

JBS&G 64627 – 154,525

L007 (Interim Audit Advice Tarago Woodlawn Siding Rev 0)

6 March 2024

██████████
Project Manager – Land Management, Regional Property & Asset Renewal | Network & Assets

Transport for NSW

Via email: ██████████

L007 Interim Audit Advice (0503-2303-007) – Tarago Woodlawn Siding NSW – Remedial Options Assessment Tarago Rail Corridor

Dear Joanne,

1. Introduction and Background

Andrew Lau of JBS&G Australia Pty Ltd (JBS&G), has been engaged by Transport for NSW (TfNSW, the client) to conduct a site audit on a portion of the Goulburn – Bombala Country Regional Network (CRN) rail corridor in Tarago NSW identified as part Lot 22 in Deposited Plan (DP) 1202608 and the property, the former station masters cottage, located at Lot 1 in DP 816626 (herein referred to collectively as 'the site'). The site occupies a strip of land of approximately 7.9 hectares. The extent of the site area and the location of the site are shown in Figure 1, in Attachment 2.

The site incorporates the former Woodlawn Mine ore concentrate load-out complex which operated between the 1970s and 1990s. The Woodlawn Mine which operated between 1978 and 1998 producing lead, zinc and copper concentrates was located approximately eight kilometres to the west of the railway line. Historical load out of ores from trucks to rail cars for processing has been identified as a potential source of contamination of the site.

Within the rail corridor, ballast within the rail siding, loop line, main line and adjacent soils have been identified as being contaminated with lead. The location and extent of the site are shown in Figures 1 and 2, in Attachment 2.

On 25 March 2020, the rail corridor at Tarago (part Lot 22 DP 1202608) was declared (Declaration No. 20201103) to be significantly contaminated land under s11 of by the *Contaminated Land Management Act 1997* (CLM Act) by the NSW EPA.

On 28 May 2020, the NSW EPA approved a Voluntary Management Proposal (VMP) (VMP No. 20211711) under the CLM Act to be undertaken by TfNSW for part of the Tarago Rail Corridor on part Lot 22 DP 1202608. The former station masters cottage has also been found to be impacted by lead contamination originating from the rail corridor. The EPA determined that regulation of contamination from lead was required.

On 9 March 2022, the NSW EPA issued a notice amending the VMP (Notice No. 20224403). The amendment was issued to reflect updated timelines due to changes in the methodology for the remediation works.

The VMP requires achieving the objectives for three stages of works within the specified timeframes. The stages are as follows:

- Stage 1 – Assessment of Contaminant at or Originating from the Site
- Stage 2 – Remediation Action Plan
- Stage 3 – Remediation and Validation

A *Remediation Options Assessment* (Ramboll 2024) has been undertaken as part of the Stage 2 works under the VMP to assess options to address risks from the contaminant on or originating from the site.

Andrew Lau is a Site Auditor accredited by the NSW Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997* (CLM Act 1997) (Accreditation Number 0503).

This interim audit advice (IAA) has been undertaken in accordance with the requirements provided by the client, to provide an independent review of the remediation options assessment prepared to address risks posed by lead contamination. The objectives of this review were to assess the appropriateness of the remedial options to address risks posed to identified receptors and make the affected land suitable for the proposed uses.

2. Report Reviewed

The following report was reviewed in the preparation of this IAA:

- *Remediation Options Assessment, Tarago Rail Corridor*. Revision 1, 19/03/2024, Ramboll Australia Pty Ltd (Ramboll 2024).

Review of the report has been undertaken against the requirements of *Consultants Reporting on Contaminated Land: Contaminated Land Guidelines* (NSW EPA 2020) and the *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPC 2013).

3. Site Description

The site details have been summarised in **Table 1**. Plans identifying the subject site have been presented in **Attachment 2**.

Table 1: Summary Site Details

Street Address	Accessed from Stewart Street and Goulburn Street Tarago NSW 2580 (rail corridor) 106 Goulburn Street Tarago (former Station Masters Cottage)
Property Description	Part Lot 22 in DP 1202608 (rail corridor) Part Lot 1 in DP 816626 (former Station Masters Cottage)
Parish	Mulwaree
County	Argyle
Local Government Area	Goulburn Mulwaree Shire Council
Zoning	RU2 Rural Landscape (rail corridor) RU6 Transition (former Station Masters Cottage) (<i>Goulburn Mulwaree Local Environmental Plan 2009</i>)
Previous Use	Rail corridor and ore loadout complex infrastructure Station Masters Cottage
Current Use	Rail corridor Vacant (former Station Masters Cottage)

3. Site Condition

The site was reported (Ramboll 2024) to comprise of a portion of the Goulburn-Bombala rail corridor in Tarago including the Tarago railway station, car park and former Station Masters Cottage. The former ore concentrate loadout facility associated with the Woodlawn Mine was located within the western side of the rail formation, approximately 20 metres north of the railway station and was demolished between 1997 and 2005. The site is fenced on the western boundary and partially fenced on the eastern boundary.

The former Tarago Station Masters Cottage residence is located along the eastern of the site, immediately to the north of the Tarago railway station. The site is reported to have been acquired by Transport Asset Holding Entity (TAHE) in 2021 and is understood to be vacant.

The site has a gentle gradient to the east towards Mulwaree River consistent with the surrounding topography.

4. Summary of Contamination Status / Issues

The Woodlawn deposit of zinc, lead and copper concentrates is reported (Ramboll 2024) to have been mined between 1978 and 1998. The ore loadout facility infrastructure included a loop road for truck access from the south, truck dumping station, conveyor from dumping station to a large building and an undercover rail loading point.

