Application for Works Approval

Division 3, Part V *Environmental Protection Act 1986*

Works Approval Number	W6371/2020/1
Works Approval Holder	Wiluna Operations Proprietary Limited
ACN	166 954 525
File Number	DER2020/000099
Premises	Wiluna Mine Site Mining Leases M53/96 and M53/200
Date of Report	23 July 2020
Status of Report	Final

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TABLES

1. Definitions of terms and acronyms

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

Table 1: Definitions

Term	Definition
AACR	Annual Audit Compliance Report
ACN	Australian Company Number
AER	Annual Environment Report
AS 4156.6 – 2000	Australian Standard AS 4156.6 – 2000: Determination of Dust/moisture Relationship for Coal.
Category/ Categories/ Cat.	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CS Act	*Contaminated Sites Act 2003* (WA)
Decision Report	refers to this document.
Delegated Officer	an officer under section 20 of the EP Act.
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation As of 1 July 2017, the Department of Environment Regulation (DER), the Office of the Environmental Protection Authority (OEPA) and the Department of Water (DoW) amalgamated to form the Department of Water and Environmental Regulation (DWER). DWER was established under section 35 of the *Public Sector Management Act 1994* and is responsible for the administration of the *Environmental Protection Act 1986* along with other legislation.
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
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
m^3	cubic metres

Minister	the Minister responsible for the EP Act and associated regulations
mtpa	million tonnes per annum
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)
Occupier	has the same meaning given to that term under the EP Act.
PAX	Potassium amyl xanthanate
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report
Risk Event	As described in *Guidance Statement: Risk Assessment*
SPP	Sulphide ore Processing Plant
Works Approval Holder	Wiluna Operations Proprietary Limited
µg/m^3	micrograms per cubic metre
µg/L	micrograms per litre

2. Purpose and scope of assessment

Wiluna Operations Proprietary Limited (the applicant) submitted a works approval application for a Sulphide Process Plant on 21 February 2020. The applicant intends to construct and operate a sulphide ore processing plant on mining lease M53/200, including flotation circuit and concentrator at the Wiluna Mine Site. The intent is to enable processing of up to 750,000 tonnes per annum (tpa) of sulphide ores.

The new sulphide plant will complement the existing oxide processing plant (authorised under L5206/1987/10), which has a capacity of 2.2 million tpa (Mtpa) throughput. Following commissioning of the sulphide ore processing plant, the total throughput for the Matilda Gold Project is expected to be a maximum of 2.95 Mtpa.

2.1 Application details

Table 2 lists the documents submitted during the assessment process.

Table 2: Documents and information submitted during the assessment process

Document/information description	Date received
Sulphide Processing Plant – Works Approval supporting Information	21/02/2020
Tailings Geochemistry (Golders, 2019) – Appendix 2	
Sulphide Process Plant Contract – Attachment 10	
Response to request of further information	26/05/2020

3. Background

Wiluna Operations Proprietary Limited holds Prescribed Premises licence L5206/1987/10 for the Wiluna Mine Site. The Wiluna Mine Site (the premises subject to this works approval application) contains existing, approved open-cut pits and underground workings with sulphide ore resources of sufficient scale to enable the construction of the sulphide ore processing plant, including flotation circuit and concentrator. A BIOX® processing plant has previously been approved and used to process sulphide ore at the premises, however the refurbishment of this process was determined to be unfeasible.

Table 3 lists the prescribed premises categories that have been applied for.

Table 3: Prescribed Premises Categories in the Existing Licence

Classification of Premises	Description	*Design capacity or throughput*
Category 5	Processing or beneficiation of metallic or non-metallic ore: premises on which — (a) metallic or non-metallic ore is crushed, ground, milled or otherwise processed; or (b) tailings from metallic or non-metallic ore are reprocessed; or (c) tailings or residue from metallic or non-metallic ore are discharged into a containment cell or dam.	750,000 tpa of sulphide ore

4. Overview of Premises

4.1 Operational aspects

The sulphide ore processing plant (SPP) construction will include minor modifications to the existing grinding and classification to enable sulphide ores to meet specification; construction of a flotation process; concentrates thickening and filtration; and reagent and concentrates storage areas. An additional linking road will be constructed to support the movement of ore and containerised concentrate on M53/200. A new pipeline from the sulphide ore processing plant to TSF K will be constructed within the existing TSF K tailing pipeline corridor on tenements M53/96 and M53/200. Construction of TSF K has been approved under works approval W6248/2019/1. Compliance documents were submitted on 14 July 2020 and are currently being assessed by DWER.

Approximately 3.66 hectares (ha) is required to be disturbed for the development, with 1.95 ha of clearing required. The remaining area has been previously disturbed by approved mining activities.

