



Licence Number	L8125/2005/4
Licence Holder	Crosslands Resources Pty Ltd
ACN	061 262 397
File Number:	DER2014/001271
Premises	Jack Hills Iron Ore Project M20/506 Beringarra-Cue Road MEEKATHARRA WA 6642 Legal description – Mining tenement M20/506
Date of Report	26 February 2020

1. Definitions and interpretation

Definitions

In this Amendment Report, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
ACN	Australian Company Number
Amendment Report	refers to this document
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the <i>Environmental Protection Act 1986</i> Locked Bag 33 Cloisters Square PERTH WA 6850 info@dwer.wa.gov.au
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of and during this Review
Licence Holder	Crosslands Resources Pty Ltd
MS	Ministerial Statement
Noise Regulations	<i>Environmental Protection (Noise) Regulations 1997 (WA)</i>
Occupier	has the same meaning given to that term under the EP Act.
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Amendment Report applies, as specified at the front of this Amendment Report.
Revised Licence	the amended Licence issued under Part V, Division 3 of the EP Act, with changes that correspond to the assessment outlined in this Amendment Report.
Risk Event	as described in <i>Guidance Statement: Risk Assessment</i>

2. Amendment Description

The following guidance statements have informed the assessment and decision outlined in this Amendment Report.

- *Guidance Statement: Regulatory Principles (July 2015)*
- *Guidance Statement: Setting Conditions (October 2015)*
- *Guideline: Decision Making (June 2019)*
- *Guidance Statement: Risk Assessment (February 2017)*
- *Guidance Statement: Environmental Siting (November 2016)*

2.1. Purpose and scope of assessment

Crosslands Resources Pty Ltd (the Licence Holder) submitted a licence amendment application to the Department of Water and Environmental Regulation (DWER) on 6 December 2019. The Licence Holder operates an open pit iron ore mine with an ore beneficiation plant, Class II putrescible landfill and a sewage treatment plant on mining tenement M20/50, Meekatharra.

The Licence Holder is seeking to increase the quantity of waste authorised for disposal and increase the number of disposal locations at the Premises. The Delegated Officer has assessed the operational impacts of these activities and these are documented through this Decision Report.

The Decision Report explains how DWER has assessed and determined the application and provides a record of DWER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DWER's assessment and decision-making under Part V of the EP Act. Other approvals may be required for the proposal, and it is the Licence Holder's responsibility to ensure that they have all relevant approvals for their Premises.

2.2. Overview of existing Premises

The Jack Hills Iron Ore Project (the Premises) is located in the Jack Hill Ranges, 400 km northeast of Geraldton and 150 km northwest of Meekatharra. The Premises is located on mining tenement M20/506 and lies within the Beringarra and Judal pastoral leases.

Operations at the Premises commenced late 2006 and consisted of a closed circuit jaw crusher, two mobile deck screens, a mobile secondary cone crusher, two product stackers and various sprinklers located on the ore storage pad and crushing circuit. The listed equipment is used to process metallic ore mined from the open pit mine at the Premises. The Premises also contains an accommodation village capable of housing up to 100 employees.

To address the wastes generated by both the accommodation camp and mine operations, the Premises contains a Class II putrescible landfill and small bioremediation facility located within/on top of a waste rock dumping area. The Premises also contains a sewage treatment plant.

The Class II putrescible landfill is located within an area referred to as the waste rock dump (WRD). This area is predominately for the containment of tailing materials and is constructed of waste rock sourced from the open pit mine. A dedicated section of the WRD has been formed for the containment of inert and putrescible wastes derived from the accommodation village. The cell is contained by a one metre high continuous earthen wall surrounding three sides of the disposal area. In addition the internal earthen wall is surrounded by waste rock which is greater than 4 metres in height. This construction method reduces windblown waste and also assists in diverting uncontaminated storm water away from the disposal area. The landfill cell is fenced, regularly inspected and covered with stockpiled earth material.

The bioremediation facility is located at the WRD and is used to treat contaminated soil from minor hydrocarbon spills. Sewage from the accommodation village is treated by a package treatment plant and then reticulated onto a fenced irrigation area. The Licence Holder monitors the water quality of the effluent discharged.

