

Sandy Ridge Project Update - Oct 2019 - Environmental Baseline Studies

- ❑ Tellus has spent five years performing environmental baseline studies (EBS) for the Sandy Ridge project
- ❑ EBS cover mainly soils, water, flora, fauna, climate, air quality and background radiation etc.
- ❑ Sound EBS are the key to a good monitoring and evaluation system before major development occurs

What are Sandy Ridge's baseline studies?

One of the first tasks that Tellus undertook once the Sandy Ridge deposit had been identified, was to initiate a series of Environmental Baseline Studies (EBS). EBS include analyzing and quantifying environmental parameters like soils, water, flora and fauna, climate, air quality, background radiation etc., for the area comprising the future Sandy Ridge project. The EBS will serve as a record of the environmental conditions before major project activities have taken place.

Why are these measurements important?

The EBS data is then used to monitor differences (positive, negative or neutral impacts) of various environmental parameters during the subsequent project development, operational and closure phases.

These EBS are also a requirement of Government approvals. Tellus has been active in complementing its 2015-2018 EBS prepared under the project's Public Environmental Review (PER) with additional EBS completed during 2019.

Where were the studies performed?

The studies were performed at the Sandy Ridge project area and cover both a regional and local scale some 240 kilometres by road west north west of Kalgoorlie.

Additional EBS research

Typical commodity mines in Western Australia complete standard EBS for planning and approvals purposes. However, Tellus has a unique business model involving both kaolin mining and the storage, recovery and permanent isolation of hazardous waste (including low level radioactive waste (LLW)). This requires additional EBS to meet various conditions of consent and the preparation of the Facility's Works Approval and Site Registration application to accept waste materials including LLW. Comprehensive environmental monitoring programs have been undertaken and are now established.



Figure 1
Source: Tellus Holdings, Geotechnical Engineering, Environmental Baseline Studies, 2015-2018, 2019, and the 2019 Public Environmental Review

Fig. 1: A second round of baseline soil sampling was completed in April 2019



Baseline soils testing and monitoring

Soils samples were collected based on a sampling grid covering an approximate area of 4km by 5km (Fig. 1). The following sampling methodology was followed;

- Sample for metal testing – 300-400g of soil (<2mm in size) from the top 0-10cm.
- Sample for radionuclide testing – 1.5 kg of soil (<2mm in size) from the top 0-10cm.
- Sample for asbestos testing – 300- 400g of soil (<2mm in size) from the top 0-10cm.
- Sample for PFAS and POPs testing – soil (<2mm in size) from the top 0-10cm.

All soil samples were analysed at accredited National Association of Testing Authorities, Australia (NATA) laboratories.

Baseline soil testing results

The results for metals, asbestos, PFAS and POP's were all below laboratory detection limits and within Western Australia Health Indicator Levels.

Baseline results for radionuclides Caesium 137 and Radon 226 were slightly elevated and above laboratory detection limits. This result is common in local and regional areas in Western Australia and South Australia.

Background radiation research and monitoring

Extensive gamma radiation monitoring has been undertaken to establish background levels prior to operations.

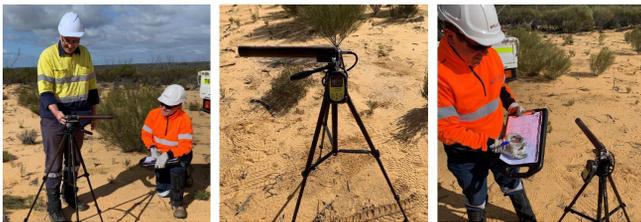


Fig. 2: Background radiation monitoring

The following areas have been surveyed;

- Mt Walton Rd, Village Access Road and the Facility Access Road using 1 km spacings (107 survey points).
- The 200-hectare mine site area using 100 m spacings (272 survey points).
- The 17-hectare facility area using 50 m spacings (which requires 139 survey points).

Measurements were recorded at 1 m above the ground using a rate-meter (see Fig. 2) with a large volume, energy compensated environmental Geiger-Muller tube (e.g. MC-71 probe).

Tellus is also investigating new and innovative techniques in radiation monitoring, which involves real-time data capture that can be monitored both on and off-site by qualified and registered radiation safety officers (RSOs). Radon gas and dust monitoring stations are now also being established.

Groundwater research and monitoring

The Sandy Ridge site does not overlie an aquifer. Tellus has established several monitoring bores to validate groundwater baseline results undertaken during the preparation of the PER (2015-2018).