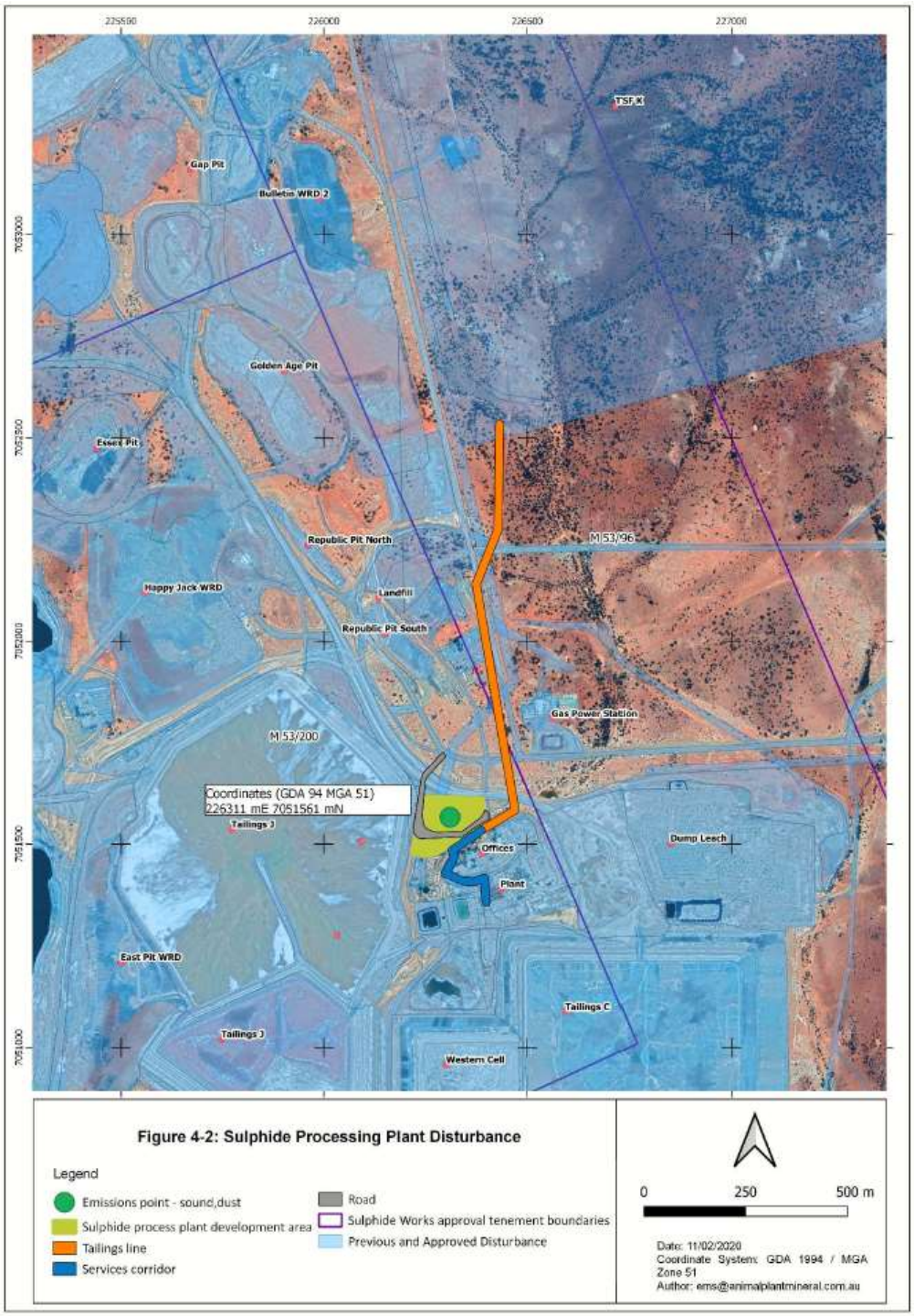

Figure 1 depicts the SPP location, tailings line diversion and the new clearing area.

4.2 Infrastructure

The sulphide processing plant facility infrastructure, as it relates to Category 5 is detailed in Table 4 and with reference to the Site Plan (attached in the Works Approval).

Table 4 lists infrastructure associated with each prescribed premises category.

Table 4: Sulphide ore processing plant facility Category 5 infrastructure

	Infrastructure	Site Plan Reference
	Prescribed Activity Category 5	
Sulphide Processing Plant		
1	SK-240 flash flotation cell (existing)	Figure 2
2	1.2 m x 3.6 m trash screen	
3	50 m^3 high intensity conditioning tank	
4	50 m^3 tank rougher flotation cells	
5	Two 20 m^3 tank cleaner flotation cells	
6	Four 20 m^3 tank cleaner scavenger flotation cells	
7	8 m diameter hi-rate concentrate thickener (existing relocated)	
8	200 m^2 vertical plate pressure filter for concentrate	
9	Concentrate storage shed	
10	Bagging plant	
11	Flotation reagents mixing, storage, distribution and dosing systems for the flotation reagents and flocculant	
	Reagent Mix Facility	
1	One 75m^3 tank for storage of copper sulphate	Figure 2
2	One 45m^3 tank for storage of potassium amyl xanthate	
	Directly related activities	
Transportable modular buildings containing control room, toilet and switch room.		

The preliminary SPP layout is shown in Figure 2.

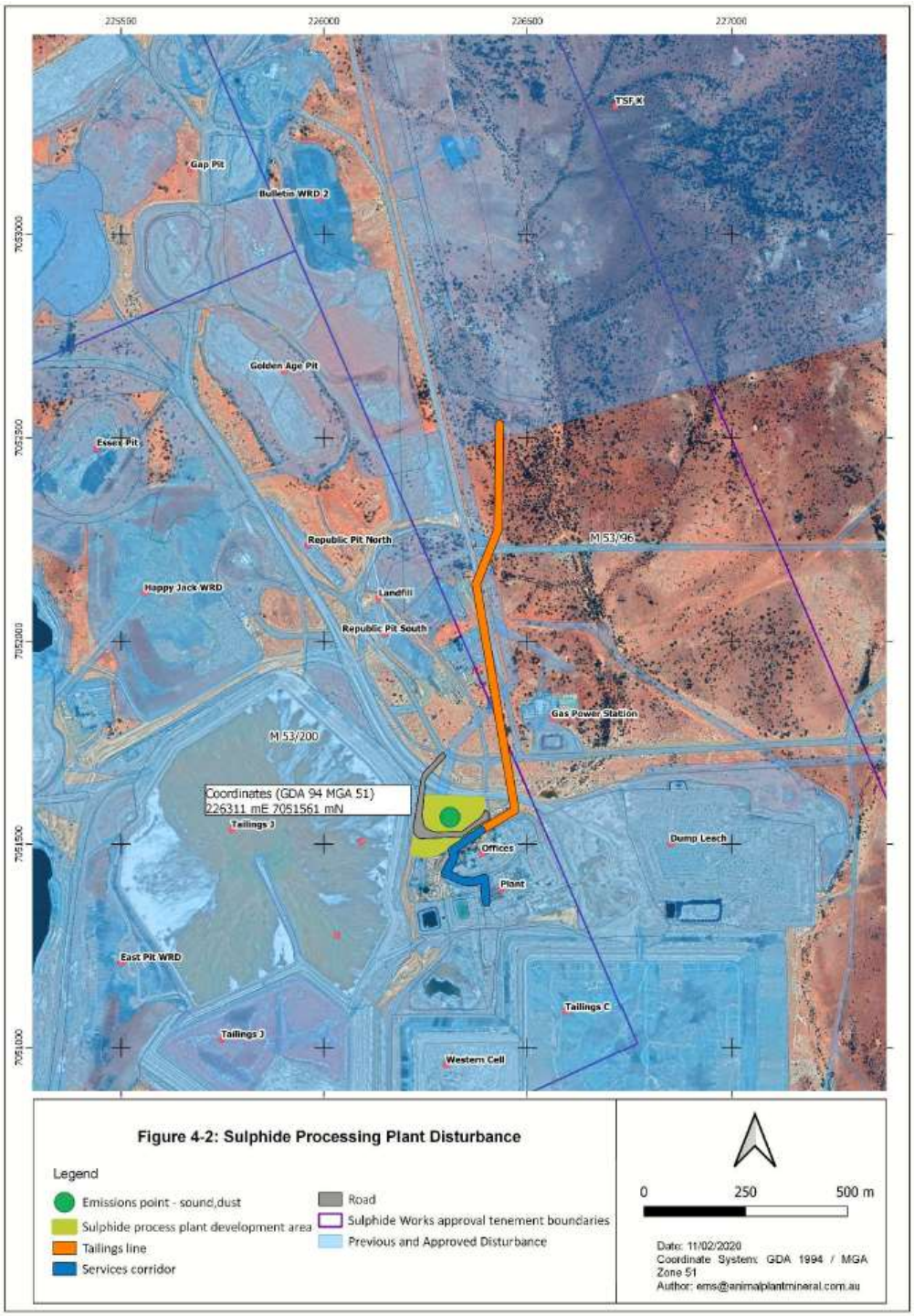

Figure 1: Sulphide processing plant and tailings pipeline location and disturbance area.

