Amendment Report

Application for Licence Amendment

Part V Division 3 of the *Environmental Protection Act 1986*

Licence Number	L9240/2020/1
Licence Holder	Tellus Holdings Ltd
ACN	138 119 829
File Number	DER2020/000039
Premises	Sandy Ridge Facility Crown lease O289974 granted by the State of Western Australia to Tellus Holdings Ltd in respect of Lot 510 on Deposited Plan 413497, Whole Volume 3169 Folio 365, as depicted in Figure 1 and Figure 2; and as defined by the coordinates in Schedule 2. 102.5km north of Great Eastern Highway, via Access Reserve 44102, BOORABBIN WA 6429.
Date of Report	1 June 2023
Decision	Revised licence granted

Abbie Crawford

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Abbie Crawford
A/Manager, Waste Industries

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

Licence L9240/2020/1 is held by Tellus Holdings Ltd (Licence Holder) for the Sandy Ridge facility (the Premises), located approximately 75 kilometres (km) north-east of Koolyanobbing in the Shire of Coolgardie, within the Goldfields Region of Western Australia.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the operation of the Premises. As a result of this assessment, Revised Licence L9240/2020/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Background

The Licence Holder has approval to operate a Class IV and Class V landfill premises, to accept solid wastes for disposal and to accept liquid wastes for immobilisation to solid form prior to disposal. The licence limits the combined total volume of all liquid, contaminated solid, asbestos, PFAS and radioactive wastes accepted onto the premises, to 100,000 tonnes per annum. The licence enables a maximum of 280,000 tonnes per annum to be disposed of to the landfill, to account for the addition of non-waste products, currently cement and kaolin clay, to liquid wastes in the solidification process.

Liquid wastes are processed through the Waste Immobilisation Plant (WIP) to stabilise liquid and sludge wastes, and convert the liquid wastes to a spadeable state prior to disposal in the waste cells. Only spadeable wastes are permitted for disposal into the landfill cell, as liquid wastes are unauthorised for disposal to Class IV or Class V landfills.

Similar treatment methods are proposed for all varieties of liquid wastes intended for acceptance – stabilisation by chemical fixation with kaolinised granite, plus solidification with the addition of cement for persistent organic pollutants. The Licence Holder has committed to researching new and alternative methods of stabilisation as new and different waste types are received at the premises.

The expected outcomes are that the resulting solid waste will be stabilised to ensure that no leachate is generated during permanent isolation within the waste cell, and also solidified to ensure that the formulated waste monolith does not collapse and cause waste cell subsidence. The two processes of stabilisation and solidification must crucially both be met, as the inability to solidify cement results in free liquid remaining present in the waste which can be compressed out of the cement with pressure from the monolith structure above.

The original proposal provided limited information regarding the methodology of treatment due to the varying liquid waste types intended to be received over time. It was noted that the Licence Holder is committed to undertake further treatment research as new waste streams are received at Sandy Ridge Facility.

The PFAS NEMP 2.0 notes that there is limited information on the long-term effectiveness of immobilisation techniques for PFAS contaminated materials and that conditions in a landfill may reverse or diminish the immobilisation chemistry in ways that are difficult to predict. The Licence Holder has previously committed to conducting research on new treatment methods.

Quality assurance/quality control (QA/QC) testing will occur for all stabilised and solidified wastes with the frequency of sampling matching the requirements in the Landfill Waste

Classification and Waste Definitions (as amended 2019). The immobilised waste is not to have subsequent wastes deposited on top of it until QA/QC testing has been completed and passed the unconfined compressive strength and free liquid tests. If the waste fails, the waste is to be removed from the cell and reprocessed.

2.3 Application summary

On 9 September 2022 the Licence Holder submitted an application to the department to amend Licence L9240/2020/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- The treatment of liquid waste outside of the Waste Immobilisation Plant in portable liquid waste treatment equipment; and
- Replacing the requirement for an achieved compaction density of ≥0.5 MPa unconfined compressive strength (UCS) with 90% of Maximum Modified Dry Density (MMDD), with this to be measured via the Clegg Impact Value (CIV).

The Licence Holder has advised they do not intend on altering the types of wastes, nor increasing the volume of Category 61, Category 61A, Category 65 and Category 66 waste accepted at the premises, as outlined in Table 1. The Existing Licence includes conditions allowing the acceptance, temporary storage and treatment (immobilisation or stabilisation) of low-level radioactive wastes. Those activities will not be assessed again, and changes will not be made to the relevant conditions of the Existing Licence as part of this Amendment application.

Table 1: Approved design capacity

Category	Approved design capacity
Category 61 Liquid Waste Facility: premises on which liquid waste produced on other premises (other than sewerage waste) is stored, reprocessed, treated or irrigated.	100,000 tonnes (combined) per annual period
Category 61A Solid Waste Facility: premises (other than premises within category 67A) on which solid waste produced on other premises is stored, reprocessed, treated, or discharged onto land.	
Category 65 Class IV secure landfill site: Class IV secure landfill site: premises (other than clean fill premises) on which waste of a type permitted for disposal for this category of prescribed premises, in accordance with the Landfill Waste Classification and Waste Definitions 1996, is accepted for burial.	280,000 tonnes (combined) per annual period
Category 66 Class V intractable landfill site: Class V intractable landfill site: premises (other than clean fill premises) on which waste of a type permitted for disposal for this category of prescribed premises, in accordance with the Landfill Waste Classification and Waste Definitions 1996, is accepted for burial.	

2.3.1 Portable liquid waste treatment equipment

The Licence Holder proposes to use portable equipment to process smaller batches of liquid waste, in addition to the use of the Waste Immobilisation Plant (WIP) for larger batches of liquid waste. There are no proposed changes to the processing method for the liquid waste, it will continue to be mixed with kaolin clay and cement in proportions to be determined by the on-site Chemists. The need for portable equipment is in response to:

- Certain liquid wastes permanently contaminate the WIP and hence make maintenance a health hazard.
- Some liquid waste batches are too small to be effectively dosed and mixed in the WIP.
- Waste densities and liquid properties prevent waste from being pumped into the WIP due to physical limitations of the pump, piping and flow measurement system.

