Application for Works Approval

Division 3, Part V *Environmental Protection Act 1986*

Works Approval Number	W6308/2019/1
Applicant	Tellus Holdings Ltd
ACN	138 119 829
File Number	DER2019/000540
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. 102.5km north of Great Eastern Highway, via Access Reserve 44102, BOORABBIN WA 6429
Date of Report	7 February 2020
Status of Report	Final

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1. Definitions of terms and acronyms

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

Table 1: Definitions

Term	Definition
Applicant	means Tellus Holdings Ltd
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ACN	Australian Company Number
Category/ Categories/ Cat.	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CBR	California Bearing Ratio
CS Act	*Contaminated Sites Act 2003* (WA)
Controlled waste	has the definition in Environmental Protection (Controlled Waste) Regulations 2004.
Contaminated solid waste	has the meaning defined in the Landfill Definitions.
Dangerous goods	has the meaning defined in the Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulations 2007.
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.
Discharge	has the same meaning given to that term under 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.

Term	Definition
Emergency Response Equipment	means the equipment stored on site for the purposes of responding to emergencies and waste spills. Equipment can include but not limited to fire apparatus, fire extinguishers, decontamination equipment, emergency spill cleanup equipment, chemical containment drums, spill response trailer and earth moving equipment.
Emission	has the same meaning given to that term under the EP Act.
Environmental Harm	has the same meaning given to that term under the EP Act.
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)
ESD	Environmental Scoping Document
Facility	refers to the Sandy Ridge Facility
Hazardous waste	has the meaning defined in the Landfill Definitions.
HDPE	High Density Polyethylene
Implementation Agreement or Decision	has the same meaning given to that term under the EP Act.
Inspector	means an inspector appointed by the CEO in accordance with s.88 of the EP Act.
Intractable waste	has the same meaning given in the Landfill Definitions
LAA	Land Administration Act 1997 (WA)
Landfill Definitions	means the document titled 'Landfill Waste Classification and Waste Definitions 1996' published by the CEO of DWER and as amended from time to time.
LWCWD	Landfill Waste Classification and Waste Definitions
LLW	Low Level Waste
LSA	Low Specific Activity
m^3	cubic metres

Term	Definition
Material Environmental Harm	has the same meaning given to that term under the EP Act.
MMDD	Maximum Modified Dry Density
Minister	the Minister responsible for the EP Act and associated regulations
MS	Ministerial Statement
mtpa	million tonnes per annum
NEMP	Refers to the PFAS National Environmental Management Plan, January 2018 (or as amended), developed by the Heads of EPAs Australia and New Zealand (HEPA)
NEPM	National Environmental Protection Measure
Noise Regulations	Environmental Protection (Noise) Regulations 1997 (WA)
NORM	Naturally Occurring Radioactive Material
Occupier	has the same meaning given to that term under the EP Act.
PFAS	Per- and polyfluoroalkyl substances
PM	Particulate Matter
PM_{10}	used to describe particulate matter that is smaller than 10 microns (µm) in diameter
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
Primary Activities	as defined in Schedule 2 of the Revised Licence
PER	Pubic Environment Review
Putrescible waste	has the meaning defined in the Landfill Definitions.
Radiological Council	means the independent statutory authority appointed under the Radiation Safety Act in Western Australia
RMP	means the Radiation Management Plan “Sandy Ridge Facility, Radiation Management Plan – Temporary Surface Storage of Low Level Radioactive Waste 2019 - #DOCID-88105952-1168” prepared by Tellus Holdings Ltd
Risk Event	As described in Guidance Statement: Risk Assessment

Term	Definition
SCO	Surface Contaminated Objects
Tellus	means Tellus Holdings Limited
UDR	Environmental Protection (Unauthorised Discharges) Regulations 2004 (WA)
µg/m^3	micrograms per cubic metre
µg/L	micrograms per litre
Unreasonable Emission	has the same meaning given to that term under the EP Act.
Waste	has the same meaning given to that term under the EP Act.
Waste code	means the waste code assigned to a type of controlled waste for purposes of waste tracking and reporting as specified in DWER's 'Controlled Waste Category List; (July 2014), as amended from time to time.
Works	refers to the Works described in Schedule 2, at the locations shown in Schedule 1 of this Works Approval to be carried out at the Premises, subject to the Conditions.
Works Approval	refers to this document, which evidences the grant of the works approval by the CEO under s.54 of the EP Act, subject to the Conditions.
Works Approval Holder	means Tellus Holdings Ltd

2. Purpose and scope of assessment

Tellus Holdings Ltd (the Applicant) has applied for a works approval to construct infrastructure associated with waste acceptance, processing and disposal as part of the Sandy Ridge Facility. The Sandy Ridge Facility (Facility) is an open-cut kaolin mine and near surface geological repository under development, located approximately 75 kilometres (km) north-east of Koolyanobbing in the Shire of Coolgardie, within the Goldfields Region of Western Australia. The Facility proposes to accept Class IV and Class V wastes for temporary surface storage and treatment, prior to permanent isolation within the geological repository. Figure 1 shows the regional location of the Facility.

This application refers to works planned as Phase 3 of the premises development.

Phase 1 involved the establishment of infrastructure associated with the open cut mine (mining of kaolinised granite) and associated Facility infrastructure including an accommodation village with wastewater treatment, a domestic waste landfill and ancillary infrastructure. Works Approval W6243/2019/1 was issued for Phase 1 construction works.

Phase 2 works involved preliminary infrastructure associated with Categories 61 (liquid waste facility) and 61A (solid waste facility), and the early acceptance and temporary storage of Class IV and Class V wastes while construction of Phase 3 works takes place. Works Approval W6305/2019/1 was granted for these Phase 2 works.

Phase 3 proposed works include primary waste acceptance, handling, storage and processing infrastructure associated with Category 61 and Category 61A activities, as well as infrastructure associated with Categories 65 (class IV secure landfill site) and 66 (class V intractable landfill site).

The proposed Phase 3 works are the scope of this assessment. Figure 2 shows the layout of Facility and infrastructure associated with works under Works Approval W6243/2019/1, W6305/2019/1 and this application.

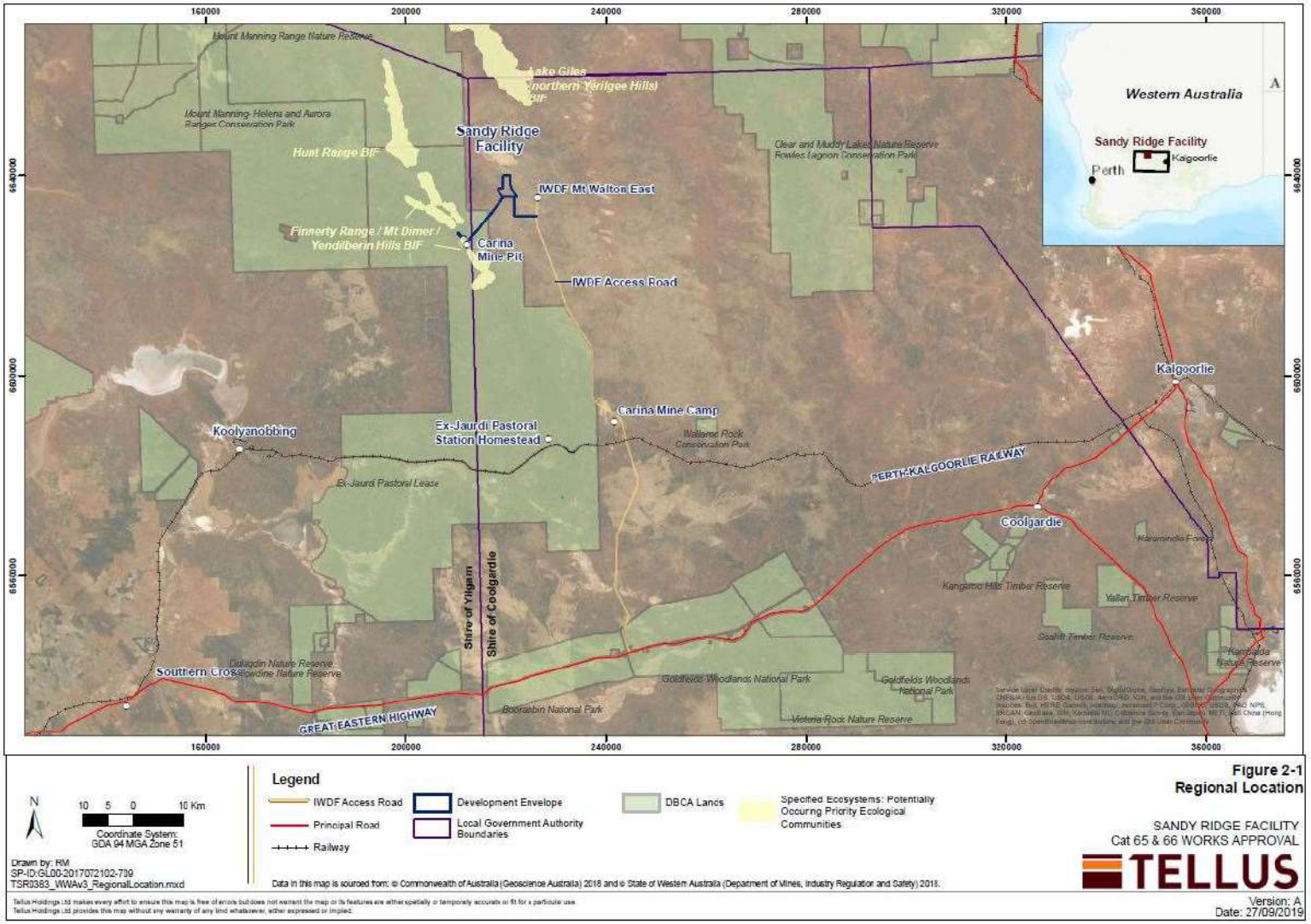


Figure 1: Regional Location

Source: Figure provided by the Applicant

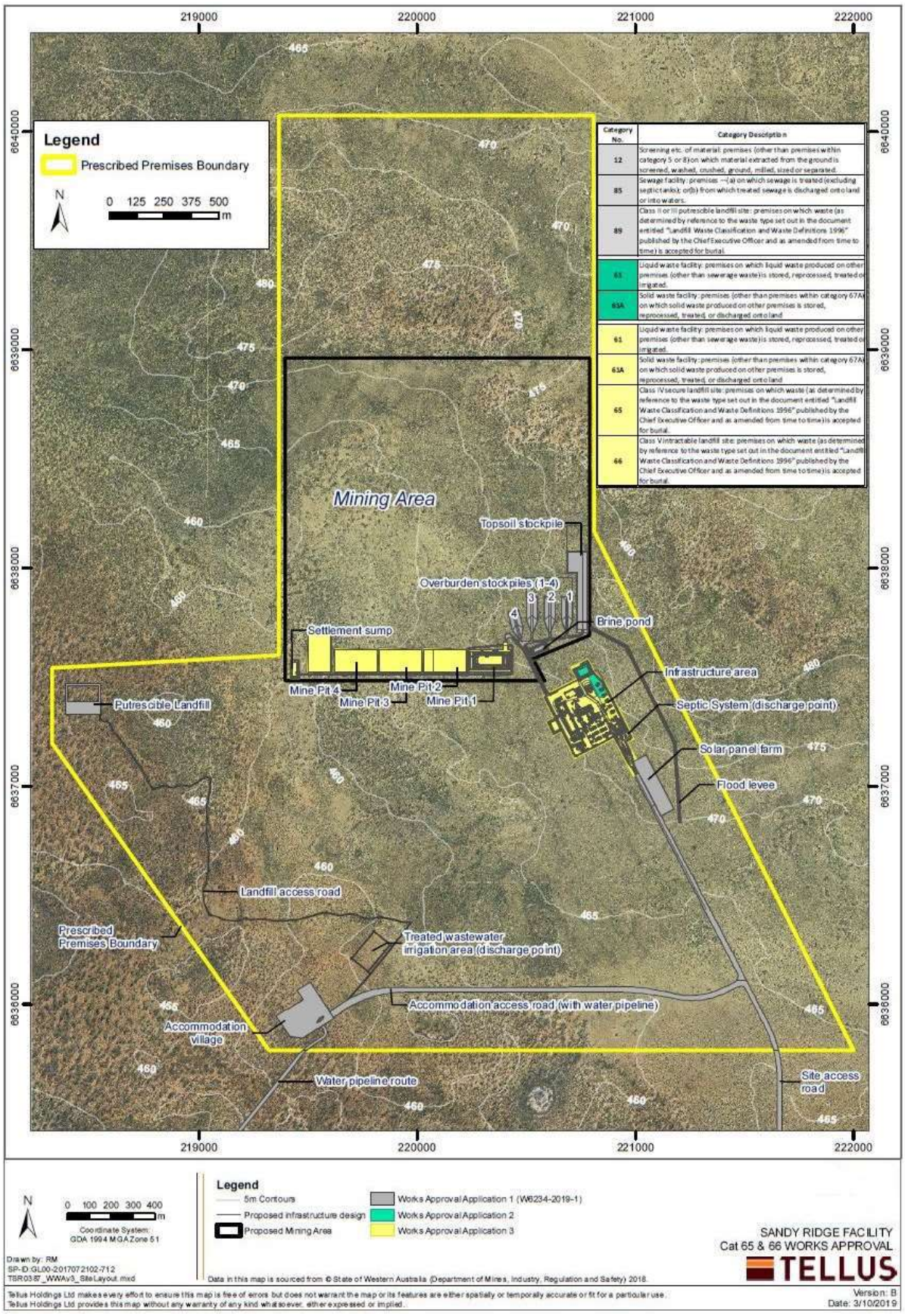


Figure 2: Facility layout

Source: Figure provided by the Applicant

3. Application details

The Applicant has applied for a works approval for surface waste storage and processing infrastructure, as well as infrastructure associated with the permanent isolation of Class IV and Class V wastes.

Table 2 lists the prescribed premises categories that have been applied for and Table 3 lists the documents submitted during the assessment process.

Table 2: Prescribed Premises Categories

Classification of Premises	Description	Proposed Premises production or design capacity or throughput
Category 61	Liquid waste facility: premises on which liquid waste produced on other premises (other than sewerage waste) is stored, reprocessed, treated or irrigated	No more than 100,000 tonnes per annum and no more than 15,000 tonnes at any one time, combined with Category 61A, stored no longer than 12 months from date of acceptance. Estimated throughout - 40,000 tonnes per annum
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.	No more than 100,000 tonnes per annum and no more than 15,000 tonnes at any one time, combined with Category 61, stored no longer than 12 months from date of acceptance. Estimated throughout - 60,000 tonnes per annum
Category 65	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.	No more than 280,000 tonnes per annum combined with Category 66 (limited by 100,000 tonnes per annum accepted onto premises by Category 61 and 61A).
Category 66	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.	No more than 280,000 tonnes per annum combined with Category 65 (limited by 100,000 tonnes per annum accepted onto premises by Category 61 and 61A).

Table 3: Documents and information submitted during the assessment process

Document/information description	Date received
Works Approval Application and Supporting documentation	04 October 2019
Detailed Construction drawings and Technical Specification	21 October 2019
Response to Request for Information – clarification of infrastructure bunding and stormwater capacity details and provision of additional information regarding batching plant dust controls, provided by Tellus Holdings Ltd	14 November 2019

Document/information description	Date received
Response to 2nd Request for Information provided by Tellus Holdings Ltd. - further clarification of stormwater controls relating to the low level radioactive waste warehouse and storage yard, non-radioactive waste inspection warehouse and waste immobilisation plant - Provision of drawing #12-567, stormwater storage tanks - Provision of updated drawing #TSR-5-SR-32200-CI-DWG-004 – flammable goods storage area bund - Provision of updated drawing #TSR-5-SR-11000-CI-DWG-001 – General arrangement, Mining Area Bulk Earthworks,	29 November 2019

3.1 Category 61 activities

The Applicant is seeking to construct infrastructure associated with the storage and processing of contaminated and hazardous liquid wastes (including sludges). Following acceptance, liquid wastes are unloaded, stored and treated via a waste immobilisation plant to solidify and encapsulate prior to permanent isolation within the near surface geological repository. Once operational, wastes proposed to be accepted and processed include hazardous, toxic and intractable liquid wastes.

3.2 Category 61A activities

The Applicant is also seeking to construct infrastructure associated with the acceptance, handling, storage and processing of contaminated and hazardous solid wastes onto the premises. Following acceptance, these wastes are to be placed within the near surface geological repository following waste segregation and isolation procedures established by the Applicant.

3.3 Category 65 and 66 activities

The Applicant is seeking to construct infrastructure associated with the permanent isolation of Class IV and Class V wastes to waste cells within the near surface geological repository. Once operational and following the excavation of kaolin/kaolinised granite, the Applicant is proposing to isolate contaminated, hazardous and intractable wastes within defined natural clay barrier waste cells. Wastes handled and treated within surface processing infrastructure will be transferred to the waste cells and segregated by compatible waste types. Following waste placement, the Applicant proposes to backfill the waste cells and apply a capping layer to isolate the wastes. The Applicant is proposing to accept a variety of wastes that include, but not limited to:

- Solid and liquid chemical wastes, including substances that contain heavy metals, hydrocarbons, polychlorinated biphenyls, organic solvents and surfactants;
- Asbestos containing materials;
- Non-nuclear low level radioactive wastes (such as sealed sources); and
- Naturally occurring radioactive waste (NORM).

Wastes that are not proposed to be accepted include explosive materials, highly flammable materials, highly reactive materials, gases, biodegradable materials and nuclear wastes.

Section 5 of this assessment has specific detail regarding proposed infrastructure and operational activities.

4. Background

The Facility was assessed by way of bilateral assessment between the Environmental Protection Authority and the Australian Government Department of Environment and Energy. Ministerial Statement 1078 (MS 1078) was granted in June 2018 under section 45 of the *Environmental Protection Act 1986* (EP Act). Australian Government approval under the *Environmental Protection and Biodiversity Conservation Act 1999* was granted in January 2019 (EPBC 2015/7478). In February 2019, a minor change to the Facility's development envelope was approved by way of a section 45C amendment under the EP Act.

Once fully constructed, the Facility is proposed to mine kaolin, accept hazardous and intractable chemical and low-level radioactive wastes for treatment, storage and disposal. For this application, the Applicant is seeking a Works Approval under Part V of the EP Act to construct primary infrastructure associated with waste acceptance, storage and processing of wastes at the Sandy Ridge Facility.

Works Approval W6243/2019/1 was granted in May 2019 to authorise the commencement of works associated with the open cut kaolin mine, accommodation camp and wastewater treatment plant, as well as a domestic waste landfill and ancillary infrastructure associated with the Facility. Registration R2498/2019/1 was granted in November 2019 for the operation of the wastewater treatment plant. Registration W2501/2020/1 is currently under assessment for the operation of the domestic waste landfill.

Works Approval W6305/2019/1 was granted on 20 December 2019 to authorise the construction of a temporary waste storage area and time-limited operations (early phase waste acceptance).

5. Overview of Premises

5.1 Construction aspects

Operations and activities at the Sandy Ridge Facility are defined within 3 construction phases. As detailed above, Phase 1 and 2 included the construction of preliminary mining and ancillary infrastructure, as well as temporary waste acceptance. This application includes infrastructure associated with the acceptance and geological isolation of wastes associated with Category 65 and Category 66 activities, as well as further waste processing associated with Category 61 and Category 61A activities (construction phase 3).

The Applicant is seeking to construct waste acceptance and inspection facilities, waste storage yards and hardstands, waste inspection warehouses and a liquid waste immobilisation plant. This infrastructure, as well as that authorised for construction under W6243/2019/1 and W6305/2019/1 will form the surface and sub-surface waste infrastructure associated with the Sandy Ridge Facility.

During operations, the Applicant is proposing to accept up to 100,000 tonnes per annum of Class IV and Class V solid and liquid hazardous and intractable wastes via dedicated waste acceptance and inspection areas. The Facility is authorised to store wastes for up to 12 months (via MS1078), however above-ground storage time for wastes at Sandy Ridge is expected to be approximately 14 days, during which, onsite waste verification testing is conducted in accordance with the Applicant's established waste acceptance procedures.

Upon acceptance, initial inspection and verification, the waste containers are transferred to the waste storage area (the Mixed Store, East Yard or Low Level Radiation Waste Storage Yard) until scheduled for transfer to the waste inspection warehouses, the waste immobilisation plant or waste cells. The waste storage yards will be constructed of interlocking concrete paving or compacted earthen hardstands, dependent on the waste type, process or loading expected to occur within each yard.

The Applicant has advised that two dedicated waste inspection warehouses are to be

constructed to allow for the opening, evaluation and inspection of the waste receptacles that are transported to the Facility in sealed containers. Waste inspection will occur through either the non-radioactive waste or low level radioactive waste/liquid waste inspection warehouses. The inside of the shipping container (or other transport container e.g. drums) would be inspected to check for damaged/leaking waste packages. If they are found to be in accordance with the waste acceptance procedures, a selection of waste packages will be removed for verification testing. The waste inspection warehouses are to be constructed with concrete floors and include concrete perimeter bunding and blind drainage sumps. The warehouses will also be roofed and walled on three sides to prevent rainwater ingress. The low level radioactive/liquid waste inspection warehouse will also house infrastructure to pump liquid and sludge wastes to the waste immobilisation plant.

The waste immobilisation plant is to be used to prepare/stabilise liquid and sludge wastes prior to disposal within the waste cells, by mixing wastes with a combination of mined kaolin granite and/or cement. These liquid wastes can include oily sludges (potentially containing hydrocarbons, NORM or heavy metals) and non-oily sludges.