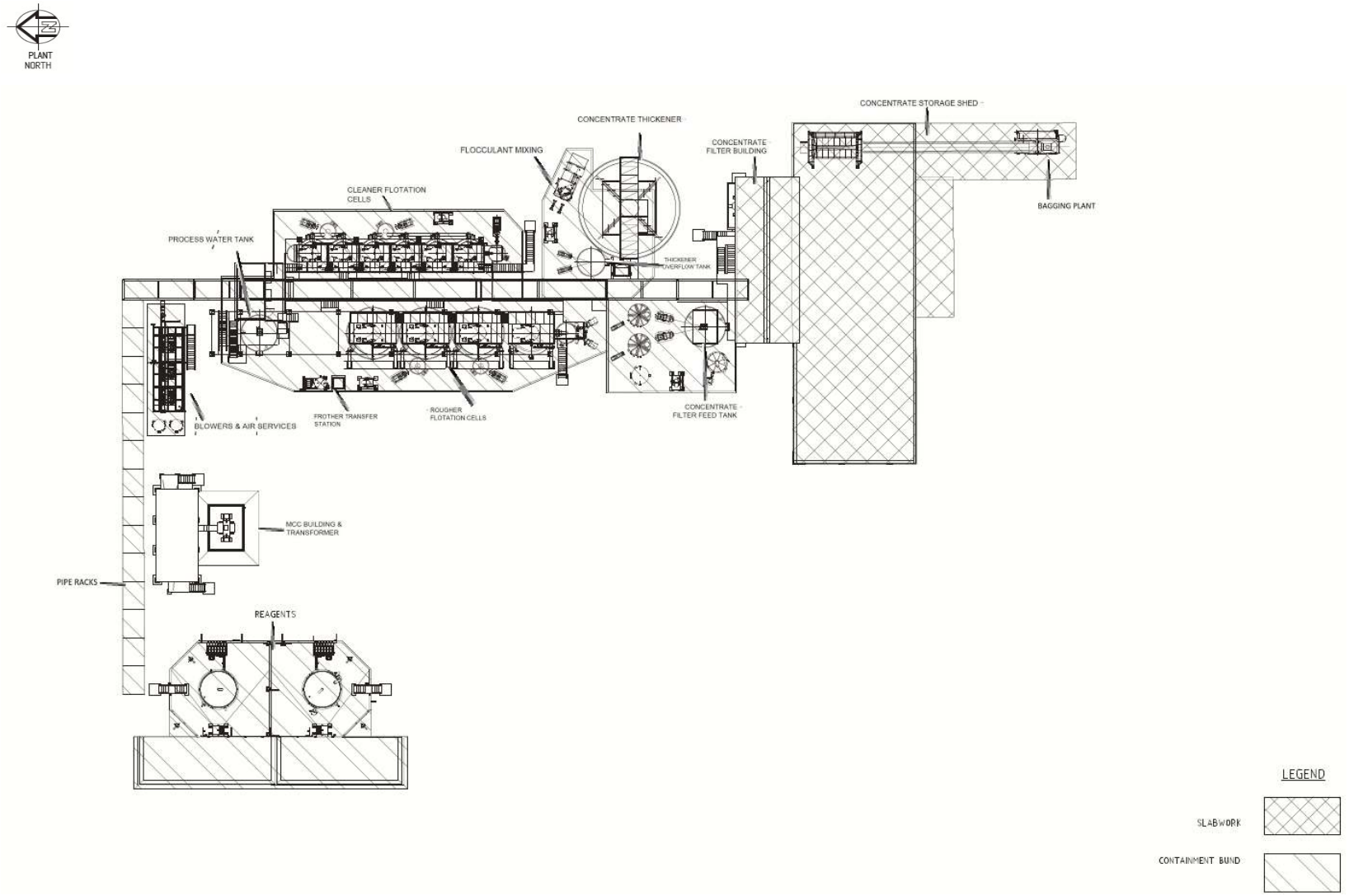

Figure 2: Sulphite process plant layout.

4.3 Sulphide ore Process Plant characteristics

Metallurgical test work has been conducted on sulphide ore samples to assist with engineering design of the SPP. The key results that have informed the SPP design include:

• The flotation concentrate filter cake moisture will be 15.6%, or less;

• The potential benefit of flash flotation has not been demonstrated; however, the potential remains because most of the equipment required is already in existence;

• The optimum grind size for rougher performance is in the order of 125 – 150 µm P_{80} range. The grind size adopted for design, P_{80} 106 µm, is conservative but appropriate for design; and

• The use of process water will not be deleterious to flotation performance.

The SPP process is described below:

Ore is fed into the ball mill and then directed to the primary cyclones. Cyclone overflow is directed to the first stage of rougher flotation, while the product from the primary cyclones is directed to the rod mill and the secondary cyclones. Oversize is returned to ball mill 2 and back to the secondary cyclones and the rougher flotation. First stage rougher flotation concentrate is directed to the concentrate thickener with flocculant added. Cleaner flotation and scavenger generate a cleaner concentrate that is also directed to the concentrate thickener. Rougher tails and cleaner scavenger tails are directed to the TSF. The concentrate thickener overflow is directed to the process water tank. The thickened concentrate is filtered and then stockpiled before bagging, loading and product transport.

A flow diagram of the SPP is shown in Figure 3.

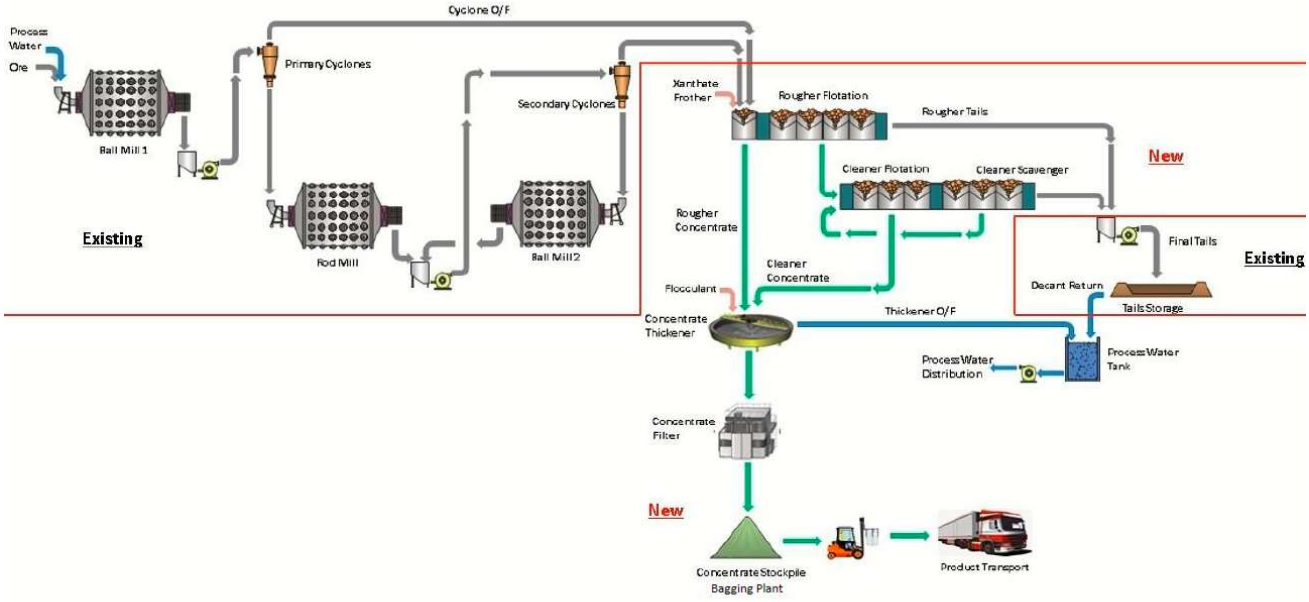

Figure 3: Flow diagram of SPP.