Environmental investigations undertaken in the Tarago Station rail corridor have identified high concentrations of lead in soil along the rail corridor, ballast within the rail siding, loop line, main line and within the fence line of the former Station Masters Cottage property that presented risks to human health and ecological receptors. With the exception of the former load-out facility, lead impact above the site specific human health criterion (2,200 mg/kg) has been delineated within the rail formation and adjacent land to a depth of 0.5 metres below ground level (m bgl) across an area of approximately two hectares. Concentrations of lead around the former load-out facility have been detected in asphalt and ballast (beneath a clay capping layer of approximately 1 m thick) exceeding the site specific criterion and delineated to a maximum depth of 1.3 m bgl.

Groundwater monitoring indicates that concentrations of dissolved metals detected were generally low and below relevant assessment criteria protective of human health. Consistent with the vertical profile of contaminants detected in site soils, the potential for impacts from soil contamination to groundwater and the receiving body of Mulwaree River are considered to be low. (Ramboll 2024)

Surface water investigations and regular monitoring do not indicate evidence of off-site migration of contaminants or unacceptable risks to human health or ecology from the site. (Ramboll 2024)

Risk assessment of lead concentrations detected in surface soil in publicly accessible areas (road verges and drainage lines including around Boyd Street) have found that risks posed to human health and ecology from the impacted rail corridor via surface water and sediment are low and acceptable.

Indicative waste classification conducted of impacted materials on-site supports segregation into the following types of waste:

- Ballast fines from the Woodlawn Siding as Hazardous Waste
- Ballast from the Woodlawn Siding as General Solid Waste
- Soils adjacent to the rail formation as Restricted Solid Waste
- Soil from the former Station Masters Cottage as General Solid Waste

5. Remediation Extent

Based on identified concentrations of lead, areas of lead impacted ballast and soils requiring remediation or management have been presented in **Table 1**.

Table 1: Areas for Remediation/Management

Area to be Remediated/ Managed	Area (m ²)	Depth (m bgl)	Volume (m ³)
Lead impacted ballast and soil surrounding siding (excluding the rail formation) – excavation	6,300	0.3	1,890
Redundant Woodlawn siding - excavation	4,000	0.5	2,000
Former Station Masters Cottage (excluding house footprint) - excavation	1,000	0.25	250
Railway sleepers – General Solid Waste			100
Total	11,300		4,240

An area of 20,800 m² of impacted soil is to remain at an estimated depth of 0.5 m bgl below the existing rail formation.

The proposed remediation extent is shown in Figures 2a-2e, Attachment 2.

5. Remediation Options Assessment

A preliminary screening of remedial options was undertaken based on site constraints including requirement for the Goulburn to Bombala rail line, Tarago Loop line and Tarago Railway Station to remain operational, and different land use zonings for the rail corridor and former Station Masters Cottage.

Following assessment of remediation options via workshops involving TfNSW community engagement, environmental management, rail operations and rail engineering subject matter experts and use of an interactive options assessment tool incorporating a range of sustainability indicators (economic, environmental and social), the most sustainable option was selected: off-site containment of contaminated soils at the Lake George Mine.

A summary of the preferred remediation strategy presented in Ramboll 2024 is provided below:

- Excavation of contaminated materials from the redundant Woodlawn Siding and areas adjacent to the rail formation;
- Road transportation of contaminated materials to the Lake George (legacy) Mine which Legacy Mines is preparing for rehabilitation;
- Placement of contaminated materials in a containment cell being constructed as part of mine site rehabilitation works;
- Recontouring of the final landform onsite to address any potential impacts of the proposed excavation on rail operations with specific regard for site hydrology;
- Management of remnant contamination in the in the operational rail formation and at depth around the former loadout facility under a Long Term Environmental Management Plan (LTEMP).

6. Auditor Opinions

Based on the information reviewed as part of this Interim Audit Advice and subject to the limitations in Attachment 1, the following audit opinions are provided:

- A range of feasible and appropriate options for remediation of the lead contaminated materials were considered by the consultant (Ramboll 2024) as part of the remediation options assessment;
- The assessment of remediation options was undertaken in accordance with EPA approved guidance / NEPM (NEPC 2013) hierarchy for remediation. The options assessment considered sustainability factors (environmental, economic and social) to determine the preferred option;

- The auditor considers that the preferred option of off-site containment of excavated lead impacted soils at the Lake George Mine containment cell is appropriate as the facility has been constructed for the purposes of management of similarly lead impacted soils associated with regional mining activities. The auditor further considers that the preferred option is technically feasible, environmentally justifiable and consistent with relevant laws, policies and guidelines.

Please note that this interim advice does not constitute a Site Audit Statement or a Site Audit Report, but is provided to assist in the assessment and management of contamination issues at the site in regard to requirements of the site audit. The information provided herein should not be considered pre-emptive of the final audit conclusions, but rather represent the findings of the audit based on a preliminary review of available site information. Furthermore, the interim advice should not be regarded as approval of any proposed investigations or remedial activities, as any such approval is beyond the scope of an independent auditor.

Should you require clarification, please contact the undersigned on 0412 512 614 or by email alau@jbsg.com.au.