The waste immobilisation plant consists of a planetary mixer, waste and binder agent feed hoppers and covered conveyors, a storage silo for bulk cement and kaolin/kaolinised granite stockpiles. The mixed waste and binder slurry from the planetary mixer is discharged into half height shipping containers (via a purpose built trolley that allows containers to accept slurry discharged from the planetary mixer) for transport as either a spade-able solid or concrete monolith, to the waste cells. Nominated key operational aspects of the waste immobilisation plant include:

- 30 tonnes per hour throughput;
- Automatic constituent dosing and measurement;
- Cement to be directed from a bulk 100 tonne storage silo. The silo includes air filtration/dust collectors and overfill alarms
- Liquid waste pumped from 20’ ISO liquid containers, IBC’s or drums via bunded pipelines;
- Kaolin/kaolinised granite manually machine loaded into feed bin then conveyed to planetary mixer;
- Records maintained for all batches run, including constituent weights for all materials by batch.
- Waste immobilisation plant contained within concrete hardstand and bunded area designed to contain a 1:100 year, 72 hours rainfall event;
- The planetary mixer is an enclosed machine and installed within the concrete bund;
- Above ground piping that dispenses liquid/sludge waste from the WIP Waste Bund is under low pressure and located within a concrete bund. Concrete bunding has blind concrete sumps to contain spills;
- Waste immobilisation mix controller via a touch panel programmable logic controller interface;
- The planetary mixer is designed with an underside discharge point which will direct the spadeable mix directly into a sealed, half-height container;
- The waste plant to be manned at all times when in operation; and
- Waste immobilisation mix controller via a touch panel programmable logic controller interface, fitted with emergency stops.

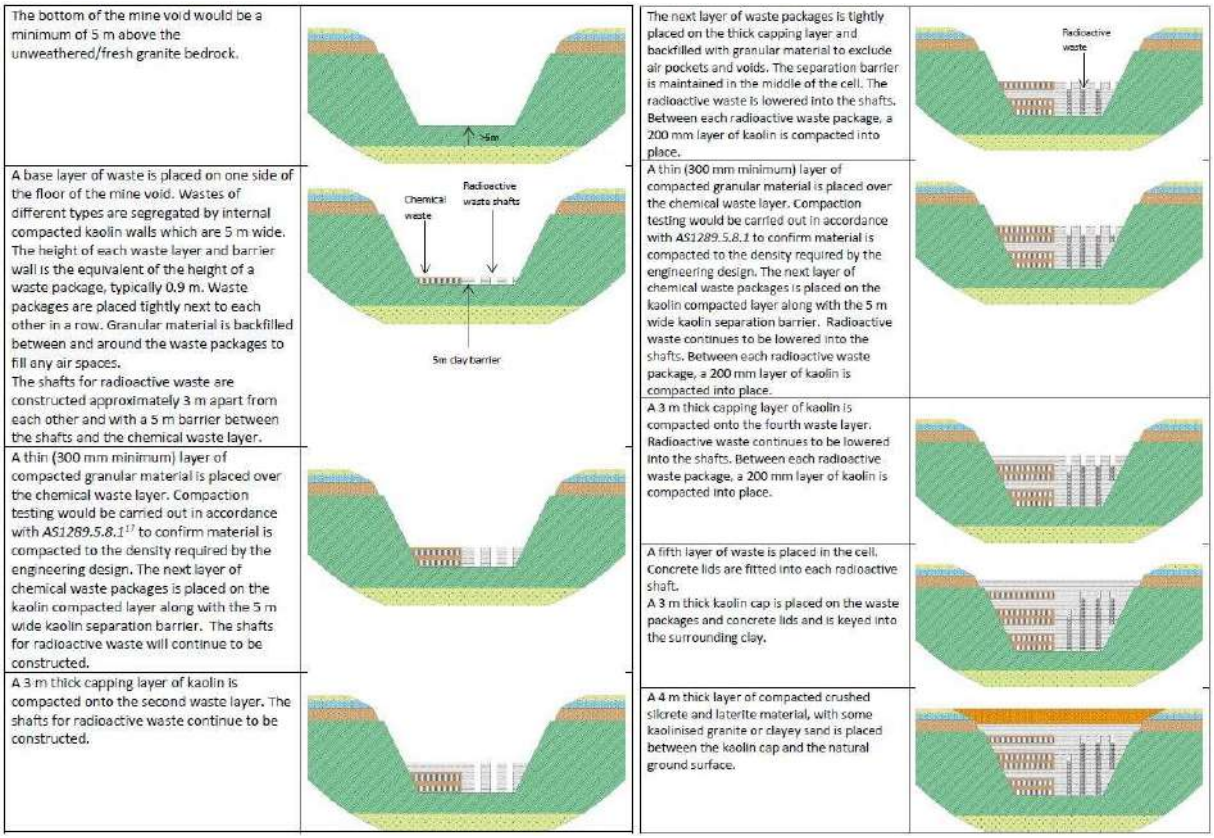
The Applicant has advised that with the addition of kaolin, cement or other binding agents used

to blend with the liquid/sludge, the added materials will increase the total mass of the waste deposited within the waste cells. Depending on the required waste treatment formulation, the mass of permanently isolated waste may be up to 220,000 tonnes per annum (tpa). Added to the proposed 60,000 tpa of solids accepted at the front gate, the total mass placed in the waste cells may be up to 280,000 tpa.

The Applicant advises that the wastes cells are to be operated in manner where only one cell is open for waste acceptance at a time. Cell excavation and waste backfilling operations are to be undertaken under a pre-inflated air dome cover. The cell dome cover will have an airlock door for entry and egress and span the width and length of each cell. Prior to placing waste into the cell, the air dome would be in place covering the entire cell. The purpose of the air dome is to exclude water from the cell until it is capped, to avoid the generation of leachate within the cell and avoid any potential structural impacts that may affect the integrity of the cell walls.

Localised drainage around the cell is also required to prevent ingress of water into the void during waste operations. This water is to be directed to a settlement sump located in the mining area and waste cell area. In addition, a flood levee is constructed on the perimeter of the Facility to prevent any surface water ingress into the waste infrastructure area and cells (constructed under W6243/2019/1).

The Applicant advises that the waste cells are to be filled in layers with multiple sections in each layer containing wastes of similar characteristics to segregate the different waste types. Chemical waste types would be placed 'like-with-like' for safety reasons and for potential future recovery (if identified as potentially valuable). Spaces between waste packages are to be backfilled with kaolinised granite and compacted to minimise air or void space. Each layer would be compacted, until approximately 7 m below the ground surface, where a thick capping layer of low permeability clay (referred to as a 'seal') would be installed to prevent water ingress into the cell. The typical sequence for waste cell backfilling and capping is shown in Figure 3.



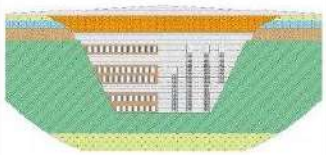
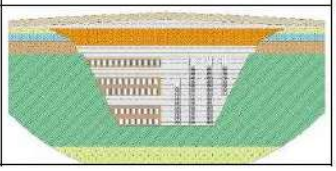
The compacted kaolin clay dome cap is placed over the cell. The final capping layer is formed of compacted kaolinised granite material (permeability approximately 6.0 x 10^{-8} m/s (Douglas Partners, 2015)) and placed in the form of a dome, so as to shed stormwater from the structure into perimeter V drains, which flow to a sump. The cap would have a 1:20 gradient and be an approximate thickness of 2 m in the middle, thinning as it slopes to integrate into the landscape. Subsidence monitoring of the cap would commence.	
Subsoil and topsoil is replaced on the cap after the cessation of subsidence monitoring.	

Figure 3: Typical waste cell backfilling and capping sequence

Source: Sandy Ridge PER

5.2 Operations aspects - waste acceptance and management

Waste types proposed to be accepted onto the Premises during operations that are included within the scope of this assessment are:

- Contaminated solid waste meeting up to an including Class IV acceptance criteria, as specified in the Landfill Waste Classification and Waste Definitions;
- Class V intractable wastes, including Low Level Wastes (LLW) and Naturally Occurring Radioactive Material (NORM);
- Special Waste Type 1 – asbestos and asbestos cement products;
- Special Waste Type 3 – PFAS contaminated waste; and
- Hazardous liquid wastes (for immobilisation/encapsulation prior to disposal). Refer to Appendix 1 for a full list of waste types proposed for acceptance during operations.

The Applicant has developed a number of waste acceptance procedures for the management of waste characterization, receival, treatment and isolation of the wastes types proposed for acceptance and disposal. These are detailed in the:

- Sandy Ridge Facility Waste Acceptance Procedure, Tellus Holdings Ltd, 2016;
- Sandy Ridge Facility Waste Acceptance Criteria, Tellus Holdings Ltd, 2016;
- Sandy Ridge Facility Radiation Management Plan for Temporary Storage of LLW, Tellus Holdings Ltd, 2019; and
- Sandy Ridge Emergency Response Plan, Tellus Holdings Ltd, 2019.

Key Finding: The Delegated Officer notes that in addition to the proposed waste acceptance criteria for Class IV and Class V landfills that:

- Wastes classified as a 'Controlled Waste' under Schedule 1 of the *Environmental Protection (Controlled Waste) Regulations 2004* (Controlled Waste Regulations) may be subject to transport and disposal requirements under these regulations. It is the Applicant's responsibility to ensure that all relevant waste tracking forms and approvals are provided upon receipt of controlled waste.
- Wrapping, labelling and storage requirements for waste acceptance may also be applicable under the Controlled Waste Regulations and other legislation such as *Dangerous Goods Safety Act 2004*. Approval to accept and dispose of wastes under

the EP Act does not negate or limit the Applicant's responsibilities under any other legislation.

5.3 Infrastructure

Infrastructure proposed for the Sandy Ridge Facility, as it relates to Category 61, 61A, 65 and 66 activities within this application is detailed in Table 4 and with reference to the Site Plan.

Table 4 lists infrastructure associated with each prescribed premises category and infrastructure area plan is shown in Figure 4.

Table 4: Sandy Ridge Facility Waste Acceptance, Storage and Processing Infrastructure

Item No.	Infrastructure	Site Plan Reference
Category 61 and 61A - Waste inspection, surface storage and waste processing		
1	Waste receival and unloading bay	ID 14 in Figure 4
2	Mixed Store	ID 15 in Figure 4
3	East Yard	ID 11 in Figure 4
4	Flammable Risk Store	ID 2 in Figure 4
5	Low Level Radiation Waste Inspection Warehouse	ID 21 in Figure 4
6	Low Level Radiation Storage Yard	ID 22 in Figure 4
7	Non-Radioactive Waste Inspection and Unloading Warehouse	ID 16 in Figure 4
8	Waste Immobilisation Plant	ID 22 in Figure 4
9	Cement Storage Silo	ID 25 in Figure 4
10	Bulk Kaolin Feed Hopper	ID 26 in Figure 4
Category 65 and 66 – Permanent isolation/disposal of Class IV and Class V wastes		
9	Waste Cells and Air Domes	Marked "Mine Pits" in Figure 2
10	Waste Cell Storm Water Diversion Settlement Sump	Marked "Settlement Sump" in Figure 2
11	Brine Pond	Marked "Brine Pond" in Figure 2

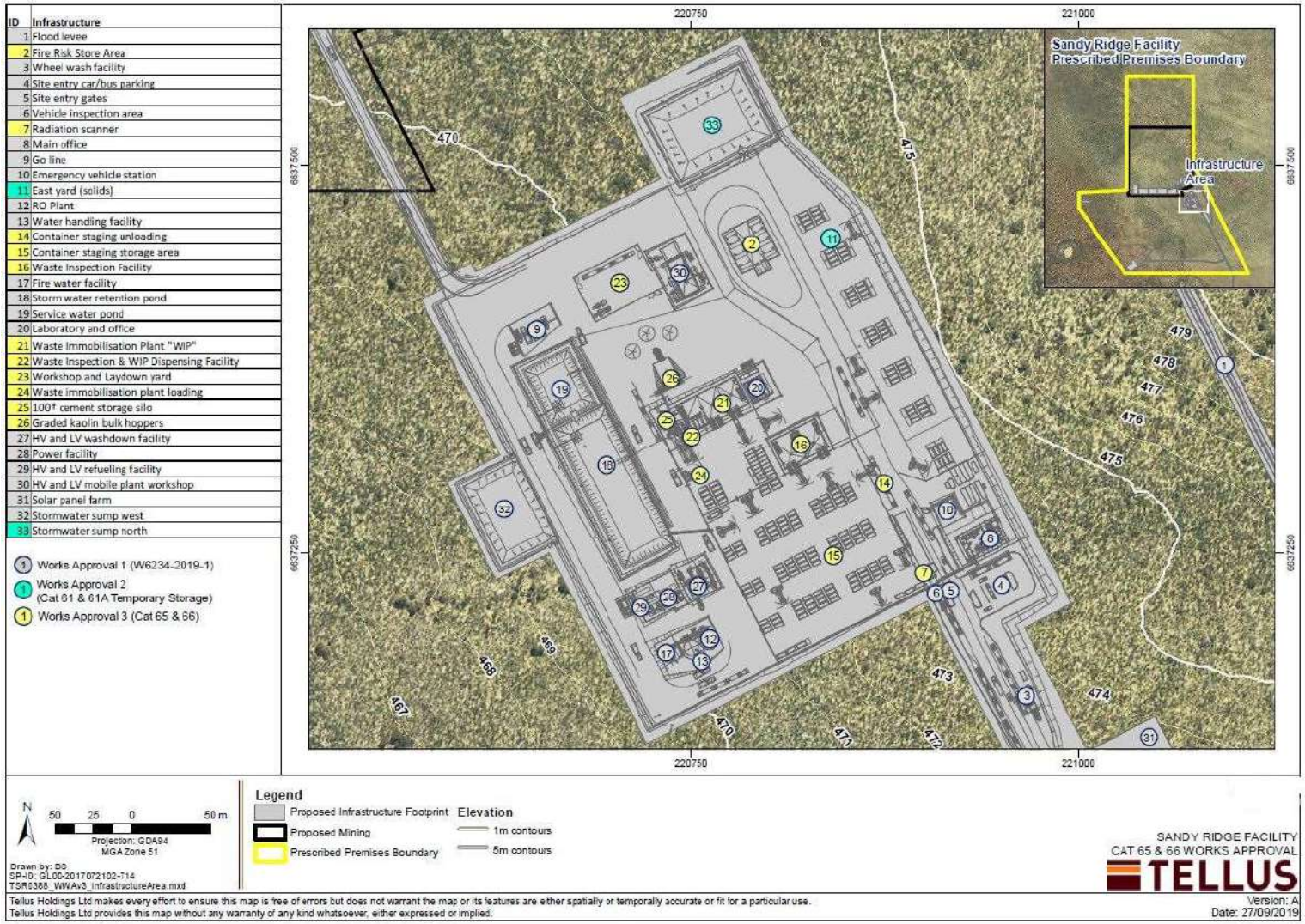


Figure 4: Facility Infrastructure layout

Source: Figure provided by the Applicant

5.4 Exclusions to the Premises

Activities relating to Category 12, 85 and 89 as previously assessed under Works Approval W6243/2019/1 are not re-considered as part of this application. Ancillary Facility infrastructure also assessed as part of W6243/2019/1 is not included as part of this assessment. This infrastructure, associated and ancillary to the surface waste acceptance, handling and storage area includes the:

- HDPE lined yard capture pond
- Clay lined stormwater catchment pond
- Service water and raw water ponds
- Reverse osmosis treatment plant
- Infrastructure area flood levee
- LV and HV washdown facilities
- Wheel wash facility
- Refuelling facility
- Administration offices

Activities relating to the acceptance and temporary storage of waste under W6305/2019/1 are not reconsidered under this application however are associated with additional infrastructure works for Category 61 and 61A under this application.

Additional premises infrastructure, including water supply pipelines and access roads are not considered prescribed activities are not considered as part of this assessment.

Key Finding: Activities relating to Category 12, 85 and 89, as well as activities relating to ancillary waste infrastructure and the temporary waste storage area are not included in this works approval assessment.

6. Legislative context

Table 5 summarises approvals relevant to the assessment.

Table 5: Relevant approvals and tenure

Legislation	Number	Subsidiary	Approval
Environment Protection and Biodiversity Conservation Act 1999 (Cth)	EPBC 2015/7478	Tellus Holdings Ltd	Bilateral assessment by the Commonwealth Department of Environment and Energy (DoEE) completed and approved 7 January 2019. Provides approval for the construction and operation of an open-cut kaolin clay mine, arid near-surface geological waste repository within mine voids, and associated infrastructure for the storage, treatment, recovery and permanent isolation (disposal) of hazardous and intractable wastes (including low level radioactive wastes) subject to conditions. Expires 31 December 2048.

Legislation	Number	Subsidiary	Approval
Planning and Development Act 2005	DAP/17/01318	Tellus Holdings Ltd	The Sandy Ridge Development Application was approved by the Joint Development Assessment Panel on 3 April 2019 This approval requires works to be substantially commenced within 5 years of approval (i.e. 2 April 2024).
Mining Act 1978 (WA)	Mining Proposal Reg ID: 75521 for G16/021, L15/361, L15/362, L16/119, L16/121 and M16/540	Tellus Holdings Ltd	Mining Proposal and Mine Closure Plan approved June 2019. Tenure granted for mining lease M16/540 13 August 2018, expires 12 August 2039. Due to granting of the Crown Lease, portions of M16/540 were extinguished. The Applicant has applied for new Mining Lease M16/574 has to replace the relevant portion of M16/540. M16/574 is currently pending.
Mines Safety and Inspections Regulations 1995 (WA)	PM-666-293959	Tellus Holdings Ltd	Project Management Plan is approved, with no expiry date.
Land Administration Act 1997	Lot 510 on Deposited plan 413497 (Land) whole volume 3169 Folio 365	Tellus Holdings Ltd	Lease agreement granted for open cut Kaolin mine and intractable waste facility purposes. Crown Lease granted 26 November 2019. Crown lease includes conditions relating to Financial Assurances that are to be finalised within 6 months of lease date, and prior to waste acceptance.
Radiation Safety Act 1975 (WA)	Registration ID: RS 210/2018 30289	Tellus Holdings Ltd	Initial Site Registration – acceptance and temporary surface storage of low level radioactive waste. Expiry date 17 October 2022.
Radiation Safety Act 1975 (WA)	pending	Tellus Holdings Ltd	Registration and licence for in-cell disposal of low level radioactive waste.
Rights in Water and Irrigation Act 1914	GWL202536	Tellus Holdings Ltd	Section 26D licence to construct monitoring and abstraction bores within the Goldfields Groundwater Management Area. Section 5C Licence to Take up to 0.18 GL per annum from Carina bore (in L16/121) within the Goldfields Groundwater Management Area. Expires 7 March 2029.
Dangerous Goods Safety Act 2004	DGS022452	Tellus Holdings Ltd	Dangerous Goods Site Licence. Expires 27 September 2023.
Bushfires Act 1954	N/A	Tellus Holdings Ltd	The Sandy Ridge Development Application and its supporting Bushfire Management Plan was approved by Joint Development Assessment Panel on 3 April 2019 The Bushfire Management Plan is linked to the Development Approval which requires

Legislation	Number	Subsidiary	Approval
			works to be substantially commenced within 5 years of approval (i.e. 2 April 2024).
Part IV of the EP Act (WA)	Ministerial Statement 1078	Tellus Holdings Ltd	Agreement that the proposal may be implemented. Additional details in section 6.1. The Ministerial Statement has no expiry date.
Part V of the EP Act (WA)	W6243/2019/1	Tellus Holdings Ltd	Works associated with Phase 1 activities, including Category 12, 64 and 85.
	W6305/2019/1	Tellus Holdings Ltd	Works associated with Phase 2 activities, including Category 61 and 61A (temporary waste storage and acceptance).
	R2498/2019/1	Tellus Holdings Ltd	Registration for the premises Category 85 wastewater treatment plant.
	R2501/2020/1 (pending)	Tellus Holdings Ltd	Registration for the premises Category 89 putrescible landfill facility.

6.1 Part IV of the EP Act

6.1.1 Background

The Sandy Ridge Facility has received approval under Part IV of the EP Act via Ministerial Statement 1078.

6.1.2 Ministerial Statement 1078

The Applicant has received approval under Part IV of the EP Act 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 (not all of which relate 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);
- Development of associated infrastructure (including clearing up to 73.75 hectares of native vegetation within a 1,061 hectare development envelope);
- Class IV & 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 Agency (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 following sections summarise the EPA's "Report and recommendations of the Environmental Protection Authority, Sandy Ridge Project, Tellus Holdings, Report 1611 (Assessment No. 2057), December 2017":

Proposal

The proposal for the Sandy Ridge Facility is to construct and operate a dual kaolin (clay) mine and a waste facility, accepting Class IV (Secure Landfill) and Class V (Intractable Landfill) waste, approximately 75 kilometres north east of Koolyanobbing, in the Shire of Coolgardie, within the Goldfields Region of Western Australia (Figure 1).The proposal would receive a maximum of 100,000 tonnes of waste per annum for approximately 25 years.

Background and context

The proponent referred the proposal to the EPA on 4 May 2015. On 12 August 2015, the EPA decided to assess the proposal and set the level of assessment at Public Environmental Review (PER) with a 10 week public review period.

It was determined that Tellus would prepare an Environmental Scoping Document (ESD) with a two week public review period. The EPA approved the ESD for the proposal on 27 May 2016. The ESD was released for public review from 31 March 2016 to 14 April 2016.

The EPA approved the draft PER for public review on 7 December 2016, with the PER released for public review from 12 December 2016 to 7 March 2017.The proposal was determined to be a controlled action under the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) on 23 September 2015 as it may impact on the following Matters of National Environmental Significance - nuclear actions (section 21 and 22A).