Mining operations ceased in 2012 and the Premises was placed in a partial care and maintenance phase. Despite the mine no longer operating, a continual presence has been maintained onsite and this has required the landfill and wastewater treatment plant to remain in operation.

2.3. Application details

The Licence Holder is currently undertaking demobilisation and rehabilitation of the mine site which will result in an increased generation of waste material expected to be in the range of 1,000 to 5,000 tonnes. The excess waste material generated will be predominately inert waste with a minor increase in putrescible waste generated as a result of increased staffing levels associated with the work. The Licence Holder expects approximately 5 tonnes of putrescible waste to be generated over the annual period in which the rehabilitation is taking place. Accordingly waste quantities and disposal locations in the Existing Licence require amendment. The Licence Holder has proposed the following amendments:

- Inclusion of two additional waste disposal locations within the Premises referred to as Waste Location 2A and 2B in Figure 1;
- Increase the landfill waste acceptance limit from 500 to 5,000 tonnes; and
- Increase the Category 64 assessed design capacity of the Premises to 5,000 tonnes per annual period.

The additional landfill locations 2A and 2B are required due to the staged nature of rehabilitation works at the Premises. Locations 2A and 2B correspond with the accommodation village and a mine laydown yard respectively. The WRD will be rehabilitated before the accommodation village and the laydown area, removing access to the existing landfill. This will result in waste material generated in the rehabilitation and decommissioning of the previously mentioned areas requiring disposal at the location of waste generation. The Licence Holder expects to dispose of approximately 5 tonnes of waste at each location.

Table 2 below provides a summary of the proposed amendments in relation to the prescribed premises categories contained on the Existing Licence.

Table 2: Proposed design capacity changes

Category	Current throughput capacity	Proposed throughput capacity	Description of proposed amendment
Category 5	50,000 tonnes per year	No change	The mine and associated processing infrastructure remain in care and maintenance.
Category 64	500 tonnes per year	5,000 tonnes per year	The amendment is required due to additional waste volumes produced by the rehabilitation and demobilisation activities.
Category 85	Less than 100 m ³ per day	No change	The volume of sewage treated on the Premises will not increase above the current approved capacity.