Yours sincerely:



Andrew Lau

NSW EPA Accredited Site Auditor

Accreditation Number 0503

JBS&G Australia Pty Ltd

Attachments:

- 1) Limitations
- 2) Site Plans

Attachment 1 – Limitations

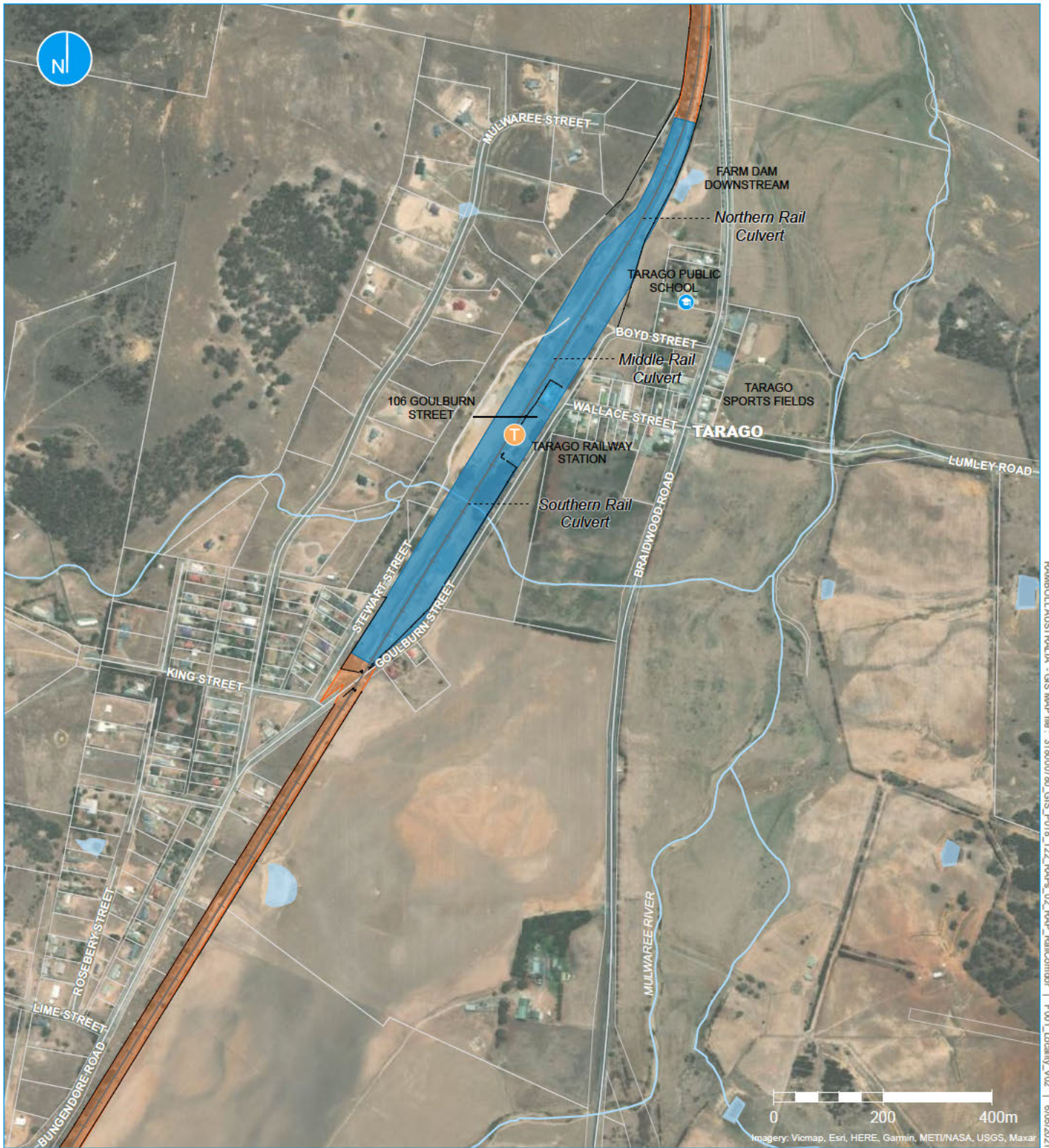
This audit was conducted with a reasonable level of scrutiny, care and diligence on behalf of the client for the purposes outlined in s.47 (1) of the *Contaminated Land Management Act 1997*. The data used to support the conclusions reached in this audit were obtained by other consultants and the limitations which apply to the consultant's report(s) apply equally to this audit report.

Every reasonable effort has been made to identify and obtain all relevant data, reports and other information that provide evidence about the condition of the site, and those that were held by the client and the client's consultants, or that were readily available. No liability can be accepted for unreported omissions, alterations or errors in the data collected and presented by other consultants. Accordingly, the data and information presented by others are taken and interpreted in good faith.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements. Limited sampling and laboratory analyses were undertaken as part of the investigations reviewed, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this audit are based on the information obtained at the time of the investigations.