The additional portable equipment proposed includes:

- Small portable cement mixers;
- Large portable cement mixers;
- Intermediate Bulk Containers (IBC) fitted with a physical motorised agitator or an air sparge to treat liquid wastes of less than 1 m^3; and
- Drums fitted with a physical motorised agitator or an air sparge to mix liquids of less than 0.25 m^3.

The portable equipment will be operated within bunded areas onsite including the Flammable Goods Store, Mixed Store (Main Yard), Non-Radioactive Waste Inspection and Unloading Warehouse, Low Level Radiation Warehouse, HV and LV washdown facility and HV and LV mobile plant workshop. The type of waste being processed will dictate the most appropriate area for the portable equipment to be operated in. These bunded, hardstand areas are already constructed and in operation at the premises. Any spills will be cleaned up immediately using skill kits already available onsite.

The on-site Chemists analyse all incoming waste streams to determine the specific components of the waste and the most suitable stabilisation processing method for that waste. Upon use of the portable equipment, the Chemists will also determine which portable equipment is best suited to the processing of that waste. Only portable equipment that will not chemically react with, or corrode from the waste will be utilised, for example an IBC over a steel drum.

Portable equipment will only be reused where residual waste can be adequately cleaned out. Where the residual waste cannot be adequately cleaned out, for example oily substances or substances with the potential to interact with water, it will be processed in portable equipment with the intention to transport that equipment into the landfill cell for final disposal with the waste. There will be no attempt made to wash this portable equipment.

Liquid waste will be processed in the portable equipment and combined with kaolinised granite and cement, in the same process as already occurs in the WIP, to a spadeable form. At the completion of processing, samples are taken for the purpose of free-liquid testing and strength testing in accordance with existing Licence conditions.

After processing the spadeable waste is transported direct to the landfill cell within an open top 20 foot, half height sea container with all sides and floor sealed with a 2-part epoxy metal priming mastic. These sea containers are already used for capturing the cement waste that exits the WIP after processing, and for transporting the waste to the landfill cell.

The portable equipment and the sea containers will be washed down within the washdown bay already installed at the premises. The washdown bay is a concrete structure containing blind sumps that are pumped out after each wash.

The WIP is washed down either at the end of each working day or at the end of processing each type of waste, whichever occurs first. Similar will occur for the portable equipment.

All wash water is retained and reused within the WIP, or within the portable equipment. All wash water is analysed by the on-site Chemists to determine the chemical constituents, and that wash water is only used as processing water where the receiving waste will not negatively react with it. Excess wash water can be stored on-site either in the HDPE lined Yard Containment Pond or in water trucks.

The samples of processed waste are left to cure prior to testing occurring. Curing plays a vital role in strength development and durability of cement. Curing begins after the cement is poured into a mould and is affected by the following parameters:

- mixture proportions;
- specified strength;
- ambient weather conditions; and
- future exposure conditions.

To mimic the dry conditions in the cell and ambient air temperatures, the cement samples are dried in a drying oven at 26°C. The compressive strength of cement increases over time (Figure 1). The cement's compressive strength is lowest after 24 hours, which is when an initial test occurs to determine the weakest point of the cement batch. Subsequently, testing is then conducted at seven days for free-liquid and strength. Over time the cement block will continue to cure and become stronger.

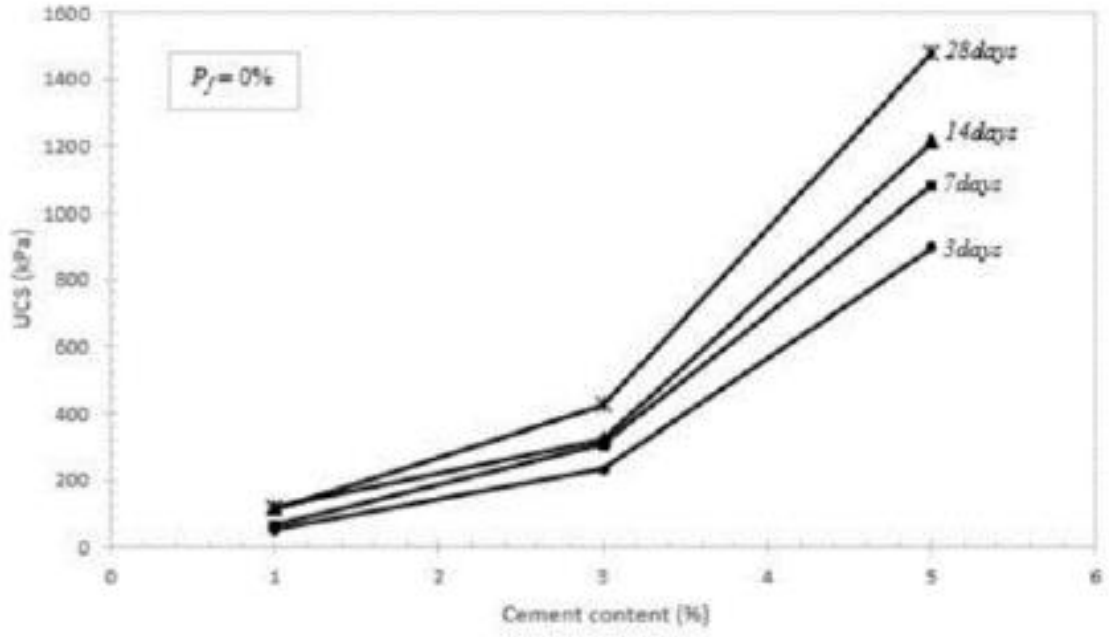

Figure 1: Cement strength over time

2.3.2 Compaction density testing

It is important that waste placed in cells does not subside over time, leading to low points or failure of the domed cap through which water may pool and infiltrate to the waste below. To prevent subsidence, the Licence Holder mixes kaolin and cement with liquid wastes to help reduce moisture content, create cementation, and ultimately improve the strength of the waste. As a means of ensuring adequate strength has been achieved in the placed fill materials, samples are regularly taken for Uniaxial Compression Strength (UCS) testing.

