GLEVAN CONSULTING

Phytophthora Dieback Occurrence Report for the Tathra Wind Farm

Prepared for SynergyRED

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Client	SynergyRED
Report name	Phytophthora Dieback Occurrence Report for the Tathra Wind Farm

Version History

Author	Reviewer	Version	Version Number	Submission Date
S. Hewitt	D. Delaporte	Draft	0.1	15/07/2025
D. Delaporte	-	Revision	0.2	11/09/2025
D. Delaporte	-	Final	1.0	08/10/2025

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This report has been prepared in accordance with the scope of work agreed between SynergyRED and Glevan Consulting and contains results and recommendations specific to the agreement. Results and recommendations in this report should not be referenced for other projects without the written consent of Glevan Consulting.

Procedures and guidelines stipulated in various manuals, particularly Phytophthora Dieback Interpreters Manual for lands managed by the Department (DBCA), are applied as the base methodology used by Glevan Consulting in the delivery of the services and products required by this scope of work. These guidelines, along with overarching peer review and quality standards ensure that all results are presented to the highest standard.

Glevan Consulting has assessed areas based on existing evidence presented at the time of assessment. The Phytophthora pathogen may exist in the soil as incipient disease. Methods have been devised and utilised that compensate for this phenomenon; however, very new centres of infestation, that do not present any visible evidence, may remain undetected during the assessment.

Executive Summary

Glevan Consulting was commissioned by SLR Consulting Australia Pty Ltd on behalf of SynergyRED to conduct a Phytophthora Dieback assessment to determine the disease status of remnant bushland within the Tathra Wind Farm 'Development Envelope' and associated 'Road Intersections'. The area assessed during the Phytophthora Dieback assessment forms the 'Project Indicative Disturbance Footprint' and is hereby referred to as the Project Area (Figure 1). The assessment was carried out in accordance with the Phytophthora Dieback Interpreter's Manual for lands managed by the Department of Biodiversity, Conservation and Attractions (DBCA).

The Project Area is located south of Eneabba-Three Springs Road and finishes approximately 12 kilometres south of Carnamah-Eneabba Road. Six road intersections were assessed, including the intersection of Brand Highway and Eneabba-Three Springs Road, the intersection of Carnamah-Eneabba Road and Rose Thomson Road, the intersection of Carnamah-Eneabba Road and Garibaldi Wills Road, and three areas located along Coorow-Green Head Road. The site predominantly consisted of cropping and livestock farmland with the future intent to build access corridors and hardstand areas for the development of the Tathra Wind Farm.

The assessment was conducted between 16/06/2025 to 20/06/2025 by Shannon Hewitt of Glevan Consulting. Miss Hewitt is accredited by the Department of Biodiversity, Conservation and Attractions in the detection, diagnosis and mapping of the Dieback disease (Interpreter Registration No: DPW PDI 45). This accreditation recognises the skills and experience of Miss Hewitt.

Of the 1605.19 ha contained within the assessment boundaries, 7.38 ha were classed as Uninfested with adequate amounts of susceptible species being present. A further 0.27 ha were deemed Permanently Uninterpretable due to the overall lack of sufficient indicators, and 1597.53 ha were Excluded due to the complete lack of natural vegetation most commonly identified as farmland. All areas within the Project Area were categorised as Protectable from Phytophthora Dieback.

Two soil and tissue samples were taken during the course of the assessment. Both samples were taken north of Carnamah-Eneabba Road residing in Lot 10890. Both samples have since returned negative results.

Phytophthora Dieback occurrence categories assigned as part of this assessment are valid for a period of 12 months from the date of survey. A Recheck Assessment may be conducted to revalidate the 2025 Phytophthora Dieback Occurrence Maps should no ground disturbance activities be undertaken during the validity period.

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Glossary

Biomass	The total quantity or weight (density) of organisms in a given area.
Buffer	The area between the edge of visible disease symptoms and demarcation.
Clean On Entry	A requirement at a defined, signposted point where entering machinery and vehicles are to be free of soil, plant, and other material to minimise the risk of spreading weeds, pests and diseases.
DBCA	Department of Biodiversity, Conservation and Attractions.
Demarcation	The physical installation and representation of boundaries between hygiene categories after interpretation.
Phytophthora Dieback	The disease of plants caused by infection by the soil-borne organisms of the genus *Phytophthora*, of which *P. cinnamomi* is the most widespread and destructive.
Disease Impact	The degree of harm caused by Phytophthora Dieback (high, moderate, low).
Excluded Area	An area of high disturbance where natural vegetation is unlikely to recover.
Host	A plant species that may be Infested with the pathogen but not cause disease.
Indicator Species	Plant species susceptible to Phytophthora disease and reliably show early symptoms.
Infection	The invasion of the disease to an individual plant and not the population.
Infestation	The invasion of the disease into a population of plants.
Infested	An area that a registered interpreter has determined is expressing disease symptoms that indicate the presence of the pathogen *Phytophthora cinnamomi*.
Incipient Disease	A disease that is not visibly symptomatic.
Interpretation	Determining disease presence or absence in natural ecosystems using observable factors.
Not Yet Resolved	Phytophthora occurrence diagnosis cannot be made because of inconsistent evidence.
Pathogen	Phytophthora species.
Phytophthora Occurrence Assessment	The entire scope of work that relates to the delivery of a Phytophthora occurrence map and report.
Permanently Uninterpretable	A natural area with inadequate visible symptoms present to make a diagnosis.
Project Area	The Project Area forms the boundaries of the Phytophthora Dieback Occurrence assessment. The proponent's area of interest, including the area where disturbance activities could occur, including access and egress to activity areas.
Protectable Area	Portions of the Project Area over which hygiene management rules for the plant pathogen *Phytophthora*, including clean on entry, will apply. These areas are generally free of disease.
Susceptible	Likely or liable to be harmed by Phytophthora pathogen.
Uninfested	An area that a registered interpreter has determined may be free of plant disease symptoms that indicate the presence of the pathogen *Phytophthora cinnamomi*.
Temporarily Uninterpretable	A naturally vegetated area that has had disturbance and is likely to recover from that disturbance in the short term.
Unprotectable	A disease-free area that is likely to become infested within a given time.
Vector	Any agent that acts as a carrier or transporter.

