TELLUS

SANDY RIDGE PER SECTION 43A AMENDMENT

Amendment Report | 23 August 2017

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Table of Contents

1 Background 1

1.1 Sandy Ridge Facility 1

1.2 Changes to proposals during assessment 1

2 Clarification 2

2.1 Waste acceptance versus permanent isolation 3

2.2 Environmental impacts unchanged 5

1 BACKGROUND

1.1 Sandy Ridge Facility

Tellus Holdings Ltd (Tellus) is proposing to develop an open-cut kaolin mine and complementary hazardous and intractable waste storage and near surface geological repository (the Facility) with supporting above ground infrastructure. The Facility would be located approximately 75 kilometres (km) north-east of Koolyanobbing, in the Shire of Coolgardie, within the Goldfields Region of Western Australia (WA).

The proposal is currently being assessed as a Public Environmental Review (PER) under section 40 of the *Environmental Protection Act 1986* – Assessment Number 2057. The proposal and its potential environmental impacts and management were described in the PER, including the proposed rate of throughput of Class IV and Class V waste materials at 100,000 tonnes per annum over a 25 year operational period.

This report serves to clarify the throughput waste capacity of the proposed Sandy Ridge Facility.

1.2 Changes to proposals during assessment

Section 43A of the *Environmental Protection Act 1986* (EP Act) states;

While a proposal is being assessed, the Authority may consent to the proponent changing the proposal without a revised proposal being referred to the Authority under this Part if the Authority considers that the change is unlikely to significantly increase any impact that the proposal may have on the environment.

As Section 2 of this report explains, Tellus is not seeking to change the proposal, simply to clarify what happens to the mass of liquid/sludge wastes after they are accepted in accordance with the Facility's Waste Acceptance Procedure (WAP).

The type and volume of liquid/sludge wastes to be accepted at the Facility has been based on "top down" assumptions using the average historic hazardous waste types and volumes reported to the West Australian and Federal Government plus it also takes into consideration future waste type and volume trends over the next 25 years. These "top down" assumptions are currently being replaced by "bottom up" assumptions with actual signed waste supply contracts and other commercial agreements that have been confirmed as reasonable by independent waste market experts..

Tellus will seek a Works Approval and Operating Licence under Part V of the EP Act. The licence will be regulated by the Department of Water and Environmental Regulation (DWER). DWER will regulate emissions and discharges on the site, including those from prescribed activities for stabilising liquid/sludge wastes and permanently isolating that waste.

2 CLARIFICATION

KEY POINTS

- *The Sandy Ridge PER states that up to 100,000 tonnes per annum (tpa) of Class IV and Class V waste will be temporarily stored and permanently isolated.*
- *Tellus' current market research indicates that of the anticipated 100,000 tpa of incoming waste, approximately 40,000 tpa may be liquid/sludge wastes.*
- *In accordance with Tellus' strict Waste Acceptance Criteria (WAC), liquid/sludge waste:*
    - *Can be accepted for temporary storage on the surface.*
    - *Requires immobilisation before it can be permanently isolated in a waste cell.*
- *Tellus is currently preparing a Works Approval and Licence application for assessment under Part V of the* Environmental Protection Act 1986*. The application will request approval for multiple prescribed categories, including Category 61 liquid waste treatment at a waste feed capacity of 40,000 tpa.*
- *In accordance with the WAC, liquid or sludge waste must be immobilised before being placed inside the waste cell. To achieve this, kaolinised granite mined from the cells and (in some cases cement or other binders) will be blended with the liquid/sludge to immobilise the contaminants so that they become a spade-able solid.*
- *The added materials, will increase the mass of the waste. Depending on the nature of the liquid waste, the total tonnes permanently isolated may be up to 220,000 per annum.*
- *Added to the 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.*
- *DWER advised Tellus that an operating licence for Sandy Ridge can stipulate that prescribed Category 66 (Class V waste disposal) capacity would reflect the tonnage accepted for disposal (permanent isolation).*
- *The action of stabilising liquid waste does not in any way compromise the safety of the receiving environment nor alter the environmental outcomes reached in the PER.*
- *The environmental factors, risks and management that are being assessed under Part IV of the EP Act remained unchanged. Tellus is not requesting an increase to 100,000 tpa of Class IV and Class V waste materials brought to the site.*

2.1 Waste acceptance versus permanent isolation

In the PER, Tellus refers to the 100,000 tonnes per annum rate:

- As an **acceptance volume** for a proposed licence (see section 2.4.2, p 41).
- As a **licence capacity** for Class IV and Class V wastes (see section 2.4.2 p 48, and section 5.5.4 p112).
- In various locations as a disposal rate (permanent isolation rate) (e.g. section 5.1.4 p83).

The definitions for landfill licence categories refer to the facility **accepting** waste for burial, e.g. for Class IV:

Class IV secure landfill site: premises on which waste (as determined by reference to the waste type set out in the document entitled "Landfill Waste Classification and Waste Definitions 1996" published by the Chief Executive Officer and as amended from time to time) is accepted for burial.

2.1.1 Waste volume accepted at the gate

The PER references a licence capacity of 100,000 tonnes per annum (tpa) of incoming waste materials at the gate of the proposed Facility. If waste passes Tellus' Waste Acceptance Criteria (WAC) at the gate, solid waste is then permanently isolated in line with Tellus' Waste Zoning Guide (WZG).