SPP water requirements

A new flotation process water tank is to be positioned adjacent to the existing process water tank in the existing plant. Make up water will be supplied from the eastern bore field and the existing pit water system. Operating and duty pumps will be installed to pump to the sulphide processing plant with an offtake to service the milling area which will be tied into the existing milling area process water reticulation network.

Raw water (medium chloride) will be pumped to the flotation area for gland water, filter cloth wash water, filter cake wash water, filter processing water and reagent make-up. A dedicated gland service tank with operating and standby high-pressure multi-stage pumps will supply gland water for the sulphide concentration area.

Concentrate Storage

Concentrate will be dumped from the concentrate filter into a concrete concentrate load out bunker beneath the filter. The concentrate can be reclaimed from the concentrate load out bunker and temporarily stored in the concentrate shed or bagged through the bagging plant and loaded for transport.

The semi-enclosed concentrate shed will abut the filter building/load-out bunker, allowing for concentrate handling to occur under protection from the elements. A 12 m x 12 m section of the shed will be used for concentrate storage (2 days) and will be enclosed with a 1.5 m high reinforced walls to facilitate concentrate loading with a loader. A bagging plant is also located within the shed and a container weigh scale will be provided by the concentrate transport contractor and will be located adjacent to the concentrate shed.

SPP Reagents

The reagents required to produce gold concentrate via the SPP are listed in Table 5.

Table 5: list of reagents used in the SPP process.

Reagent	Hazard Identification	Annual consumption
Polyfroth W22C	Combustible liquid, harmful to aquatic life	15 tpa
Copper Sulphate	Skin irritation, Toxic to environment	540 tpa
Potassium amyl xanthanate (PAX)	Corrosive, irritant	154 tpa
Magnafloc 155	N/A	1 tpa

The reagent storage areas will be designed to meet the requirements of the *Dangerous Goods Safety Act 2004*, including consideration of separation distances and bunded containment.

4.4 Tailings management and characteristics

Flotation tailings will be pumped to TSF K and distributed around the perimeter of the dam through spigots spaced 40 m apart. Tailings will be pumped from the SPP to TSF K at a rate of approximately 700,000 tonnes per annum. The tailings slurry pipelines to the TSF is to be installed in a bunded piping corridor. The tailings disposal lines will be fitted with two magnetic flowmeters to provide rupture detection and a pressure transmitter for monitoring purposes.

Geochemical analysis

Fresh rock material were used as samples in the sulphide test plant. The tailings generated in the process were submitted to geochemical analysis (one sample). The sample was classified as Non Acid Forming (NAF), with net acid generation (NAG) pH>4.5 and negative net acid potential (NAPP).

A modified version of USEPA LEAF test method 1313 was performed, with the solid fraction, under pH 2, 4, 6, 8, 10 and 12. The results are shown in Table 6.

Table 6: LEAF test result from single metallurgical test sample.

Element	pH 2	pH 4	pH 6	pH 8	pH 10	pH 12	ANZECC freshwater 95% species protection
Al (mg/L)	39	0.47	<0.01	0.04	0.11	3.3	0.0008 (pH<6.5) 0.055 (pH>6.5)
As (mg/L)	0.82	0.001	**0.037**	**0.068**	**0.22**	**9.7**	0.013
B (mg/L)	0.08	0.06	0.05	0.04	0.04	0.05	0.37
Cd (mg/L)	**0.022**	**0.0015**	0.0002	<0.0001	<0.0001	<0.0001	0.0002
Co (mg/L)	**0.35**	**0.14**	**0.047**	0.001	<0.0001	<0.0001	0.001
Cr (mg/L)	1.5	<0.001	<0.001	<0.001	<0.001	0.033	0.001
Cu (mg/L)	**20**	**4.8**	**0.05**	**0.002**	<0.001	**0.006**	0.0014
F^- (mg/L)	<0.1	0.1	0.0	0.2	0.2	0.2	-
Fe (mg/L)	540	22	<0.01	<0.01	<0.01	0.04	-
Hg (mg/L)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.0006
Mg (mg/L)	670	320	21	8.1	4.6	<0.5	-
Mo (mg/L)	0.001	<0.001	0.002	0.003	0.003	**0.004**	0.034
Ni (mg/L)	**0.89**	**0.36**	**0.16**	0.007	0.001	<0.001	0.011
Pb (mg/L)	**0.12**	<0.001	<0.001	<0.001	<0.001	<0.001	0.0034
Se (mg/L)	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	0.011
SO_4^{-2} (mg/L)	<20	<20	31	24	26	27	-
U (mg/L)	**0.0027**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005
Zn (mg/L)	**20**	**0.53**	**0.2**	**0.01**	<0.001	<0.001	0.008

Note: bold numbers indicate concentration above ANZECC Guidelines for Freshwater 95% species protection.

Tailings supernatant were also analysed. The results are shown in Table 7.

Table 7: Chemistry of tailings liquid fraction.

Element	ANZECC freshwater 95% species protection	Concentration (mg/L)
Al	0.0008 (pH<6.5) 0.055 (pH>6.5)	**0.02**
As	0.013	**0.14**
B	0.37	**0.39**
Cd	0.0002	<0.0001
Co	0.001	0.001
Cr	0.001	<0.001
Cu	0.0014	**0.009**
F^-	-	0.4
Fe	-	<0.01
Hg	0.0006	<0.00005
Mg	-	37
Mo	0.034	0.03
Ni	0.011	**0.08**
Pb	0.0034	<0.001
Se	0.011	<0.001
SO_4^{-2}	-	300
U	0.0005	<0.0005
Zn	0.008	<0.001

Note: bold numbers indicate concentration above ANZECC Guidelines for Freshwater 95% species protection.

Geotechnical analysis

Geotechnical properties of sulphide tailings expected to be similar to oxide tailings material. Oxide tailings characteristics are provided in Table 8.
For TSF K Stage 1 it is anticipated that the composition of tailings reporting to TSF K will be 25% sulphide tailings and75% oxide tailings.