1 Introduction

Glevan Consulting was commissioned by SLR Consulting Australia Pty Ltd on behalf of SynergyRED to conduct a Phytophthora Dieback assessment to determine the disease status of remnant bushland within the Tathra Wind Farm 'Development Envelope' and associated 'Road Intersections'. The area assessed during the Phytophthora Dieback assessment forms the 'Project Indicative Disturbance Footprint' and is hereby referred to as the Project Area (Figure 1).

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The Phytophthora Dieback occurrence assessment was completed in June 2025 by Miss Shannon Hewitt. Miss Hewitt is accredited by the Department of Biodiversity, Conservation and Attractions in the detection, diagnosis and mapping of the Dieback disease (Interpreter Registration No: DPW PDI 45). This accreditation recognises the skills and experience of Miss Hewitt.

Phytophthora Dieback occurrence categories assigned as part of this assessment are valid for a period of 12 months from the date of survey. A Recheck Assessment may be conducted to revalidate the 2025 Phytophthora Dieback Occurrence Maps should no ground disturbance activities be undertaken during the validity period.

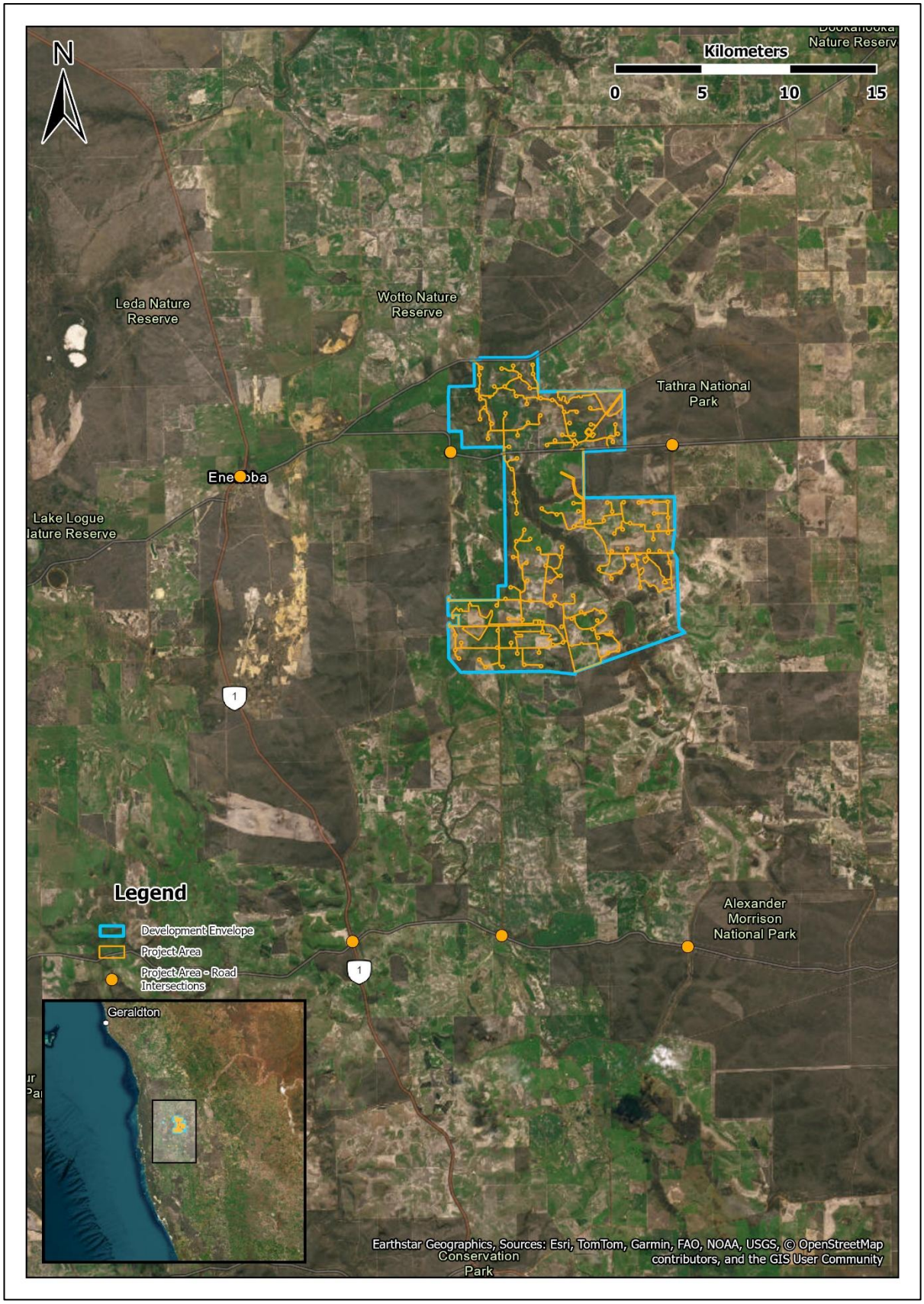

Figure 1 – Tathra Wind Farm Development Envelope and Phytophthora Dieback Assessment Project Area location.

2 Background – Phytophthora Species and Dieback Disease

Thousands of Australian native plant species are susceptible to Phytophthora Dieback (Dieback), a disease caused by the pathogen *Phytophthora cinnamomi* and other *Phytophthora* species. Whilst many root pathogens that cause disease are present within the Australian landscape, *Phytophthora cinnamomi* has caused the most significant impact to date and poses the biggest threat (Commonwealth of Australia, 2018). This disease is a significant threat to Australia's biodiversity, placing important plant species at risk of death, local extirpation or even extinction. Its impact on plant communities can also result in major declines in some insect, bird and animal species due to the loss of shelter, nesting sites and food sources. Phytophthora Dieback can cause permanent damage to ecosystems. Once an area is Infested with the pathogen, eradication is usually impossible. Awareness that human activity can easily spread the pathogen will help prevent an increase in the extent of this disease (Commonwealth of Australia, 2018).