Attachment 2 – Site Plans



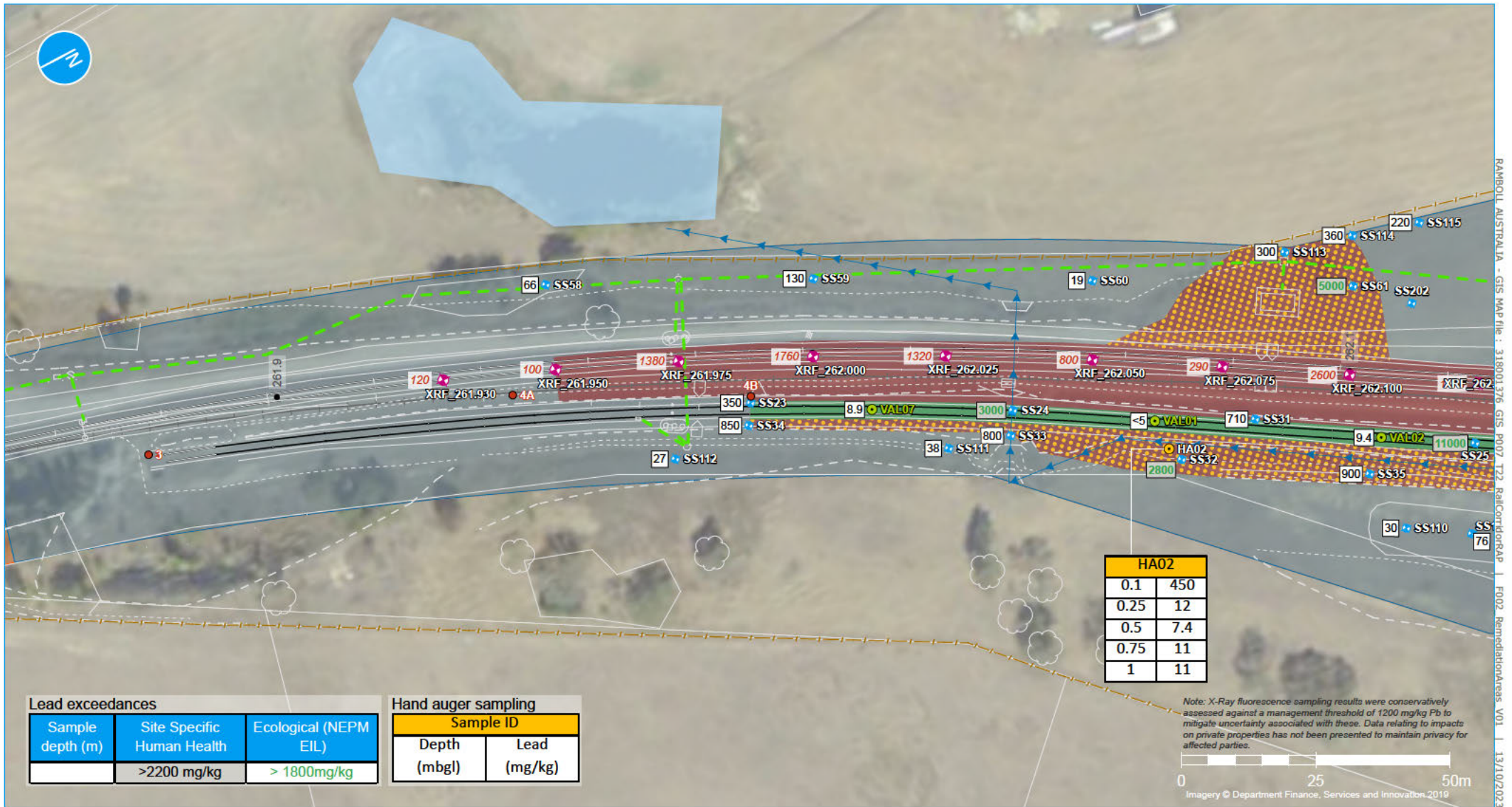
P:\M\B\AUSTRALIA - GIS MAP file : 31800780_GIS_P018_122_P04P_02_P04P_RailCorridor | F001_Locality_V02 | 6/05/2021

- Legend**
- Site boundary
 - Rail corridor
 - Rail corridor fence

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Figure 1 | Locality Plan



RAMBOLL AUSTRALIA - GIS MAP file : 3188011376 GIS P007 T22 RailCorridorAP | F002 RemediationAreas_V01 | 13/10/2023

- Legend**
- Site boundary
 - 0.1km chainage point
 - Surface water flow (indicative)

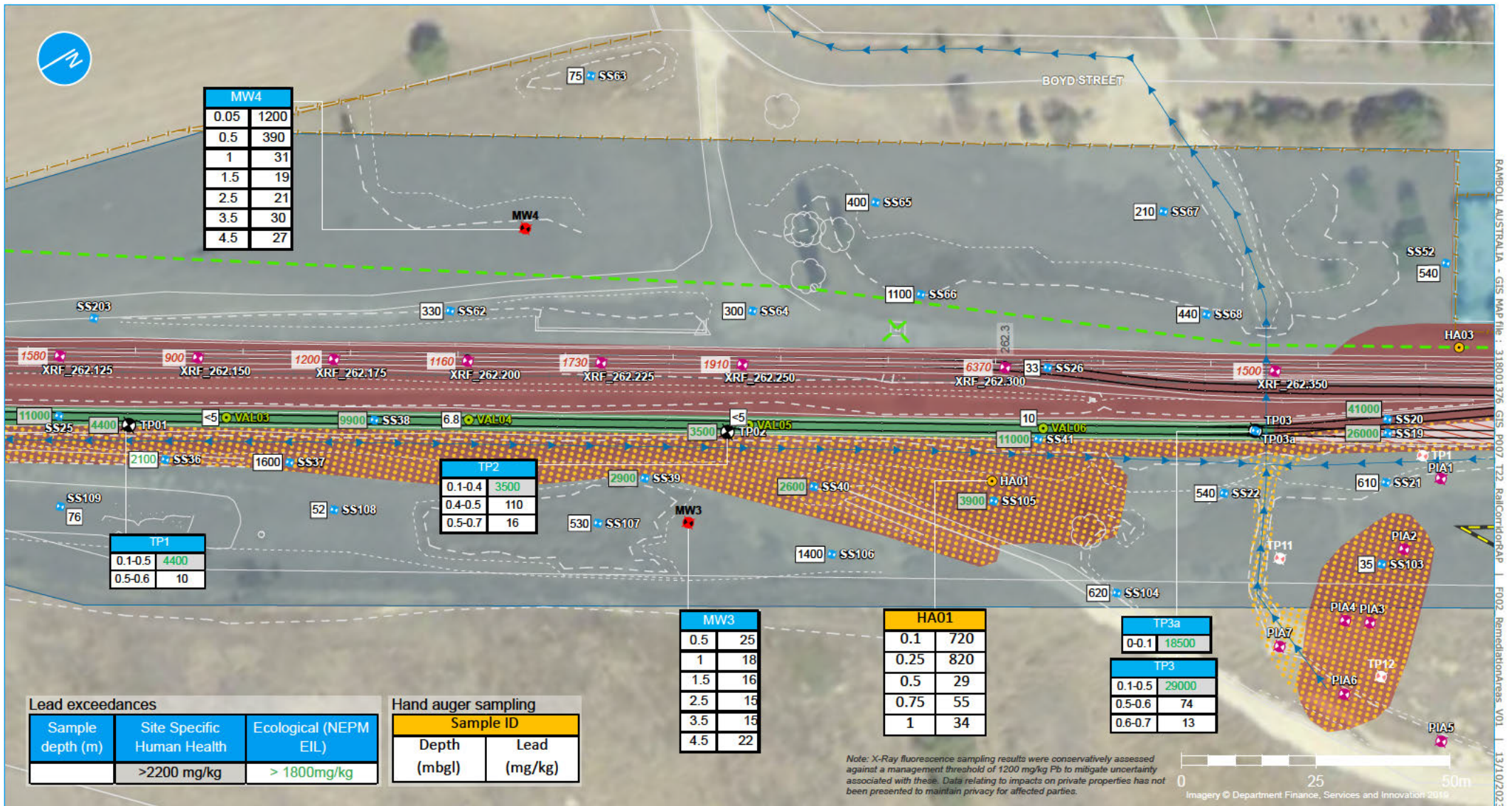
- Survey lines**
- Rail track
 - Top of bank
 - Bottom of bank
 - Signal trench
 - Rail corridor fence
 - Other elements