Table 8: Key Physical Characteristics of Oxide Tailings Material (anticipated to represent sulphide tailings characteristics)*

Material Characteristic	Unit	Value	Source
Particle size distribution (PSD)	% passing 75 µm	76	KP (2016)
Plasticity Index	%	10	KP (2016)
Slurry concentration	% solids	38 to 45	KP (2016) No change from existing TSF J
Particle density	Specific gravity	2.8	KP (2016)
Dry density	t/m^3	~1.35	KP (2016)
Beach slope	(V:H)	1:150 to 1:250	Assumed based on TSF J
Shear strength	Undrained strength ratio	0.25	Assumed based on plasticity and PSD
	Drained (degrees)	28°	Assumed based on PSD
Consolidation	M_v (m^2/MN)	0.029	KP (2016)
	c_v (m^2/year)	89	KP (2016)
	C_c	0.57	KP (2016)
Hydraulic conductivity	k (m/s)	1×10^{-6} under low stress 1×10^{-8} under moderate stress	KP (2016) Estimated
Liquefaction resistance	Cyclic resistance ratio	0.1 to 0.15	Assumed based on PSD
Post liquefaction strength	Strength ratio	0.1	Assumed based on PSD

* Table extracted from *Design Report to Support Application for Tailings Storage Facility K – Stage 1* (Golder, July 2019)

4.5 Exclusions to the Premises

Existing infrastructure in the form of camp accommodation, offices, tailings storage facilities, power station, water licences, landfill site and workshops will support the development and are covered under existing licence L5206/1987/10.

5. Legislative context

Table 9 summarises approvals relevant to the assessment.

Table 9: Relevant approvals and tenure

Legislation	Approval Number	Approval
Mining Act 1978	*Mining Proposal REG ID 85715*	*Approval for Sulphide Processing Plant Stage 1 and Re-alignment of TSF K pipeline corridor approved through a Mining Proposal Variation 30 April 2020.*
Rights in Water and Irrigation Act 1914	*GWL 159247(4)*	*2,365 GL per year*
Dangerous Goods Safety Act 2004	*To be obtained*	*Reagents required for the Sulphide Processing Plant will be added to the existing site Dangerous Goods Licence when appropriate.*

5.1 Contaminated sites

Historically the site has been used for mining and processing of gold ores historically for over 100 years, which is a potentially contaminating activity as well as an underground diesel fuel leak in 2003. The site is classified as Possibly Contaminated (under the *Contaminated Sites Act 2003*). A preliminary contaminated site investigation was conducted by Knight Piesold consulting and supplied to DWER in 2016.

5.2 Part V of the EP Act

5.2.1 Applicable regulations, standards and guidelines

The overarching legislative framework of this assessment is the EP Act and EP Regulations.

The guidance statements which inform this assessment are:

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

5.2.2 Works approval and licence history

Table 10 summarises the works approval and licence history for the premises.

Table 10: Works approval and licence history

Instrument	Issued	Nature and extent of works approval, licence or amendment
L5206/1987/10	28/08/2014	Licence amendment to update improvement Program and transfer of occupier to Matilda Operations Pty Ltd
L5206/1987/10	10/06/2016	Licence amendment to authorise the construction of TSF Cell J and update the associated groundwater monitoring network. Increase to Category 5 production throughput to 1,800,000 tonnes per annum and to authorise tyre disposal by burial at Essex Pit. Finalised improvement program conditions removed and new improvement conditions for dust management, ecological assessment of dewatering impacts and checking of sampling ports for off-gas stacks were included.
L5206/1987/10	22/09/2016	Amendment Notice 1 Amendment to extend the submission date for improvement
L5206/1987/10	24/05/2018	Amendment Notice 2 Licence amendment to construct the stage 2 lift for Tailings Storage Facility (TSF) J, to increase the production throughput of ore processed from 1.8Mtpa to 1.95Mtpa, update Improvement Program and to extend the Licence to 21 November 2019.
L5206/1987/10	01/10/2019	Extension of Licence L5206/1987/10 expiry date from 21 November 2019 to 30 June 2020.
W6248/2019/1	05/09/2019	Construction of TSF K

L5206/1987/10	05/06/2020	Amendment of Licence L5206/1987/10 to include tyre storage and disposal and extension of the expiry date to 30 June 2040.
W6371/2020/1	23/07/2020	Construction of a sulphide ore processing plant, including flotation circuit and concentrator

5.2.3 Clearing

Approximately 3.66 hectares (ha) is required to be disturbed for the development, with 1.95 ha of clearing required. The remaining area has been previously disturbed by approved mining activities. Under Schedule 1 of the Environment Protection (Clearing of Native Vegetation) Regulations 2004 up to 10 ha of clearing is permitted per tenement per financial year for an approved activity. The proposed clearing will result in less than 10 ha cleared during that period; therefore, a Native Vegetation Clearing Permit (NVCP) is not required.

6. Consultation

The application was advertised in the West Australian newspaper on 23 March 2020 for a comment period ending on 6 April 2020. No comments were received.

A letter inviting comment was sent to the Shire of Wiluna and the Department of Mines, Industry and Safety on 17 March 2020. No comments were received.

7. Location and siting

7.1 Siting context

The Wiluna Gold Operation is located approximately 750 km north east of Perth and 5 km south east of the town of Wiluna, Western Australia. The Wiluna mine is part of a broader project; the Matilda Gold Project comprises mining leases and miscellaneous licenses covering approximately 50 square kilometers (km²). This works approval only applies to mining tenements M53/96 and M53/200, as shown in Figure 1.

7.2 Residential and sensitive receptors

The distances to residential and sensitive receptors are detailed in Table 11.

Table 11: Receptors and distance from activity boundary

Sensitive Land Uses	**Distance from Prescribed Activity**
Bondini Community	3.5 km North East of SPP
Wiluna Town site	4.2 km North West of SPP
Environmental Receptors	**Distance from Prescribed Activity**
Lake Violet	1.1 km South East

7.3 Specified ecosystems

Specified ecosystems are areas of high conservation value and special significance that may be impacted as a result of activities at or Emissions and Discharges from the Premises. The distances to specified ecosystems are shown in Table 12. Table 12 also identifies the

distances to other relevant ecosystem values which do not fit the definition of a specified ecosystem.

Table 12: Environmental values

Specified ecosystems	**Distance from the Premises**
Threatened / Priority Ecological Communities	Priority 1 - Stygofauna assemblages associated with Lake Violet Calcrete system. Buffer Zone edge 2.4 km south downstream of SPP. Priority 1 – Stygofauna assemblages associated with Uramurdah Lake Calcrete system. Buffer Zone edge 2.5 km east of SPP.
Biological component	**Distance from the Premises**
Threatened/Priority Fauna	Two confirmed recordings of mammals approximately 4.5 km North of TSF K, bilby (*Macrotis lagotis*) and brush-tailed mulgara (*Dasycercus blythi*). Twelve recordings of migratory bird species protected under international agreement approximately 4.5km north of TSF K (bird sightings).

Figure 4 shows the distance between SPP and sensitive receptors.