P. cinnamomi is one of at least 32 *Phytophthora* species that exist in Australia. Whilst *P. cinnamomi* has to date had the largest impact on the Western Australia vulnerable zone, other destructive *Phytophthora* species are emerging in Australia such as *P. arenaria, P. constricta, P. cryptogea, P. elongata, P. gregata, P. megasperma* and *P. multivora. P. multivora* is notable in having been linked to declines in vegetation within the Western Australian vulnerable zone (Commonwealth of Australia, 2018).

P. cinnamomi is a microscopic water mould that belongs to the class Oomycetes. Oomycetes organisms are filamentous and absorptive and reproduce both sexually and asexually. *Phytophthora* species are considered parasitic, behaving largely as a necrotrophic pathogen causing damage to the host plant's root tissues because of infection and invasion (Department of Parks and Wildlife, 2015). The pathogen infects a host when it enters at a cellular level and damages the cell structure.

Dieback is the result of interaction between three physical components forming a 'disease triangle': the pathogen (*Phytophthora* species), the environment and the host. All three components are needed for the disease to develop over time. A population of hosts is made up of susceptible, infected and immune or resistant individuals.

The relationship between the presence of *Phytophthora* and the development of Dieback disease is variable based on the susceptibility of native plant species and the different environmental characteristics, landform types and rainfall zones across bioregions.

The plant host is a highly variable part of the disease triangle. Assessment sites may range from having no susceptible hosts present through to almost all plants present in the environment demonstrating high levels of susceptibility to *P. cinnamomi*. Over 2000 potential host species for the *P. cinnamomi* pathogen exist in Western Australia alone (Commonwealth of Australia, 2018). Skilled Dieback Interpreters are able to observe and interpret disease presence using hundreds of different susceptible plant species (referred to as indicator species) across multiple vegetation communities. Interpreters are able to recognise when disease detection is not possible due to insufficient hosts being present within an area.

Within the vulnerable zone of Western Australia, three main family groups are regarded as highly susceptible to Phytophthora Dieback disease:

1. Proteaceae
2. Ericaceae
3. Xanthorrhoeaceae.

The Proteaceae plant family demonstrates a high level of susceptibility to the *Phytophthora cinnamomi* pathogen. Genera such as *Banksia*, *Isopogon*, *Adenanthos, Persoonia, Petrophile* and *Xylomelum* demonstrate high susceptibility, providing reliable indicators through much of the vulnerable zone of Western Australia. *Andersonia, Astroloma* and *Leucopogon* species from the Ericaceae family also demonstrate high levels of susceptibility, whilst other species within the family do not demonstrate the same level of vulnerability to the pathogen. All species contained in the Xanthorrhoeaceae family are considered to be reliable indicator species.

Not all species within the vulnerable zone of Western Australia are susceptible to Dieback, with some species demonstrating a resistance to the pathogen. Resistance to the pathogen is recognised within genera such as *Acacia, Calothamnus, Eucalyptus* (excluding *Eucalyptus marginata*), *Lepidosperma* and *Melaleuca*, among others. Resistance to *P. cinnamomi* is dependent on a multitude of factors such as the ability for a species to compartmentalise the infected part of a root or the plants ability to quickly regrow new roots in order to replace those infected by the pathogen (Commonwealth of Australia, 2018). It has been recognised under field conditions that herbaceous perennials, annuals and

geophytes demonstrate greater resistance to Phytophthora Dieback compared to woody perennials (Commonwealth of Australia, 2018).

Where species considered to be resistant to the *P. cinnamomi* pathogen are observed to be dying suddenly, Armillaria Rot Disease (ARD) may be considered to be the cause of death. ARD is caused by the *Armillaria luteobubalina* fungus. Drought conditions are another contributing cause of death other than ARD to Phytophthora resistant species.

Temperature, rainfall and soil type all affect the impact that Dieback has on an area. *P. cinnamomi* does not generally cause significant vegetation declines in areas that receive less than 400 millimetres of rain annually and occur north of latitude 30° (O'Gara et al., 2005 as cited in Commonwealth of Australia, 2018). Within Western Australia, the vulnerable zone exists in areas of Mediterranean climate (warm to hot, dry summers and mild to cool, wet winters) where annual rainfall exceeds 400 millimetres in the southwest of Western Australia. The most significant impact of the pathogen is observed in areas receiving an annual rainfall of above 800 to 1000 millimetres.

Soil characteristics also play a significant role in the occurrence of Dieback. Moisture is essential for the survival of the *Phytophthora* pathogen and for sporangia production, with wet soil conditions and warm temperatures favouring the release of motile zoospores from the sporangia. Optimal temperatures for the survival and reproduction of the pathogen are between 21°c to 30°c, a temperature range that is common through the vulnerable zone of Western Australia (Department of Parks and Wildlife, 2015). The growth and reproduction of the pathogen is also affected by soil pH, with a favourable pH range of between five and six (mildly acidic). Strong host resistance is observed in areas with a high level of soil fertility, creating a less favourable soil environment for the pathogen.

Whilst autonomous (active) spread of the disease does occur, *P. cinnamomi* is passively spread (or vectored) by animals and human activity via the movement of soils, allowing the rapid infestation of a new area by the pathogen. The movement of even small pieces of vegetation or soil containing viable inoculum (zoospores, chlamydospores, oospores) can result in the spread of the pathogen. Passive spread by a vector can occur both overland and in subsurface water flow (Commonwealth of Australia, 2018). Human induced spread of the *P. cinnamomi* pathogen is a significant risk in the Western Australian landscape. Activities such as road construction and maintenance, commercial activities (timber harvesting and mining), off-road vehicle movement and bush walking activities can result in the spread of the disease should movement of Infested soil occur.

3 Materials and Methods

3.1 Project Area

The Project Area assessed during the 2025 Tathra Wind Farm assessment incorporated the 'Project Indicative Disturbance Footprint' within the site 'Development Envelope' and associated 'Road Intersections'. The Project Area included proposed access routes, hard stand areas and areas for associated infrastructure to be developed.