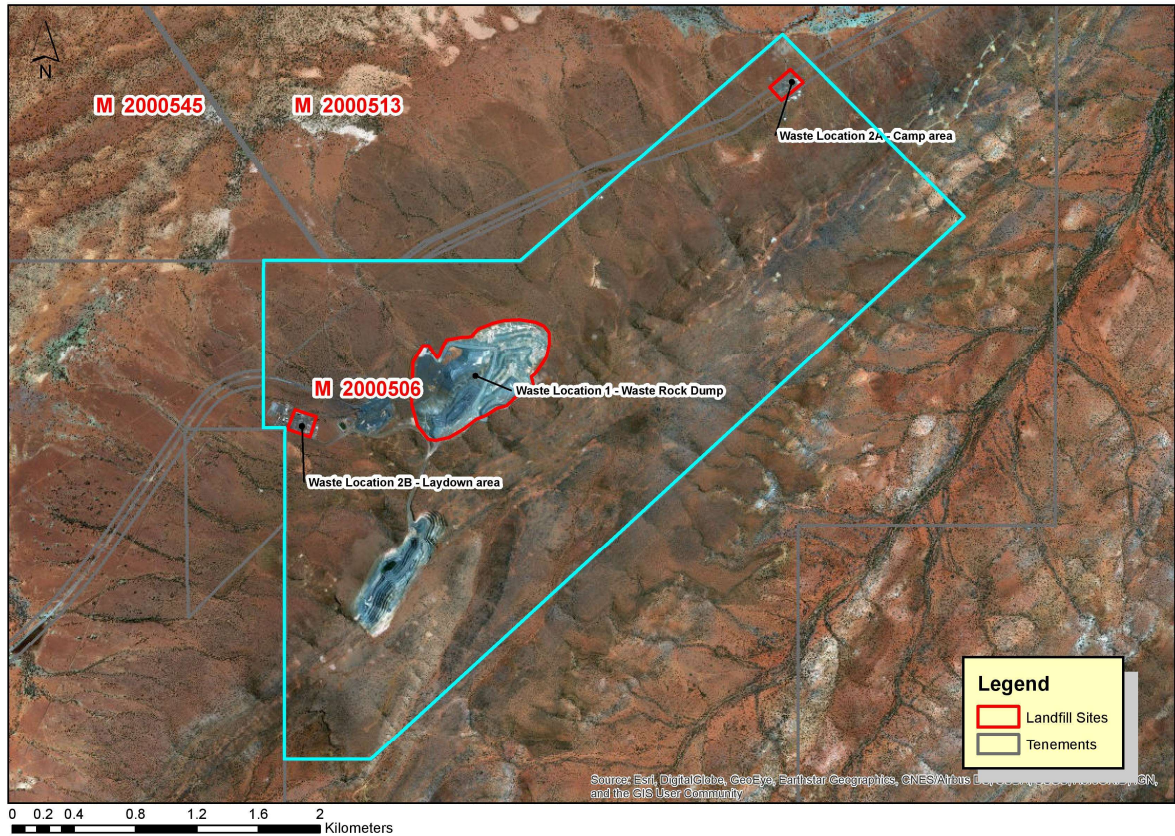


Figure 1: Proposed waste disposal locations within the Premises. The Premises boundary is shown in blue.

3. Other approvals

The Licence Holder has provided the following information relating to other approvals as outlined in Table 3.

Table 3: Relevant approvals

Legislation	Number	Approval
<i>Environmental Protection Act 1984</i> Part IV	Ministerial Statement 727	Statement that the Jack Hills Iron Ore Project may be implemented pursuant to the provisions of the EP Act.
<i>Rights in Water and Irrigation Act 1914</i>	GWL158132(8)	Groundwater abstraction licence for the East Murchison Meekatharra Combined - Fractured Rock West - Fractured Rock aquifer.

4. Instrument history

Table 4 provides the instrument history for the Premises.

Table 4: Instrument history

Instrument	Issued	Scope
W4259/2005/1	04/09/2006	Works Approval
L8125/2005/1	08/11/2006	New application
L8125/2005/2	18/10/2007	Licence re-issue
L8125/2005/3	22/10/2010	Licence re-issue
L8125/2005/3	21/02/2013	Licence amendment to change capacities
L8125/2005/4	29/10/2015	Licence re-issue
L8125/2005/4	23/06/2016	Licence amendment - registered address and Licence duration
L8125/2005/4	02/12/2019	Licence transfer - registered address
L8125/2005/4	26/02/2020	Amendment as outlined in this Decision Report – waste disposal

5. Environmental siting

The Jack Hills Iron Ore Project is located in the Jack Hills range, 400 km north-east of Geraldton and 150 km north-west of Meekatharra, within the Western Murchison region. The Jack Hills range rises up to approximately 300 m above the flat plain of the Murchison River, which is between 400 to 450 m above sea level. The range extends for approximately 60 km in an arc-shape from the north-east to south-west.

The Premises is located within a sparsely populated area of the Shire of Meekatharra. The area is predominately zoned Pastoral, being comprised of extensive pastoral leases generally used for livestock grazing.

5.1. Potential receptors

Table 5 below lists the sensitive land uses and environmental receptors in the vicinity of the Prescribed Premises which may be relevant to the proposed amendment.

Table 5: Distance and description of potential receptors

Human receptors	Description	Distance from activity / prescribed premises
Residential premises	Homestead on Judal Station	Approximately 27 km south-east of the activity area.
	Homestead on Neringarra Station	Approximately 30 km west of the activity area.
Environmental receptors	Description	Distance from activity / prescribed premises
Priority Ecological Community (PEC)	Jack Hills vegetation complexes (banded ironstone formation) listed as Priority 1.	The Premises falls within the mapped area of the PEC and its buffer.