The proposal is being assessed under the bilateral agreement between the Commonwealth and Western Australian governments. The Environmental Protection Act 1986 (EP Act) requires that the EPA's report on the outcome of its assessment sets out key environmental factors identified in the course of the assessment, as well as the EPA's recommendations as to whether or not the proposal may be implemented and, if so, the conditions and procedures that should apply.

Public submissions

Key issues raised in the submissions during the PER public review period included:

- Potential impacts to human health from the handling, storage and transport of Class V intractable waste;
- Concerns about the long-term management and decommissioning of the site;
- The waste acceptance criteria and transport of the waste;
- Potential impacts from waste leachate to soils and groundwater from the storage of intractable waste; and
- Potential impacts to significant vegetation and flora, and terrestrial fauna from clearing and waste emissions.

Tellus provided responses to issues raised in the public submissions and further information where appropriate in the Response to Submissions document (Tellus, 2017a). In the response to submissions, the proponent clarified and provided supplementary technical information

regarding flora and vegetation (*Lepidosperma sp*.) and fauna (short range endemic fauna). This information was made available to the public on the EPA's website and has been considered in this assessment.

Key environmental factors and relevant principles

The EPA identified the following key environmental factors (see Section 4) 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.

In identifying the key environmental factors, the EPA had regard to the object and principles set out in section 4A of the EP Act. The EPA considered that the following principles were particularly relevant to this assessment (see Section 4):

1. The precautionary principle;
2. Principles relating to improved valuation, pricing and incentive mechanisms; and
3. The principle of waste minimisation.

Assessment and recommendations

The EPA had taken the following into account in its assessment of the proposal as a whole:

1. The impacts to the key environmental factors including Terrestrial Environmental Quality, Flora and Vegetation, Human Health, Terrestrial Fauna, and Inland Waters Environmental Quality;
2. The EPA's confidence in the proponent's proposed mitigation measures;
3. The relevant EP Act principles, including the precautionary principle, principles relating to improved valuation, pricing and incentive mechanisms and the principle of waste minimisation; and
4. The EPA's environmental objectives for Terrestrial Environmental Quality, Flora and Vegetation, Human Health, Terrestrial Fauna, and Inland Waters Environmental Quality.

The EPA concluded that the proposal is environmentally acceptable and recommended that the proposal may be implemented subject to the conditions within the Ministerial Statement.

The EPA report also recommended the following:

1. That the proposal assessed is for the construction and operation of a dual open cut kaolin mine and a near-surface geological waste repository.
2. The key environmental factors identified by the EPA in the course of its assessment were Terrestrial Environmental Quality, Flora and Vegetation, Human Health, Terrestrial Fauna, and Inland Waters Environmental Quality.
3. The EPA has 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*, *Lepidosperma lyonsii*, and the undescribed *Lepidosperma sp*; and

f) For a management plan for terrestrial fauna.

The EPA provided further advice regarding waste acceptance criteria, financial assurances and insurance, institutional control periods, agency resourcing and landfill waste levies.

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 Decision Report:

- The Sandy Ridge Facility may accept waste from within Western Australia, other Australian States and Territories, and the Australian Exclusive Economic Zone.
- The Part IV findings 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 by Part IV.
- Part IV 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.
- Part IV 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.
- Part IV 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.
- Part IV 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.
- Part IV has limited Class IV & 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.
- Part IV 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.

As part of this works approval assessment, DWER referred the application to EPA Services seeking advice regarding the proposed works and consistency with MS1078. On 19 December 2019 and 16 January 2020, EPA Services advised that the proposed infrastructure as part of this application was not inconsistent with the proposal as assessed by the EPA for MS1078.

6.2 Contaminated sites

At the time of assessing this Works Approval application, the proposed Facility was not reported or registered as a Contaminated Site.

6.3 Other relevant approvals

6.3.1 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 proposed 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) (LLA) is required for the construction and operation of the proposal.

The Applicant was granted land tenure under the LAA (Crown Lease) on 26 November 2019. It is noted that the Crown Lease stipulates that the Lessee must not accept any waste at the Leased Premises until a Financial Assurance Arrangement has been entered into.

Key Finding: The Delegated Officer notes it is the responsibility of the Applicant to ensure the necessary Financial Lease Arrangement is entered into prior to waste acceptance on the premises.

6.3.2 Department of Mines, Industry Regulation and Safety

The Department of Mines, Industry Regulation and Safety granted approval for a Mining Proposal and Mine Closure Plan associated with the Facility on 04 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 Applicant has received a Dangerous Goods Site Licence (DGS022452) for the Facility on 27/09/2018 under the *Dangerous Goods Safety Act 2004*, as regulated by the Department of Mines, Industry Regulation and Safety.

During the assessment of this works approval, the Delegated Officer notes that the Department of Mines, Industry Regulation and Safety provided comment regarding the proposed storage of waste containers on the premises. It is the responsibility of the Applicant 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.

Key Finding: The Delegated Officer notes that storage requirements for certain hazardous wastes and dangerous goods on the proposed Facility is regulated under the *Dangerous Goods Safety Act 2004,* and Dangerous Goods Licence DGS022452.

6.3.3 Radiation Safety Act 1975

The Applicant has been granted a registration under the *Radiation Safety Act 1975* (RS Act) for the temporary surface storage of low level radioactive wastes. This registration is limited to the temporary, surface storage of low level radioactive wastes in accordance with the Applicant's Radiation Management Plan.

The Applicant is currently seeking further approval under the RS Act for the long-term disposal of radiation wastes.

Key Finding: The Delegated Officer notes that the ongoing storage and disposal of low level radiation wastes requires approval under the RS Act.

The Delegated Officer also notes that this approval is required to inform the operational risk assessment of radioactive waste acceptance, storage, treatment and disposal under Part V of the EP Act, and as such, the assessment of risk for radioactive waste acceptance storage and disposal will be conducted during the licensing phase of Facility development.

6.3.4 Federal Legislation

Environment Protection and Biodiversity Conservation Act 1999 (Cth)

On 23 September 2015, the Department of Environment determined under section 75 of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) 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 Per- and polyfluoroalkyl substances (PFAS) National Environmental Management Plan (NEMP);
- Surface and floodwater management; and
- Waste placement within cells is not to include disposal by the borehole method (also called BOSS method)

The following excerpt is taken from the PFAS National Environment Management Plan (page 21):

Although not comprehensive, the following apply to storage PFAS-contaminated materials:

- *Materials should be stored, handled and transferred in a proper and efficient manner so as to minimise the likelihood of any leakage, spillage, or release to stormwater, surface water, land or air.*
- *Unloading, loading and any internal transfer of liquids should be undertaken in a manner that minimises the possibility of spillage and occur on an area that is*

impervious to liquid, and sufficiently graded and bunded to retain any spillage or leakage, including any firewater.

- *Unloading of solids should be carried out in a manner that minimises the creation of dust, and minimises or prevents emissions by any other manner.*
- *Smaller containers (e.g. not exceeding 15 litres) should be stored in a secondary containment.*
- *Containers should be stored a sufficient distance from bund walls, unless splash shields or baffles of compatible, non-combustible materials, effective to prevent leakage or spillage, are installed that prevent any release beyond the bund wall.*
- *Packages and bulk containers should be stored and handled so that they cannot fall and cause spillage outside of the containment.*
- *Wherever practicable, a roof or solid cover should be placed over bunded areas.*

Further to the above, the Delegated Officer understands that the National Chemicals Working Group has reviewed and proposed PFAS National Environmental Management Plan version 2.0. It is understood that this review includes updated guidance for the temporary and longer term onsite storage and containment of PFAS containing materials, and is likely to be approved within timeframes that will affect the storage and containment requirements for PFAS contaminated wastes at the Sandy Ridge Facility.

Expected changes to the PFAS NEMP include the designation and specification of controls for the temporary storage of PFAS containing wastes. Temporary storage is considered to include storage from 48 hours to 6 months, and relevant for the proposed surface storage timeframes as proposed by the Applicant. It is expected the guidelines will stipulate the storage infrastructure for PFAS containing liquid wastes to be within self-bunded containment vessels covered, with lockable access, on impervious, bunded hardstand, with effective stormwater controls.

Key Finding: The Delegated Officer notes that the acceptance and storage of PFAS contaminated wastes is conditioned within approval EPBC/2015/7478. The Delegated Officer also notes that the risk assessment for the acceptance, storage and treatment of PFAS contaminated wastes under this application will give consideration to the expected revision of the PFAS NEMP.

6.4 Part V of the EP Act

6.4.1 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: Land Use Planning (February 2017)
- Guidance Statement: Decision Making (February 2017)
- Guidance Statement: Risk Assessments (February 2017)
- Guidance Statement: Environmental Siting (November 2016)

6.4.2 Works approval and licence history

Table 6 summarises the works approval history for the premises.

Table 6: Works approval and licence history

Instrument	Issued	Nature and extent of works approval, licence or amendment
W6243/2019/1	20/05/2019	Works Approval granted for activities relating to Category 12 – Screening etc., of material, Category 85 – Sewage facility and Category 89 – Putrescible landfill site, and ancillary premises infrastructure.
R2498/2019/1	28/11/2019	Registration for Category 85: Sewage Facility, associated with the sewage facility constructed under W6243/2019/1.
W6305/2019/1	20/12/2019	Works Approval granted for Category 61 and 61A activities, restricted temporary waste storage.
W6308/2019/1	This application	Works Approval application for the Category 61, 61A, 65 and 66 – waste handling, storage, processing and permanent isolation.
R25012020/1	Under assessment	Registration for Category 89: Putrescible Landfill Facility, associated with the domestic landfill constructed under W6243/2019/1.

6.4.3 Key and recent approvals

Works approval W6243/2019/1 was granted on 20 May 2019 for Category 12, 85 and 89 activities within the premises, as well as subsidiary infrastructure associated with the broader Sandy Ridge Facility.

Works approval W6305/2019/1 was granted on 20 December 2019 for Category 61 and 61A activities associated with temporary waste storage infrastructure with the Sandy Ridge Facility.

6.4.4 Clearing

Clearing activities for the Facility are regulated under Ministerial Statement 1078.

7. Location, siting and modelling

7.1 Siting Context

The Premises is located in the Shire of Coolgardie and is approximately 140 km north-west of Kalgoorlie and 75 km north-east of Koolyanobbing. The site is zoned Rural/Mining in the Shire of Coolgardie Town Planning Scheme No. 4 (District Scheme) Consolidated Scheme (TPS4).

7.2 Residential and sensitive receptors

The description residential and sensitive receptors and distance from the proposed prescribed activities are detailed in Table 7 and shown in Figure 5.

Table 7: Receptors and distance from activity boundary

Sensitive Land Uses	Distance from Prescribed Activity
Mount Walton Intractable Waste Disposal Facility (IWDF) (Facilities to cater for five permanent personnel, however the premises has been under care and maintenance since 2008 and no permanent workforce is located here at the time of assessment)	Approximately 5 km east of the Premises.
Ex-Juardi pastoral station homestead	Approximately 50 km south of the Premises.
Mine village camp (Carina Iron Ore Mine Accommodation Village)	Approximately 52 km south of the Premises.
Town of Koolyanobbing	Approximately 75 km south-east of the Premises.

Key Finding: The Delegated Officer notes that on the basis of distance from the proposed activities, the majority of these sensitive receptors are not considered to be significant to the risk assessment for the construction and operation of the waste acceptance, treatment and disposal infrastructure with the Facility that are within the scope of this assessment. Receptors considered as relevant for the assessment of risks associated with the scope of this assessment are:

- Human receptors at the Mount Walton Intractable Waste Disposal Facility

Risks associated with these receptors in relation to the proposed activities are considered in Section 8.

7.3 Regional Ecosystem

The proposed facility is located in the Coolgardie Interim Biogeographic Regionalisation of Australia (IBRA) Bioregion, as well as the Southern Cross subregion. The Southern Cross subregion comprises the western section of the Yilgarn Craton and is characterised as gently undulating uplands dissected by broad valleys with bands of low greenstone hills (Cowan et al., 2001, as referenced within the Sandy Ridge PER, 2016). The granite strata of the Yilgarn Craton are interrupted by parallel intrusions of Archaean Greenstone.

The majority of the vegetation within the proposed development area belongs to the Beard vegetation association 437 “Scrublands: mixed acacia thicket on sandplain”.

Three Priority Ecological Communities (listed as Priority 1) were identified as potentially occurring within the vicinity of the proposed development envelope. These include:

- Finnerty Range/Mt Dimer/Yendilberin Hills vegetation complexes (banded ironstone formation).
- Hunt Range vegetation complexes (banded ironstone formation).
- Lake Giles vegetation complexes (banded ironstone formation).

These communities are all associated with the banded iron formation that does not occur within the proposed development envelope. There are no Threatened or Endangered Ecological Communities listed under the *Wildlife Conservation Act 1950* or Threatened or Endangered Ecological Communities listed under the EPBC Act within the proposed development envelope.

7.4 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 8 and shown in Figure 5. Table 8 also identifies the distances to other relevant ecosystem values which do not fit the definition of a specified ecosystem. The table has also been modified to align with the *Guidance Statement: Environmental Siting*.

Table 8: Environmental values

Specified ecosystems	Distance from the Premises
Important wetlands – Western Australia	There are no Important wetlands are located within 20 km of the premises (based on available GIS dataset – Geomorphic Wetlands and Wetland (DIWA)).
Geomorphic Wetlands	There are no geomorphic wetlands within 20 km of the premises (based on available GIS dataset – Geomorphic Wetlands).
RAMSAR Wetlands	There are no RAMSAR wetlands within 20 km of the Premises.
Public drinking water source areas	There are no Public Drinking Water Source Areas within 20 km of the premises (based on available GIS dataset – Public Drinking Water Source Areas).
Parks and Wildlife 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.
Threatened Ecological Communities and Priority Ecological Communities	The Finnerty Range/Mt Dimer/Yendilberin Hills Vegetation Complexes (Banded Ironstone Formation) are located approximately 12.5 km to the south west of the Premises.
Threatened/Priority Flora	6 threatened/priority flora are located within a 10 km radius of the Premises, the closest being approximately 3 km from the Premises boundary.
Threatened/Priority Flora – as identified from Public Environment Review	*Calytrix creswellii* – listed as Priority 3 by the DBCA - recorded within the mine infrastructure area. *Banksia arborea* – listed as Priority 4 by the DBCA - recorded within the groundwater abstraction area.
Threatened/Priority Fauna	*Leipoa ocellata* is mapped within premises boundary.

Key Finding: The Delegated Officer notes that on the basis of distance from the proposed activities, a number of these specified ecosystems are not considered to be significant to the risk assessment for the construction and operation of the waste acceptance, treatment and disposal infrastructure with the Facility that are within the scope of this assessment. Receptors considered as relevant for the assessment of risks associated with the scope this assessment are:

- Threatened Priority Flora and Fauna and the ecosystem with which they are associated.

Risks associated with these receptors in relation to the proposed activities are considered in Section 8.

It is also noted that potential impacts to Threatened/Priority fauna and flora were also considered and assessed under Ministerial Statement 1078. MS1078 includes conditions relevant for potential impacts to flora and fauna associated with the Facility.

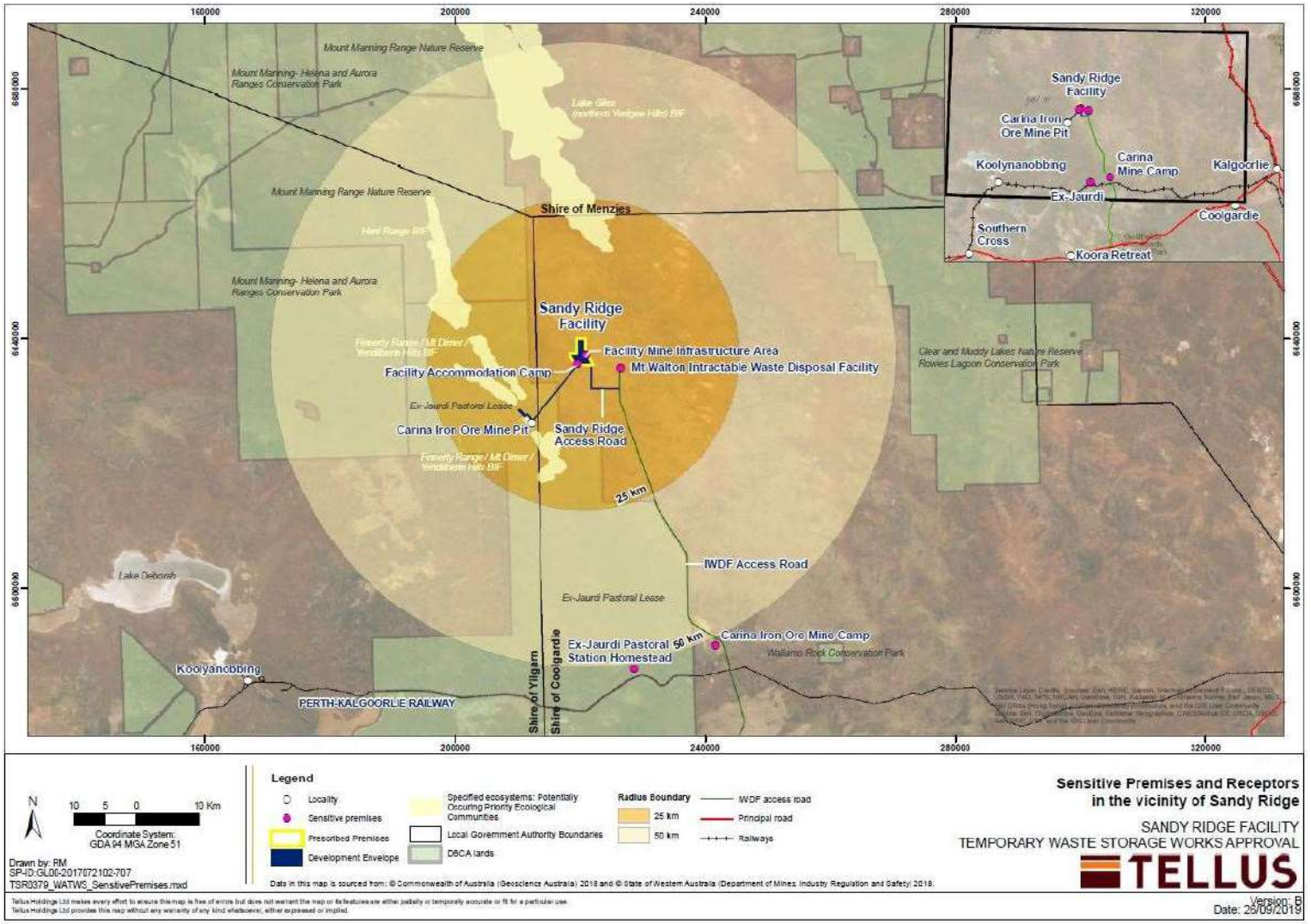


Figure 5 – Distance to receptors

Source: Figure provided by the Applicant

7.5 Geology and soil

7.5.1 Geology

The proposed facility is located within the Archean Yilgarn Craton that comprises an area of approximately 657,000 km^2. The bulk of the craton is thought to have formed between 3,000 and 2,600 million years ago, with some gneissic terranes exceeding 3,000 million years in age (Anand and Butt, 2010, as referenced within the Sandy Ridge PER 2016). The surface of the Yilgarn Craton, the Yilgarn Plateau, has low relief and, on a regional scale, likely represents a Proterozoic erosion surface modified by weathering, partial erosion, and sedimentation, resulting in a complex regolith (Anand and Butt, 2010, as referenced within the Sandy Ridge PER 2016). Broad landforms are understood to have been in place for about 250 million years and the Yilgarn Craton has been tectonically stable for approximately 2,500 million years.

The local geology is well understood due to mineral exploration drilling across the exploration tenement. In geological terms the proposed development envelope is a deeply weathered granitoid terrane that generally comprises four main lithologies. From the surface these are:

- Colluvial sand and gravel with mottled zone laterite – comprising mostly yellow brown quartz sand overlying pisolitic-ironstone gravel and/or nodular red-brown clayey sand (lateritic mottled zone).
- Silcrete – comprising kaolinitic clay and silica to form a hard cap over underlying lithologies. The base of the silcrete generally merges gradationally into the underlying kaolinitic clay profile and as a result the silcrete can be quite variable in terms of overall thickness. The silcrete has most likely been hardened as the result of a secondary chemical process that effectively has re-cemented the kaolinitic clay profile from its upper surface.
- Kaolinitic clay – comprises soft white kaolin weathered from pre-existing granitoids. Drilling indicates the clay profile may be absent in certain areas where silcrete stretches to the granitoid basement, but generally is more than 15 m thick and up to a maximum of nearly 40 m thick. The clay is quite uniformly white with little fracturing and only exhibits minor iron staining in the few fracture zones present.
- Granitoid basement – comprises a fine to medium grained light coloured granite containing pegmatite and quartz veins. The basement topography varies widely to less than 5 m from the surface to greater than 45 m below the surface.

A typical cross section profile of the geology at the proposed Sandy Ridge Facility is shown in Figure 6.

The Premises is located within an area that has been previously identified as being suitable for siting Class V waste disposal facilities by the Geological Survey of WA (Hirschberg, 1988 as referenced within the Sandy Ridge PER 2016). The geological characteristics that were indicated to make this area suitable for the disposal of intractable wastes include:

- Location on the Yilgarn Craton – the region is underlain by granitic rocks with a thick weathered profile comprised of clays that have a low permeability to infiltrating water;
- Location near a continental drainage divide – the area is located in the vicinity of a drainage divide that separates westward flowing rivers from the internal drainage systems that are located to the east of the divide. Land in the vicinity of the drainage divide has a high elevation, and groundwater is likely to have only a limited occurrence at depth in this area;
- Low rainfall – the average rainfall of the area is less than 300 mm and the potential annual rate of evaporation is greater than about 2,000 mm, factors that limit the amount

of water that can infiltrate through soil profiles in the area to provide groundwater recharge; and

- Tectonic stability – the area is located in a highly stable part of the Yilgarn Craton that has a very low incidence of earthquakes.