Significantly disturbed areas within the Project Area (Figure 1) were categorised as Excluded based on Vegetation Condition Scale (Keighery, 1994) shown in Table 1.

The Tathra Wind Farm site was largely observed to contain areas completely cleared of all native vegetation and possessed a Keighery Vegetation Condition Scale rating of 6; Completely Degraded. All remaining area was categorised post-assessment into Phytophthora Dieback occurrence categories (Table 2).

Table 1 – Keighery Vegetation Condition Scale and Assessability (Department of Parks and Wildlife, 2015).

Assessability	Scale		Vegetation Condition
Assessable	1	Pristine	Pristine or nearly so; no obvious signs of disturbance.
	2	Excellent	Vegetation structure intact; disturbance affecting individual species and weeds are non-aggressive species.
	3	Very good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Possibly assessable – Discretion required	4	Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Not assessable – Excluded from assessment	5	Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
	6	Completely degraded	The structure of the vegetation is no longer intact, and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Table 2 – Phytophthora Dieback Assessment for Vegetation Condition.

Vegetation Condition	Phytophthora Occurrence Category
Naturally vegetated areas. Keighery disturbance rating of 3 or less Phytophthora occurrence categorisation is possible.	Infested - Determined to have plant disease symptoms consistent with the presence of *Phytophthora cinnamomi.*
	Uninfested - Determined to be free of plant disease symptoms that indicate the presence of *P. cinnamomi*
	Permanently Uninterpretable - Undisturbed areas where susceptible plants are absent, or too few to make a determination of the presence or absence of *P. cinnamomi.*
	Not yet resolved.
Vegetation structure temporarily altered.	Temporarily Uninterpretable - Areas of disturbance where natural vegetation is likely to recover.
Vegetation structure severely altered. Keighery disturbance rating 4 or greater. Phytophthora occurrence assessment is not possible	Excluded.

3.2 Assessment Method

Prior to assessment, all information relevant to the assessment was assembled to assist the interpretation process. This information included previous assessments of the area, historic sample results, history of burning and possible other disturbances. This process is referred to as the Desktop Assessment.

All Phytophthora Dieback detection, diagnosis and mapping are performed to standards and procedures defined in *FEM047 Phytophthora Dieback Interpreter's Manual for lands managed by the department* (Department of Parks and Wildlife, 2015). These procedures are grounded on the presence of indicator species in the vegetation, and the observance of deaths in these plants. An indicator species is a plant species that is reliably susceptible to *Phytophthora cinnamomi*. Indicator Species Deaths alone do not necessarily indicate disease presence, and it is necessary to consider all environmental and ecological factors that may be present. These other factors include:

- Chronology of deaths,
- Pattern of deaths,
- Topographical position,
- Vectoring – causal agencies, and

- Biomass and biological diversity reduction.

Other causes of plant deaths need to be considered when determining the presence of Phytophthora Dieback (Department of Parks and Wildlife, 2015), including:

- Armillaria Root Disease,
- Various cankers,
- Insects,
- Drought, wind scorch and frost,
- Salinity and waterlogging,
- Fire and lightning,
- Senescence and competition,
- Physical damage, and
- Herbicides and chemical spills.

The Phytophthora Dieback assessment process is undertaken using the following basic sequence as documented in *FEM047 Phytophthora Dieback Interpreter's Manual for lands managed by the department* (Department of Parks and Wildlife, 2015):

- Observe,
- Hypothesise,
- Undertake evidence collection,
- Form a diagnosis,
- Test the diagnoses (sample results, previous assessment, second assessment),
- Evidence is reviewed with a new hypothesise formed, if necessary,
- Final field diagnoses determined.

3.3 Collection of Evidence of Phytophthora Dieback

During the assessment process, the collection of evidence to support the field diagnosis was recorded using a tablet running the ESRI Field Maps application. Waypoints are recorded at locations to show evidence of:

- Where field diagnosis is certain or almost certain of Phytophthora Dieback infestation,
- Healthy indicator species where field diagnosis is almost certain of the site being Uninfested,
- Sites with too few or devoid of indicator species, thus supporting Permanently Uninterpretable classification, or

- Areas of disturbance, which are Temporarily Uninterpretable or Excluded.

Additional waypoints recorded include:

- Points requiring soil and tissue sampling,
- Points located where samples have been taken,
- Points located at indicator species deaths, and
- Points that need to be revisited for further examination.

The assessment was conducted using the methodology of a linear assessment. Linear assessments represented by an assessment area 25 meters either side of the centre line are assessed using a minimum of a single pass on each side of the centre line. Assessment areas that exceed 25 meters either side of the centre line are either assessed using the methodology of a comprehensive assessment or additional transect lines are established parallel to the centre line at increments of 50 meters.

Waypoint evidence, sample sites and results, and digital occurrence category boundaries were then digitised into a Phytophthora Dieback Occurrence Map according to the standards defined by the *FEM047 Phytophthora Dieback Interpreter's Manual for lands managed by the department* (Department of Parks and Wildlife, 2015).

3.4 Demarcation

The Phytophthora Dieback occurrence categories not demarcated in the field using the appropriate flagging tape (**Error! Reference source not found.**). Instead, digital boundaries were established using the Field Maps application with an appropriate buffer applied. An appropriate buffer width is determined by Interpreters during the course of the assessment, and takes into consideration the following:

- Natural autonomous spread of the pathogen,
- Likely presence of incipient disease,
- Potential for surface water to flow into an area from an infestation,
- Current rate of spread,
- Location of natural drainage lines, such as creeks and brooks,
- Other site factors, including soil types that increase or decrease the rate of spread and degree of slope.

At a minimum, an up-slope buffer of 15 meters and a down-slope buffer width of 25 meters will be applied.