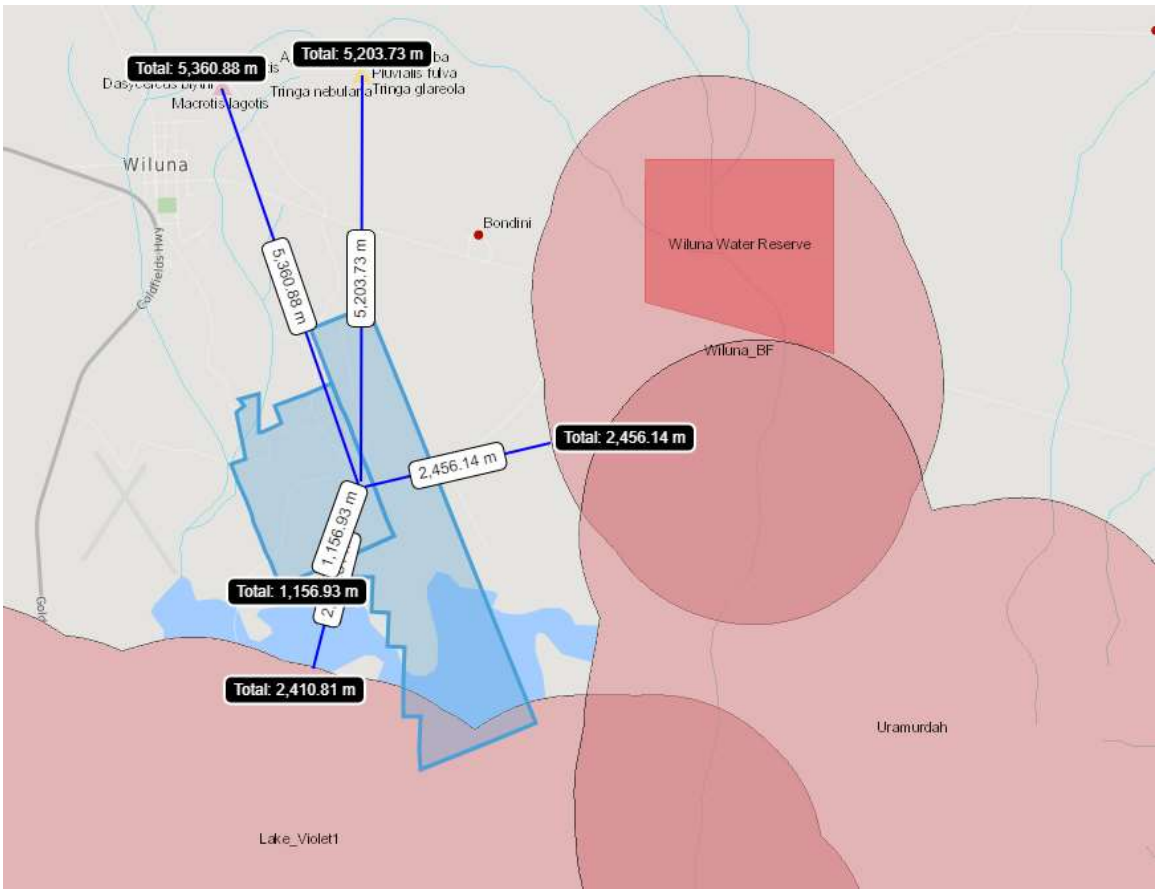

Figure 4: Distance to sensitive environmental receptors: Violet Lake, Priority 1 Ecological Communities (Lake Violet1, Uramurdah and Wiluna_BF), Violet Lake and priority flora and fauna.

7.4 Groundwater and water sources

Groundwater at the premises is hypersaline and is contaminated from mining activities. The distances to groundwater and water sources are shown in Table 13.

Table 13: Groundwater and water sources

Groundwater and water sources	Distance from Premises	Environmental value
Lake Violet	1.5 km south of SPP and 3.5 km south of TSF K (point of discharge)	Salt lakes are an important inland aquatic ecosystem with conservation and ecological values. Producing seeds, eggs or other propagules that will 'survive' over summer and grow when suitable conditions return.
Groundwater	Groundwater level at Wiluna ranges from 10 mbgl in the mining area to 2 mbgl near Lake Violet. Due to the proximity of TSF H and TSF J to Lake Violet, bores to the south of the TSF show rising levels following high rainfall events when the Lake floods. In particular: TD2, TD3, TD4, TD5, TD6, TD7. (AER 2019).	Superficial groundwater system linked to Lake Violet.

7.5 Soil type

The near surface soils comprise thin alluvium and colluvial wash soils typically less than 1.0 m thick overlying variably weathered mafic rock. Weathered mafic rock also outcrops at the ground surface. The alluvial channel to the west of TSF K continues southwards towards Lake Violet.

Figure 5 details soil types and characteristics relevant to the tailings discharge component.

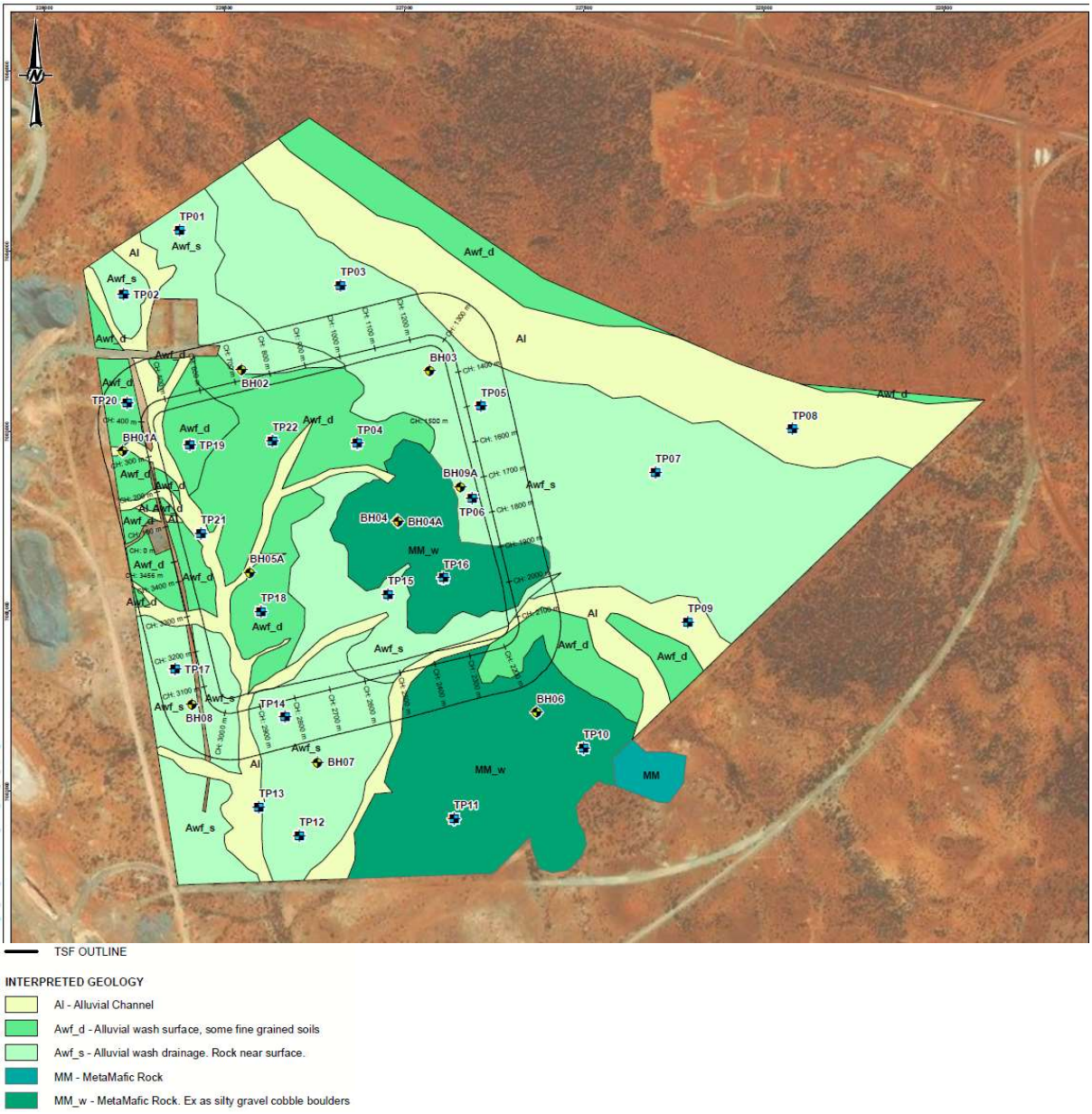

Figure 5: Geological map around TSF K.