In accordance with the Existing Licence conditions, a target UCS result of ≥0.5 MPa is required for all samples. It has been modelled that the material at the base of the cell will be subjected to 0.5 MPa of vertical pressure with the intent that the waste cement is sufficiently strengthened whereby liquid does not discharge under the applied load and the final landfill formation remains structurally sound.

To date UCS testing has been found to be unpractical and unrepeatable. UCS has produced largely inconsistent results despite the consistent effort undertaken with the material mix. The main reason being that many cement samples were found to break when the mould is removed rendering them unsuitable for testing. The required 0.5 MPa test value is unusually low for UCS testing. UCS testing is conducted in stronger materials typically about 5 MPa. For these reasons alternative test methods have been considered.

The Clegg Impact Hammer was investigated, assessed, and reviewed as an alternative means of demonstrating a competent material (consistency) for the cement waste. Importantly, a cement sample is not required as the testing can be done with the spadeable waste in-situ inside the landfill cell.

The Clegg Impact Hammer is a device that was initially developed to assess the degree of compaction of road bases and is now widely used in other geotechnical applications to provide in situ measurements of the compaction of soil-like materials. Consequently, an Australian Standard has been developed for this purpose: *AS 1289.6.9.1: Methods for testing soils for engineering purposes- Method 6.9.1: Soil Strength and Consolidation test - Determination of stiffness of soil - Clegg Impact Value (CIV)*.

A study by CMW (2022) indicates a CIV of 25 is required to achieve an equivalent UCS result of 0.5 MPa. Due to normal variability of the wastes accepted, a slightly higher mean CIV of 30 is proposed by CMW to ensure compliance with the intended ≥0.5 MPa.

The Licence Holder has advised they would like the compliance criteria to be:

- A mean CIV of 30 is to be demonstrated on material for any given batch, with a minimum of 10 tests per batch; and
- 100% of the samples tested have a CIV of 25 or greater for any given test batch, with a minimum of 10 tests per batch.

Key Findings:

1. The Delegated Officer notes a minimum CIV of 25 is the equivalent UCS of 0.5 MPa.
2. The Delegated Officer notes a mean CIV of 30 ensures the tests are ‘greater than’ an equivalent of 0.5 MPa.

3. Legislative context and other approvals

3.1 Part IV of the EP Act

The Licence Holder has received approval under Part IV of the EP Act in June 2018, through Ministerial Statement 1078, to implement a dual open cut kaolin clay mine and a near-surface geological waste repository accepting Class IV and Class V waste, approximately 75 kilometres north east of Koolyanobbing.

The elements specifically authorised by MS 1078 relevant to this application are:

- Mine pits/waste cells (including clearing up to 202.3 hectares of native vegetation within a 1,061 hectare development envelope);
- Class IV and V waste accepted at gate (up to 100,000 tonnes per annum);
- Temporary waste storage on surface (up to 15,000 tonnes);
- Maximum temporary storage time (up to 12 months);
- Waste (including treated waste) disposed to waste cells (up to 280,000 tonnes per annum); and
- Water abstraction (up to 0.18 gigalitres per annum)
- Access roads, pipeline corridors, stormwater sumps and a flood levee.

The proposal is subject to a number of conditions including a requirement to implement and maintain a waste management system, undertake independent audits, ensure impacts to soil quality are minimised, avoid and manage impacts to flora and fauna, develop a decommissioning plan, and provide financial assurance.

The assessment conducted by the Environmental Protection Authority (EPA) (Report 1611) concluded that the relevant EP Act principles and environmental objectives for terrestrial environment quality, flora and vegetation, human health, terrestrial fauna and inland waters environmental quality can be met (subject to conditions) and that the application is environmentally acceptable.

The EPA identified the following key environmental factors during the course of its assessment:

1. Terrestrial environment quality – direct impacts to the quality of land and soils during the operation of the proposal and from the acceptance and storage of hazardous and intractable waste (including radioactive material).
2. Flora and vegetation – direct impacts associated with the clearing of native vegetation.
3. Human health – direct impacts from exposure to chemical/hazardous materials from waste handling, and leaks or spills from waste packages.
4. Terrestrial fauna – direct impacts on fauna habitat from clearing, and contaminants or radiation exposure to fauna.
5. Inland waters environmental quality – direct impacts from potential leaks or spills and generation of leachate from waste package storage.

The EPA concluded that the proposal may be implemented, provided the implementation of the proposal is carried out in accordance with the recommended conditions and procedures. Matters addressed in the conditions include the requirement:

a) To ensure only permitted wastes generated within Australia and the Australian Exclusive Economic Zone are accepted on site;

b) To keep detailed records of accepted wastes on site;

c) To conduct an annual independent audit of the accepted wastes on site;

d) For a Leachate Monitoring and Management Plan;

e) For a targeted flora survey and management plan for *Calytrix Creswellii*, *Leipidosperma lyonsii*, and the undescribed *Lepidosperma* sp.; and

f) For a management plan for terrestrial fauna.