3.5 Soil and Tissue Samples

Soil and tissue samples taken during the assessment were to standards and prescriptions defined in *FEM047 Phytophthora Dieback Interpreter's Manual for lands managed by the department* (Department of Parks and Wildlife, 2015). While species specific sampling techniques were undertaken, the general process to collect a soil and tissue sample is as follows:

- Tools and equipment are checked for the presence of soil and plant matter. Sterilisation will have occurred at the completion of the previous sample. Re-sterilise if required.
- Using the sampling tool (long or short handle mattock), dig down to expose the stem base and roots of the target plant, to a minimum depth of 30 cm.
- Remove sections of the root material and stem base from all sides of the target plant and place into a plastic sample bag.
- Collect several handfuls of soil from different depths around the base of the target plant and place into the plastic sample bag.
- Complete two metal tags with the sample tag information, including project name, sample number, company details, sample date and Interpreter initials. Place one tag into the bag.
- Complete a paper tag with the above information and secure to the sample bag.
- Mark the location of the sample with flagging tape and secure the second metal information tag to a plant within the immediate vicinity of the flag.
- Record the sample location and required information as an evidence point using ESRI Field Maps.
- Remove any material from the sampling tools and sterilise.
- Store the sample(s) in a cool location away from direct sunlight until transported to the laboratory.

All samples were analysed in the Vegetation Health Services (DBCA) laboratory using best-practice techniques (Department of Parks and Wildlife, 2015).

Taking a soil and tissue sample from dead and dying plants is an integral part of assessment – although in some cases sampling is not essential. Sample results provide evidence to support field diagnostic

decisions. The following table (Table 3) shows the need for sampling to assist the disease diagnosis process.

Table 3 – Determination of Requirement for Sampling (Department of Parks and Wildlife, 2015).

Observable factors indicating likelihood of *Phytophthora cinnamomi* presence				
ISD type	Multiple	Cluster	Scattered	Isolated
Species	Some or most indicator species	Any indicator plant	Any indicator plant	Any indicator plant
Pattern development	Obvious			Not obvious
Chronology	Obvious			Not obvious
Topographic situation	Gully/flat	Lower to mid slope	Mid slope to upper slope	Ridge
Causal agent	Obvious			Not obvious
Requirement for soil and tissue sample	Low	High	High	Low

Samples may also be taken for the following strategic reasons:

- Supporting Infested field diagnosis,
- Incipient, subtle or cryptic disease in apparent Uninfested sites, or
- Altering mapped Infested area boundaries.

3.6 Determining Protectable Areas

Following the determination of Phytophthora Occurrence categories, all interpretable vegetation was assessed for protectability, using the Department of Biodiversity, Conservation and Attractions (DBCA) Protectable Areas criteria.

The *FEM047 Phytophthora Dieback Interpreter's Manual for lands managed by the department* (Department of Parks and Wildlife, 2015) defines 'Protectable Areas' as those that:

- Have been determined to be free of the pathogen Phytophthora spp. by a registered Dieback Interpreter (all susceptible indicator plant species are healthy and no plant disease symptoms normally attributed to Phytophthora Dieback are evident),
- Consists of areas where human vectors are controllable (e.g., not an open road, private property), and

- Are positioned in the landscape and are of sufficient size (e.g., > 4 ha with axis >100 m) such that a qualified Interpreter judges that the pathogen will not autonomously engulf them in the short term (a period of a few decades), or
- Includes areas of high conservation and/or socio-economic value (for example, a small Uninfested area with a known population of a susceptible species of Threatened flora).

Areas deemed Unprotectable are displayed on the Phytophthora Dieback Occurrence Map (See Section 7.1) as grey hatched areas. By default, all areas not displayed as Unprotectable on the Phytophthora Dieback Occurrence Map have been categorised as Protectable.

4 Results

4.1 Desktop Assessment

Landforms and Vegetation

The Pre-European Vegetation dataset (DPIRD-006) (Department of Primary Industries and Regional Development, 2019) recognises the Project Area as containing the following system associations:

TATHRA_49: "Heath; Low shrubs of mixed composition".
TATHRA_379: "Scrub-heath; Mixed heath with scattered tall shrubs *Acacia* spp., PROTEACEAE and MYRTACEAE".
TATHRA_391: "Thicket; Wattle, casuarina and teatree *Acacia-Allocasuarina-Melaleuca* alliance".

Based on the Desktop Assessment of vegetation types within the Project Area, several areas were identified as likely to support Indicator Species suitable for assessing the Phytophthora Dieback status. Conversely, other areas were expected to be dominated by non-susceptible species and were therefore anticipated to be classified as Permanently Uninterpretable. The findings of the Desktop Assessment were subsequently corroborated by field observations.

Fire History

Analysis of the DBCA Fire History (DBCA-060) database (Department of Biodiversity, Conservation and Attractions, 2025) indicates that very small sections of the Project Area experienced a prescribed burn in 2023 (Carnamah-Eneabba Road), however from a desktop assessment the prescribed burn has not impacted vegetation within the project boundaries. As such, it is expected that the majority of vegetation present within the Project Area will not be subject to fire disturbance at the time of assessment. The results of the Desktop Assessment were validated through subsequent field observations.

Historical Assessments

Review of Glevan Consulting's database does not show any previous recoveries of *Phytophthora cinnamomi* within or around the Project Area. The closest positive recovery of *Phytophthora cinnamomi* can be found 8.9 kilometres west of the Project Area near Brand Highway.

Rainfall

The annual average rainfall (2012 to 2024) recorded at the nearby Carnamah Weather Station is 305.26 mm (Bureau of Meteorology, 2025). The *Phytophthora cinnamomi* vulnerable zone is recognised as occurring in areas that exceed 400 mm of annual rainfall (Department of Parks and Wildlife, 2015). Phytophthora Dieback is therefore very unlikely to occur within the Project Area.

4.2 Phytophthora Dieback Distribution

The Project Area consisted of 7.38 ha of interpretable vegetation, with the remaining bushland and farmland within the assessment categorised as Permanently Uninterpretable (Section 4.3) or Excluded (Section 4.4) (**Error! Reference source not found.** – Figure 11). No historic or new infestations were observed within the Project Area.

