference MINEWPER00303AJ-AD Ops Man – Plant Mngmt Rev 0 dated 13 August 2009 and the document "Integrated Waste Landform Tailings Storage Facility Operations Manual – Plant Staff Catalpa Resources Limited Edna May Gold Project" produced by Coffey Mining, document reference MINEWPER00303AJ-AE Ops Man Plant Staff Rev 0, dated 13 August 2009.
- Maintaining bunding, drains and sealed collection sumps around the process plant, mechanical workshops, laboratory and power generation areas to enable recovery of spillages. Collected matter shall be disposed of in an approved manner.
- Conducting a groundwater monitoring program, and. prepare and implement a groundwater monitoring contingency plan.



APPENDIX B: EMISSIONS AND DISCHARGES RISK ASSESSMENT MATRIX

Table 3: Measures of Significance of Emissions

Emissions as a percentage of the relevant emission or ambient standard		Worst Case Operating Conditions (95 th Percentile)			
		>100%	50 – 100%	20 – 50%	<20%*
Normal Operating Conditions (50 th Percentile)	>100%	5	N/A	N/A	N/A
	50 – 100%	4	3	N/A	N/A
	20 – 50%	4	3	2	N/A
	<20%*	3	3	2	1

*For reliable technology, this figure could increase to 30%

Table 4: Socio-Political Context of Each Regulated Emission

		Relative proximity of the interested party with regards to the emission				
		Immediately Adjacent	Adjacent	Nearby	Distant	Isolated
Level of Community Interest or Concern*	5	High	High	Medium High	Medium	Low
	4	High	High	Medium High	Medium	Low
	3	Medium High	Medium High	Medium	Low	No
	2	Low	Low	Low	Low	No
	1	No	No	No	No	No

Note: These examples are not exclusive and professional judgement is needed to evaluate each specific case

*This is determined by DEC using the DEC "Officer's Guide to Emissions and Discharges Risk Assessment" May 2006.

Table 5: Emissions Risk Reduction Matrix

		Significance of Emissions				
		5	4	3	2	1
Socio-Political Context	High	A	A	B	C	D
	Medium High	A	A	B	C	D
	Medium	A	B	B	D	E
	Low	A	B	C	D	E
	No	B	C	D	E	E

PRIORITY MATRIX ACTION DESCRIPTORS

A = Do not allow (fix)

B = licence condition (setting limits + EMPs - short timeframes)(setting targets optional)

C = licence condition (setting targets + EMPs - longer timeframes)

D = EIPs, other management mechanisms/licence conditions (monitoring/reporting)/other regulatory tools

E = No regulation, other management mechanisms

Note: The above matrix is taken from the DEC Officer's Guide to Emissions and Discharges Risk Assessment May 2006.