Key Findings:

The Delegated Officer has determined that the following environmental aspects are managed through Ministerial Statement 1078, under Part IV of the EP Act and are therefore not assessed further in this Amendment Report:

- The Sandy Ridge Facility may accept waste from within Western Australia, other Australian States and Territories, and the Australian Exclusive Economic Zone.
- The assessment under Part IV of the EP Act indicated that the acceptance of waste types can be adequately regulated under Part V in combination with requirements of the *Radiation Safety Act 1975*.
- Specific and detailed waste records are required to be kept under the Waste Management System administered under Part IV of the EP Act.
- MS1078 requires the proponent to engage an independent waste expert approved by the CEO to undertake an annual audit of the waste disposal operations at the Sandy Ridge Facility.
- MS1078 requires the proponent submit a Leachate Monitoring and Management Plan to the CEO, to demonstrate that impacts to soil quality are minimised, of which will include six monthly monitoring.
- MS 1078 requires the proponent to submit a Flora and Vegetation Management Plan to the CEO, to mitigate, monitor and manage indirect impacts including those for fire, dust suppression, water quality and weeds.
- The assessment under Part IV of the EP Act has assessed the clearing of up to 202.3 hectares of native vegetation within a 1061 hectare development envelope for mine pits/waste cells and the clearing of up to 73.75 hectares of native vegetation within a 1061 hectare envelope for associated infrastructure.
- MS 1078 has limited Class IV and V waste accepted at gate to a maximum of 100,000 tonnes per annum and waste (including treated waste) disposed to waste cells to a maximum of 280,000 tonnes per annum.
- MS 1078 has limited the temporary waste storage on the surface to a maximum of 15,000 tonnes and a maximum storage time of 12 months. It is noted that the aspects managed under MS 1078 will be considered in the risk assessment outcomes for aspects that are within the scope of this assessment and in the determination of appropriate regulatory controls.

3.2 Planning approvals

The Midwest/Wheatbelt Joint Development Assessment Panel accepted and approved DAP/17/01318 for the proposed Facility on 3 April 2019. The assessment panel accepted that the DAP Application reference DAP/17/01318 is appropriate for consideration as a “Waste Disposal Facility” land use and compatible with the objectives of the zoning table in accordance with Local Planning Scheme No 5 of the Shire of Coolgardie.

The assessment panel also approved the DAP Application reference DAP/17/01318 and

accompanying plans in accordance with Clause 68 of the Planning and Development (Local Planning Schemes) Regulations 2015 and the provisions of the Shire of Coolgardie Local Planning Scheme No.5 subject to conditions.

Due to the dual nature of the Facility to undertake mining operations and the acceptance and disposal of waste simultaneously on the same land, tenure granted under both the *Mining Act 1978* (WA) and *Land Administration Act 1997* (WA) (LAA) was required for the construction and operation of the proposal.

The Licence Holder was granted land tenure under the LAA (Crown Lease) on 26 November 2019.

3.3 Department of Mines, Industry Regulation and Safety

The Department of Mines, Industry Regulation and Safety (DMIRS) granted approval for a Mining Proposal and Mine Closure Plan associated with the Facility on 4 June 2019 (Mining Proposal Registration ID: 75521). This proposal relates to mining activities associated with the project, outside those specifically related to this application.

Further, the Licence Holder has received a Dangerous Goods Site Licence (DGS022452) for the Facility on 27 September 2018 under the *Dangerous Goods Safety Act 2004*, as regulated by DMIRS.

It is the responsibility of the Licence Holder to ensure that storage, separation distances and packaging criteria for hazardous waste or dangerous goods on the premises meets the requirements of *Dangerous Goods Safety Act 2004*, or other relevant legislation.

3.4 Radiation Safety Act 1975

The *Radiation Safety Act 1975* (RS Act) regulates the keeping and use of radioactive substances in Western Australia. Registration and licensing are the principal means by which the use of radiation is regulated. The Radiological Council is an independent statutory authority appointed under the RS Act to assist the Minister for Health to protect public health and to maintain safe practices in the use of radiation.

The Radiological Council recently considered a proposal by Tellus for the permanent isolation (disposal) of LLW in waste cells at Sandy Ridge. The proposal, which was submitted in April 2022, included an operational Radiological Safety Case (Safety Case) for the Sandy Ridge Facility, dated April 2022. In November 2022, the WA Department of Health advised DWER that the Radiological Council had approved the Safety Case for Sandy Ridge.

The Safety Case was required under the *Australian Code for Disposal Facilities for Solid Radioactive Waste* (RPS C-3) published by ARPANSA. The Code sets out the principles and regulatory requirements for the safety and security of disposal of solid radioactive waste. The Code aims to ensure that people and the environment are protected against radiation risks.

The Radiological Council issued an updated “Certificate of Registration of Premises in which Radioactive Substances are to be used, stored or manufactured” under the RS Act on 8 November 2022 for the Sandy Ridge Facility (RS 210/2018 30289), with an expiry date of 17 October 2025.

Key Findings:

The Delegated Officer notes that the amendment subject to this assessment does not seek to change the low-level radioactive waste acceptance conditions granted under the Existing Licence.

3.5 Environment Protection and Biodiversity Conservation Act 1999 (Cth)

On 23 September 2015, the former Department of Environment determined under section 75 of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) determined the construction of the Sandy Ridge Facility to be a controlled action to be assessed under the Bilateral Agreement with Western Australia (Agreement between the Commonwealth of Australia and Western Australia under section 45 of the EPBC Act relating to Environmental Impact). The relevant matters of national environmental significance considered for the Sandy Ridge Facility included s21 and 22A – Nuclear action.

In January 2019, the Department of Environment and Energy granted approval for the Facility (EPBC Reference No.: 2015/7478) under section 133 of the EPBC Act.

Key conditions within EPBC/2015/7478, (not all of which relate to this application) include:

- Submission and implementation of a deep groundwater monitoring and management plan;
- Implementation of the PFAS National Environmental Management Plan (NEMP) as amended;
- Surface and floodwater management; and
- Waste placement within cells not to include disposal by the borehole method (also called BOSS method).

In May 2020, the National Chemicals Working Group of the Heads of EPAs Australia and New Zealand released the PFAS NEMP - Version 2.0 (PFAS NEMP 2.0). The PFAS NEMP 2.0 provides new and revised guidance on four of the areas that were identified as urgent priorities in the first version of the NEMP, including environmental guideline values, soil reuse, wastewater management and on-site containment. The PFAS NEMP 2.0 also includes updated guidance for the temporary and longer term onsite storage and containment of PFAS containing materials, including the designation and specification of controls for the temporary and short term storage of PFAS containing wastes.