Vegetation classified as Uninfested appeared to be in good condition, with scatter indicators deaths seen throughout. These deaths can likely be attributed to drought and mechanical disturbance, as the majority of deaths were found on the edge of bushland where cropping takes place. Indicator species found throughout the site included:

Adenanthos cygnorum,
Banksia attenuata,
Banksia candolleana,
Banksia fraseri,
Banksia leptophylla,
Banksia menziesii,
Banksia prionotes,
Banksia shpaerocarpa,
Xanthorrhoea preissii,
Xylomelum angustifolium.

The Phytophthora Dieback Occurrence categories mapped during the assessment are displayed in Figure 2 – Figure 11.

4.3 Permanently Uninterpretable Areas

Permanently Uninterpretable vegetation was observed to occupy 0.27 ha of the Project Area, located on the intersection of Rose Thompson Road and Coorow-Green Head Road (Figure 9). Indicator species in these areas were sparsely populated, mainly dominated by non-susceptible species often found in low lying wetland areas.

4.4 Excluded Areas

Excluded areas are not able to be assessed for the presence of Phytophthora Dieback due to the level of disturbance of the vegetation, based on the Keighery Vegetation Condition Scale. A total of 1597.53 ha of land within the Project Area was deemed Excluded due to the complete lack of natural vegetation, corresponding to a Keighery Vegetation Condition Scale rating of 6 (Completely Degraded). Areas such as this were commonly identified as livestock and cropping paddocks. A number of areas within the project boundaries were also categorised as Excluded due to the natural vegetation having become dominated by paddock vegetation and weeds, roads and farm windbreaks (Keighery Vegetation Condition Scale rating of 5 (Degraded)). Windbreaks are tree and shrubs that have been purposely planted to reduce wind damage to crops and livestock.

4.5 Allocation of Categories

The Phytophthora Dieback Occurrence categorised mapped during the assessment are tabulated in Table 4 (**Error! Reference source not found.** – Figure 11).

Table 4 – Results Summary of the Project Area.

Category	Protectable Area (ha)	% of Total Area
Uninfested	7.38	0.46
Permanently Uninterpretable	0.27	0.02
Excluded	1597.53	99.52
TOTAL AREA	**1605.19**	**100**

4.6 Sample Summary

Two soil and tissue samples were taken on the edge of bushland where indicator species deaths were identified. Both samples have returned a negative result (Table 5).

Table 5 – Soil and Tissue Sample Results.

Sample Number	Plant Sampled	Easting	Northing	Result
SH01	*Banksia leptophylla*	352480	6702500	Negative
SH02	*Xanthorrhoea preissii*	351458	6704932	Negative

5 Discussion

Glevan Consulting was commissioned by SLR Consulting Australia Pty Ltd, on behalf of SynergyRED, to conduct a Phytophthora Dieback assessment of the proposed Tathra Wind Farm Project Area. The assessment took place between 15/06/2025 to 13/07/2025, with no infestations of Phytophthora Dieback observed within the Project Area.

7.38 ha of remnant bushland was classified as Uninfested with sufficient indicators present for interpretation. Indicator species included *Banksia attenuata, Banksia menziesii, Banksia candolleana, Banksia leptophylla, Banksia sphaerocarpa, Banksia fraseri, Banksia prionotes, Adenanthos cygnorum, Xylomelum angustifolium* and *Xanthorrhoea preissii.*

Scattered deaths could be found along the edges of native vegetation and paddocks, these deaths were determined to be background deaths and highly likely to be related to drought, water-logging and mechanical disturbance. Deaths along high points and ridges can likely be attributed to drought and mechanical disturbances as livestock and machinery for cropping operations may use the outer edges of paddocks to traverse. Deaths found in low-lying areas can be attributed to waterlogging through the wetter months.

One discreet area was identified where the vegetation was classified as Permanently Uninterpretable, this area can be found on the Intersection of Coorow-Green Head Road and Rose Thompson Road. The vegetation comprised of non-susceptible shrub species and lacked sufficient indicator species to accurately assess the area for the presence of Phytophthora Dieback.

Excluded areas included paddocks for livestock and cropping, planted windbreaks, roads and natural vegetation that has been overrun with paddock vegetation. As such these areas did not have sufficient indicators to determine the presence or absence of the pathogen and were Excluded from the assessment.

Phytophthora Dieback occurrence categories assigned as part of this assessment are valid for a period of 12 months from the date of survey. A Recheck Assessment may be conducted to revalidate the 2025 Phytophthora Dieback Occurrence Maps should no ground disturbance activities be undertaken during the validity period.

6 Bibliography

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7 Appendices

7.1 Phytophthora Dieback Occurrence Map

The provided maps are the Phytophthora Dieback occurrence maps (Figure 2 – Figure 11).

The assessment area is displayed as an orange boundary line. The following categories are also shown:

- Excluded (shown as yellow). Areas of high disturbance where natural vegetation has been cleared and is unlikely to recover to a level that is interpretable.
- Uninfested (shown as green). Determined from the assessment to be free of plant disease Phytophthora Dieback.
- Permanently Uninterpretable (shown as purple). Undisturbed areas where susceptible plants are absent, or too few to decide the presence or absence of Phytophthora Dieback.

Additional spatial data that may be shown include:

- Sample location.