Threatened and Priority flora and fauna	Threatened and priority flora and fauna species associated with the Jack Hills vegetation complexes.	Located within the Premises.
Watercourse	Multiple non-perennial watercourses arising in the Jack Hills range drain north-west across the Premises towards the Murchison River.	Within the Premises and activity area.
	Murchison River	Approximately 4.8 km north and north-west of the Premises boundary.
Groundwater	<p>Permanent groundwater is present in a low yield, fractured rock aquifer.</p> <p>Generally local groundwater flows from higher lying areas towards main drainage lines, with regional groundwater flow being from east to west. Accordingly the inferred groundwater flow direction at the Premises is north-west towards the Murchison River.</p> <p>Perched groundwater lenses occur occasionally through the Premises.</p> <p>Groundwater bores identified within 5km of the Premises are owned by the Licence Holder.</p>	Permanent groundwater depth varies across the Premises between approximately 22 - 180 mbgl. Shallower water levels are present on valley floors and depth generally increases with topographic height.
Environmental aspects	Description	Distance from activity / prescribed premises
<i>Rights in Water and Irrigation Act 1914</i>	East Murchison Groundwater Area	The Premises is located wholly within the proclaimed area.

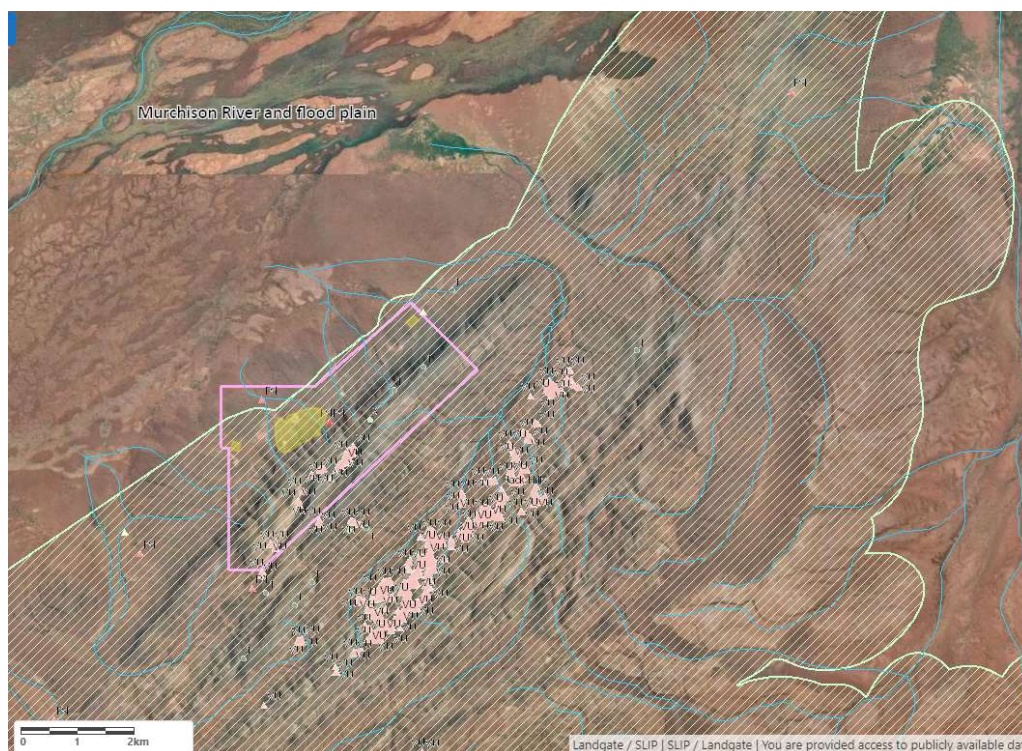


Figure 2: Potential receptors surrounding the Premises. The Premises boundary is shown in pink and the landfill areas are shown shaded yellow. Point marks indicate recorded occurrences of threatened and priority flora or fauna. The hatched area shows the Jack Hills vegetation complexes PEC and surface watercourses are shown in blue.

5.2. Potential pathways

Air, soil seepage, surface run-off and groundwater have been considered potential pathways during the assessment. The meteorological, topographical and geological conditions at the Premises have been presented in Table 6 below and this information has been considered in the risk assessment table in Section 6. Groundwater information is contained in Table 5 above as it is considered both a potential pathway and receptor.