Temporary storage is considered to include storage from 48 hours to 6 months, short term storage is considered to include storage from 6 months to 2 years, and both are relevant for the proposed surface storage timeframes as proposed by the Licence Holder (of up to 12 months above ground storage). Guidance within the PFAS NEMP 2.0 specifies the storage infrastructure for PFAS containing liquid wastes to be within self-bunded containment vessels covered, with lockable access, on an impervious, bunded hardstand, with effective stormwater controls.

Key Findings:

3. The Delegated Officer notes that:
    - Approvals for the Facility under the EPBC Act require the Licence Holder to implement the PFAS NEMP 2.0 (and subsequent amendments)
    - The PFAS NEMP 2.0 includes additional requirements for the temporary and short term storage of PFAS wastes.
    - It is the responsibility of the Licence Holder to ensure the acceptance and storage of PFAS wastes is conducted in accordance with the relevant Commonwealth approval for the Facility,
    - It is the responsibility of the Licence Holder to ensure that the disposal of PFAS wastes is conducted in accordance with the relevant Commonwealth approval for this facility, as well as approvals under Part IV of the EP Act.

4. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk assessments* (DWER 2020).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

4.1 Source-pathways and receptors

4.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises operation which have been considered in this Amendment Report are detailed in Table 2 below. Table 2 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 2: Licence Holder controls

Sources	Emission	Potential pathways	Proposed controls
Operation of the portable liquid waste treatment equipment			
Operation of portable liquid waste treatment equipment	Noise	Air / windborne pathway	Location of the premises remote from sensitive receptors.
	Odour	Air / windborne pathway	Location of the premises remote from sensitive receptors.
	Leachate	Direct discharge to land	Site selected for low rainfall and high evaporation rates. Presence of a natural silcrete layer in the geological profile which prevents rainfall transmission through the profile to the underlying kaolinised granite (clay) layer. Presence of a thick (up to 40m) subsurface clay formation with very low permeability. Operated on bunded hardstands that drain into blind sumps. Continue to comply with current Licence conditions where solidified wastes are to meet a free liquid limit of <0.1%. Implementation of a Leachate Monitoring and Management Plan (approved under MS 1078).
	Chemical spills	Direct discharge to land	Portable equipment to be operated within existing bunded areas at the Flammable Goods Store, Mixed Store (Main Yard), Non-Radioactive Waste Inspection and Unloading Warehouse, Low Level Radiation Warehouse, HV and LV washdown facility and HV and LV mobile plant workshop. Processed wastes to be transported to the landfill cell within the epoxy lined sea container.

Sources	Emission	Potential pathways	Proposed controls
Operation of the portable liquid waste treatment equipment			
			Yard area is paved with an underlayer of clay to contain spills and enable recovery and removal of spills. Spills are reprocessed through the WIP, or portable equipment as necessary. Emergency and spill response equipment present on-site.
	Contaminated wash water	Direct discharge to land	Portable equipment is washed down within the washdown bay already installed on-site. Washdown bay consists of concrete walls and floor, with blind concrete sumps to collect all wash water. Sumps are pumped out and wash water for reuse through the WIP or portable equipment. Wash water is analysed for chemical constituents, to determine best reuse method.
	Potentially contaminated stormwater	Direct discharge to land	Uncontaminated stormwater is diverted off-site. Potentially contaminated stormwater is directed to the stormwater settlement pond via a v-drain and stored in on-site storage tanks.
Modification of the measurement method to determine compaction density of solid wastes			
Solidification of wastes prior to permanent isolation / disposal in landfill cells	Leaching of hazardous contaminants resulting from landfill instability leading to ingress of stormwater	Direct discharge to land	Processing of liquid wastes with cement to ensure solidification prior to disposal. All waste disposed of in the landfill to be spadeable. Batches of processed waste to achieve: • A mean CIV of 30, with a minimum of 10 tests per batch; and • 100% of the samples tested have a CIV of 25 or greater for any given test batch, with a minimum of 10 tests per batch. Waste unable to meet the Clegg Impact Value to be removed from the landfill and reprocessed.