7.2 Mapping Metadata

Dataset Description	
Title	Tathra_Wind_Farm_2025
Data Created	14/07/2025
Date Last Updated	14/07/2025
Abstract	Phytophthora Dieback occurrence, samples, evidence, and project area shapefiles for the Tathra Windf Farm.
Purpose	Dieback category boundary mapping.
Document Number	GC-25-0024
Contact Organisation	Glevan Consulting
Contact Name	Shannon Hewitt
Contact Position	Registered Interpreter
Contact Phone	0457 253 158
Contact Email	shannon.hewitt@glevan.com.au
Lineage	All field data recorded using ESRI Field Maps application on a GPS enabled tablet.
Datum / Coordinate System	GDA2020 MGA Zone 50
Geographic Description	Shire of Carnamah
Restrictions	None

7.3 Shapefile Spatial Data

Shapefile Spatial Data	
File Contents	**File Name**
Occurrence	Tathra_Wind_Farm_2025_Occurrence
Samples	Tathra_Wind_Farm_2025_Samples
Evidence	Tathra_Wind_Farm_2025_Evidence
Project Area	Tathra_Wind_Farm_2025_Project_Area

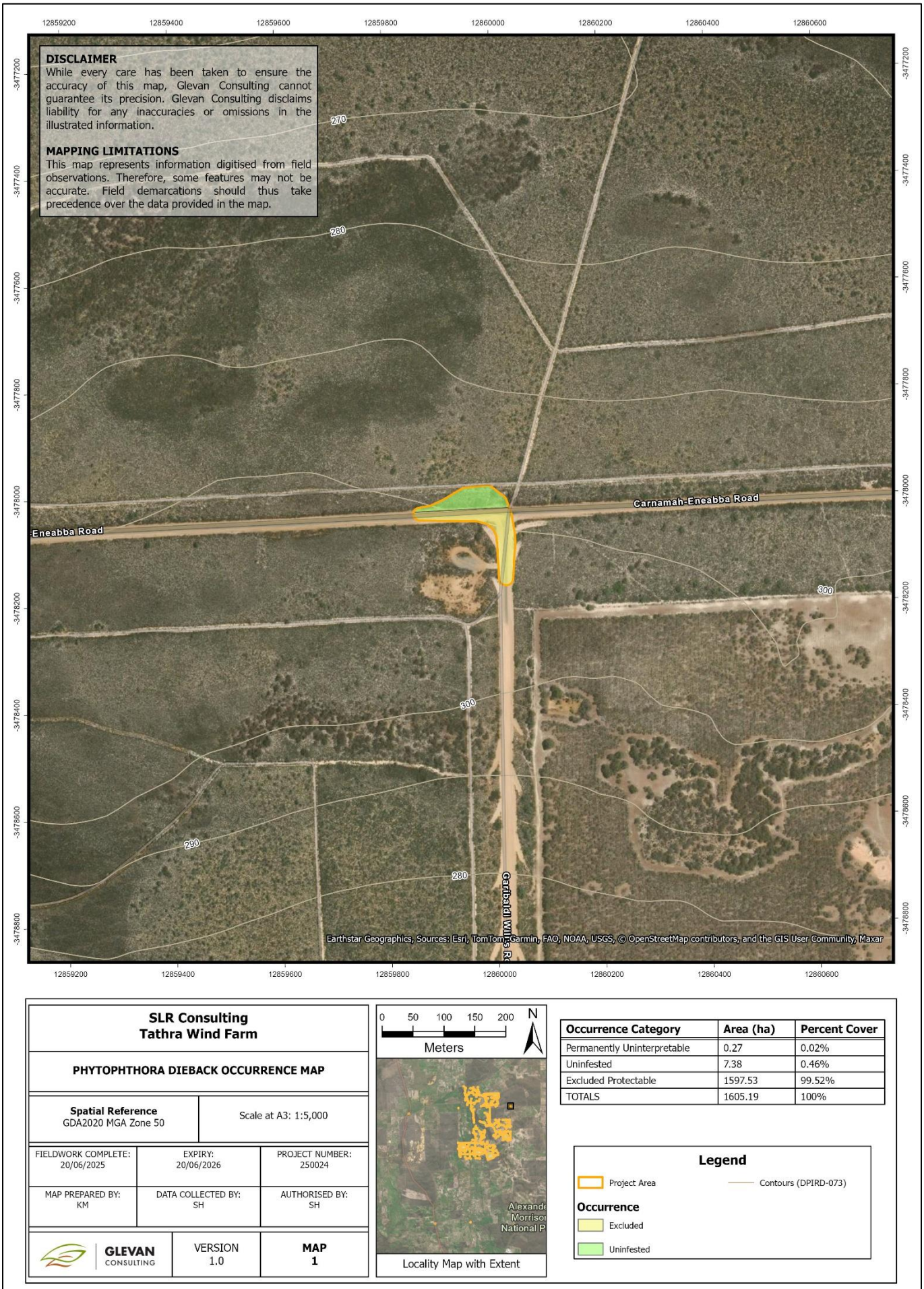

Figure 2 – Phytophthora Dieback Occurrence Map 1.