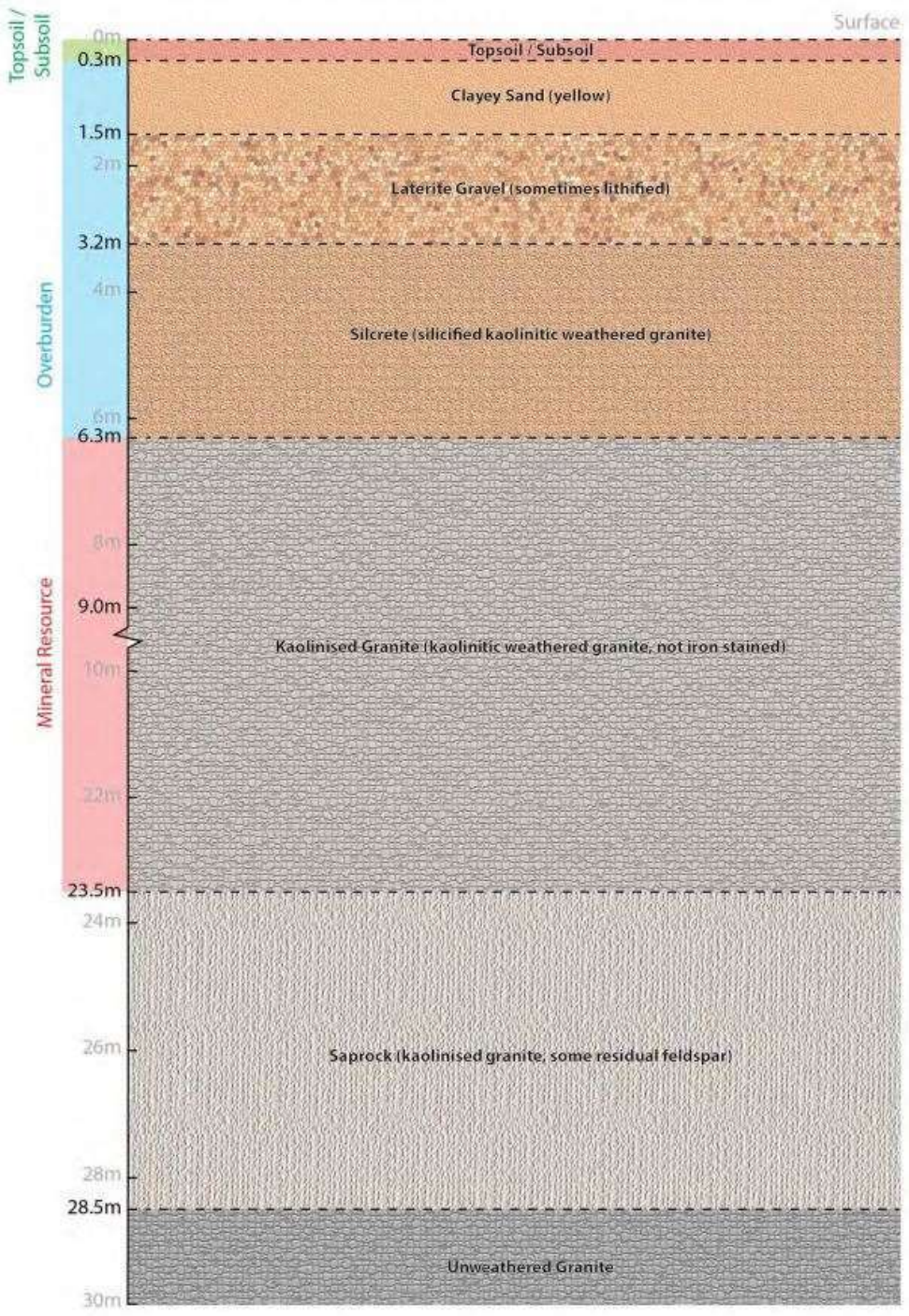


Figure 6 – Typical geological profile at the Sandy Ridge Facility.

Source: Figure provided by the Applicant

7.5.2 Soil

The Applicant engaged Landloch Pty Ltd to undertake a baseline soil assessment of the proposed Premises. The proposed facility is located within the Norseman (266) soil landscape mapping zone, within the Kalgoorlie Province as defined by Tille (Sandy Ridge Public Environment Review 2016). The soils of the Norseman zone are described as calcareous loamy earths, yellow sandy and loamy earths, red loamy earths, deep red sands and salt lake soils. The Applicant has advised that the Premises geologic profile includes 2 m to 5 m of impermeable silcrete and up to 40 m of low permeability clay.

In situ geotechnical investigations undertaken by the Applicant applied Hazen's formula to laboratory testing of the soil types above the silcrete layer to estimate permeability. Permeability values of between 1 x 10^{-6} m/s (0.08 m/day) and 1 x 10^{-5} m/s (0.8 m/day) are suggested for the slightly silty sand, sandy gravel and weakly cemented sand.

Below the upper slightly silty sand, sandy gravel and weakly cemented sand soil layers, test pitting conducted within the proposed infrastructure areas determined compacted gravel and silcrete layers at depths up to 1.5 m below ground level. Figure 7 provides indicative test pitting results for test pits dug within the infrastructure area of the Facility.

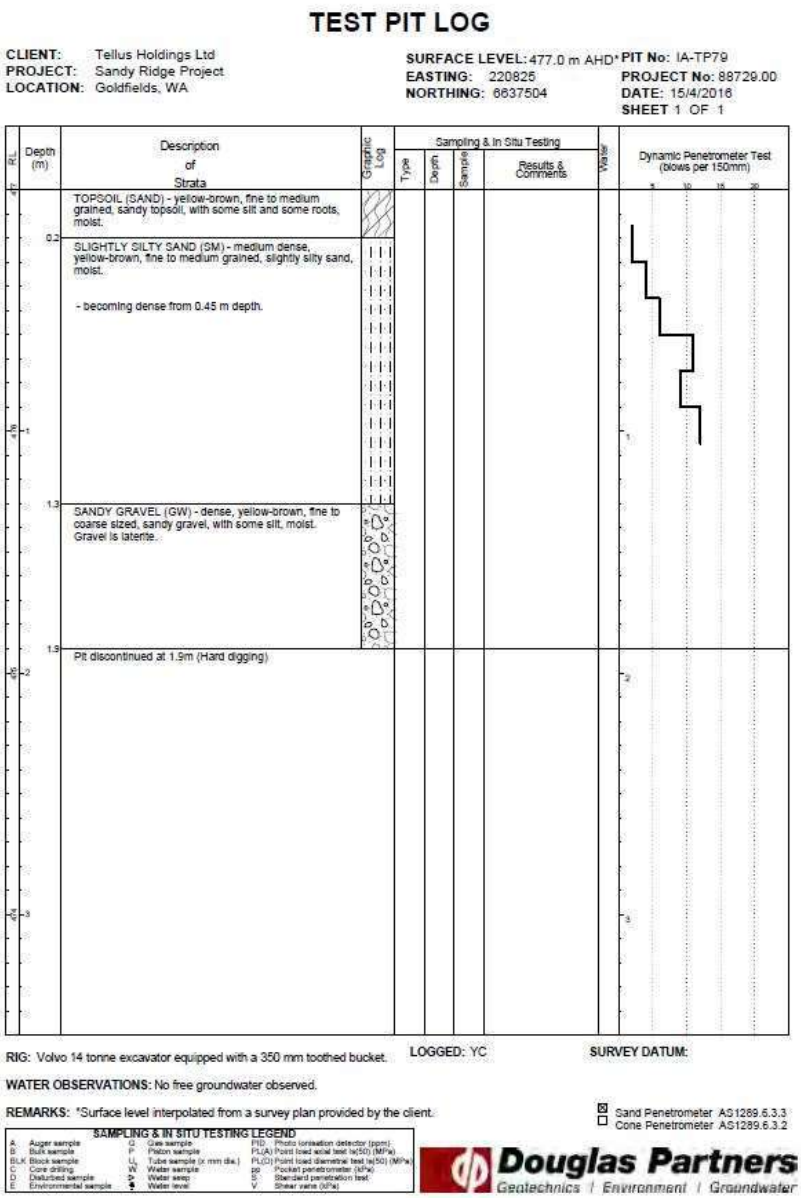
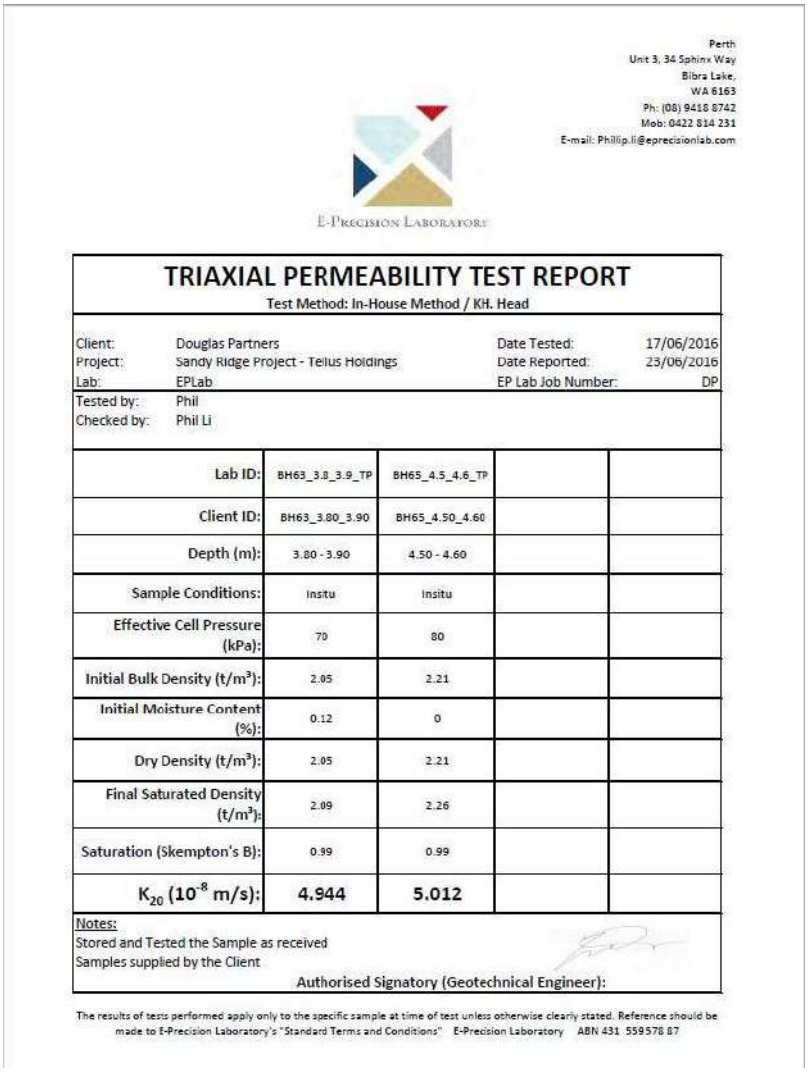


Figure 7 – Silcrete permeability test results

Source: Figure provided by the Applicant

Permeability results for silcrete taken from bore holes onsite indicated a silcrete permeability of 4.944×10^{-8} m/s and 5.012×10^{-8} m/s, as shown in Figure 8.



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E-Precision Laboratory

TRIAXIAL PERMEABILITY TEST REPORT

Test Method: In-House Method / KH. Head

Client:	Douglas Partners	Date Tested:	17/06/2016
Project:	Sandy Ridge Project - Tellus Holdings	Date Reported:	23/06/2016
Lab:	EPLab	EP Lab Job Number:	DP
Tested by:	Phil		
Checked by:	Phil Li		

Lab ID:	BH63_3.8_3.9_TP	BH65_4.5_4.6_TP		
Client ID:	BH63_3.80_3.90	BH65_4.50_4.60		
Depth (m):	3.80 - 3.90	4.50 - 4.60		
Sample Conditions:	Insitu	Insitu		
Effective Cell Pressure (kPa):	70	80		
Initial Bulk Density (t/m³):	2.05	2.21		
Initial Moisture Content (%):	0.12	0		
Dry Density (t/m³):	2.05	2.21		
Final Saturated Density (t/m³):	2.09	2.26		
Saturation (Skempton's B):	0.99	0.99		
K_{20} (10^{-8} m/s):	4.944	5.012		

Notes:
Stored and Tested the Sample as received
Samples supplied by the Client

Authorised Signatory (Geotechnical Engineer):

The results of tests performed apply only to the specific sample at time of test unless otherwise clearly stated. Reference should be made to E-Precision Laboratory's "Standard Terms and Conditions". E-Precision Laboratory ABN 431 559578 87

Figure 8 – Silcrete permeability test results

Source: Provided by the Applicant

Key finding: The Delegated Officer notes that compaction and permeability test results for the upper soil profile indicate that while the permeability of the overlying silty sand, sandy gravel and weakly cemented sand is between 1 x 10^{-6} m/s (0.08 m/day) and 1 x 10^{-5} m/s (0.8 m/day), the permeability of the underlying silcrete is low. The subsurface silcrete layer is likely to act as natural barrier to infiltration and seepage from surface waste storage.

7.6 Hydrogeological Setting

The Premises is located on the Yilgarn Craton and is underlain by granitic rocks of Archaean age. These rocks have been extensively weathered and drilling on site by the Applicant indicates that fresh bedrock is overlain by a clayey weathered profile which varies from 26 to 31 metres in thickness. The drilling indicated that only minor amounts of groundwater were likely to occur in partially weathered rock (saprock) near the base of the weathered profile. No continuous groundwater table was identified during the drilling of boreholes at depths between 21 to 49 metres below ground level.

Groundwater was only definitively intersected in two of the seven investigations bores that were

drilled by Rockwater at the Sandy Ridge site. Groundwater at the site is saline and has a total dissolved solids (TDS) content of about 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 monitoring purposes, at the Intractable Waste Disposal Facility at Mount Walton East 5.5 km east of the development envelope. The closest water supply bores are located at the Mount Dimer gold mine, 23 km from the Facility.

Where groundwater has been encountered, it occurs in natural traps in the deepest parts of the basement surface. Desktop and field research undertaken by the Applicant between 2014 and 2019 indicates:

- There is no surface recharge of groundwater in the survey area combined with a significant horizon of low permeability in the kaolinite and saprock horizons (Geo9, 2019);
- No groundwater aquifer was intersected during targeted groundwater investigations (Rockwater, 2015);
- No groundwater aquifer has been intersected during exploration drilling. This included 216 holes with depths ranging from 12.0–47.5 mBGL across the proposed development envelope;
- Very small quantities of groundwater were airlifted from two bores (SRMB150 (0.03 L/s) and SRMB152 (<0.01 L/s)). The low airlift yield and low permeability indicate that the water-bearing zones containing the groundwater do not constitute an aquifer (Rockwater, 2015);
- Analysis of resource samples collected during mining exploration activities indicate that for weathered granite deeper than 6 mBGL, moisture content is typically between 10% and 12% by weight. This suggests the soil is very dry, the area has limited recharge, the depth to the water table is inferred to be well below the weathered granite, and the material is free draining (i.e. water flows vertically under a unit gradient due to gravity) (CyMod, 2016);
- Since monitoring began in 1995, no groundwater has been detected in monitoring bores at the IWDF. The bores vary in depths of between 24 m and 41 mBGL, (Department of Finance, 2014);
- The absence of a groundwater aquifer in the weathered granite profile. The absence of a water table in the weathered kaolinised granite on top of the fresh granite suggests any deep water infiltration would subsequently migrate into very low permeability fresh granite and water stored in the fresh granite is to likely to form localised fractured rock aquifers;
- No evidence of a shallow groundwater table (i.e. in soils above the silcrete and kaolin), due to annual evaporation rates (greater than 2400 mm (BoM, 2015b)) exceeding the average annual rainfall amount of 250 mm.

The Applicant has conducted contaminant fate and transport modelling to consider the possibility of cell containment failure and degradation of the waste packages, allowing water ingress into the cells and the production of leachate. Modelling results predicted that in the worst-case scenario, seepage could enter the environment at a rate of 6 cubic centimetres per year and that the unsaturated geology directly beneath the cell has sufficient capacity to contain this volume of water for approximately 400,000 years. Without any environmental or engineering control measures in place, should geological storage capacity be exceeded, then contaminated water would take between 6,000 and 200,000 years (depending on fracture connectivity) to reach the most likely exposure point 75 km to the north.

Key finding: The Delegated Officer notes that no developed groundwater aquifer was found within the proposed premises during hydrogeological investigations, and notes that a pathway to groundwater is unlikely. The potential for risks to groundwater users as receptors are therefore not considered to be significant to the risk assessment for the construction and operation of the waste acceptance, treatment and disposal infrastructure with the Facility that are within the scope of this assessment. The risk assessment will still consider impacts associated with subsurface seepage from operational areas where subsurface flow of leachate has been identified as a potential pathway to other identified receptors.

7.7 Surface water and Topography

The area is characterised as semi-arid, with little rainfall occurring over the site. The Applicant conducted a hydrological study which included a desktop review of regional hydrogeology and field investigations. There are no permanent channels or creeks in the development envelope, however within the larger proposed premises boundary, DWER mapping data indicate two minor non-perennial channels associated with Lake Raeside. DWER mapping data also indicates two non-perennial water bodies associated with Lake Raeside, one approximately 50 m south of the Premises boundary and one approximately 450 m west of the Premises boundary.

These surface water bodies represent localised drainage depressions, with the western water body being indicatively upstream of the Facility (approximately 2.5 km from surface infrastructure associated with this application), while the southern water body is indicatively downstream of the Facility (approximately 1.4 km from surface infrastructure associated with this application).

The distances to the identified surface water bodies are shown in Table 9.

Table 9: Surface water bodies

Groundwater and water sources	Distance from Premises
Major watercourses/waterbodies	There are no major watercourses/water bodies within 20 km of the premises (based on available GIS dataset – Hydrography WA 250K – Surface Waterbodies).
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 approximately 2.5 km and 1.4 km respectively from the proposed infrastructure area and temporary waste storage area.

Surface water management requirements are considered to be restricted to short term flows during infrequent high rainfall events (Rockwater 2016, as referenced within the Sandy Ridge PER 2016). Surface water and hydrological modelling for these rainfall events included an assessment for peak discharge rainfall events (modelling of Intensity Rainfall Duration (IFD) rainfall curves) as well as catchment runoff hydraulic calculations. Calculated Average Recurrence Interval rainfall events are presented in Table 10 below.

Table 10: Total rainfall including probable maximum precipitation

Duration	ARI/total rainfall (mm)									
	2	5	10	20	50	100	200	500	1000	2000
24	40	57	70	87	113	136	155	180	201	222
48	47	68	83	104	135	163	186	216	241	266
72	50	72	89	111	146	176	200	232	258	285

Source: Extracted from Sandy Ridge PER

Catchment runoff modelling determined 14 catchments within the development envelope, as shown within Figure 9. Flow durations were assessed to be short, with expected peak flows within the vicinity of the infrastructure area ranging from 1.6 m^3/s to 5.5 m^3/s (for the 100 year ARI event) and 7 m^3/s to 20 m^3/s for the probable maximum rainfall event (2,000 year event). With the absence of any surface water bodies, and no predominant surface water flow direction due to the flat surface, overland flow from the premises is considered to be restricted to on-site movement and limited off-site movement.

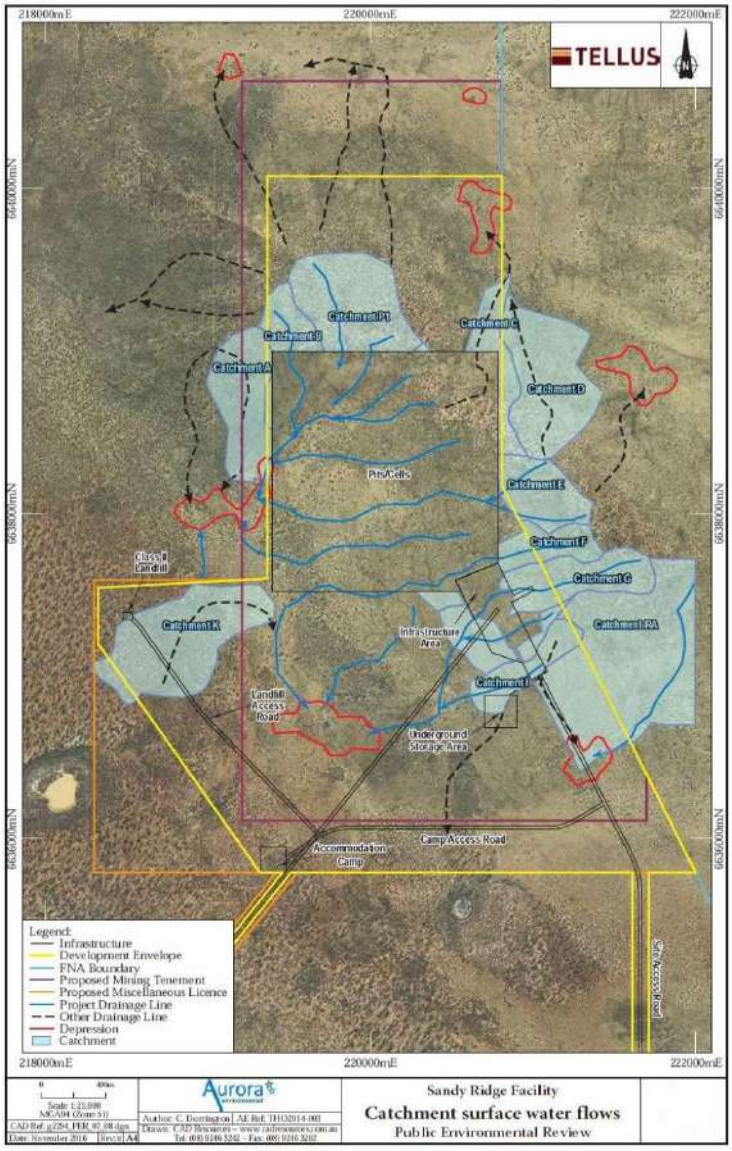

Figure 9 – Premises catchment surface water flows

Source: Sandy Ridge Public Environment Review

Key finding: The Delegated Officer notes that due to local topography, the proposed facility is subject to catchment drainage and overland flows of stormwater from both within and external to the proposed facility boundary. Receptors considered as relevant for the assessment of risks associated with the scope this assessment are:

- Non-Perennial Surface Water Bodies

Risks associated with surface water flows and drainage in relation to the proposed activities associated with this risk assessment are considered in Section 8.