- X-Ray fluorescence sampling (Ramboll 2019, 2020)
- Previous sampling location (McMahon)
- Shallow soil (Ramboll 2019)
- Hand auger (Ramboll 2019)
- Lead concentration for XRF sample (mg/kg)
- Validation sample (Ramboll 2019)

- Lead impacted area to remain
- Lead impacted area surrounding the siding (excluding all rail formation) - proposed excavation depth 0.3 mbgl
- Area of excavation during loop extension (no further excavation proposed)



Figure 2a | Site Plan



- Legend**
- Site boundary
 - 0.1km chainage point
 - Surface water flow (indicative)
 - Former loadout road (approximate)

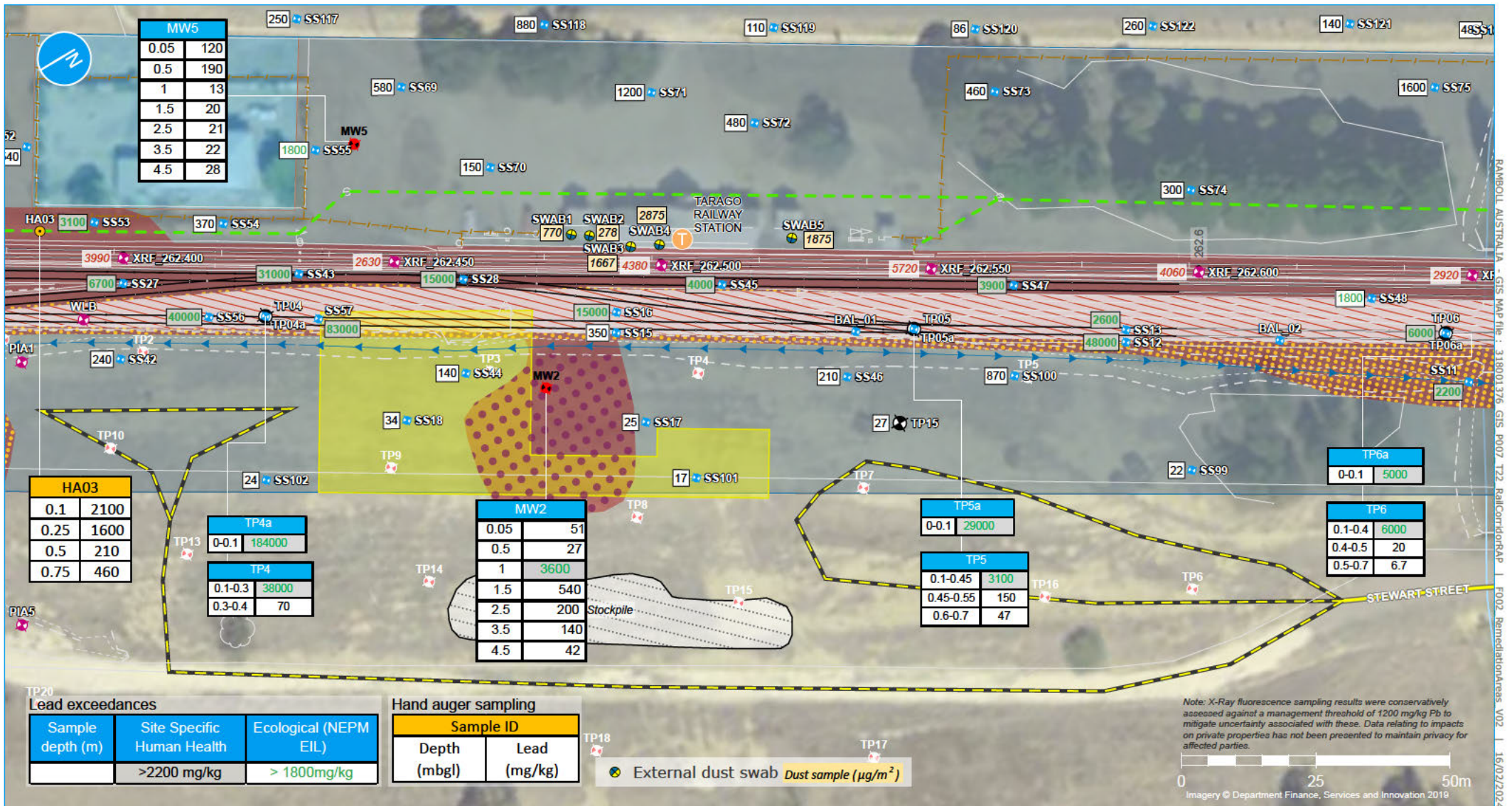
- Survey lines**
- Rail track
 - Top of bank
 - Bottom of bank
 - Signal trench
 - Rail corridor fence
 - Other elements