Table 6: Potential pathways

Environmental aspects	Description
Soil type and surface geology (Curry <i>et al</i> , 1994)	<p>The Premises falls predominately within the mapped area of the Weld land system described as rugged ranges and ridges of banded ironstone and quartzite with dense stony mantles. Soils range from skeletal lithosols of dark red loamy or clayey sands with infrequent clay subsoil in the upper slopes, reddish-brown or dark red shallow red earths on the footslopes and red earthy sands on valley floors.</p> <p>The north-eastern most area of the Premises is within the Yarrameedie Land System described as undulating stony interfluves, drainage floors and foothill plains below major ranges of crystalline rocks (mainly the Weld land system). Soils are dark red earth sands, shallow red earths or occasional duplexes with a dense to very dense stony mantle.</p>
Topography and surface hydrology	<p>The Premises extends from the foothills of the Jack Hills range in the north-west towards Mt Hale and Mt Matthew in the south-east, from approximately 380 to 520 mAHD. The operational areas on the Premises lie between approximately 380 to 450 mAHD.</p> <p>The Premises is situated on the north-west draining catchment of the Jack Hills range, where infrequent drainage is associated with major rainfall events. Runoff rates from the catchment are typically high because of low permeability surfaces and steep slopes of the range (Curry <i>et al</i>, 1994).</p>
Prevailing wind direction and rainfall (Bureau of Meteorology, accessed February 2020)	<p>The Meekatharra Airport 7045 weather station, located approximately 100km east of the Premises is the closest station recording climatic information.</p> <p>Annual average rainfall at the station is 235.8 mm occurring across 28.2 days. Highest rainfall occurs in February with 36.4 mm and lowest rainfall is during September with 4.4 mm. Higher rainfall occurs during the summer months associated with thunderstorms, tropical lows or weakening tropical cyclones.</p> <p>Annual evaporation is approximately 3,500 mm with low evaporation rates occurring in winter to spring when rainfall is at its lowest.</p> <p>The prevailing wind direction is east or north-easterly in the morning. Afternoon wind directions are easterly in the afternoon during January to June and west to north-westerly during July to December. The change in prevailing wind direction occurs as the sub-tropical ridge seasonally shifts position.</p>

6. Risk assessment

Table 7 below describes the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. The table identifies whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Table 7: Risk assessment for proposed amendments during operation

Risk Event				Consequence rating ¹	Likelihood rating ¹	Risk ¹	Reasoning	Regulatory controls (refer to conditions of the granted instrument)
Source/Activities*	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
Increased quantity of waste disposed by landfilling Disposal of inert and putrescible waste by landfilling at locations 2A and 2B	Leachate and contaminated stormwater	Seepage through the soil profile to groundwater causing downgradient loss of beneficial use.	Landfills will be located within existing disturbed areas. Waste is disposed in a defined trench or area enclosed by earthen bunds.	Moderate - low level offsite impacts	Unlikely	Medium	Only minor quantities of leachate are expected to be produced as a result of the proposed increase in waste disposal. This is due to the low proportion of putrescible material with wastes being predominately clean fill and inert material that would not produce a leachate. Additionally the Premises is sited in an area with low rainfall and high evaporation, reducing the volume of rainfall infiltrating through the waste mass. When considering the Licence Holder's proposed controls, the greater than 20 m separation distance from groundwater and conditions on the Existing Licence, the Delegated Officer has determined that further regulatory controls are not required. Existing Licence conditions will be modified to give effect to this amendment.	Condition 4: <i>Waste acceptance limits</i> Condition 5: <i>Waste disposal and processing locations</i>
		Overland flow and groundwater discharge causing impact to surface water quality: <ul style="list-style-type: none">Murchison River and associated drainage lines	Tipping area will not exceed two metres in height above ground level. Size of the tipping face will not exceed 30m in length. Waste material will be compacted after placement. Landfill trenches will be covered after deposition is complete or within one month of deposition.	Moderate – low level offsite impacts	Unlikely	Medium		
	Odour	Air/windborne pathway causing impacts to amenity of closest human receptors: <ul style="list-style-type: none">Judal Station homestead (27 km southeast)Neringarra Station homestead (30 km west)	Landfill trenches will be covered after deposition is complete or within one month of deposition.	Slight – local scale minimal impacts to amenity	Rare	Low	The Delegated Officer does not consider odour to be an emission requiring further regulatory control due to the small quantity of waste and long distance to the nearest human receptors.	N/A
Increased quantity of waste disposed by landfilling	Noise	Air/windborne pathway causing impacts to health and amenity of closest human receptors:	None	Slight – local scale minimal impacts to amenity	Rare	Low	The Delegated Officer does not consider noise to be an emission requiring further regulatory control due to the small scale of operations and long distance to the nearest human receptors.	N/A
Disposal of inert and putrescible waste by landfilling at locations 2A and 2B Vehicle/machinery movements	Dust	<ul style="list-style-type: none">Judal Station homestead (27 km southeast)Neringarra Station homestead (30 km west)	Dust suppression by watercart	Slight – local scale minimal impacts to amenity	Rare	Low	The Delegated Officer does not consider dust to be an emission requiring further regulatory control due to the small scale of operations and long distance to the nearest human receptors.	N/A