8. Risk assessment

Risk ratings have been assessed in accordance with the *Guidance Statement: Risk Assessments* (DER 2017) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 7. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls, these have been considered when determining the final risk rating. Where the Delegated Officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the W6371/2020/1 as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 14.

Works Approval W6369/2020/1 that accompanies this Decision Report authorises construction and commissioning. The conditions in the issued Works Approval, as outlined in Table 14 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence is required following commissioning authorised under the works approval to authorise emissions associated with the operation of the Premises i.e. sulphide ore processing activities. A risk assessment for the operational phase has been included in this Decision Report, however licence conditions will not be finalised until the department assesses the licence application.

Table 14: Determination of emission, pathway, receptor and Regulatory Controls

Risk Event					Consequence rating*	Likelihood rating*	Risk*	Reasoning	Regulatory controls (Refer to conditions of the granted works approval)
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway & receptor (impact)**					
Category 5: Processing or beneficiation of metallic or non-metallic ore Construction of the SPP, chemicals storage area and pipelines	Earthworks, vehicle movements, construction of infrastructure	Noise	No residences or other sensitive receptors in close proximity – nearest receptor 3.5 km north east of the premises	Air / wind dispersion, causing amenity impacts	N/A	N/A	N/A	The Delegated Officer considers there is sufficient separation from sensitive receptors to mitigate the risk of noise impacts. Construction is within an existing mine/processing area and for a finite period of time.	None specified
		Dust	No residences or other sensitive receptors in close proximity – nearest receptor 3.5 km north east of the premises	Air / wind dispersion causing dust impacts, potential health impacts, smothering vegetation impacting photosynthesis	N/A	N/A	N/A	The Delegated Officer considers there is sufficient separation from sensitive receptors and specified ecosystems to mitigate the risk of dust impacts. Construction is within an existing mine/processing area and for a finite period of time.	None specified
	Use and storage of hydrocarbons and reagents	Spills and breach of containment causing hydrocarbon or chemical discharge to land.	Soil and vegetation adjacent to areas of spill or breach	Direct discharge to land and infiltration to groundwater impacting soil, groundwater contamination	N/A	N/A	N/A	All bulk hydrocarbons and chemicals stored at Wiluna Gold are contained in permanent or temporary facilities. Bunds are checked to ensure integrity and that there is adequate capacity following rainfall events. Hydrocarbon contaminated materials such as hydraulic hoses, rags and filters are disposed of in dedicated bins located at workshops, which are then transported to Perth by a controlled waste carrier for disposal or recycling. Waste oil is collected by authorised contactors The Delegated Officer considers there is sufficient separation from sensitive receptors, and that the proposed management measures adequately mitigate the risk of spills and breach of containment, and considers that additional regulatory controls are not required to mitigate this risk.	None specified

Risk Event					Consequence rating*	Likelihood rating*	Risk*	Reasoning	Regulatory controls (Refer to conditions of the granted works approval)
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway & receptor (impact)**					
Category 5: Processing or beneficiation of metallic or non-metallic ore Commissioning and operation of the SPP	Sulphide Processing Plant area	Processing water leaks / spills (contaminated) Solution leaks / spills	Soils, vegetation, groundwater / Lake Violet	Direct discharge to land causing contamination of soil and impacts to groundwater Groundwater is 2 mbgl around the site.	Mid-level onsite impact **Moderate**	Could occur at some time **Possible**	**Medium** Acceptable, subject to controls	Spill from processing facility cannot be discharged directly to the environment. Three reagents used in the Sulphide Processing Plant are toxic to the environment or corrosive (Table 5).	Works approval controls: - All processing areas are bunded. - Reagant pipelines to have double containment as all other areas containing reagent have double containment - All spill material within bunded area to be disposed of in to tailings facility or re-directed back through the processing plant. - Submission of compliance documents
Category 5: Processing or beneficiation of metallic or non-metallic ore Commissioning and operation of the SPP	Sulphide Processing Plant area	Stormwater runoff	Soils, vegetation, groundwater / Lake Violet	Direct discharge to land causing contamination of soil and impacts to groundwater. Groundwater is 2 mbgl around the site	Minimal onsite impact **Slight**	Could occur at some time **Possible**	**Low** Acceptable, subject to controls	The sulphide processing plant storm water runoff will be integrated into existing area storm water catchment systems. Several drains have been installed at Wiluna top divert surface water flows around major infrastructure such as the plant and surface tailings storage facilities. One drain diverts a creek-line to the east of the plant area. A second, smaller drain, runs around the northern side of the plant and collects surface flow from within the mine area, discharging into a settlement pond in front of the Western Cell tailings dam. In accordance with the Department's Guidance Statement: Risk Assessments (DER, 2017a), as these controls lower the risk of impacts, they will be conditioned in the works approval and licence.	Works approval controls: Requirement to direct potentially contaminated stormwater from the Sulphide Plant to the event pond. Stormwater will then be re-directed through the processing plant or directed to the TSF
	Chemicals pipeline	Chemicals spills from pipeline			Mid-level onsite impact **Moderate**	Could occur at some time **Possible**	**Medium** Acceptable, subject to controls	PAX and copper sulphate will be pumped from a facility within the processing area. These reagents are toxic to environment and corrosive. Pipeline linking this facility to processing plant will be on a pipe rack and bunded.	Works approval controls: Double containment required for the transfer lines of reagents from the reagent storage and mixing facility to the sulphide ore processing plant. Compliance documentation
	Storage of chemicals	Lost of containment			Mid-level onsite impact **Moderate**	Could occur at some time **Possible**	**Medium** Acceptable, subject to controls	The reagent storage areas will be designed to meet the requirements of the *Dangerous Goods Safety Act 2004*, including consideration of separation distances and bunded containment.	Works approval controls: All chemical and reagents classed as dangerous goods stored in accordance with the requirements of the *Dangerous Goods Safety Act 2004* and the Dangerous Goods Safety (*Storage and Handling of Non-explosives) Regulations 2007*. Compliance documentation
Category 5: Processing or beneficiation of metallic or non-metallic ore Sulphide Processing Plant tailings deposition into TSF K	Tailings pipeline	Rupture of pipeline causing tailings discharge to land	Localised soils and groundwater located adjacent to process plant and tailings pipeline	Land: Direct discharge to land	Minimal onsite impact **Slight**	Could occur at some time **Possible**	**Low** Acceptable, not subject to controls	The applicant indicated that the tailings from the sulphide plant will have similar geochemical characteristics to the oxide tailings approved under L5206/1987/10. Tailings pipelines to be overland, within the existing pipeline corridor; • Construct tailings pipelines with secondary containment to manage unintentional spills and leaks; • The tailings disposal lines will be fitted with two magnetic flowmeters to provide rupture detection and a pressure transmitter for monitoring purposes; • 12-hourly pipeline inspections of tailings and return water pipelines will be conducted as part of the standard TSF operating procedures.	Works approval controls: Compliance documentation