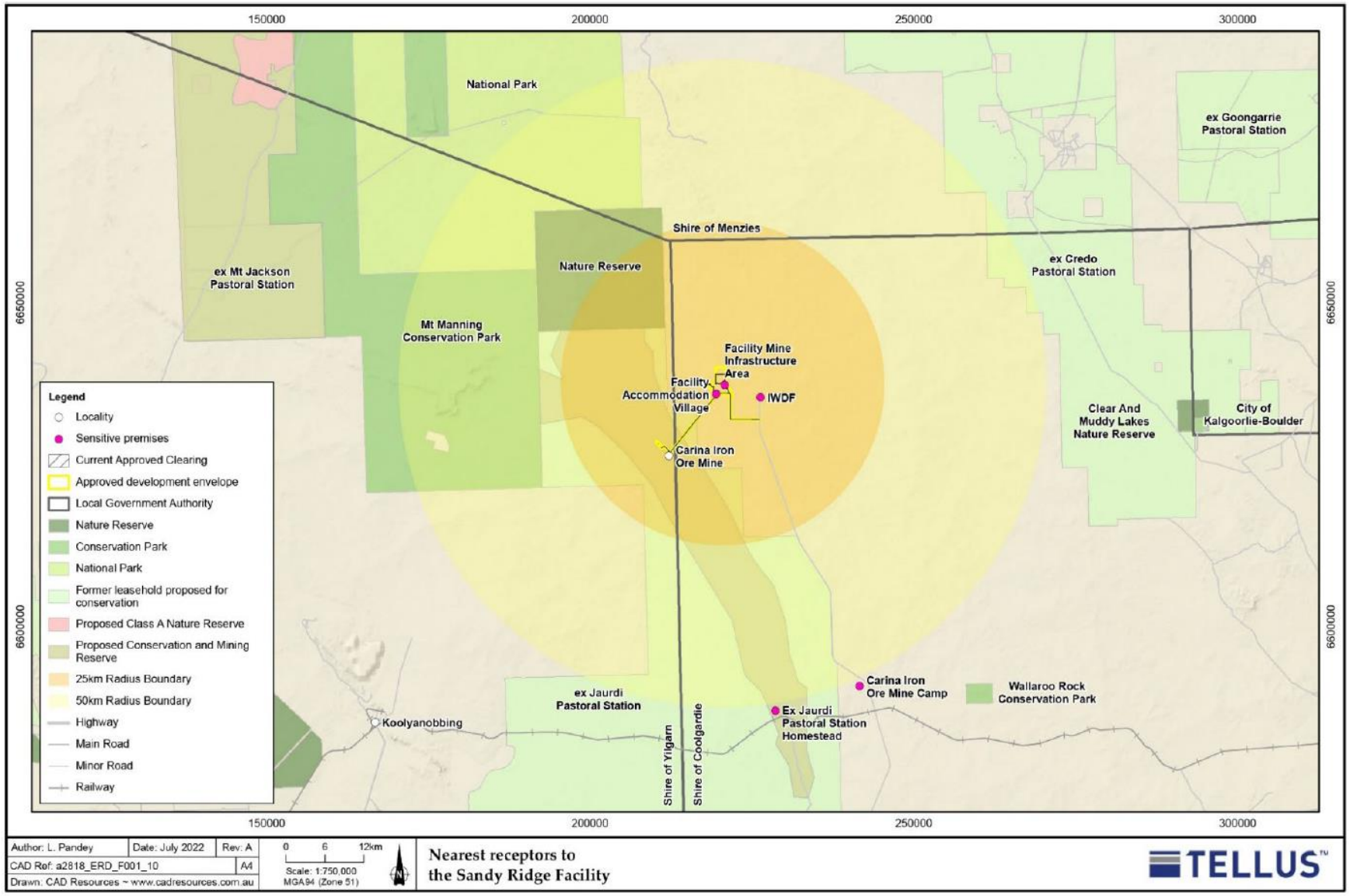

Figure 2: Distance to sensitive receptors

Licence: L9240/2020/1

4.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder's from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

A native title claim, which was registered by the Marlinyu Ghoorlie under the National Native Title Register on 28 March 2019, includes the premises boundary. In future if the claim is determined, the native title holders may visit the area near the premises. However, a cultural heritage assessment that was undertaken in June 2015 indicated no known record of heritage items within the site. There are no known Aboriginal sites or heritage places within the Project footprint or within 10 km. As such the Marlinyu Ghoorlie have not been considered as a receptor for the purposes of the risk assessment, given visits are only likely on an occasional and short duration basis.

Table 3 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental siting* (DWER 2020)).

Table 3: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	**Distance from prescribed activity**
Workers at the Mount Walton Intractable Waste Disposal Facility (IWDF)	Approximately 5 km east of the premises. **The Delegated Officer considers that due to distance there is no likely impact on this premises, so the workers are not considered receptors under this assessment.**
Environmental receptors	**Distance from prescribed activity**
Underlying groundwater (non-potable purposes)	No developed groundwater aquifer was found within the premises during hydrogeological investigations. Groundwater at the site is saline and has a total dissolved solids content of ~6,000 - 6,500 mg/L. There are no registered groundwater users (or bores) in the local area, with the exception of bores constructed for environmental purposes, at the Intractable Waste Disposal Facility at Mount Walton East 5.5 km east of the development envelop. The closest water supply bores are located at the Mount Dimer gold mine, 23 km from the Facility.
Non-perennial surface water bodies	DWER GIS data indicate two minor non-perennial waterbodies associated with Lake Raeside, one approximately 50 m south of the proposed premises boundary and one approximately 450 m west of the proposed premises boundary (based on available GIS dataset – Hydrography WA 250K – Surface Waterbodies). These waterbodies are located approximately 2.5 km and 1.4 km respectively from the proposed infrastructure area and temporary waste storage area. EPA Report 1611 considered potential impacts from waste leachate to inland surface water receptors from the storage of intractable waste and found that there is unlikely to be any residual impact.

Threatened and Priority Ecological Communities	The Finnerty Range/Mt Dimer/Yendilberin Hills Vegetation Complexes (Banded Ironstone Formation) (Priority 1 PEC) are located approximately 12.5 km to the south-west of the premises. **The Delegated Officer considers that due to distance there is no likely impact on this priority ecological community, so it is not considered a receptor under this assessment.**
Threatened and Priority Flora	Two priority flora have been recorded within the premises boundary. Six threatened and/or priority flora are located within a 10 km radius of the premises Potential impacts to Threatened and Priority fauna and flora were considered and assessed under Ministerial Statement 1078. MS 1078 includes conditions relevant for potential impacts to flora and fauna associated with the Facility.
Threatened and Priority Fauna	*Leipoa ocellate* is mapped within the premises boundary. Potential impacts to Threatened and Priority fauna and flora were considered and assessed under Ministerial Statement 1078. MS 1078 includes conditions relevant for potential impacts to flora and fauna associated with the Facility.
DBCA-Managed Lands and Waters	The Mount Manning Range Nature Reserve is located approximately 9.8 km north-west of the premises. The Mount Manning – Helena and Aurora Ranges Conservation Park is located approximately 19.8 km west of the Premises. The Boorabbin National Park is located approximately 100 km south of the premises. The former Jaurdi Pastoral Lease, which is a proposed conservation reserve, is located approximately 4 km south-west of the premises. **The Delegated Officer considers that due to distance there is no likely impact on these reserves, so they are not considered receptors under this assessment.**

4.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 4.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the Licence Holder has proposed mitigation measures/controls (as detailed in Section 4.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Licence Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 4.