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the Department's Guidance Statement: Risk Assessments (February 2017)

7. Consultation

Table 8: Summary of consultation

Method	Comments received	DWER response
Local Government Authority advised of proposal (23 January 2020)	None	N/A
Department of Mines, Industry Regulation and Safety advised of proposal (23 January 2020)	None	N/A
Applicant referred draft documents (17 February)	<p>The Licence Holder responded on the 17th and 19th February identifying minor formatting and typographical errors in the Licence and Amendment Report.</p> <p>The Licence Holder stated that they had no further comments and waived the remainder of the comment period.</p>	DWER has rectified formatting and typographical errors in the final Licence and Amendment Report.

8. Decision

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

8.1. Summary of amendments

Table 9 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

Table 9: Licence amendments

Condition No.	Proposed amendments
-	The assessed design capacity for Category 64 was changed from 500 tonnes per year to 5,000 tonnes per year.
4 (Table 1)	The quantity limit for clean fill, inert waste type 1, inert waste type 2 and putrescible waste acceptance was increased from 500 tonnes per year to 5,000 tonnes per year.
5 (Table 2)	Wording of the landfill process limits was modified to reference multiple locations.
Schedule 1 (Figure 3)	The map of waste disposal and processing locations was updated to include the additional 2A and 2B waste locations.

MANAGER WASTE INDUSTRIES
 REGULATORY SERVICES
An officer delegated by the CEO under section 20 of the EP Act

Appendix 1: Key documents

Document title	Availability
Licence L8125/2005/4 – Jack Hills Iron Ore Project	accessed at www.dwer.wa.gov.au
Jack Hills Iron Ore Project <i>Environmental Protection Statement</i>	accessed at www.epa.wa.gov.au/
Jack Hills Iron Ore Project <i>Preliminary Decommissioning and Closure Plan</i>	
Jack Hills Expansion Project <i>Public Environmental Review Document</i>	
Ministerial Statement 727	
Ministerial Statement 784	
Ministerial Statement 886	
Crosslands Resources Pty Ltd, December 2009. <i>Final Decommissioning and Closure Management Plan</i>	DWER records (A1866153)
Crosslands Resources Pty Ltd, November 2017. <i>Groundwater monitoring summary – Jack Hills borefield. 1 November 2016 – 31 October 2017.</i>	DWER records (DWERDT25282)
Curry <i>et al</i> , 1994. <i>An inventory and condition survey of the Murchison River Catchment, Western Australia.</i> Department of Agriculture and Food, Perth.	accessed at www.researchlibrary.agric.wa.gov.au
DER, July 2015. <i>Guidance Statement: Regulatory principles.</i> Department of Environment Regulation, Perth.	accessed at www.dwer.wa.gov.au
DER, October 2015. <i>Guidance Statement: Setting conditions.</i> Department of Environment Regulation, Perth.	
DER, November 2016. <i>Guidance Statement: Risk Assessments.</i> Department of Environment Regulation, Perth.	
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