- X-Ray fluorescence sampling (Ramboll 2019, 2020)
- Shallow soil (Ramboll 2019)
- Test pit (Ramboll 2019)
- Hand auger (Ramboll 2019)
- Lead concentration for XRF sample (mg/kg)
- Validation sample (Ramboll 2019)
- Groundwater monitoring location
- Test pit (loadout complex)

- Lead impacted area to remain
- Redundant Woodlawn siding - proposed excavation depth 0.5 mbgl
- Lead impacted area surrounding the siding (excluding all rail formation) - proposed excavation depth 0.3 mbgl
- Area of excavation during loop extension (no further excavation proposed)



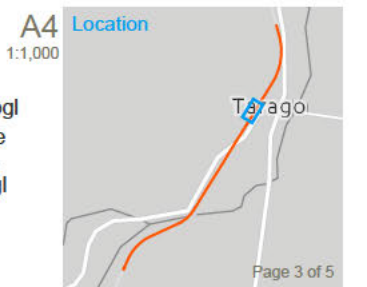
Figure 2b | Site Plan

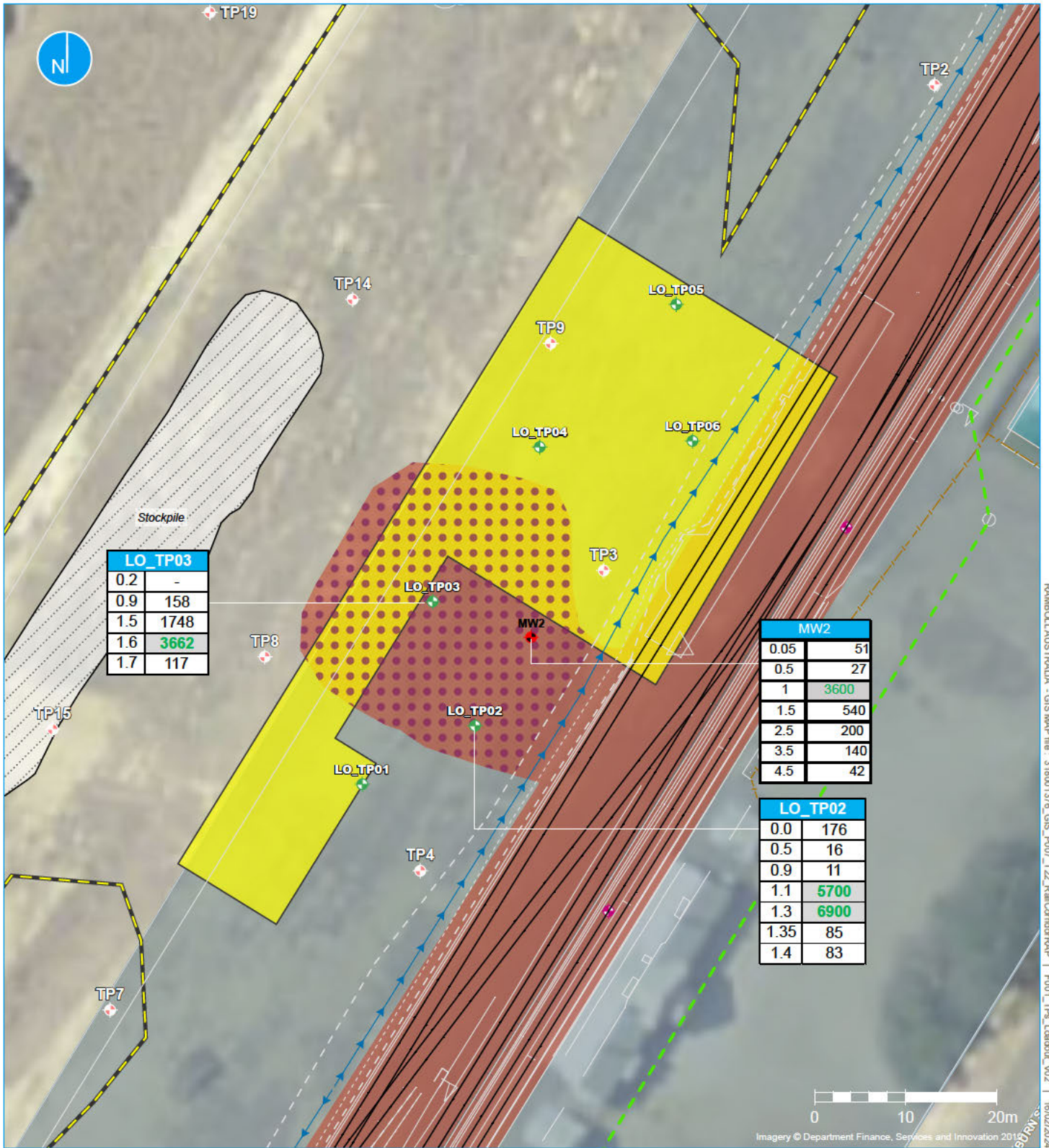


Legend

- Site boundary
- 0.1km chainage point
- Surface water flow (indicative)
- Former loadout road (approximate)
- Former loadout complex building footprint
- Lead impacted area to remain at depth beneath existing capping
- Survey lines: Rail track, Top of bank, Bottom of bank, Signal trench, Rail corridor fence, Other elements
- X-Ray fluorescence sampling (Ramboll 2019, 2020)
- Shallow soil (Ramboll 2019)
- Test pit (Ramboll 2019)
- Hand auger (Ramboll 2019)
- Lead concentration for XRF sample (mg/kg)
- Groundwater monitoring location
- Test pit (loadout complex)
- Lead impacted area to remain
- Redundant Woodlawn siding - proposed excavation depth 0.5 mbgl
- Lead impacted area surrounding the siding (excluding all rail formation) - proposed excavation depth 0.3 mbgl
- Haul route