The Revised Licence L9240/2020/1 that accompanies this Amendment Report authorises emissions associated with the operation of the premises.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 4. Risk assessment of potential emissions and discharges from the premises during operation

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source / Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Operation								
Operation of portable liquid waste treatment equipment	Noise	Air / windborne pathway	None	Refer to Section 5.1	No receptors present			The Delegated Officer considers there is no foreseeable risk from noise emissions given the distance to sensitive receptors. No further risk assessment is required.
	Odour	Air / windborne pathway	None	Refer to Section 5.1	No receptors present			The Delegated Officer considers there is no foreseeable risk from odour emissions given the distance to sensitive receptors. No further risk assessment is required.
	Spills of contaminated liquid wastes and spadeable wastes	Direct discharge to land	Surrounding ecosystems, native vegetation communities and fauna	Refer to Section 5.1	C = Moderate L = Unlikely **Medium Risk**	Yes	Conditions 12, 13, 14, 29 **Conditions 1 and 15**	The Licence Holder has proposed controls including waste acceptance, storage and spill response practices to reduce the likelihood of spills occurring. The Delegated Officer considers that in the event of a spill, the engineered concrete hardstand and bunding as well as the underlying soil and geological profile will provide a sufficient barrier to limit vertical seepage until clean-up measures are implemented. Existing licence conditions have been amended to include the types of portable equipment, location, processing of wastes, monitoring and reporting. This will ensure the portable equipment is operated as intended, and thereby mitigate the risk of spills occurring.

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source / Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
	Contaminated wash water	Direct discharge to land	Surrounding ecosystems, native vegetation communities and fauna	Refer to Section 5.1	C = Minor L = Unlikely **Medium Risk**	Yes	Conditions 12, 13, 14, 29 **Conditions 1 and 15**	The Licence Holder has proposed infrastructure and management controls that include the containment of contaminated wash water. Proposed storage practices are considered appropriate to minimise the potential for emissions from contaminated wash water. Existing licence conditions have been amended to include the operating location of portable equipment and processing of wastes. This will ensure the equipment is operated as intended, and thereby mitigate the risk posed by discharges of contaminated wash water.
	Potentially contaminated stormwater	Direct discharge to land	Surrounding ecosystems, native vegetation communities and fauna	Refer to Section 5.1	C = Minor L = Unlikely **Medium Risk**	Yes	Conditions 1, 12, 13, 14, 29	The Licence Holder has proposed infrastructure and management controls that include the diversion of uncontaminated stormwater and the containment of potentially contaminated stormwater. Proposed storage practices are considered appropriate to minimise the potential for emissions from contaminated stormwater. Existing regulatory controls on the current Licence require management of stormwater so that contamination does not occur. No additional regulatory controls are required on the Licence.

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source / Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Solidification of wastes prior to permanent isolation / disposal in landfill cells	Leaching of hazardous contaminants resulting from landfill instability leading to ingress of stormwater	Direct discharge to land Subsurface seepage Impacts including contamination of soil, to vegetation health, degradation of groundwater and surface water quality	Surrounding ecosystems, native vegetation communities and fauna	Refer to Section 5.1	C = Major L = Unlikely **Medium Risk**	Yes	Condition **Conditions 1, 15, 28, 29, 33**	The Delegated Officer notes the overall risk of leaching of hazardous contaminants is directly related to the effectiveness of Licence Holder controls during operation to ensure the landfill cells remain encapsulated and solidified in perpetuity. To determine effectiveness of operations, the Delegated Officer applied compaction density limits to the Licence to require testing of all waste cement mixes. The Delegated Officer is satisfied that the Clegg Impact Hammer is capable of testing compaction density. The Licence Holder has proposed a modification to the rate of achieving compaction density (solidification) which is equivalent to that of existing licence conditions. The Delegated Officer considers there is no increased risk from modification of the measurement method and solidification rate achieved, as was previously assessed. Existing licence conditions have been amended to include the new compaction density rates.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020).

Note 2: Proposed Licence Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

5. Consultation

Table 5 provides a summary of the consultation undertaken by the department.

Table 5: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website (20/02/2023)	None	N/A
Shire of Coolgardie advised of proposal (20/02/2023)	None	N/A
Shire of Yilgarn advised of proposal (20/02/2023)	On 27/03/2023 the Shire of Yilgarn advised that council have no objections.	N/A
Native Title Services Goldfields advised of proposal (20/02/2023)	None	N/A
Department of Mines, Industry Regulation and Safety advised of proposal (20/02/2023)	DMIRS advised on 27/02/2023 they have no objections or comments to make in relation to the proposal.	N/A
Department of Planning, Lands and Heritage advised of proposal (20/02/2023)	None	N/A
Other Stakeholders advised of proposal (20/02/2023)	None	N/A
Licence Holder provided with draft amendment (16/05/2023)	See Appendix 1	See Appendix 1

6. Conclusion

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

6.1 Summary of amendments

Table 6 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 6: Summary of licence amendments

Condition no.	Proposed amendments
Throughout	Deleted the phrases fixate, immobilise, cure and harden and replaced with stabilise/stabilised and solidify/solidified.
Condition 1 Table 1	Row added to Table 1 to specify the operational requirements of the portable liquid waste treatment equipment and its operating locations.

Condition 3 Table 2	An administrative error was identified in the Licence for Intractable Waste (Radioactive Waste), where disposal was not incorporated into the acceptance specification, as per the licence amendment granted on 25 January 2023. This error was corrected by the addition of the words “and disposal” for the acceptance specification.
Condition 7	Added the word “with” to clarify the licence requirement.
Condition 15 Table 4	Removed duplicate wording from the condition to clarify the licence requirement. Amended Table 4 for the waste types of liquid wastes, liquid intractable wastes and PFAS wastes to be: • Treatment process to include the portable mixing equipment; • The compaction density to be 90% of Maximum Modified Dry Density • Specifications to include average CIV of 30, 100% of tests to achieve CIV of 25 or greater, conducted in accordance with AS 1289, and use a standard Clegg Impact Hammer weight of 4.5 kg.
Condition 16	Added reference to portable mixing equipment. Edited the word “steam” to read “stream” in condition 16(a)(ii).
Condition 18	Added reference to portable mixing equipment.
Condition 28 Table 5	Amended Table 5 for liquid wastes to include a time period applicable to each load accepted to the WIP or the portable equipment. Amended Table 5 for Immobilised liquid wastes to include post processing within the WIP or via the portable equipment, and for the parameter to include the process system being the WIP or portable equipment.
Condition 29	Added row (i) to ensure reporting on the outcomes of condition 15. Amended row (l) to include wastes reprocessed as well as removed in accordance with condition 18.
Condition 33 Table 6	Amended row 2 to add reporting requirements on portable mixing equipment in accordance with condition 16.
Definitions Table 7	Added definitions: AS 1289.6.9.1, cement, concrete, solidify/solidification, stabilise/stabilisation. Deleted definitions that are no longer applicable: qualified civil or geotechnical engineer, RMP, SCO.