The PER also states (section 5.5.4, p123) that sludge wastes accepted cannot be permanently isolated in that form and they require treatment and/or conditioning before being isolated. The detail of the PER is presented again for clarification.

Some wastes delivered to the Facility may require treatment or conditioning in order to meet the WAC (Appendix A.24) for placement into a cell. In general, the proponent is not aiming to become a waste treatment contractor or service provider. However, there are presently gaps in the service offerings of the established waste management service companies and some waste treatment processes are best applied immediately prior to placement in the cell.

All waste treatment processes which would be carried out at the Facility have not yet been identified. The proponent currently has test work commissioned with European specialists in the area of non-solid waste solidification and stabilisation. The aim of this work is to confirm the performance of various cement blends with a range of liquid and paste waste types, which would guide the design of the blending and mixing plant. The likely processes that may be implemented at the Facility are described below. A Works Approval would be obtained under Part V of the EP Act prior to the construction of pre-treatment plants. The proponent would ensure that the pre-treatment processes do not result in unacceptable emissions or discharges to the environment.

- ***Oily sludge*** *- Hydrocarbon sludge containing NORM and/or heavy metals cannot always be recovered or safely disposed of using existing treatment processes such as biodegradation, oxidisation, stabilisation or incineration. The proponent is currently investigating methodologies for the stabilisation and solidification of such sludges using pozzolanic materials and cement based additives.*

Oily sludges would be delivered in either intermediate bulk containers inside sea containers, or as bulk liquids in a tanker truck, with the former being more likely. Oily sludges would be stored until such time as they are ready to be placed in the cell. The oily sludge would then be mixed with controlled measures of binding and stabilising materials such as high carbon fly ash and Portland cement, to produce a cement-like slurry which would either be placed directly into the waste cell, or poured into moulds where it would set. The direct placement slurry would be allowed to set in-place in the cell, and moulded blocks would be placed into the cell in the same manner as other packaged wastes.

- ***Non–oily liquid and sludge -*** *Other wastes in either liquid or sludge form would ideally be reduced in volume, filtered or dried before delivery to Sandy Ridge, preferably by an existing waste management contractor. In the event of some liquid wastes not being able to be treated or only being partially treated (to a sludge), solidification and stabilisation treatment would be provided for these wastes using absorbent materials such as clays and pozzolanic materials such as fly ash and cement. Solidification and stabilisation would typically take place with both materials being added to a mixing device.*

  In the event of drums of waste being delivered where a liquid has separated in transport from a paste, absorbent material would need to be added into the drum or container to absorb the released liquid before the waste can be placed in a cell.

Given the above, it is reasonable that Tellus has openly assumed that the proposed Facility seeks approval for 100,000 tpa waste accepted at the gate. Therefore, Tellus is not seeking to change the proposal, simply to clarify what happens to liquid/sludge wastes after they are accepted in accordance with the Waste Acceptance Procedure (WAP).

The materials added to immobilise liquid wastes, such as kaolin, cement and gypsum will increase the mass of the waste. Depending on the nature of the liquid waste, the increase in weight may be up to 5 times the original weight. For example:

- **Hydrocarbon** liquid/sludge waste from the oil and gas industry is estimated to increase 3 times i.e. 40,000 tonnes hydrocarbon wastes increases to approximately 120,000 tonnes of spade-able product.
- Perfluorooctanesulfonic acid (PFOS) liquids from the defence and emergency response sectors is estimated to increase 5.5 times i.e. 40,000 tonnes of PFOS liquid increases to approximately 220,000 tpa tonnes of spade-able product.
- Added to the 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.

This is summarised in Table 1.

Table 1:Waste acceptance versus permanent isolation

Waste type	Total volume accepted at gate (tpa)	WAC requirement	Stabilisation materials	Mass bulking factor	Total volume permanently isolated (tpa)
Solid waste	60,000	Can be permanently isolated if it passes the WAC	Not required	-	60,000
Liquid waste	40,000	Must be immobilised before it is permanently isolated	Kaolinised granite, cement, gypsum	Up to 5.5	Up to 220,000
TOTAL VOLUME	**100,000**				**280,000**

2.2 Environmental impacts unchanged

The requirement to process and condition liquid/sludge wastes will increase the volume of waste after that waste passes through the gate at Sandy Ridge. This is a requirement of the Sandy Ridge WAC.

The action to immobilise liquid/sludge wastes does not:

- Alter the assessment undertaken in the PER, or
- Alter the predicted environmental outcomes for key environmental factors in the PER including terrestrial environmental quality or inland waters.

Subject to approval of the Sandy Ridge proposal under Part IV of the EP Act, Tellus will submit a detailed Works Approval and Licence application that is a requirement under Part V of the EP Act.

The Works Approval application will describe the prescribed activities as per Schedule 1 of the *Environmental Protection Regulations 1987,* and pollution control in the facility. This will include descriptions of liquid waste treatment methods that are proposed for Sandy Ridge, in compliance with the Sandy Ridge Waste Acceptance Criteria. Permanent isolation of waste materials will be carried out in accordance with the Sandy Ridge Waste Zoning Guide that meets the requirements of *Dangerous Goods (Storage and Handling of Non-explosives) Regulations 2007*.