The monitoring of these bores and additional bores around future mining pits and waste cells will continue throughout operation and well into post closure of the Facility. Runoff and utilities water sampling will be implemented as part of a broader water resource management plan for the Facility.

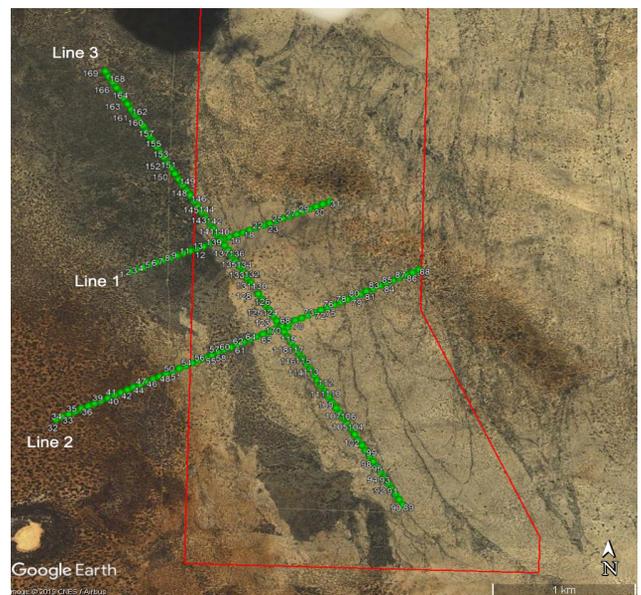


Fig. 3: Regional groundwater & permeability research

Regional electrotelluric and electroseismic hydrogeology research was undertaken in April and May (2019) to: (a) compliment baseline work from the PER; (b) support the preparation of forthcoming compliance documents including a Leachate Monitoring Management Plan, Deep Groundwater Management Plan and, Waste Facility Decommissioning Closure Plan, and (c) to identify any potential offsite movement pathways (Fig. 3).

Tellus has had soil temperature and moisture monitors installed at the Sandy Ridge site since 2015. These sensors are buried at a range of depths in the soil profile and provide calibration data for the site hydrogeological model.



Fig. 4: Installing soil monitors

Groundwater testing results

The results indicate that Sandy Ridge is a dry site, which does not have an aquifer at depth.

The interface of the weathered kaolin and unweathered granite is steeply undulating. Isolated and small pockets of groundwater appear to occur in small natural traps in the deepest parts of the unweathered granite basement surface.

There is no recharge of groundwater in the survey area with the natural clayey surface materials, silcrete and kaolinized granite all being of low permeability. The surficial layers act as a 'store and release' hydrogeological barrier to recharge.

Flora and fauna studies

Several additional flora and fauna studies have been completed in 2019 to

- (a) demonstrate commitments made in the PER, and
- (b) support site enabling works activities, including road access tracks and a fly camp.



Fig. 5: Onsite flora and fauna studies

Climate and air quality monitoring

Climate monitoring has been undertaken at Sandy Ridge since early 2015 (Fig. 6). Dust and air quality monitoring station locations have been identified and equipment procured for long-term human health and environmental monitoring.



Fig. 6 – Local climate monitoring has been in action at Sandy Ridge since early 2015

Water monitoring, geotechnical, resource drilling

Prior to 2019, Tellus completed four drilling programs with over 324 holes drilled (10,122m).

In 2019 Tellus has drilled many more mine planning holes. Fig. 7 below illustrates the location of the main holes.

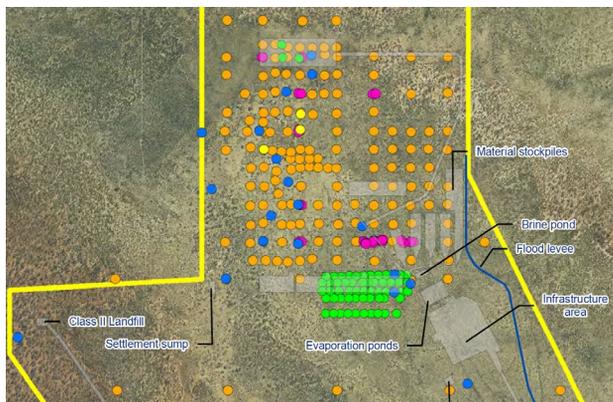


Fig. 7 – Over 320 water monitoring, geotechnical, and resource holes drilled in the local area

Compliance reporting

Compliance reporting and relevant ESB information and data will be made available on Tellus' website in line with Ministerial Statement 1078.

https://www.tellusholdings.com/project_sandy_ridge_project_compliance.php