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.

7. Appendix 1: Summary of Licence Holder's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder's comment	Department's response
Condition 1 Table 1	Request to add two additional areas to process liquid wastes in portable equipment: 1. HV and LV washdown facility 2. HV and LV mobile plant workshop Both locations were constructed to the specs in the provided engineer's drawings approved in the original Works Approval. Both areas are already operational onsite for washing or servicing vehicles as per our current license conditions and both include bunded concrete hardstands.	The additional two areas are existing infrastructure and meet the operational requirements of existing licence conditions. The risk assessment for the two additional areas is consistent with the risk assessment conducted for the original application. The Amendment Report and subsequent Licence conditions have been amended to incorporate the two new operating areas.

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY					
Application type					
Works approval	☐				
Licence	☐	Relevant works approval number:		None	☐
		Has the works approval been complied with?		Yes ☐ No ☐	
		Has time limited operations under the works approval demonstrated acceptable operations?		Yes ☐ No ☐ N/A ☐	
		Environmental Compliance Report / Critical Containment Infrastructure Report submitted?		Yes ☐ No ☐	
		Date Report received:			
Renewal	☐	Current licence number:			
Amendment to works approval	☐	Current works approval number:			
Amendment to licence	☒	Current licence number:	L9240/2020/1		
		Relevant works approval number:		N/A	☒
Registration	☐	Current works approval number:		None	☐
Date application received	9 September 2022				
Applicant and Premises details					
Applicant name/s (full legal name/s)	Tellus Holdings Ltd				
Premises name	Sandy Ridge Facility				
Premises location	O289974 granted by the State of Western Australia to Tellus Holdings Ltd in respect of Lot 510 on Deposited Plan 413497, volume/Folio 3169/365. 102.5 km north of Great Eastern Highway, along access reserve 44201, Boorabbin WA 6429				
Local Government Authority	Shire of Coolgardie				
Application documents					
HPCM file reference number:	DWERDT657283				
Key application documents (additional to application form):	Attachment 3 – supporting document Attachment 9 – landfills category checklist Further information – Letter dated 14 December 2022 Report on Geotechnical Assessment, Sandy Ridge Project, Goldfields, WA (Douglas Partners, May 2015) Memo: Sandy Ridge – 1 Waste Material Strength (CMW Geosciences, 13 December 2022)				

Scope of application/assessment	
Summary of proposed activities or changes to existing operations.	Licence amendment application to authorise: The treatment of liquid waste outside of the Waste Immobilisation Plant in portable liquid waste treatment equipment. Locations proposed for the use of portable equipment: Non-radioactive waste inspection and unloading warehouse Mixed store – main yard Radioactive Waste Warehouse Radioactive waste and liquid waste storage yard. Portable equipment proposed: A cement mixer, for small batches of liquid waste A large portable cement mixer (on a truck) IBCs fitted with a motorised agitator or air sparge, for liquids of less than 1 m^3 Drums fitted with a motorised agitator or air sparge, for liquids of less than 0.25 m^3 Half height sea containers, sealed with a 2-part epoxy metal priming mastic as a treatment vessel For all liquid wastes being stabilised/solidified, replacing the requirement for an achieved compaction density of 0.5 MPA unconfined compressive strength (UCS) to mean Clegg Impact Value (CIV) > 30 per batch and at least 90% of the samples to have a CIV > 20 (min 10 tests per batch). The free liquid limit of <0.1% in Table 4 of the licence will continue to apply in order to mitigate the risk of leachate generation.

Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Assessed production or design capacity	Proposed changes to the production or design capacity (amendments only)
61	100,000 tonnes (combined) per annual period	No change
61A		No change
65	280,000 tonnes (combined) per annual period	No change
66		No change

Legislative context and other approvals		
Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes ☐ No ☒	Assessed under Part IV ☒
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes ☒ No ☐	Ministerial statement No: MS1078 EPA Report No: 1611
Has the proposal been referred and/or assessed under the EPBC Act?	Yes ☒ No ☐	Reference No: EPBC 2015/7478
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes ☒ No ☐	General lease ☒ Expiry: 99 years from 26 Nov 2019 Mining lease ☒ Expiry: M16/547, commencing 13/3/2020 for 21 years
Has the applicant obtained all relevant planning approvals?	Yes ☒ No ☐ N/A ☐	Approval: DAP/17/01318 Expiry date: Granted 3 April 2019, works to be substantially commenced by 2 April 2024

Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes ☐ No ☒	No clearing is proposed as part of this amendment application.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes ☐ No ☒	No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes ☐ No ☒	Licence/permit No: GWL202536(1)
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes ☐ No ☒	
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes ☐ No ☒	
Is the Premises subject to any other Acts or subsidiary regulations (e.g. *Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx*)	Yes ☒ No ☐	*Radiation Safety Act 1975;* RS 210/2018 30289 expired 17 October 2022. Tellus applied for a 3-yearly renewal on 14 September 2022. Under s37(2) of the RS Act, operation can continue while awaiting a response to the renewal application from the WA Radiological Council. *Mining Act 1978*; M16/547 *Mines Safety Inspections and Regulations 1995*; Project Management Plan PM-666-293959 *Land Administration Act 1997*; Crown Lease includes conditions relating to a Financial Assurance Deed
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes ☐ No ☒	
Is the Premises subject to any EPP requirements?	Yes ☐ No ☒	
Is the Premises a known or suspected contaminated site under the *Contaminated Sites Act 2003*?	Yes ☒ No ☐	Classification: contaminated – restricted use (C–RU) Date of classification: 30 March 2022