7.7.1 Surface water use within waste cells

The Applicant has undertaken an assessment of the requirement for, and application of water during waste cell backfilling and compaction activities. The Applicant has advised that uncontaminated surface water and raw water will be used within the waste cells during backfilling activities to assist with the compaction of kaolin clay within the waste cells. The typical sequence for backfilling the waste cells is presented in Figure 3. Calculations provided with the application suggests that the kaolin stored onsite from cell mining operations has a typical moisture content of 5%, and needs to be increased to 18% to assist with the compaction of the clay during cell operations. The Applicant advised that this will be achieved by adding water to the clay within the cell (at the rate of 0.13 tonnes of water per 1 tonne of clay).

The Applicant advises that re-used stormwater to be applied by a spray-boom water cart in the cell in accordance with procedures, following by ongoing calibration using a nuclear density gauge. The Applicant indicates that the method of delivery of water within the cell will prevent pooling.

Key finding: The Delegated Officer notes that the use of water within the waste cells is for the purpose of optimising kaolinised granite placement and compaction and is not intended for the management of excess stormwater at the premises. The Applicant's proposed controls should ensure that delivery of water prevents pooling and is managed for the placement of kaolinised granite.

7.8 Meteorology

The Applicant has advised that the proposed development envelope is located within a 'semi desert Mediterranean' climate and averages approximately 250 mm of rainfall per annum (Beard, 1990, as referenced within the Sandy Ridge Public Environment Review). The climatic pattern during the warmer months of November to April is influenced by high pressure systems to the south-east, with the proposed site generally subjected to mostly easterly winds, clear skies and hot days. Sporadic high intensity rainfall can also occur in the summer months as a result of remnant tropical cyclones that cross the coast between Carnarvon and Port Hedland. These track south-easterly, weakening to rain-bearing troughs or depressions between the usual high pressure systems. Strong wind gusts can be associated with these depressions.

7.8.1 Wind direction and strength

Using information available on the Bureau of Meteorology's website, the proposed facility is located between two weather stations for climate data, Southern Cross Airfield (No. 012320) and Menzies (012052). Wind data available for the Menzies station provides an historic dataset (1957 to 1996), while the Southern Cross Airport weather station provides data from 1996 to 2019. The Menzies weather station is located approximately 115 km north east of the proposed premises and the Southern Cross Airport weather station is located approximately 117 km south west from the proposed premises boundary.

Based on the climate data for the Menzies station (Jan 1957 to Dec 1996), winter morning winds

are generally north-easterly and north-westerly, while the prevailing afternoon winter wind direction is north-westerly. In the summer months, historic wind data at Menzies indicates prevailing south-easterly and north-easterly winds in the morning, and south-easterly in the afternoon. This is depicted in the wind roses shown in Figure 10. Mean 9am wind speed during the summer months is 19 km/h, while in the winter months 14 km/h.

Based on the climate data for the Southern Cross Airfield station (Oct 1996 to Aug 2019), the prevailing wind direction in winter months is northerly in the morning to west/north–westerlies in the afternoon, and in summer months the prevailing wind direction is generally easterly in the morning and variable in the afternoon.

This is depicted in the wind roses shown in Figure 11. Mean 9am wind speed during the summer months is 22 km/h, while in the winter months 13 km/h.

Figure 10 – Menzies wind roses

Source: Bureau of Meteorology

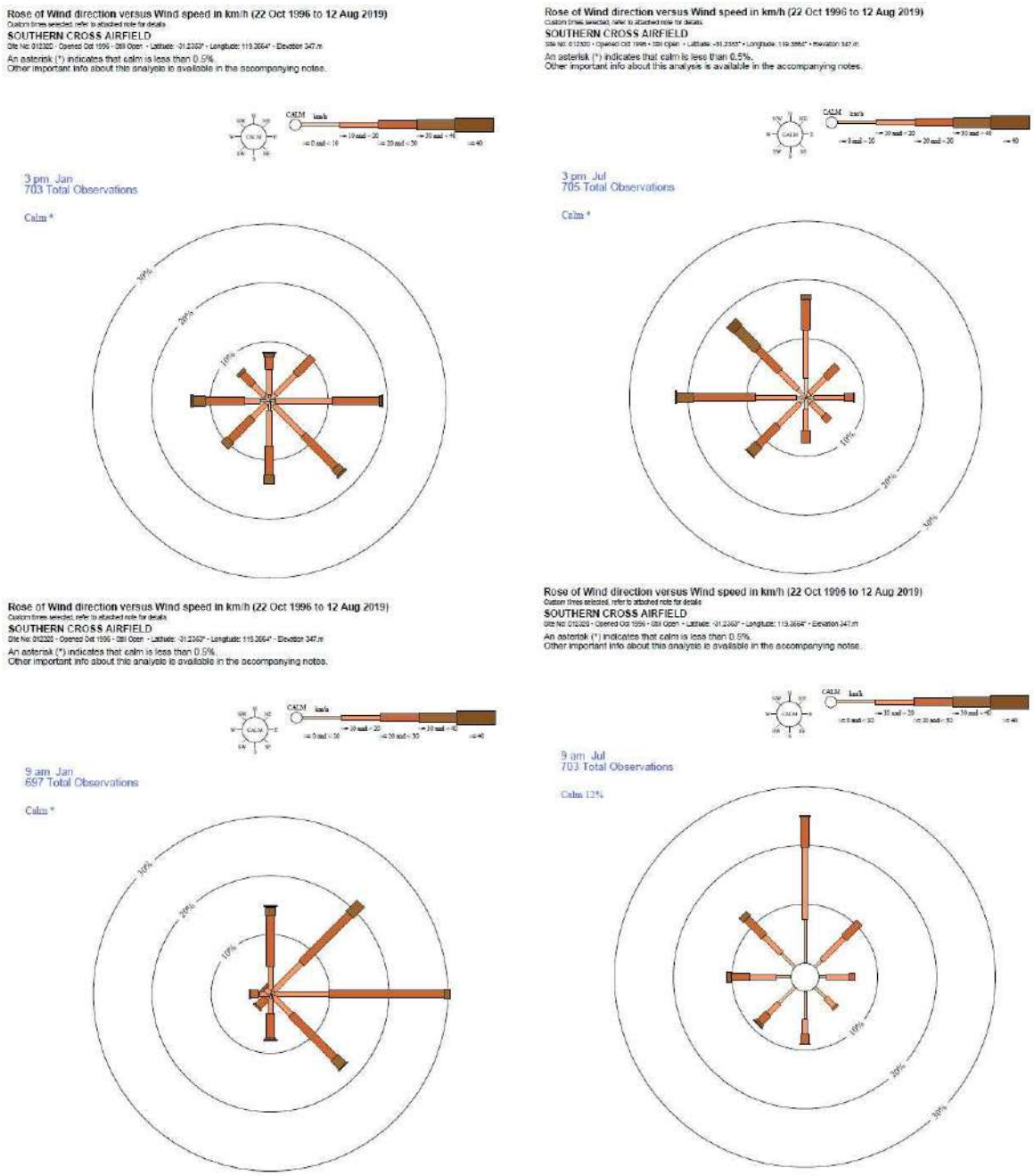

Figure 11 – Southern Cross Airfield wind roses

Source: Bureau of Meteorology

As detailed in the Sandy Ridge Facility Public Environment Review, the Applicant has established an automatic weather station within the proposed development area. Data collected includes wind speed and direction at 10 m, relative humidity and air temperature at 2 m, as well as precipitation. Data provided with the PER indicates annual and seasonal wind roses for wind data collected from the AWS between 7 May 2015 and 4 April 2016.The wind roses indicate that over the course of the year, winds were predominantly observed from the east/north-east to south-easterly directions. The majority of wind speeds experienced at the development envelope generally ranged from 3.6 km/h to 28 km/h (frequency of 78% combined) with the highest wind speeds (>37.5 km/h) occurring from a west and west-north-westerly direction.

7.8.2 Rainfall and temperature

Mean annual rainfall data for the Southern Cross Airfield weather station is 306 mm (1996 to 2019). Mean annual rainfall data for the Menzies weather station is 254 mm (1897 to 2014). With the Sandy Ridge PER, rainfall data for the onsite automatic weather station indicates 304.2 mm of rainfall from May 2015 to April 2016, with the highest fall recorded in January, and the next highest falls in February, March and August. This is consistent with long-term trends from the Menzies and Southern Cross Airport weather station. Less than 1 mm of rain was recorded in May and September.

During the 2015-16 recording period, more rainfall occurred in the summer months (132.2 mm) than the winter months (76.2 mm). Maximum daily rainfall of 53.8 mm was observed during the summer, with the average rainfall during the summer months being the highest of all seasons. Lowest maximum and daily average rainfall was observed during the spring months at the proposal site.

Air temperatures measured at the proposed site between 7 May 2015 and 4 April 2016 varied between a minimum of 0.4 °C and a maximum of 42.1 °C. The average temperature measured over the monitoring period was 19.0 °C. This compares to annual average maximum air temperatures between 18 °C and 35 °C and annual average minimum air temperatures between 3°C and 18°C for the Southern Cross Airfield weather station (1996 to 2019 dataset).

Rainfall and air temperature data for the Southern Cross Airfield weather station is shown in Figure 12.

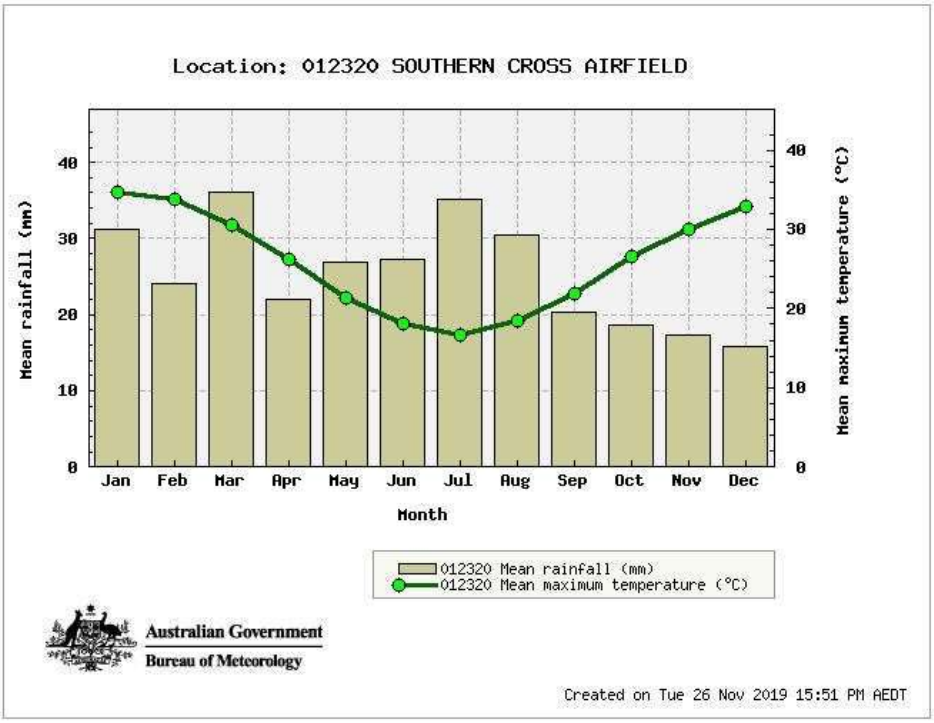

Figure 12 – Southern Cross Airfield rainfall and mean maximum air temperature data

Source: Bureau of Meteorology

8. Consultation

The Applicant advises that extensive public consultation has been conducted for the Sandy Ridge Facility. This consultation included local, state and federal government agencies, native title groups, non-government organisations, local and regional industries and development boards, as well as local, regional, state and national public consultation.

Consultation included cultural heritage community engagement, local community engagement, public consultation for the draft the project Environmental Scoping Document (ESD) and consultation through the Pubic Environment Review (PER) (as part of the Part IV Ministerial approval). The main topics raised during these consultation periods were related to approvals, sponsorship opportunities, land tenure, waste management and closure.

The Applicant also advises stakeholder consultation with the Department of Health, the Department of Mines, Industry Regulation and Safety and the Department of Planning, Lands and Heritage during the development of the ESD and PER for the proposed facility.

No comments were received to DWER during public advertising for new works approval applications (for W6243/2019/1, W6305/2018 or this application) and to date no public comment or appeals have been lodged for granted works approvals W6243/2019/1 and W6305/2019/1.

Table 11 provides a summary of the consultation undertaken as part of this works approval assessment.

Table 11: Summary of consultation

Consultation	Comments received	DWER response
Application advertised on DWER website (28/10/2019)	No comments received	N/A
Application advertised in the West Australian (04/11/2019)	No comments received	N/A
Local Government Authority (Shire of Coolgardie) advised of proposal on 04/11/2019	No comments received	N/A
Local Government Authority (Shire of Yilgarn) advised of proposal on 04/11/2019	No comments received	N/A
Department of Planning, Lands and Heritage advised of proposal on 04/11/2019	Response received 12/11/2019 advising no approvals are required under the *Aboriginal Heritage Act 1972*, and that the Applicant should refer to the State's Aboriginal heritage Due Diligence Guidelines.	Noted
Department of Mines, Industry Regulation and Safety advised of proposal on 04/11/2019	Response received 08/11/2019 advising that: • DMIRS assessed a mining proposal from Tellus for the extraction of clay material at the Sandy Ridge Facility which was approved 04 June 2019; and • While DMIRS only assessed the clay mining operation, it is noted that the post-mining land-use for the clay pits is to act as waste cells for the deposition of Class IV and Class V waste.	Noted

Consultation	Comments received	DWER response
Department of Mines, Industry Regulation and Safety – Critical Risks and Dangerous Goods advised of proposal on 04/11/2019	Response received 26/11/2019 advising that: • Sandy Ridge currently has a valid dangerous good licence (DGS022452); • To be granted a licence, specific criteria are required to be met in relation to planning the construction of appropriate storage facilities for dangerous goods; and • The design drawings provided are consistent with suitable packaged dangerous goods storage. • There is conflicting information in relation to the separation distance between freight container stacks documented in the application and the drawings reviewed a part of application W6308/2019/01. The application details separation should be at least 15 m and the technical drawings indicate separation of only 5 m. • From the information provided it is difficult to ascertain the total quantity of dangerous goods likely to be stored in each freight container and as such, the appropriate separation distance required between the freight container stacks e.g. segregation required between incompatibles • Further to this, consideration should be given to the packaging criteria for receipt of dangerous goods. Dangerous goods should be received in approved UN packaging as per the most current edition of the Australian Dangerous Goods Code.	Noted
Radiological Council advised of proposal 04/11/2019	Response received 20/11/2019 advising that: • Activities proposed to be undertaken on the premises require registration for the temporary surface storage of low level radioactive waste; • This registration has now been approved, with a condition applied limiting the site to surface storage in accordance with the company's Radiation Management Plan; and • The Applicant has been advised that prior to the commencement of any additional stages of the operation beyond surface storage, further approvals and authorisation will be required from the Council.	Noted
EPA Services advised of proposal 26/11/2019	Advice requested of EPA Services seeking confirmation that the proposed facility is consistent with the assessment and approval undertaken for MS1078. Response received 19 December 2019 and 16 January 2020 that the proposed works are not inconsistent with that assessed under MS1078.	Noted
Applicant referred draft documents 24/01/2020	Refer to Appendix 3	Refer to Appendix 3

9. Risk assessment

9.1 Determination of emission, pathway and receptor

In undertaking its risk assessment, DWER will identify all potential emissions pathways and potential receptors to establish whether there is a Risk Event which requires detailed risk assessment.

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. Where there is no actual or likely pathway and/or no receptor, the emission will be screened out and will not be considered as a Risk Event. In addition, where an emission has an actual or likely pathway and a receptor which may be adversely impacted, but that emission is regulated through other mechanisms such as Part IV of the EP Act, that emission will not be risk assessed further and will be screened out through Table 12 and Table 13.

The identification of the sources, pathways and receptors to determine Risk Events are set out in Tables 11 and 12 below.

Table 12: Identification of emissions, pathway and receptors during construction

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Construction of infrastructure and positioning of equipment Movement of vehicles	Plant and Equipment movements including reversing alarms Earthworks Placement of machinery, equipment and infrastructure	Noise and vibration	Temporary workers of Mount Walton IWDF 5 km away.	Air / wind dispersion	Impacts to health and amenity	No	The movement of plant and equipment during construction works is not expected to generate significant noise emissions. The nearest sensitive receptor is a significant distance away. The Delegated Officer considers it unlikely a Risk Event for noise emissions will occur given the minimum distance of 5 km between the Premises boundary and these receptors. As such, the Delegated Officer does not consider the risk to be significant enough to warrant further assessment and that the Applicant's proposed construction plan is likely to address any fugitive emissions.

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**		
Construction of infrastructure and positioning of equipment Movement of vehicles	Plant and Equipment movements on unsealed access roads and unsealed ground Earthworks Placement of machinery, equipment and infrastructure	Dust	Temporary workers of Mount Walton IWDF 5 km away	Air / wind dispersion	Impacts to health and amenity	No	The movement of plant and equipment during construction works is not expected to generate significant dust emissions. The nearest sensitive receptor is a significant distance away. The Delegated Officer considers it unlikely a Risk Event for dust emissions will occur given the minimum distance of 5 km between the Premises boundary and these receptors. As such, the Delegated Officer does not consider the risk to be significant enough to warrant further assessment and that the Applicant's proposed construction plan is likely to address any fugitive emissions..
			Surrounding ecosystems, native vegetation communities	Air / wind dispersion	Potential suppression of photosynthetic and respiratory functions	No	The Delegated Officer notes that the management of construction impacts from land clearing and adjacent vegetation communities is managed under requirements of the Part IV Ministerial Statement (MS1078) and does not require further assessment under Part V of the EP Act.

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
	Clearing of native vegetation	Unauthorised vegetation clearing	Native vegetation	Clearing vegetation	Reduced biodiversity	No	The Delegated Officer notes that the management of construction impacts from land clearing and adjacent vegetation communities is managed under requirements of the Part IV Ministerial Statement (MS1078) and does require further assessment under Part V of the EP Act.
Fuel storage and chemical use	Fuel and other chemicals and liquids stored and used onsite for use during construction activities	Hydrocarbon and contaminated liquid spills and seepage	Non-perennial surface water bodies within and adjacent to premises	Direct discharge to land and waters	Contamination of waters or deterioration of local/regional surface water ecosystems	No	The Applicant proposes that fuel used during construction will be stored and managed in accordance with the Dangerous Goods Safety (Storage and Handling of Non explosives) Regulations 2007 and Australian Standard 1940-:2017 - The storage and handling of flammable and combustible liquids. The Delegated Officer considers that with the short term storage of relatively small quantities of fuels during construction, hydrocarbons and other liquid spill impacts during construction activities can be sufficiently managed and do not require a detailed risk assessment. Discharges of hydrocarbons and other chemicals may also be subject to the provisions of the *Environmental Protection (Unauthorised Discharges) Regulations 2004*
		Breach of containment causing discharge to land	Surrounding ecosystems, native vegetation communities and fauna.	Direct discharge	Soil contamination causing impacts to vegetation growth and fauna health		

Table 13: Identification of emissions, pathway and receptors during operation

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Waste acceptance and handling	Acceptance and handling of Class IV and Class V wastes onto the premises for temporary storage prior to permanent isolation/disposal	Dust	Temporary workers of Mount Walton IWDF 5 km away.	Air / wind dispersion	Impacts to health and amenity	No	The movement of plant and equipment during operations is not expected to generate significant dust emissions. The nearest sensitive receptor is a significant distance away and waste unloading areas are paved. The Delegated Officer considers it unlikely a Risk Event for dust emissions will occur given the minimum distance of 5 km between the Premises boundary and these receptors. As such, the Delegated Officer does not consider the risk to be significant enough to warrant further assessment and that the Applicant's proposed operational infrastructure is likely to control any fugitive emissions.
		Noise/ vibration	Temporary workers of Mount Walton IWDF 5 km away.	Air / wind dispersion	Impacts to health and amenity	No	The movement of plant and equipment during operation is not expected to generate significant noise or vibration emissions. The nearest sensitive receptor is a significant distance away. The Delegated Officer considers it unlikely a Risk Event for noise emissions will occur given the minimum distance of 5 km between the Premises boundary and these receptors. As such, the Delegated Officer does not consider the risk to be significant enough to warrant further assessment and that the Applicant's proposed operational infrastructure is likely to control any fugitive emissions.