Figure 2c | Site Plan





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Legend

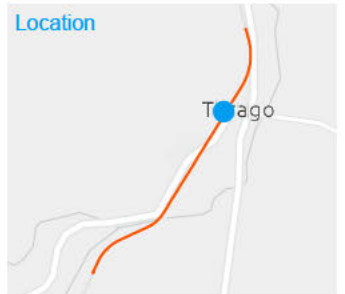
- Former loadout complex building footprint
- Former loadout road (approximate)
- Site boundary
- Surface water flow (indicative)
- Lead impacted area
- Lead impacted area to remain at depth beneath existing capping
- Loadout complex testpit (March 2020)
- Loadout complex testpit (August 2020)
- Groundwater monitoring location

Survey lines

- Rail track
- Top of bank
- Bottom of bank
- Signal trench
- Rail corridor fence
- Other elements

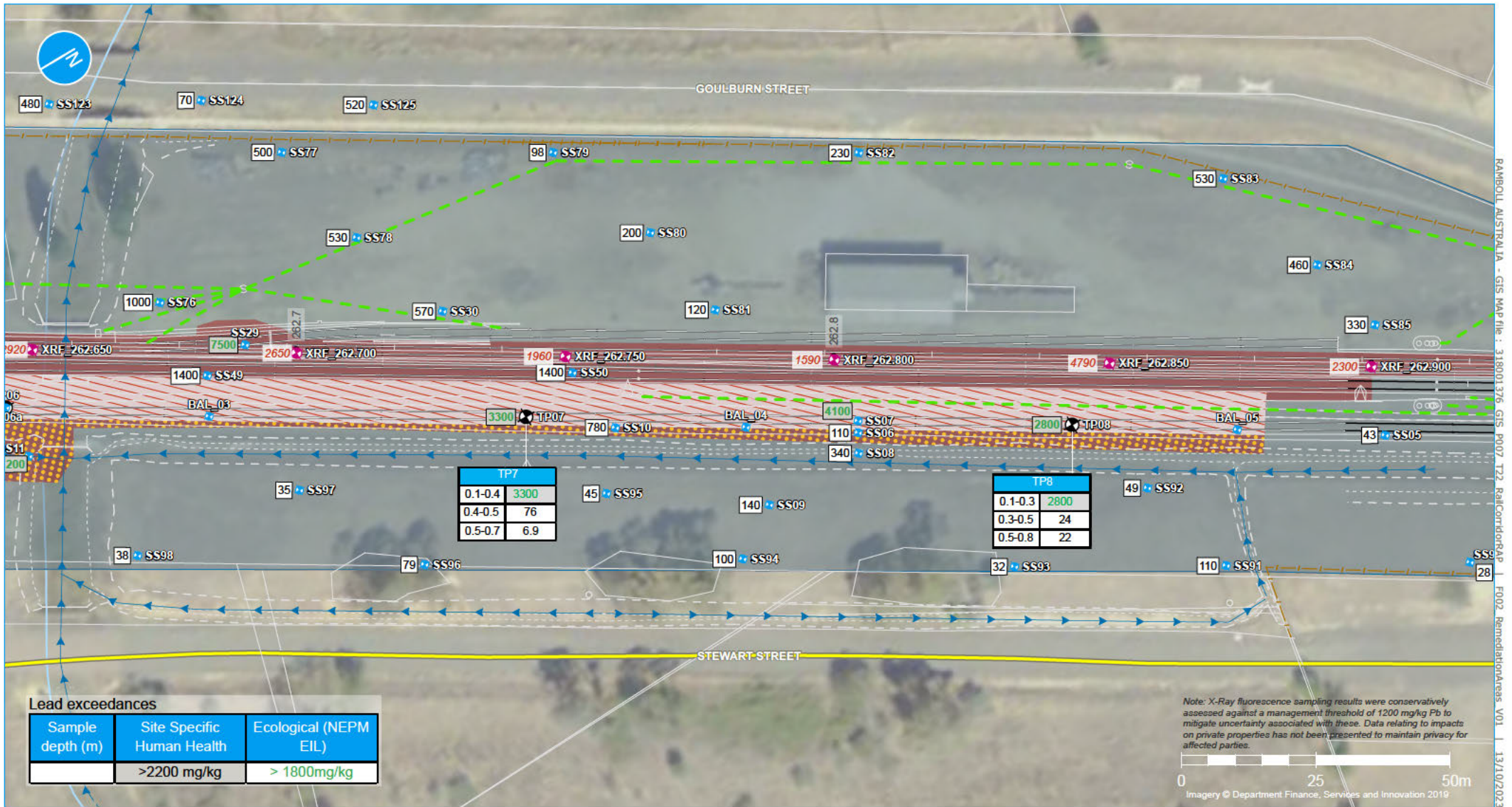
Lead exceedance criteria

Sample depth (m)	Site Specific Human Health	EIL Commercial/Ind. (NEPM 2013)
	>2200 mg/kg	>1800 mg/kg



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Figure 2ci | Loadout complex sampling locations