Risk Event					Consequence rating*	Likelihood rating*	Risk*	Reasoning	Regulatory controls (Refer to conditions of the granted works approval)
Source/Activities		Potential emissions	Potential receptors	Potential pathway & receptor (impact)					
	Tailings deposition	Seepage	Leachate to groundwater.	Groundwater and groundwater dependent ecosystems Lake Violet	Mid-level onsite impact **Moderate**	Could occur at some time **Possible**	**Medium** Acceptable, subject to controls	The applicant indicated that geotechnical properties of sulphide tailings expected to be similar to oxide tailings material. For TSF K Stage 1 it is anticipated that the composition of tailings reporting to TSF K will be 25% sulphide tailings and 75% oxide tailings. Tailings will be deposited between 35 to 48% solids. This wet state will prevent dust lift off during operation of TSF K. Change in tailings solids composition may affect the water recovery system and increase seepage.	<u>Works approval controls:</u> Sulpide Processing Plant tailings sampling and testing (for geochemical and geotechnical properties) required.

8.1 Consequence and likelihood of risk events

A risk rating will be determined for risk events in accordance with the risk rating matrix set out in Table 15 below.

Table 15: Risk rating matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 16 below.

Table 16: Risk criteria table

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
			Environment	Public health* and amenity (such as air and water quality, noise, and odour)
Almost Certain	The risk event is expected to occur in most circumstances	Severe	• **onsite impacts**: catastrophic • **offsite impacts local scale**: high level or above • **offsite impacts wider scale:** mid-level or above • Mid to long-term or permanent impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are significantly exceeded	• Loss of life • **Adverse health effects:** high level or ongoing medical treatment • Specific Consequence Criteria (for public health) are significantly exceeded • **Local scale impacts:** permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	• **onsite impacts**: high level • **offsite impacts local scale**: mid-level • **offsite impacts wider scale**: low level • Short-term impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are exceeded	• **Adverse health effects:** mid-level or frequent medical treatment • Specific Consequence Criteria (for public health) are exceeded • **Local scale impacts**: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	• **onsite impacts**: mid-level • **offsite impacts local scale**: low level • **offsite impacts wider scale**: minimal • Specific Consequence Criteria (for environment) are at risk of not being met	• **Adverse health effects:** low level or occasional medical treatment • Specific Consequence Criteria (for public health) are at risk of not being met • **Local scale impacts:** mid-level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	• **onsite impacts**: low level • **offsite impacts local scale**: minimal • **offsite impacts wider scale**: not detectable • Specific Consequence Criteria (for environment) likely to be met	• Specific Consequence Criteria (for public health) are likely to be met • **Local scale impacts:** low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	• **onsite impact**: minimal • Specific Consequence Criteria (for environment) met	• **Local scale**: minimal to amenity • Specific Consequence Criteria (for public health) met

^ Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting.*
* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines.*
"onsite" means within the Prescribed Premises boundary.

8.2 Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment table 17 below:

Table 17: Risk treatment table

Rating of Risk Event	Acceptability	Treatment
Extreme	Unacceptable.	Risk Event will not be tolerated. DWER may refuse application.
High	May be acceptable. Subject to multiple regulatory controls.	Risk Event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
Medium	Acceptable, generally subject to regulatory controls.	Risk Event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
Low	Acceptable, generally not controlled.	Risk Event is acceptable and will generally not be subject to regulatory controls.

9. Determination of Works Approval conditions

The conditions in the issued Works Approval in Attachment 1 have been determined in accordance with the *Guidance Statement: Setting Conditions*. Table 18 provides a summary of the conditions to be applied to this works approval.

Table 18: Summary of conditions to be applied

Condition Ref	Grounds
Construction phase	
Infrastructure and Equipment 1	These conditions require that infrastructure is constructed and designed as per the supporting documents. These conditions are valid, risk-based and consistent with the EP Act.
Compliance reporting 2, 3 and 4	These conditions require a compliance report to be provided following construction completion of items in condition 1. These conditions are valid, risk-based and consistent with the EP Act.
Environmental commissioning phase	
Environmental commissioning requirements 5, 6,7 and 8	These conditions allow commissioning of the sulphide processing plant for 3 months.

	Provided that the compliance documentation has been received. These conditions are valid, risk-based and consistent with the EP Act.
Reporting during environmental commissioning 9 and 10	These conditions require that a commissioning report be provided that includes environmental performance of the infrastructure. These conditions are valid, risk-based and consistent with the EP Act.
Records and reporting general	
Records and reporting (general) 11, 12 and 13	These conditions are valid and are necessary administration and reporting requirements to ensure compliance.

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 works approvals under the EP Act.

10. Applicant's comments

The Applicant was provided with the draft Decision Report and draft issued Works Approval on 30 June 2020. The Applicant provided comments on 20 July 2020, which are summarised, along with DWER's response, in Appendix 2.

11. Conclusion

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 (listed in Appendix 1).

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

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

Carmen Standring

A/MANAGER, RESOURCE INDUSTRIES
Delegated Officer
under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key documents

	Document title	In text ref	Availability
1.	Application - Works Approval – Wiluna Matilda – Category 5		DWER records (A1870347)
2.	Application - Works Approval – Wiluna Matilda – Category 5 Applicant response to Request For Information		DWER records (A1897166)
3.	Application - Works Approval – Wiluna Matilda – Category 5 Applicant response to DRAFT Amendment		DWER records (A1915516)
4.	Matilda Operations Pty Ltd Tailings Storage Facility K Mining Proposal, February 2019 MP78710		accessed at https://minedex.dmirs.wa.gov.au
5.	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	DER 2015a	accessed at www.dwer.wa.gov.au
6.	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	DER 2015b	
7.	DER, August 2016. *Guidance Statement: Licence duration.* Department of Environment Regulation, Perth.	DER 2016a	
8.	DER, November 2016. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	DER 2016b	
9.	DER, November 2016. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.	DER 2016c	

Appendix 2: Summary of applicant's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder comment	DWER response
N/A	On 10 July 2020 Matilda Operations Pty Ltd ACN (166 954 525) change its name to Wiluna Operations PTY LTD. The ACN remains the same. (TRIM A1915457)	Amended
N/A	Time limited operations also required for a period of 3-6 months following construction of the Processing Plant, until such time as the Processing Plant can be incorporated into the Site Licence.	Time limited operation was not part of the original application, thus not assessed in this report. Time limited operation was not included in this works approval.

Attachment 1: Issued Works Approval W6371/2020/1