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
		Breach of containment of waste containers	Surrounding ecosystems, native vegetation communities and fauna.	Direct discharge to land	Soil contamination causing impacts to vegetation growth and fauna health	Yes	Refer to section 9.4
Waste acceptance and handling	Acceptance and handling of Class IV and Class V wastes onto the premises for temporary storage prior to permanent isolation/disposal	Odour	Temporary workers of Mount Walton IWDF 5 km away.	Air / wind dispersion	Impacts to health and amenity	No	Wastes accepted onto the premises are not expected to generate significant odour emissions. The nearest sensitive receptor is a significant distance away. The Applicant advises that the majority of wastes accepted onto the premises are contained within sealed containers. The Delegated Officer considers it unlikely a Risk Event for odour emissions will occur given the minimum distance of 5 km between the Premises boundary and these receptors. As such, the Delegated Officer does not consider the risk to be significant enough to warrant further assessment and that the Applicant's proposed operational infrastructure is likely to control any fugitive emissions.
		Radiation	Temporary workers of Mount Walton IWDF 5 km away. Surrounding ecosystems, native vegetation communities and fauna.	Air / wind dispersion Direct discharge	Impacts to health and amenity Soil contamination causing impacts to vegetation growth and fauna health	Yes	Refer to Section 9.6
Waste storage	Temporary surface storage of wastes within dedicated storage yards (mixed store/east yard/low level	Wastewater (contaminated stormwater) discharging from waste storage yards	Surrounding ecosystems, native vegetation communities and fauna	Direct discharge to land	Soil contamination causing impacts to vegetation growth and fauna health	Yes	Refer to section 9.7

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
	radiation waste storage yard) pending processing or disposal		Non-perennial surface water bodies within and adjacent to premises	Direct discharge to land and waters	Contamination of waters or deterioration of local/regional surface water ecosystems		
Waste storage	Temporary surface storage of wastes within dedicated storage yards (mixed store/east yard/low level radiation waste storage yard) pending processing or disposal	Wastewater (contaminated stormwater) overtopping stormwater ponds	Surrounding ecosystems, native vegetation communities and fauna.	Direct discharge to land	Soil contamination causing impacts to vegetation growth and fauna health	Yes	Refer to section 9.8
			Non-perennial surface water bodies within and adjacent to premises	Direct discharge to land and waters	Contamination of waters or deterioration of local/regional surface water ecosystems		
		Odour	Temporary workers of Mount Walton IWDF 5 km away.	Air / wind dispersion	Impacts to health and amenity	No	Waste accepted onto the premises are not expected to generate significant odour emissions. The nearest sensitive receptor is a significant distance away. The Delegated Officer considers it unlikely a Risk Event for odour emissions will occur given the minimum distance of 5 km between the Premises boundary and these receptors. As such, the Delegated Officer does not consider the risk to be significant enough to warrant further assessment and that the Applicant's proposed operational infrastructure is likely to control any fugitive emissions..

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
		Breach of containment of waste containers	Surrounding ecosystems, native vegetation communities and fauna.	Direct discharge to land	Soil contamination causing impacts to vegetation growth and fauna health	Yes	Refer to section 9.4
Waste storage	Temporary surface storage of wastes within dedicated storage yards (mixed store/east yard/low level radiation waste storage yard) pending processing or disposal	Breach of containment of liquid waste containers containing PFAS	Surrounding ecosystems, native vegetation communities and fauna.	Direct discharge to land	Soil contamination causing impacts to vegetation growth and fauna health	Yes	Refer to section 9.5
		Windblown Waste	Surrounding ecosystems and fauna.	Air / wind dispersion	Impacts to wildlife and causing detriment to the conservation values	No	Waste accepted onto the premises are not expected to generate windblown waste emissions. The Applicant advises that the majority of wastes accepted onto the premises are contained within sealed containers. The Delegated Officer notes that the management of impacts to fauna is managed under requirements of the Part IV Ministerial Statement (MS1078) and does not require further assessment under Part V of the EP Act.

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
		Radiation	Temporary workers of Mount Walton IWDF 5 km away. Surrounding ecosystems, native vegetation communities and fauna.	Air / wind dispersion Direct discharge	Impacts to health and amenity Soil contamination causing impacts to vegetation growth and fauna health	Yes	Refer to Section 9.6
		Explosion/fire Smoke	Temporary workers of Mount Walton IWDF 5 km away.	Air / wind dispersion	Impacts to health and amenity	Yes	Refer to Section 9.9
Waste inspection and unloading from transport containers	Unloading hazardous wastes from transport packaging, inspection, consolidation and transfer to WIP or permanent isolation (low level rad. warehouse, non-rad. waste inspection warehouse.	Breach of containment causing discharge to land	Surrounding ecosystems, native vegetation communities and fauna.	Direct discharge to land	Soil contamination causing impacts to vegetation growth and fauna health	Yes	Refer to section 9.4
		Wastewater (contaminated stormwater)	Surrounding ecosystems, native vegetation communities and fauna.	Direct discharge to land and waters	Soil contamination causing impacts to vegetation growth and fauna health	Yes	Refer to section 9.7

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
			Non-perennial surface water bodies within and adjacent to premises	Direct discharge	Contamination of waters or deterioration of local/regional surface water ecosystems	Yes	Refer to section 9.7
		Radiation	Temporary workers of Mount Walton IWDF 5 km away. Surrounding ecosystems, native vegetation communities and fauna.	Air / wind dispersion Direct discharge	Impacts to health and amenity Soil contamination causing impacts to vegetation growth and fauna health	Yes	Refer to Section 9.6
Waste inspection and unloading from transport containers	Unloading hazardous wastes from transport packaging, inspection, consolidation and transfer to WIP or permanent isolation (low level rad. warehouse, non-rad. waste inspection warehouse.	Explosion/fire Smoke	Temporary workers of Mount Walton IWDF 5 km away.	Air / wind dispersion	Impacts to health and amenity	Yes	Refer to Section 9.9
		Odour	Temporary workers of Mount Walton IWDF 5 km away.	Air / wind dispersion	Impacts to health and amenity	No	Waste accepted onto the premises are not expected to generate significant odour emissions. The nearest sensitive receptor is a significant distance away. The Delegated Officer considers it unlikely a Risk Event for odour emissions will occur given the minimum distance of 5 km between the Premises boundary and these receptors. As such, the Delegated Officer does not consider the risk to be significant enough to warrant further assessment.

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Waste Processing	Treatment, solidification and encapsulation of wastes within the Waste Immobilisation Plant	Dust	Temporary workers of Mount Walton IWDF 5 km away.	Air / wind dispersion	Impacts to health and amenity	No	The operation of the waste immobilisation plant is not expected to generate significant dust emissions. The nearest sensitive receptor is a significant distance away. The Applicant has proposed dust emissions controls that include dust suppression for kaolin stockpiles, cement silo dust filtration, covered conveyors and enclosed planetary mixer. The Delegated Officer considers it unlikely a Risk Event for dust emissions will occur given the minimum distance of 5 km between the Premises boundary and these receptors. As such, the Delegated Officer does not consider the risk to be significant enough to warrant further assessment.
Waste Processing	Treatment, solidification and encapsulation of wastes within the Waste Immobilisation Plant	Odour	Temporary workers of Mount Walton IWDF 5 km away.	Air / wind dispersion	Impacts to health and amenity	No	Wastes processed within the waste immobilisation plant is not expected to generate significant odour or noise emissions. The nearest sensitive receptor is a significant distance away. The Delegated Officer considers it unlikely a Risk Event for odour or noise emissions will occur given the minimum distance of 5 km between the Premises boundary and these receptors. As such, the Delegated Officer does not consider the risk to be significant enough to warrant further assessment.
		Noise					

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**		
Waste Processing	Treatment, solidification and encapsulation of wastes within the Waste Immobilisation Plant	Breach of containment causing discharge to land of hazardous wastes	Surrounding ecosystems, native vegetation communities and fauna.	Direct discharge to land	Soil contamination causing impacts to vegetation growth and fauna health	Yes	Refer to section 9.4
		Wastewater (contaminated stormwater)		Direct discharge to land and waters		Yes	Refer to section 9.7
		Wastewater (contaminated stormwater) overtopping stormwater ponds		Direct discharge to land and waters		Yes	Refer to section 9.8
		Leachate from encapsulated/ solidified wastes		Direct discharge		Yes	Refer to section 9.10
Permanent Isolation of wastes within waste cells	Placement of solid and encapsulated Class IV and Class V wastes within geological repository waste cells	Wastewater (contaminated stormwater)	Surrounding ecosystems, native vegetation communities and fauna.	Direct discharge to land and waters	Soil contamination causing impacts to vegetation growth and fauna health	No	The Delegated Officer notes that aspects of premises operations that relate to the permanent isolation or disposal of wastes is managed under requirements of the Part IV Ministerial Statement (MS1078) and does not require further assessment under Part V of the EP Act.
			Non-perennial surface water bodies within and adjacent to premises		Contamination of waters or deterioration of local/regional surface water ecosystems		

9.2 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 14 below.

Table 14: 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 15 below.

Table 15: 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**: mid-level or frequent 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.

9.3 Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment Table 16 below:

Table 16: 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.

9.4 Risk Assessment – Breach of Waste Containment (other than PFAS containing wastes)

Description of risk event for a breach of waste containment during operations

Class IV and Class V solid and liquid wastes accepted onto the premises, and handled via plant and equipment during internal transfer, storage and processing have the potential to breach containment. This containment can include the primary and secondary waste storage containers (used for transport and temporary onsite storage as well as surface waste containment infrastructure. Breaches of containment can occur during the physical movement of waste packages within the premises or during storage (e.g. rupture, piercing, dropping, accidental contact with plant/machinery). During operations, wastes have the potential to breach containment during:

- Waste acceptance and unloading from delivery vehicles, including damage during transportation;
- Movement of waste containers within the facility;
- Storage of waste containers within storage yards and compounds;
- Waste inspection and unloading from shipping containers; and
- Transfers, consolidation and immobilisation of wastes within infrastructure area of the proposed Facility.

Wastes that breach containment (source) have the potential to be discharged to land, surface water or groundwater via direct discharge, vertical seepage, leaching or lateral overland flow (pathway) to the surrounding soil, vegetation communities adjacent to the infrastructure area and non-perennial water bodies within and nearby the proposed premises boundary (receptors).

The release of hazardous and toxic solid and liquid wastes has the potential to lead to negative impacts to soil quality, vegetation health, fauna habitat and surface water quality (adverse impact).

Breach of waste containment for liquid wastes containing PFAS materials are considered in section 9.5.

Criteria for assessment

Relevant land and surface water quality criteria include:

- National Environment Protection (Assessment of Site Contamination) Measure 1999; and
- ANZECC & ARMCANZ (2000) – freshwater criteria.

Terrestrial ecosystem function and health observations may also indicate absence or presence of environmental impact.

Applicant controls

This assessment has reviewed the controls set out below.

- Solid and liquid wastes transported to the premises within primary packaging (e.g. drums), within secondary shipping containers;
- Shipping containers inspected for structural integrity prior to acceptance onsite;
- Storage containers and secondary containment materials impermeable to the substance being stored and will not react with the substance being stored;
- Liquid waste shipping containers are self bunded, with bund capacity 110% of largest IBC/drum within the shipping container;
- Waste inspection and auditing (at receival) to assess for damage/leaks;
- Liquid wastes and sludges to be stored within the Mixed Store waste storage area, constructed of engineered concrete paving;
- Engineered concrete paving selected for durability, expected freight and machinery loading, as well as repair, replacement and serviceability considerations in the event of future damage or spill recovery;
- Low level radioactive wastes to be stored within the low level radioactive waste storage yard, constructed of engineered concrete paving;
- Only dry and bulk solid wastes packages stored within the East Yard waste storage area, constructed of compacted select fill;
- No opening of waste packages outside the waste inspection warehouses;
- Flammable materials stored within bunded, engineered paving storage area;
- Waste inspection bays (for non-radioactive and low level radioactive wastes) are covered to prevent rainfall ingress, constructed of concrete and bunded;
- Waste immobilisation plant contained within concrete bunded area, with planetary mixer enclosed;
- Waste immobilisation plant fitted within emergency stops;
- Implementation of Emergency Response Management Plans and Procedures;
- Daily inspections of waste storage areas;
- Permeability testing indicates that any inadvertent discharge of solid waste to ground will sit on top of the surface before being removed and placed into a sealed container.

Liquid waste expected to move slowly through the soil lay (at an expected rate of less than 0.35 m/day); and

- Spill response and recovery equipment located on site (spill kits containing absorbent material appropriate to the type of substance being used on-site, earth moving machinery, trained response personnel) to ensure spills to ground are contained and removed.

Key findings

The Delegated Officer has reviewed the information regarding a breach of waste containment and has found:

1. Applicant proposed controls include the acceptance and storage of hazardous wastes within secondary containment and bunding where necessary will likely reduce the likelihood of breaches of containment and spills of hazardous wastes discharging to the environment.
2. In the event of a breach, the underlying soil and geological profile, Applicant proposed engineered pavement and concrete will provide a sufficient barrier to limit vertical seepage for liquid wastes (other than PFAS contaminated wastes) until waste clean-up measures are implemented.
3. In the event of a breach, the underlying soil and geological profile, Applicant proposed compacted hardstand engineered pavement and concrete will provide a sufficient barrier to limit vertical seepage for solid wastes until waste clean-up measures are implemented.

Consequence

Taking into consideration the Applicant's proposed controls, should a breach of waste containment occur, the Delegated Officer has determined that the impacts to soil quality, vegetation health, fauna habitat and surface water quality will be low level on a local scale. Therefore, the Delegated Officer considers the consequence of a breach of waste containment to be **Minor**.

Likelihood of Risk Event

Taking into consideration the distance to receptors and the Applicant's proposed controls, the Delegated Officer has determined that the likelihood of a breach of waste containment occurring will probably only not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood to be **Unlikely**.

Overall rating of a breach of waste containment

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 13) and determined that the overall rating for the risk of a breach of waste containment is **Medium**.

9.5 Risk Assessment – Breach of waste containment – Liquid wastes containing PFAS

Description of risk event for a breach of liquid waste containment during operations

Liquid wastes proposed to be accepted onto the premises include wastes that contain PFAS. These wastes, handled via plant and equipment during internal transfer, storage and processing

have the potential to breach containment. This containment can include the primary and secondary waste storage containers (used for transport and temporary onsite storage as well as surface waste containment infrastructure. Breaches of containment for liquid waste packages can occur during the physical movement of waste packages within the premises or during storage (e.g. rupture, piercing, dropping, accidental contact with plant/machinery). During operations, wastes have the potential to breach containment during:

- Waste acceptance and unloading from delivery vehicles;
- Movement of waste containers within the facility ;
- Storage of waste containers within storage yards and compounds;
- Waste inspection and unloading from shipping containers; and
- Transfers, consolidation and immobilisation of wastes within infrastructure area of the proposed Facility.

Liquid wastes containing PFAS materials that breach containment (source) have the potential to be discharged via direct discharge, vertical seepage, leaching or lateral overland flow (pathway) to the surrounding soil, vegetation communities adjacent to the infrastructure area and non-perennial water bodies within and nearby the proposed premises boundary (receptors). The release of wastes containing PFAS has the potential to lead to negative impacts to soil quality, vegetation health, fauna habitat and surface water quality (adverse impact).

Criteria for assessment

Relevant land and surface water quality criteria include:

- National Environment Protection (Assessment of Site Contamination) Measure 1999;
- ANZECC & ARMCANZ (2000) – freshwater criteria; and
- PFAS National Environmental Management Plan.

Applicant controls

This assessment has reviewed the controls set out below.

- Liquid wastes stored within sealed drums within secondary, self-bunded sealed containers;
- Storage containers and secondary containment materials impermeable to the substance being stored and will not react with the substance being stored;
- Liquid waste storage container bund capacity 110% of largest IBC/drum;
- Waste inspection and auditing (at receival) to assess for damage/leaks;
- Liquid wastes and sludges to be stored within the Mixed Store waste storage area, with hardstand of constructed of concrete interlocking pavers and drainage to the HDPE lined yard capture pond;
- Waste inspection bays (for non-radioactive and low level radioactive wastes) are covered to prevent rainfall ingress, constructed of concrete and bunded;
- The non-radioactive and radioactive waste inspection warehouses are constructed with concrete hardstands and designed to contain any intermittent rainfall ingress and spills of wastes/materials within blind sumps; and
- Waste immobilisation plant contained within concrete hardstand and bunded area.

Key findings

The Delegated Officer has reviewed the information regarding containment of PFAS containing wastes and has found:

4. The Applicant has proposed that waste inspection and treatment will occur within the concrete bunded and lined waste inspection warehouse and the bunded waste immobilisation plant.
5. That proposed storage for waste containers containing PFAS materials meets the current minimum requirements of the PFAS NEMP version 1.0, in that the PFAS contaminated wastes are be stored within primary storage packages (drums/IBC's) inside bunded secondary storage containers.
6. That proposed storage for waste containers containing PFAS materials is not considered to meet the expected minimum storage requirement for temporary waste storage under the revised PFAS NEMP version 2.0, in that the PFAS contaminated wastes are be stored within self bunded containment vessels, covered, with lockable access, on impervious bunded hardstands.
7. That additional storage infrastructure (impervious bunded hardstand) is required for the future temporary storage of PFAS containing liquid wastes and is required to be considered as part of the infrastructure constructed as part of this application.

The Delegated Officer notes that Applicant provided further information and proposed additional infrastructure for the storage of PFAS contaminated wastes during the review of the draft works approval. Detail regarding this infrastructure is provided in Appendix 3.

Consequence

Taking into consideration the Applicant's proposed controls, should a breach of PFAS containing liquid waste occur, the Delegated Officer has determined that the impacts to soil quality, vegetation health, fauna habitat and surface water quality will be mid-level on a local scale. Therefore, the Delegated Officer considers the consequence of a breach of containment with PFAS containing liquid wastes to be **Moderate**.

Likelihood of Risk Event

Taking into consideration the distance to receptors and the Applicant's proposed controls in relation to the expected requirements of the PFAS NEMP version 2.0, the Delegated Officer has determined that the likelihood of a breach of containment with liquid waste containing PFAS could occur at some time. Therefore, the Delegated Officer considers the likelihood to be **Possible**.

Overall rating of a breach of liquid waste containment during operations

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 13) and determined that the overall rating for the risk of a breach of containment with PFAS containing liquid wastes is **Medium**.

9.6 Risk Assessment – Radiation wastes

Description of risk event for radiation wastes during operations

Wastes proposed to be accepted onto site include Class V intractable low level radioactive wastes and naturally occurring radioactive materials.

These wastes have the potential to breach containment (source) and have the potential to be

discharged via direct discharge, atmospheric dispersion, or leaching (pathway) to the surrounding soil, vegetation communities adjacent to the infrastructure area and human receptors located at the Mount Walton Intractable waste disposal facility (receptors).

The release of radioactive wastes has the potential to lead to negative impacts to soil quality, vegetation health, fauna habitat and human health (adverse impact).

It is noted that potential adverse impacts on human health and biodiversity associated with radiation exposure for the Facility are also assessed by the WA Radiation Health Unit and Radiological Council under the RS Act. The Applicant has been granted a site registration for the temporary storage of low level radiation wastes, however the Delegated Officer notes that further approval is required under the RS Act for ongoing radioactive waste acceptance, storage, treatment and disposal.

Criteria for assessment

Relevant land and surface water quality criteria include:

- National Environment Protection (Assessment of Site Contamination) Measure 1999.

Terrestrial ecosystem function and health observations may also indicate absence or presence of environmental impact.

It is noted that the RS Act has additional requirements for storage and handling of radiative wastes and other criteria may be relevant for the purposed of regulation under the associated approvals (Section 6.3.3).

Applicant controls

This assessment has reviewed the controls set out below.

- Solid waste transported to the premises within primary packaging (e.g. drums), within secondary shipping containers;
- Radiation detectors located at entry to premises to screen all incoming waste packages to assess waste containment integrity and waste composition;
- Radiation wastes stored in locked, secure containers with tamper proof seals;
- Waste inspection bay (for low level radioactive wastes) is covered to prevent rainfall ingress, constructed of concrete and bunded;
- Applicant developed Waste Acceptance Procedures and Waste Acceptance Criteria
- Applicant developed Radiation Management Plan, Operational Safety Case and standard operating procedures;
- Continuous monitoring of personnel on-site;
- Emergency response plans and procedures;
- Low level radioactive wastes stored within an access controlled storage yard; and
- Daily waste storage inspections.

Key findings

The Delegated Officer has reviewed the information regarding radioactive waste storage and treatment and has found:

8. The acceptance, storage, treatment and disposal of radioactive wastes is regulated under the both the EP Act and RS Act;
9. The operational risk assessment under Part V of the EP Act, including regulatory controls for emissions and discharges of radiation is informed by the assessment and approval under RS Act and further approval under the RS Act is required for the ongoing acceptance, storage, treatment and disposal of radioactive wastes;
10. The assessment of operational risk associated with the disposal of low level radioactive waste will be conducted during the licence risk assessment for premises activities.
11. Based on the existing RS Act site registration, infrastructure proposed to be constructed for the storage of radioactive wastes is considered suitable for purposes of surface waste storage only.
12. Acceptance of low level radioactive waste, in addition to that approved under the current RS Act site registration (and works approval W6305/2019/1) will not be permitted until the additional RS Act approval is registered for the premises.
13. Should the RS Act approval require alteration to the proposed infrastructure included within the works approval assessment that an amendment to the works approval will be sought by the Applicant.

Consequence

To be determined during licence assessment.

Likelihood of Risk Event

To be determined during licence assessment.