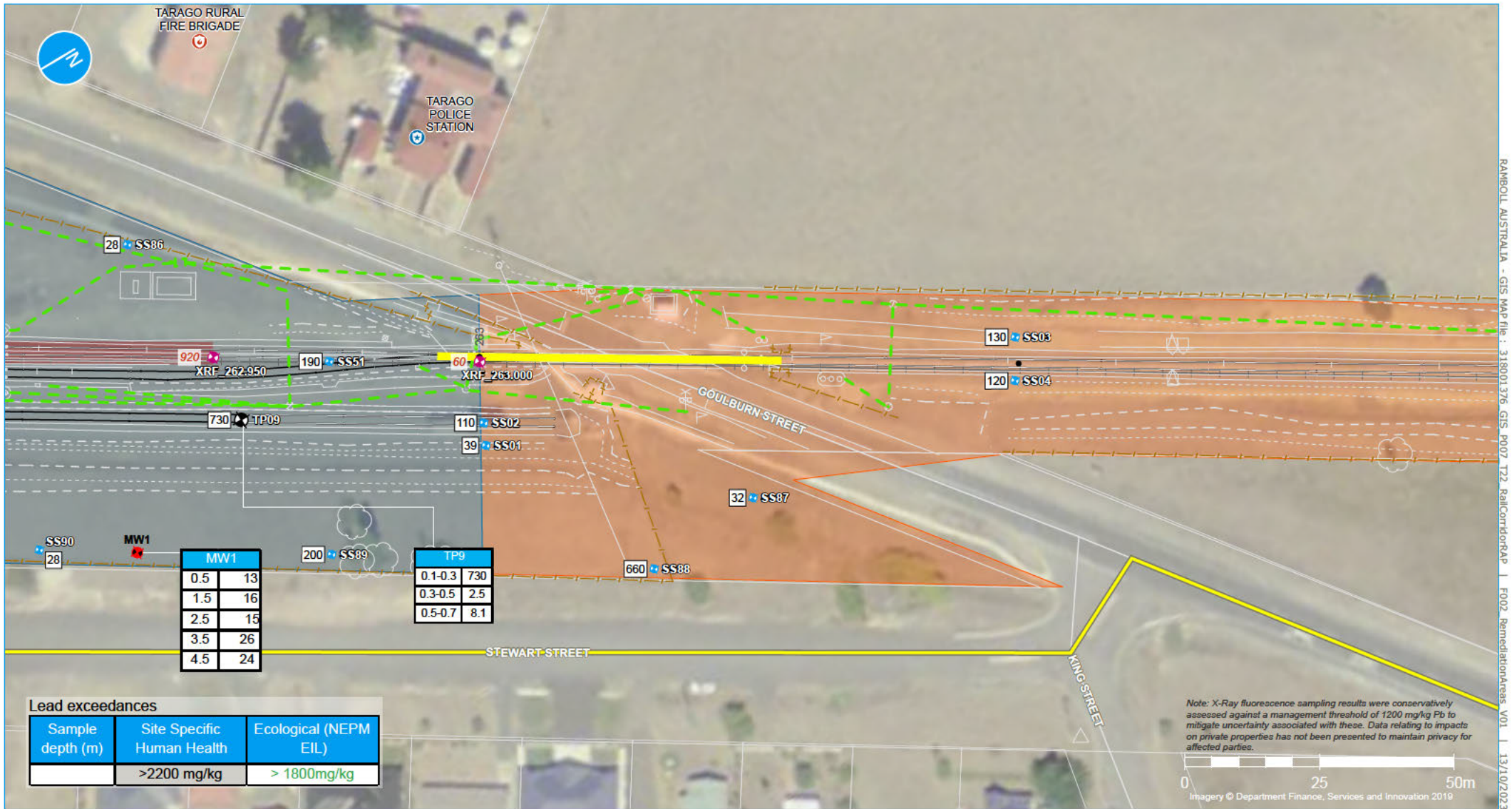


Legend

- Site boundary
- 0.1km chainage point
- Surface water flow (indicative)
- Rail track
- Top of bank
- Bottom of bank
- Signal trench
- Rail corridor fence
- Other elements
- X-Ray fluorescence sampling (Ramboll 2019, 2020)
- Shallow soil (Ramboll 2019)
- Test pit (Ramboll 2019)
- Lead concentration for XRF sample (mg/kg)
- Lead impacted area to remain
- Redundant Woodlawn siding - proposed excavation depth 0.5 mbgl
- Lead impacted area surrounding the siding (excluding all rail formation) - proposed excavation depth 0.3 mbgl
- Haul route



Figure 2d | Site Plan



RAMBOLL AUSTRALIA - GIS MAP file : 318001 376 GIS P007 T22 RailCorridorRAP | F002 RemediationAreas_V01 | 13/10/2023

Legend

- Site boundary
- 0.1km chainage point
- Goulburn Street level crossing
- Rail track
- Top of bank
- Bottom of bank
- Signal trench
- Rail corridor fence
- Other elements
- X-Ray fluorescence sampling (Ramboll 2019, 2020)
- Shallow soil (Ramboll 2019)
- Test pit (Ramboll 2019)
- Lead concentration for XRF sample (mg/kg)
- Groundwater monitoring location
- Lead impacted area to remain
- Haul route

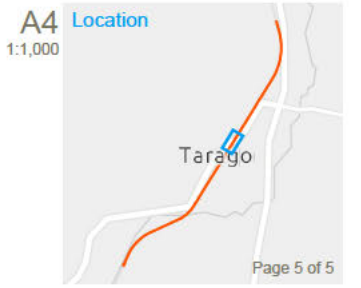


Figure 2e | Site Plan