Overall rating for risks associated with emissions of low level radioactive waste

To be determined during licence assessment.

9.7 Risk Assessment – Contaminated Stormwater (storage yards)

Description of risk event for discharges of contaminated stormwater during operations

Stormwater flows within the surface storage areas of Class IV and Class V wastes have the potential to become contaminated. Contaminants, from previously spilled wastes within storage areas, or from the external surfaces of waste storage containers may contaminate stormwater falling directly within the storage area or from surface flows.

Contaminated stormwater (source) have the potential to be discharged via lateral overland flow (pathway) to the surrounding soil, vegetation communities adjacent to the infrastructure area and non-perennial water bodies within and nearby the proposed premises boundary (receptors).

This contaminated stormwater, potentially containing hazardous, toxic and radioactive wastes has the potential to lead to negative impacts to soil quality, vegetation health, fauna habitat and surface water quality (adverse impact).

Criteria for assessment

Relevant land and surface water quality criteria include:

- National Environment Protection (Assessment of Site Contamination) Measure 1999; and
- ANZECC & ARMCANZ (2000) – freshwater criteria

Terrestrial ecosystem function and health observations may also indicate absence or presence of environmental impact.

Applicant controls

This assessment has reviewed the controls set out below.

- Solid and liquid wastes transported to the premises within primary packaging (e.g. drums), within secondary shipping containers;
- Shipping containers inspected for structural integrity prior to acceptance onsite;
- Storage containers and secondary containment materials impermeable to the substance being stored and will not react with the substance being stored;
- A flood levee is installed on the upslope side of the infrastructure area to prevent surface flows entering the infrastructure area;
- Waste inspection bays (for non-radioactive and low level radioactive wastes) are covered to prevent rainfall ingress, constructed of concrete and bunded;
- The mixed store waste storage area hardstand is constructed of concrete interlocking pavers and drains to the HDPE lined yard capture pond;
- The east yard waste storage area drains to the earthen lined stormwater sump on the north east of the infrastructure area;
- The flammable risk store hardstand is constructed of interlocking concrete paving and is contained within a 300 mm concrete bund;
- The non-radioactive and radioactive waste inspection warehouses are constructed with concrete hardstands and designed to contain any intermittent rainfall ingress and spills of wastes/materials within blind sumps;
- The radioactive wastes storage yard hardstand is constructed of interlocking concrete paving, designed to drain to blind sumps interconnected with the radioactive waste inspection warehouse;
- Waste immobilisation plant contained within concrete hardstand and bunded area;
- Stormwater collected within premises bunds and ponds will be tested for contaminants prior to re-use for dust suppression (uncontaminated), transferred for use within the waste immobilisation plant (contaminated) or re-used with the waste cells to assist backfilling and compaction activities;
- Daily inspections of waste storage areas to assess for leaks, spills or containment issues; and
- Spill response and recovery equipment is to be located on site (spill kits containing absorbent material appropriate to the type of substance being used on-site, earth moving machinery, trained response personnel) to ensure spills to ground are contained and removed.

Key findings

The Delegated Officer has reviewed the information regarding contaminated stormwater and has found:

14. The Applicant has proposed infrastructure and management controls that include the diversion of uncontaminated stormwater and the containment of potentially contaminated stormwater.
15. Proposed waste acceptance, storage and spill response practices are considered to minimise the potential for hazardous wastes and materials to contaminate stormwater.

Consequence

Taking into consideration the Applicant's proposed controls, should stormwater become contaminated, the Delegated Officer has determined that the impacts to soil quality, vegetation health, fauna habitat and surface water quality will be low level on a local scale. Therefore, the Delegated Officer considers the consequence of contaminated stormwater to be **Minor**.

Likelihood of Risk Event

Taking into consideration the distance to receptors and the Applicant's proposed controls, the Delegated Officer has determined that the likelihood of contaminated stormwater occurring will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood to be **Unlikely**.

Overall rating of discharges of contaminated stormwater during operations

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 13) and determined that the overall rating for the risk of discharges of contaminated stormwater is **Medium**.

9.8 Risk Assessment – Overtopping Stormwater Containment Infrastructure

Description of risk event for overtopping stormwater containment infrastructure during operations

As detailed within section 8.5, stormwater flows within the surface storage areas of the Facility have the potential to become contaminated. Contaminants, from previously spilled wastes within storage areas, or from the external surfaces of waste storage containers may contaminate stormwater falling directly within the storage area or from surface flows.

The Applicant has detailed that potentially contaminated stormwater is designed to be contained within bunded areas, or directed to blind sumps and storage ponds. During storm events, the overflow of potentially contaminated stormwater within storage ponds and sumps (source) has the potential to be discharged via lateral overland flow (pathway) to the surrounding soil, vegetation communities adjacent to the infrastructure area and non-perennial water bodies within and nearby the proposed premises boundary (receptors).

This potentially contaminated stormwater, containing hazardous, toxic and radioactive wastes has the potential to lead to negative impacts to soil quality, vegetation health, fauna habitat and surface water quality (adverse impact).

Criteria for assessment

Relevant land and surface water quality criteria include:

- National Environment Protection (Assessment of Site Contamination) Measure 1999; and
- ANZECC & ARMCANZ (2000) – freshwater criteria

Terrestrial ecosystem function and health observations may also indicate absence or presence of environmental impact.

Applicant controls

This assessment has reviewed the controls set out below.

- A flood levee is installed on the upslope side of the infrastructure area to prevent surface flows entering the infrastructure area;
- Waste inspection bays (for non-radioactive and low level radioactive wastes) are covered to prevent rainfall ingress, constructed of concrete and bunded;
- The mixed store waste storage area drains to the HDPE lined yard capture pond, designed to contain a 1:100 year 72 hour rainfall event (approved under W6243/2019/1);
- The yard capture pond is designed to overflow to the HDPE lined raw water pond;
- The east yard wastes storage area drains to the earthen lined stormwater sump on the north east of the infrastructure area, designed to contain a 1:100 year 72 hour rainfall event (from the East Yard catchment area);
- The flammable risk store is contained within a concrete bund, designed to contain a 1:100 year 72 hour rainfall event;
- The non-radioactive and radioactive waste inspection warehouses are designed to contain any intermittent rainfall ingress and spills of wastes/materials within blind sumps;
- The radioactive wastes storage yard is designed to drain to sumps interconnected with the radioactive waste inspection warehouse;
- Waste immobilisation plant contained within concrete bunded area designed to contain a 1:100 year, 72 hours rainfall event;
- Daily inspections of waste storage areas to assess for leaks, spills or containment issues; and
- Spill response and recovery equipment is to be located on site (spill kits containing absorbent material appropriate to the type of substance being used on-site, earth moving machinery, trained response personnel) to ensure spills to ground are contained and removed.

It is noted that the Applicant provided additional detail regarding the stormwater capacity of the low level radiation waste inspection warehouse and storage yard following the submission of the initial application. Within the additional detail provided, the Applicant confirmed additional infrastructure and management controls for this infrastructure in order to retain 1:100 year, 72 hours rainfall events. This additional infrastructure includes the installation of four 45 kL water storage tanks, used during storm events to contain stormwater collected within the low level radiation waste inspection warehouse and storage yard.

Collected stormwater, following contaminant testing is to be used onsite for dust suppression (uncontaminated stormwater), within the waste immobilisation plant (contaminated stormwater) or within the waste cells to condition kaolinised granite during compaction activities.

With the inclusion of these storage tanks, infrastructure associated with the low level radiation waste inspection warehouse and storage yard is sufficient to contain a 1:100 year, 72 hour rainfall event (calculations based on 1:100 year 72 hours rainfall event of 176 mm and required calculated capacity of 480.48m^3).

The design of the proposed infrastructure and controls for the management of stormwater and potentially contaminated stormwater have been reviewed and are generally considered to be acceptable for the purpose of the proposed operations.

It is noted that management controls will be considered further at the licensing stage to ensure infrastructure associated with stormwater containment are sufficient and aligned with any other approvals issued to satisfy other legislative requirements (e.g. RS Act and DG Act).

Key findings

The Delegated Officer has reviewed the information regarding overtopping stormwater containment infrastructure and has found:

16. That the climate conditions at the Premises will likely result in the stormwater containment infrastructure being empty during a period of each year (dry season).
17. Applicant proposed infrastructure and controls that include containment of potentially contaminated stormwater include the capacity to retain a 1:100 year, 72 hour rainfall event.
18. Proposed waste acceptance, storage and spill response practices are considered to minimise the potential for contaminants to be released or discharged to the environment.

Consequence

Taking into consideration the Applicant's proposed controls, should overtopping stormwater containment infrastructure occur, then the Delegated Officer has determined that the impacts to soil quality, vegetation health, fauna habitat and surface water quality will be low level on a local scale. Therefore, the Delegated Officer considers the consequence of a breach of stormwater containment to be **Minor**.

Likelihood of Risk Event

Taking into consideration the distance to receptors and the Applicant's proposed controls, the Delegated Officer has determined that the likelihood of overtopping stormwater containment infrastructure occurring will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood to be **Unlikely**.

Overall rating of overtopping stormwater containment infrastructure during operations

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 13) and determined that the overall rating for the risk of overtopping stormwater containment infrastructure is **Medium**.

9.9 Risk Assessment – Smoke emissions (in the event of fire)

Description of risk event for smoke emissions during operations

Normal operations are unlikely to cause fire and smoke emissions. Proposed storage of wastes at the Facility include hazardous and potentially flammable solid wastes provides a fuel source for a potential fire. There is also the potential for spontaneous combustion of wastes where

wastes are stored in close proximity or inappropriately.

In the event of an unplanned fire event, smoke (source) would be released into the air (pathway), this may cause amenity and public health impacts for human receptors. The inhalation of particulate matter can cause respiratory distress (adverse impact).

Criteria for assessment

There are no specific consequence criteria for smoke emissions. The general provisions of the EP Act make it an offence to cause or allow unreasonable emissions that unreasonably interfere with the health, welfare, convenience, comfort or amenity of any person. Additionally, section 50A of the EP Act makes it an offence for a person who causes, or allows to be caused, material environmental harm.

Applicant controls

This assessment has reviewed the controls set out below.

- Wastes stored within sealed drums within secondary, self bunded sealed containers;
- Wastes that are flammable, chemically unstable or corrosive (to storage containers) not accepted onto the premises;
- No incompatible mixing of wastes within shipping containers;
- Hazardous and chemical wastes to be stored and managed in accordance with the Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007 and Australian Standard 1940-:2017 - The storage and handling of flammable and combustible liquids;
- Emergency and spill response equipment; and
- Daily inspections.

Key findings

The Delegated Officer has reviewed the information regarding smoke emissions and has found:

19. Proposed waste acceptance, storage and spill response practices are considered to minimise the potential for hazardous wastes and materials to combust.
20. The Applicant has Dangerous Goods Licence #DGS022452 for the storage of hazardous, corrosive, toxic and flammable materials, as regulated by the Department of Mines, Industry Regulation and Safety.
21. Regulatory controls regarding surface waste acceptance, storage and treatment will be considered during the assessment for Licence for the Facility.

Consequence

Taking into consideration the Applicant's proposed controls, should smoke emissions occur in the event of a fire, the Delegated Officer has determined that the impacts to human receptors located at the Mount Walton Intractable waste disposal facility will be low-level on a local scale. Therefore, the Delegated Officer considers the consequence of smoke emissions to be **Minor**.

Likelihood of Risk Event

Taking into consideration the distance to receptors and the Applicant's proposed controls, the Delegated Officer has determined that the likelihood of smoke emissions in the event of a fire

impacting human receptors located at the Mount Walton Intractable waste disposal facility may only occur in exceptional circumstances. Therefore, the Delegated Officer considers the likelihood to be **Rare**.

Overall rating of smoke emissions

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 13) and determined that the overall rating for the risk of smoke emissions in the event of a fire is **Low**.

9.10 Risk Assessment – Leachate from waste immobilisation

Description of risk event for leachate emissions during operations

The seepage of leachate to the surrounding environment from liquid and sludge wastes treated in the waste immobilisation plant may occur during operations. Leachate emissions may occur as a result of excess moisture within immobilised waste or inappropriate treatment techniques.

During the operation of the waste immobilisation plant, leachate from treated wastes (source) may discharge directly (pathway) to the surrounding soil and the vegetation communities adjacent to the waste cells within the proposed premises boundary (receptors).

This leachate, potentially containing hazardous and toxic wastes has the potential to lead to negative impacts to soil quality and vegetation health.

Leachate may also contain heavy metals such as lead, nickel and copper, hydrocarbons and synthetic or organic compounds. As the Facility proposes to accept special wastes and solid wastes up to Class V criteria, any leachate generated may also include PFAS, organochlorine pesticides (OCPs), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and other compounds that may leach from Class IV and Class V waste types.

It is noted that leachate emissions to the terrestrial environment within the waste cells were considered and assessed under Part IV of the EP Act. Under MS1078, the Applicant is required to develop a leachate monitoring and management plan to minimise impacts to the terrestrial environment and soil quality. To avoid duplication, this assessment will only consider the risks associated with surface waste treatment as they relate to potential leachate generation.

Criteria for assessment

Relevant criteria include the:

- National Environment Protection (Assessment of Site Contamination) Measure 1999; and
- Landfill Waste Classification and Waste Definitions 1996 (as amended 2019)

Applicant/Licence Holder controls

This assessment has reviewed the controls set out below.

- Waste immobilisation plant contained within concrete hardstand and bunded area designed to contain a 1:100 year, 72 hours rainfall event;
- Concrete blind sumps to contain spills;
- The planetary mixer is an enclosed machine and installed within the concrete bund;
- Above ground piping that dispenses liquid/sludge waste from the WIP Waste Bund is under low pressure and located within a concrete bund. Concrete bunding has blind concrete sumps to contain spills;

- Waste immobilisation mix controller via a touch panel programmable logic controller interface;
- Waste dispensing pumps are to be fitted with emergency stop buttons;
- The planetary mixer is designed with an underside discharge point which will direct the spadeable mix directly into a sealed, half-height container;
- Waste containers to have closable lids; and
- The waste plant to be manned at all times when in operation.

It is noted that while the application has detailed liquid and sludge wastes are to be solidified, immobilised or encapsulated within the waste immobilisation plants, and proposed infrastructure within the waste immobilisation plant is considered sufficient for the containment of wastes during the treatment, the application has not provided sufficient information to determine specific controls that would be applied during operations to regulate the treatment of wastes. This includes information relating to the strategies and methodologies for immobilising differing waste types and contaminant concentrations and conformational testing of immobilised wastes. This additional information is required to be submitted at the licence application stage to demonstrate specific waste immobilisation/encapsulation techniques for the various types and classes of waste to be treated through the waste immobilisation plant and disposed to the waste cells.

Additional regulatory controls will be considered as part of the Licence assessment regarding specific waste treatment methods.

Key findings

The Delegated Officer has reviewed the information regarding leachate emissions from the waste immobilisation process and has found:

22. Waste cell containment infrastructure was subject to assessment and approval under MS1078
23. That the while the proposed waste immobilisation plant includes infrastructure considered sufficient for waste containment (during treatment), further detailed information is required during the assessment for Licence regarding specific liquid and sludge waste treatment and immobilisation methods
24. Regulatory controls regarding waste treatment immobilisation methods will be considered during the assessment for Licence for the Facility.
25. Regulatory controls regarding the permanent isolation or disposal of Class IV and Class V waste will be considered during the assessment for Licence for the Facility.

Consequence

To be determined during licence assessment.

Likelihood of Risk Event

To be determined during licence assessment.

Overall rating of leachate emissions during operations

To be determined during licence assessment.

9.11 Summary of acceptability and treatment of Risk Events during operations

A summary of the risk assessment (during operations) and the acceptability or unacceptability of the risk events set out above, with the appropriate treatment and control, are set out in Table 17 below. Controls are described further in section 9.

Risk events associated with the construction of the proposed facility are considered acceptable (Section 9.1) based on the proposed applicant controls, construction methods and requirements of other approvals.

Table 17: Risk assessment summary

	Description of Risk Event			**Applicant controls**	**Risk rating**	**Acceptability with controls (conditions on instrument)**
	Emission	**Source**	**Pathway/ Receptor (Impact)**			
1.	Breach of waste containment	Acceptance, handling, storage, treatment of Class IV and Class V wastes	Direct discharge pathway to soil causing contamination. Impacts to surrounding ecosystems, vegetation growth and the health of fauna.	Solid and liquid wastes transported to the premises within primary packaging , within secondary shipping containers. Liquid waste storage container bund capacity 110% of largest IBC/drum. Waste inspection and auditing (at receival) to assess for damage/leaks. Wastes storage areas constructed with engineered paving or concrete hardstands. Implementation of Emergency Response Management Plans and Procedures. Daily inspections of waste storage areas. Spill response and recovery equipment located on site.	Minor consequence Unlikely likelihood **Medium Risk**	Acceptable subject to Applicant's proposed controls and outcomes based operational controls. The operating licence will include conditions to reinforce Applicant controls as well as standard conditions to monitor the effectiveness of operational controls.

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	**Source**	**Pathway/ Receptor (Impact)**			
2.	Radiation	Acceptance, handling, storage, treatment and disposal and Class V intractable low level radioactive wastes	Air / wind dispersion and direct discharge causing impacts to health and amenity Soil contamination causing impacts to vegetation growth and fauna health	Radiation detectors located at entry to premises to screen all incoming waste packages to assess waste containment integrity and waste composition. Radiation wastes stored in locked, secure containers with tamper proof seals. Applicant developed Waste Acceptance Procedures, Waste Acceptance Criteria, Radiation Management Plan, Operational Safety Case and standard operating procedures. On-site continuous monitoring of personnel. Emergency response plans and procedures.	Unable to be determined until site approval is granted under the Radiation Safety Act.	Acceptability of controls will be considered during assessment for licence. Acceptance of low level radioactive waste, in addition to that approved under the current RS Act site registration (and works approval W6305/2019/1) is not permitted until the additional RS Act approval is registered for the premises.

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	**Source**	**Pathway/ Receptor (Impact)**			
3.	Contaminated Stormwater (storage yards)	Class IV and Class V wastes stored in surface waste storage and treatment areas	Overland flow to surrounding ecosystems, native vegetation communities and non-perennial surface water bodies within and adjacent to premises, causing soil contamination impacts to vegetation growth, fauna health and the contamination of waters or deterioration of local/regional surface water ecosystems	Flood levee is installed on the upslope side of the infrastructure area. Waste inspection bays (for non-radioactive and low level radioactive wastes) are covered to prevent rainfall ingress, constructed of concrete and bunded. The mixed store waste storage area hardstand is constructed of concrete interlocking pavers and drains to the HDPE lined yard capture pond. The east yard wastes storage area drains to the earthen lined stormwater sump on the north east of the infrastructure area. The flammable risk store hardstand is constructed of interlocking concrete paving and is contained within a 300 mm concrete bund. The non-radioactive and radioactive waste inspection warehouses are constructed with concrete hardstands and designed to contain any intermittent rainfall ingress and spills of wastes/materials within blind sumps. The radioactive wastes storage yard hardstand is constructed of interlocking concrete paving, designed to drain to blind sumps interconnected with the radioactive waste inspection warehouse. Waste immobilisation plant contained within concrete hardstand and bunded area.	Minor consequence Unlikely likelihood **Medium Risk**	Acceptable subject to Applicant's proposed controls and outcomes based operational controls. The operating licence will include conditions to reinforce Applicant controls as well as standard conditions to monitor the effectiveness of operational controls.

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	**Source**	**Pathway/ Receptor (Impact)**			
4	Contaminated Stormwater (overtopping containment)	Stormwater ponds	Overland flow to s surrounding ecosystems, native vegetation communities and non-perennial surface water bodies within and adjacent to premises, causing soil contamination impacts to vegetation growth, fauna health and the contamination of waters or deterioration of local/regional surface water ecosystems	The mixed store waste storage area drains to the HDPE lined yard capture pond, designed to contain a 1:100 year 72 hour rainfall event (constructed under W6243/2019/1). The yard capture pond is designed to overflow to the HDPE lined raw water pond. The east yard wastes storage area drains to the earthen lined stormwater sump on the north east of the infrastructure area, designed to contain a 1:100 year 72 hour rainfall event (from the east yards catchment area). The flammable risk store is contained within a concrete bund, designed to contain a 1:100 year 72 hour rainfall event. The non-radioactive and radioactive waste inspection warehouses are designed to contain any intermittent rainfall ingress and spills of wastes/materials within blind sumps. The radioactive wastes storage yard is designed to drain to sumps interconnected with the radioactive waste inspection warehouse. Waste immobilisation plant contained within concrete bunded area designed to contain a 1:100 year, 72 hours rainfall event.	Minor consequence Unlikely likelihood **Medium Risk**	Acceptable subject to Applicant's proposed controls and outcomes based operational controls. The operating licence will include conditions to reinforce Applicant controls as well as standard conditions to monitor the effectiveness of operational controls.

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	**Source**	**Pathway/ Receptor (Impact)**			
5	Breach of containment (PFAS containing wastes)	Acceptance, handling, storage, treatment of Class IV and Class V PFAS wastes	Direct discharge pathway to soil causing contamination. Impacts to surrounding ecosystems, vegetation growth and the health of fauna.	Liquid wastes stored within sealed drums within secondary, self bunded sealed containers. Liquid waste storage container bund capacity 110% of largest IBC/drum. Waste inspection and auditing (at receival) to assess for damage/leaks. Liquid wastes and sludges to be stored within the Mixed Store waste storage area, with hardstand of constructed of concrete interlocking pavers and drainage to the HDPE lined yard capture pond.	Moderate consequence Possible likelihood **Medium Risk**	Acceptable subject to Applicant's proposed controls and outcomes based operational controls. The operating licence will include conditions to reinforce Applicant controls as well as standard conditions to monitor the effectiveness of operational controls. The operating licence will also include conditions that will require the management of PFAS containing waste in accordance with the PFAS NEMP version 2.0.
6	Smoke (in the event of fire)	Class IV and V wastes stored within surface waste storage and treatment areas	Air / wind dispersion causing impacts to health and amenity of temporary workers of Mount Walton IWDF 5 km away.	Wastes that are flammable, chemically unstable or corrosive (to storage containers) not accepted onto the premises. No incompatible mixing of wastes within shipping containers. Hazardous and chemical wastes to be stored and managed in accordance with the Dangerous Goods Safety (Storage and Handling of Non explosives) Regulations 2007 and Australian Standard 1940-:2017 - The storage and handling of flammable and combustible liquids. Emergency and spill response equipment.	Minor consequence Rare likelihood **Low Risk**	Acceptable subject to Applicant's proposed controls and outcomes based operational controls. The operating licence will include conditions to reinforce Applicant controls as well as standard conditions to monitor the effectiveness of operational controls.

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	**Source**	**Pathway/ Receptor (Impact)**			
7	Leachate	Wastes treated within the waste immobilisation plant	Seepage or direct discharge to surrounding ecosystems and native vegetation communities causing soil contamination causing impacts to vegetation growth and fauna health	Waste immobilisation plant contained within concrete hardstand and bunded area designed to contain a 1:100 year, 72 hours rainfall event. Concrete blind sumps to contain spills. The planetary mixer is an enclosed machine and installed within the concrete bund. Above ground piping that dispenses liquid/sludge waste from the WIP Waste Bund is under low pressure and located within a concrete bund. Concrete bunding has blind concrete sumps to contain spills. Waste immobilisation mix controller via a touch panel programmable logic controller interface. Waste dispensing pumps are to be fitted with emergency stop buttons. The planetary mixer is designed with an underside discharge point which will direct the spadeable mix directly into a sealed, half-height container.	Unable to be determined until licence application stage	Additional information is required to determine the risks associated with the Applicant's operation of the constructed liquid waste treatment facility.

10. Regulatory controls

10.1 Works Approval controls

- Condition 1 and Schedule 2 allows construction of the infrastructure as per Table 2 and Table 5 in the Works Approval.
- Condition 1 requires that the storage area for PFAS contaminated waste be constructed with impervious concrete hardstand and bunded to retain stormwater and potential spillages of PFAS wastes stored in the area.
- Condition 2 allows for minor deviations from the proposed construction.
- Condition 3 requires a construction compliance document to be submitted to the CEO, to confirm all infrastructure has been constructed as required by each stage of construction.
- Condition 5 relates to authorised emissions from the proposed works.
- Conditions 6 and 7 require accurate record keeping and outlines that a Works Approval Holder must comply with a Departmental Request within 14 days.

10.2 Aspects to be determined as of Licence assessment

The assessment has noted that in some cases the assessment of risk was based on limited information, or that further information would be required to assess operational risks in order to determine regulatory controls for assessment of the future Licence amendment application. While noted throughout the document a summary of additional information required to be provided with the Licence application is listed below:

- Specific detail on liquid and sludge waste treatment, processing and immobilisation/encapsulation strategies for differing waste types and contaminant concentrations, as well as conformational testing of immobilised wastes;
- Detailed waste treatment and disposal specifications for low level radioactive wastes and naturally occurring radioactive materials as approved under the RS Act;
- Confirmation and verification of the nature of intractable wastes to be accepted onto the premises (as per the Landfill Waste Classification and Waste Definitions) and evidence that no practical alternative destruction or treatment technology exists for the specific wastes proposed;
- Liquid PFAS waste management and storage; and
- Specific operational controls for the management of water re-use within the premises, including waste cells.

It is noted that this list is not exhaustive and that DWER may request additional information to be provided as part of that assessment.

The risk assessment has determined that additional controls will be applied to the Licence following construction of the proposed works in order to manage identified operational risks. These include but are not limited to:

- Operational conditions for waste acceptance, storage, processing and disposal/isolation;
- Stormwater and pond management conditions;
- Infrastructure maintenance conditions;

- Conditions detailing reportable events, reporting requirements and contingency procedure to be followed on the occasion of a reportable event;
    - Conditions detailing monitoring requirements (locations and parameters) for:
    - Ambient environmental monitoring;
    - Groundwater/seepage monitoring; and
    - Waste acceptance/rejection

11. 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
Infrastructure and Equipment 1 – 4	These conditions are valid, risk-based and contain appropriate controls.
Authorised Emissions 5	This condition is valid, risk-based and consistent with the EP Act.
Record keeping and Reporting 6 – 7	These conditions are valid, risk-based and consistent with the EP Act.

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 approval under the EP Act.

12. Applicant's comments

The Applicant was provided with the draft Works Approval and draft Decision Report on 24 January 2020. The Applicant provided comments on the draft documents which are summarised, along with DWER's response, in Appendix 3.

13. 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 (summarised in Appendix 2).

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

Tracey Hassell
A/Manager Waste Industries
Delegated Officer under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Proposed Waste types for acceptance at the Sandy Ridge Facility

		Temporary Storage		Operational	
NEPM code	Waste description	Solid Waste	Liquid Waste	Solid Waste	Liquid Waste
A100	Waste resulting from surface treatment of metals and plastics	✓	×	✓	✓
A110	Waste from heat treatment and tempering operations containing cyanides	×	×	✓	✓
A130	Cyanides (inorganic)	×	×	✓	✓
B100	Acidic solutions or acids in solid form	×	×	✓	✓
C100	Basic solutions or bases in solid form	×	×	✓	✓
D100	Metal carbonyls	×	×	✓	✓
D110	Inorganic fluorine compounds excluding calcium fluoride (SPL)	×	×	✓	✓
D120	Mercury; mercury compounds	✓	×	✓	✓
D130	Arsenic; arsenic compounds	✓	×	✓	✓
D140	Chromium compounds (hexavalent and trivalent)	✓	×	✓	✓
D141	Tannery wastes containing chromium	✓	×	✓	✓
D150	Cadmium; cadmium compounds	✓	×	✓	✓
D151	Used nickel cadmium batteries	×	×	✓	✓
D160	Beryllium; beryllium compounds	✓	×	✓	✓
D170	Antimony; antimony compounds	✓	×	✓	✓
D180	Thallium; thallium compounds	✓	×	✓	✓
D190	Copper compounds	✓	×	✓	✓
D200	Cobalt compounds	✓	×	✓	✓
D210	Nickel compounds	✓	×	✓	✓
D211	Used nickel metal hydride batteries	×	×	✓	✓
D220	Lead; lead compounds	✓	×	✓	✓
D221	Used lead acid batteries	×	×	✓	✓
D230	Zinc compounds	✓	×	✓	✓
D240	Selenium; selenium compounds	✓	×	✓	✓
D250	Tellurium; tellurium compounds	✓	×	✓	✓
D270	Vanadium compounds	✓	×	✓	✓
D290	Barium compounds (excluding barium sulphate)	✓	×	✓	✓
D300	Non-toxic salts	✓	×	✓	✓
D310	Boron compounds	✓	×	✓	✓
D330	Inorganic sulphides	✓	×	✓	✓
D340	Perchlorates	×	×	✓	✓
D350	Chlorates	×	×	✓	✓
D360	Phosphorus compounds excluding mineral phosphates	×	×	✓	✓
E100	Waste containing peroxides other than hydrogen peroxide	×	×	✓	✓
E120	Waste of an explosive nature not subject to other legislation	×	×	×	×

E130	Highly reactive chemicals not otherwise specified	✗	✗	✓	✓
F100	Waste from the production, formulation and use of inks, dyes, pigments, paints, lacquers and varnish	✓	✗	✓	✓
F110	Waste from the production, formulation and use of resins, latex, plasticisers, glues and adhesives	✗	✗	✓	✓
F120	Solvent based-wastes from the production, formulation and use of inks, dyes, pigments, paints, lacquers and varnish	✗	✗	✓	✓
F130	Solvent based wastes from the production, formulation and use of resins, latex, plasticisers, glues and adhesives	✗	✗	✓	✓
G100	Ethers	✗	✗	✓	✓
G110	Non-halogenated organic solvents	✗	✗	✓	✓
G130	Dry-cleaning wastes containing perchloroethylene	✗	✗	✓	✓
G150	Halogenated organic solvents	✗	✗	✓	✓
G160	Waste from the production, formulation and use of organic solvents	✗	✗	✓	✓
H100	Waste from the production, formulation and use of biocides and phytopharmaceuticals	✗	✗	✓	✓
H110	Organic phosphorous compounds	✗	✗	✓	✓
H130	Organochlorine pesticides	✗	✗	✓	✓
H170	Waste from manufacture, formulation and use of wood-preserving chemicals	✗	✗	✓	✓
J100	Waste mineral oils unfit for their original intended use	✓	✗	✓	✓
J120	Waste oil/water, hydrocarbons/water mixtures or emulsions	✗	✗	✓	✓
J130	Oil interceptor wastes	✓	✗	✓	✓
J160	Waste tarry residues arising from refining, distillation, and any pyrolytic treatment	✓	✗	✓	✓
J170	Used oil filters	✗	✗	✓	✓
J180	Oil sludge	✗	✗	✓	✓
K100	Animal effluent and residues (abattoir effluent, poultry and fish processing wastes)	✗	✗	✗	✗
K110	Grease trap waste	✗	✗	✗	✗
K130	Sewage sludge and residues including nightsoil and septic tank sludge	✗	✗	✗	✗
K140	Tannery wastes (including leather dust, ash, sludges and flours)	✓	✗	✓	✓
K190	Wool scouring wastes	✗	✗	✓	✓
K200	Food and beverage processing wastes	✗	✗	✗	✗
K210	Septage wastes	✗	✗	✗	✗
L100	Car and truck wash waters	✗	✗	✓	✓
L150	Industrial wash waters contaminated with a controlled waste	✗	✗	✓	✓
M100	Waste substances and articles containing or contaminated with polychlorinated biphenyls,	✓	✗	✓	✓

	polychlorinated naphthalenes, polychlorinated terphenyls and/or polybrominated biphenyls				
M105	Waste substances and articles containing polybrominated biphenyls (PBB), polychlorinated naphthalenes (PCN), and/or polychlorinated terphenyls (PCT)	✓	×	✓	✓
M130	Non-halogenated organic chemicals	×	×	✓	✓
M150	Phenols, phenol compounds including chlorophenols	✓	×	✓	✓
M160	Organo halogen compounds—other than substances referred to in this Table (e.g. CFCs)	×	×	✓	✓
M170	Polychlorinated dibenzo-furan (any congener)	✓	×	✓	✓
M180	Polychlorinated dibenzo-p-dioxin (any congener)	✓	×	✓	✓
M210	Cyanides (organic)	×	×	✓	✓
M220	Isocyanate compounds	×	×	✓	✓
M230	Triethylamine catalysts for setting foundry sands	×	×	✓	✓
M250	Surface active agents (surfactants), containing principally organic constituents and which may contain metals and inorganic materials	✓	×	✓	✓
M260	Highly odorous organic chemicals (including mercaptans and acrylates)	×	×	✓	✓
M270	Per- and polyfluoroalkyl substances (PFAS) contaminated materials, including waste PFAS containing products and contaminated containers	✓	✓	✓	✓
N100	Containers and drums that are contaminated with residues of substances referred to in this list	✓	×	✓	✓
N120	Soils contaminated with a controlled waste	✓	×	✓	✓
N140	Fire debris and fire wash waters	✓	×	✓	✓
N150	Fly ash, excluding fly ash generated from Australian coal fired power stations	✓	×	✓	✓
N160	Encapsulated, chemically-fixed, solidified or polymerised wastes referred to in this list	✓	×	✓	✓
N190	Filter cake contaminated with residues of substances referred to in this list	✓	×	✓	✓
N205	Residues from industrial waste treatment/disposal operations	✓	×	✓	✓
N220	Asbestos	✓	×	✓	✓
N230	Ceramic-based fibres with physico-chemical characteristics similar to those of asbestos	✓	×	✓	✓
R100	Clinical and related wastes	×	×	×	×
R120	Waste pharmaceuticals, drugs and medicines	×	×	✓	✓
R130	Cytotoxic waste	×	×	×	×
R140	Waste from the production and preparation of pharmaceutical products	×	×	✓	✓
T100	Waste chemical substances arising from research and development or teaching activities, including those which are not identified and/or are new and whose effects on human health and/or the environment are not known	✓	×	✓	✓
T120	Waste from the production, formulation and use of photographic chemicals and processing materials	×	×	✓	✓
T140	Tyres	×	×	×	×
LLW	Low level radioactive waste	✓	×	✓	✓

Appendix 2: Key documents

	Document title	In text ref	Availability
1.	Works Approval/Licence (W6308/2019/1) application form and supporting documentation (October, 2019)	W6308/2019/1	DWER records (DWERDT210490)
2.	Response to Request for Information and supporting documentation	N/A	DWER records (DWERDT223802)
3.	Response to 2nd Request for Information and supporting documentation	N/A	DWER records (DWERDT229211)
4.	The Proposed Sandy Ridge Facility - Public Environment Review, Final Report December 2016	Sandy Ridge PER	accessed at www.tellusholdings.com
5.	Report and recommendations of the Environmental Protection Authority, Sandy Ridge Project (Report 1611, December 2017).	MS1078	accessed at www.epa.wa.gov.au
6.	Ministerial Statement 1078	MS 1078	accessed at www.epa.wa.gov.au
7.	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	DER 2015a	accessed at www.dwer.wa.gov.au
8.	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	DER 2015b	
9.	DER, August 2016. *Guidance Statement: Licence duration.* Department of Environment Regulation, Perth.	DER 2016a	
10.	DER, February 2017. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	DER 2017	
11.	DER, June 2019. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.	DER 2019	

Appendix 3: Summary of applicant's comments on risk assessment and draft conditions

The Applicant was provided with the draft Works Approval and Decision Report on 24 January 2020 for review and comment. The Applicant responded on 29 January 2020 with the following comments:

Condition	Summary of Licence Holder comment	DWER response
-	The Crown Lease for the premises is more accurately cited as: 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.	Noted, premises description updated to reflect the details of the Crown Lease.
-	As a result of the Crown Lease, much of M16/540 was extinguished. New Mining Lease M16/574 has been applied for to replace the relevant portion of M16/540. As M16/574 is pending grant, Tellus recommends removing Mining Act tenure from the Premises details in W6308/2019/1.	Noted, premises description updated to remove reference to the Mining Act tenure. Premises activities as assessed for this works approval application are within Lot 510 on Deposited Plan 413497, Whole Volume 3169 Folio 365.
-	Minor typographical edit suggested to the access route to the Premises: *102.5km north of Great Eastern Highway, via (*not along*) Access Reserve 44102 (*not 44201*), BOORABBIN WA 6429*	Noted, premises location reference updated.
Works Approval Condition 1 Table 2 DWER additional infrastructure request PFAS Contaminated Waste Storage Area	Confirmation of the inclusion of a PFAS contaminated waste storage area within the infrastructure area of the facility. Confirmation that the construction requirements of the PFAS Contaminated Waste Storage Area: - Will be constructed with a low permeability concrete hardstand. - The perimeter of the hardstand will be surrounded with a 300mm concrete bund, sufficient to contain a 1:100 year, 72 hour rainfall event. - The dimensions of the PFAS storage area are 20m x 77m or a total area of 1540m2. - The area will a 1300 litre blind (impermeable) liquid storage sump.	Proposed additional infrastructure accepted. Works Approval condition 1, Table 2 updated to include additional infrastructure requirements for the PFAS Contaminated Waste Storage Area. New figures 7 and 8 added to the Works Approval.

Condition	Summary of Licence Holder comment	DWER response
	The volume of water expected to be produced in a 1:100 year 72 hour rainfall event at Sandy Ridge has been calculated by Rockwater Hydrological and Environmental Consultants as probable maximum precipitation (PMP) 176mm. The PFAS storage area will be constructed with a minimum 300mm high concrete bund. This will adequately contain all storm water in a 1:100 year 72 hour storm event. Storm water collected from the PFAS storage area will be either pumped into the WIP for immobilisation via a formulation/fixation process or used for dust suppression and/or compaction in a waste cell. In the event of an unscheduled spill within the bunded area, spills will be contained and cleaned up in accordance with site management plans and operating procedures. All spills will be recorded by Tellus and reported in the Facility Compliance Assessment Report required by Ministerial Statement 1078. Daily operations at Sandy Ridge includes a visual inspection of all waste areas for evidence of odours, leaks and spills	
Condition 3 Qualified Geotechnical Engineer	Suggestion to include a structural or mechanical engineer to assess and report compliance for items constructed with the Facility that are not geotechnical in nature.	Noted and agreed. Condition 3 updated to include a Qualified Mechanical Engineer to conduct the compliance assessment and reporting for those relevant items within the Facility.
Decision Report Section 7.6, paragraph 5 references rates of contaminated water reaching an exposure point 75 km to the north.	Minor detail provided for context to the description of geological storage capacity at the premises.	Noted, additional detail added to relevant section of decision report.

Condition	Summary of Licence Holder comment	DWER response
Decision Report Section 6.3.4 details management of solid and liquid PFAS wastes in accordance with the PFAS NEMP And Section 9.5 Key findings 6 and 7 for liquid PFAS waste	Condition 4 of EPBC 2015/7478 states: *To ensure a nationally consistent approach to the environmental regulation of PFAS, the approval holder must implement the PFAS National Environmental Management Plan.* The PFAS NEMP is defined in Part C, item s of EPBC 2015/7478 as: *PFAS National Environmental Management Plan means the PFAS National Environmental Management Plan (HEPA 2018) or as amended.* As the PFAS NEMP has not yet been amended (i.e. version 2 to which DWER refers), Tellus is of the opinion that is inappropriate to implement a draft management plan that is subject to change. Instead, Tellus suggests that DWER clarify that Sandy Ridge Facility needs to be constructed and operated in accordance with the PFAS NEMP and its amendments. Tellus acknowledge that it is Tellus' risk to ensure the current facility design will comply with the possible future amendments of the PFAS NEMP. To that end, Tellus has added a concrete bunded area for PFAS waste storage with specifications meeting the requirements suggested by DWER.	Noted. The risk assessment conducted for the storage of PFAS contaminated wastes on the premises was informed by applicant proposed controls, impacts to soil quality, vegetation health, fauna habitat and surface water quality, as well as the PFAS NEMP. Taking these factors into consideration, the risk of PFAS contaminated waste adversely impacting the environment was considered a medium risk. In accordance with the *Guidance Statement: Risk Assessments*, medium risk events are generally acceptable and subject to regulatory controls. The Delegated Officer considers that containment infrastructure, as specified within the PFAS NEMP version 2, includes relevant infrastructure to manage the risks associated with PFAS contaminated waste. As noted above, DWER acknowledge that the additional Applicant proposed controls and infrastructure for the storage of PFAS contaminated wastes. Works Approval condition 1, Table 2 is updated to include these additional infrastructure requirements for the PFAS contaminated waste storage area. Construction specification for the nominated PFAS contaminated waste storage area is to be consistent (aside from roofing and walls) to that of the proposed non-radioactive waste inspection warehouse.

Condition	Summary of Licence Holder comment	DWER response
		New figures 7 and 8 also added to the Works Approval for reference to the nominated location and construction specification of the PFAS contaminated water storage area.
Decision Report Table 11 in Section 8 DMIRS discrepancy Re. separation distances.	Dangerous Goods (DG) Licence (DGS022452) stipulates separation distances based on DG risk. Different separation distances apply depending on container contents and configuration (e.g. stacking) as specified in DG licence. Sandy Ridge will be operated in accordance with the approved DG licence.	DWER notes that it is the responsibility of the Applicant 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.
Decision Report Section 10.2 requires Tellus to submit more information for the future licence amendment application.	Tellus has applied for an operating licence related to W6305/2019/1 to operate the temporary above-ground storage facility in the East Yard at Sandy Ridge Facility. As agreed with DWER, Tellus will apply to amend that operating licence (once granted) to include further prescribed categories as the construction related to W6308/2019/1 progresses. Further information regarding the operation of infrastructure authorised in W6308/2019/1 will be submitted with the licence amendment application(s).	Noted.

Appendix 4: Works Assessed

At the time of assessment, Emissions and Discharges from the Works listed in the table below were considered in the determination of the risk and related Conditions for the Works Approval. As detailed in the works approval application, works to be constructed in accordance with the "Tellus Holdings Ltd, Sandy Ridge Project, Quality Management Plan, TSR-5-SR-08500-QA-PLN-001, GR Engineering Services" and the "Sandy Ridge Project – EPC Works Specification, TSR-5-PO-07400-EG-SPC-0001, Tellus Holdings Ltd". Works also be constructed in accordance with the design and construction drawings submitted during the assessment process (as detailed in Table 3).

Works	**Specifications/Drawings**
Waste Storage – Mixed Store	As detailed in the Works Approval (W6308/2019/1) application form and supporting documentation (October, 2019) and Response to Request for Information and supporting documentation
Waste Storage – East Yard	
Non-Radioactive Waste Inspection Warehouse	
Radiation Detector	
Flammable Goods Store	
Workshop and laydown yard	
Low Level Radiation Waste Warehouse/Liquid Waste Unloading Area	
Low Level Radiation Waste Storage Yard	
Waste Immobilisation Plant	
4 x Stormwater Storage Tanks	As detailed in the Response to 2nd Request for Information and supporting documentation
Brine Pond	As detailed in the Works Approval (W6308/2019/1) application form and supporting documentation (October, 2019) and Response to Request for Information and supporting documentation
Waste Cells and Settlement Sump	