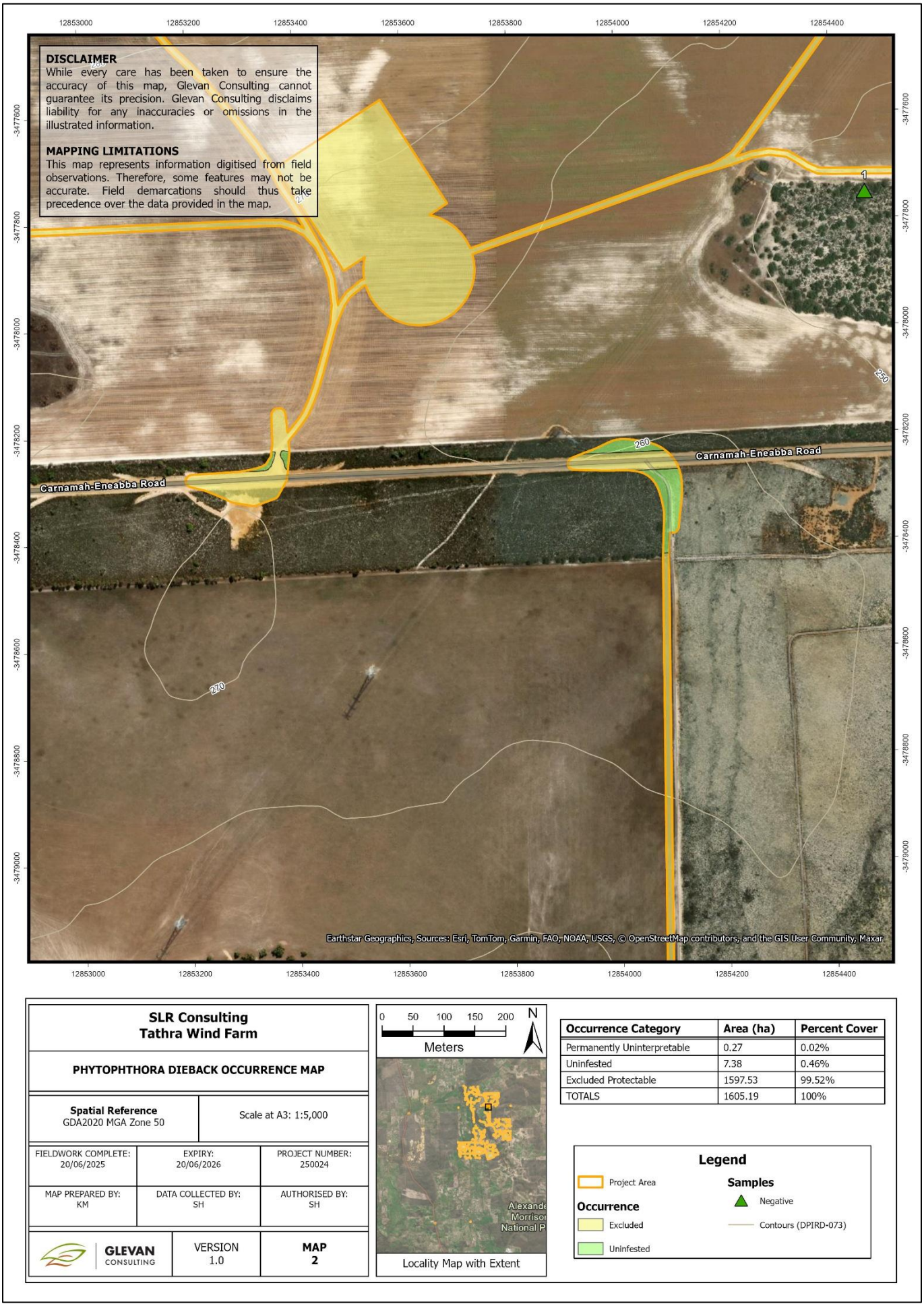

Figure 3 – Phytophthora Dieback Occurrence Map 2.

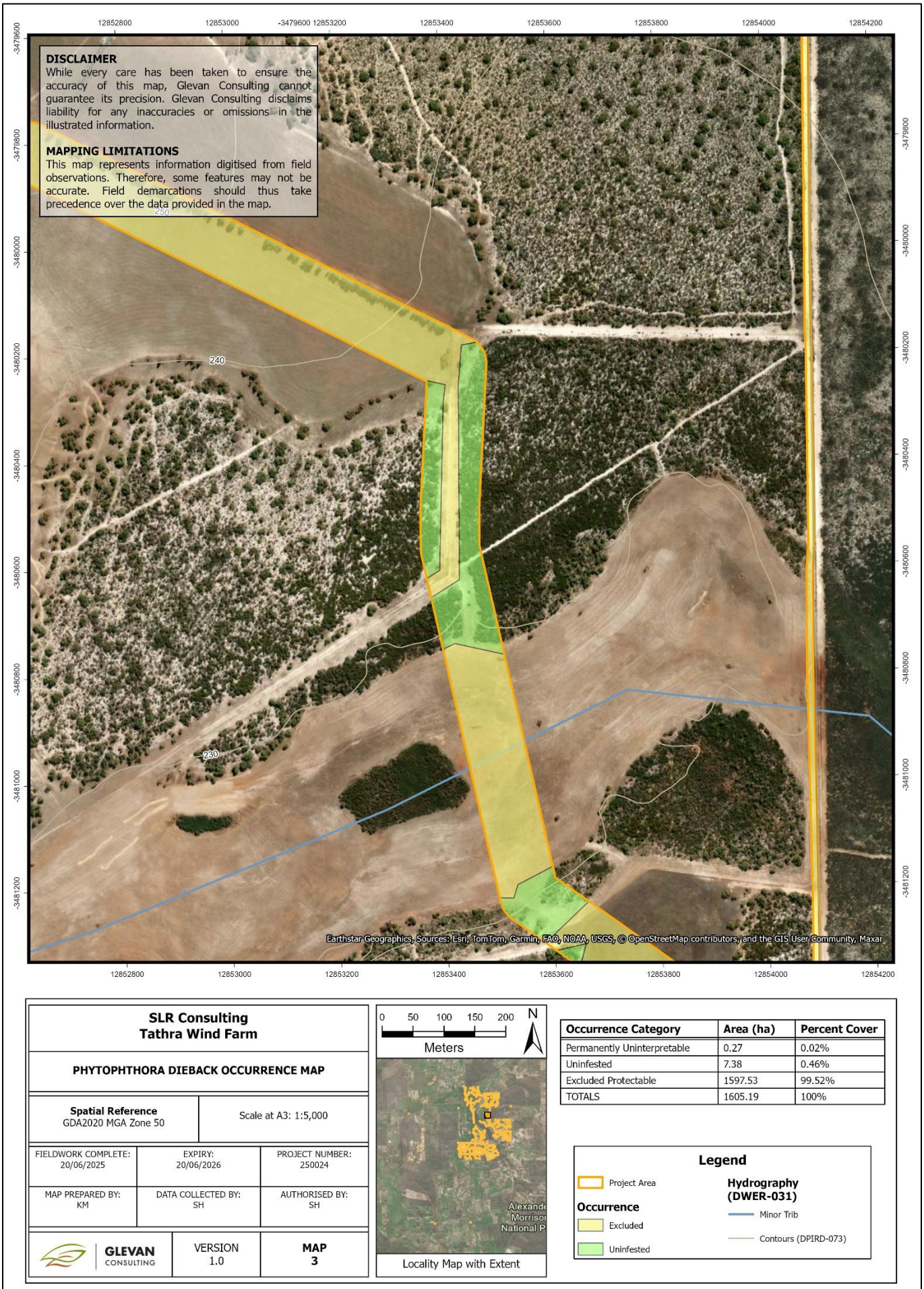

Figure 4 – Phytophthora Dieback Occurrence Map 3.

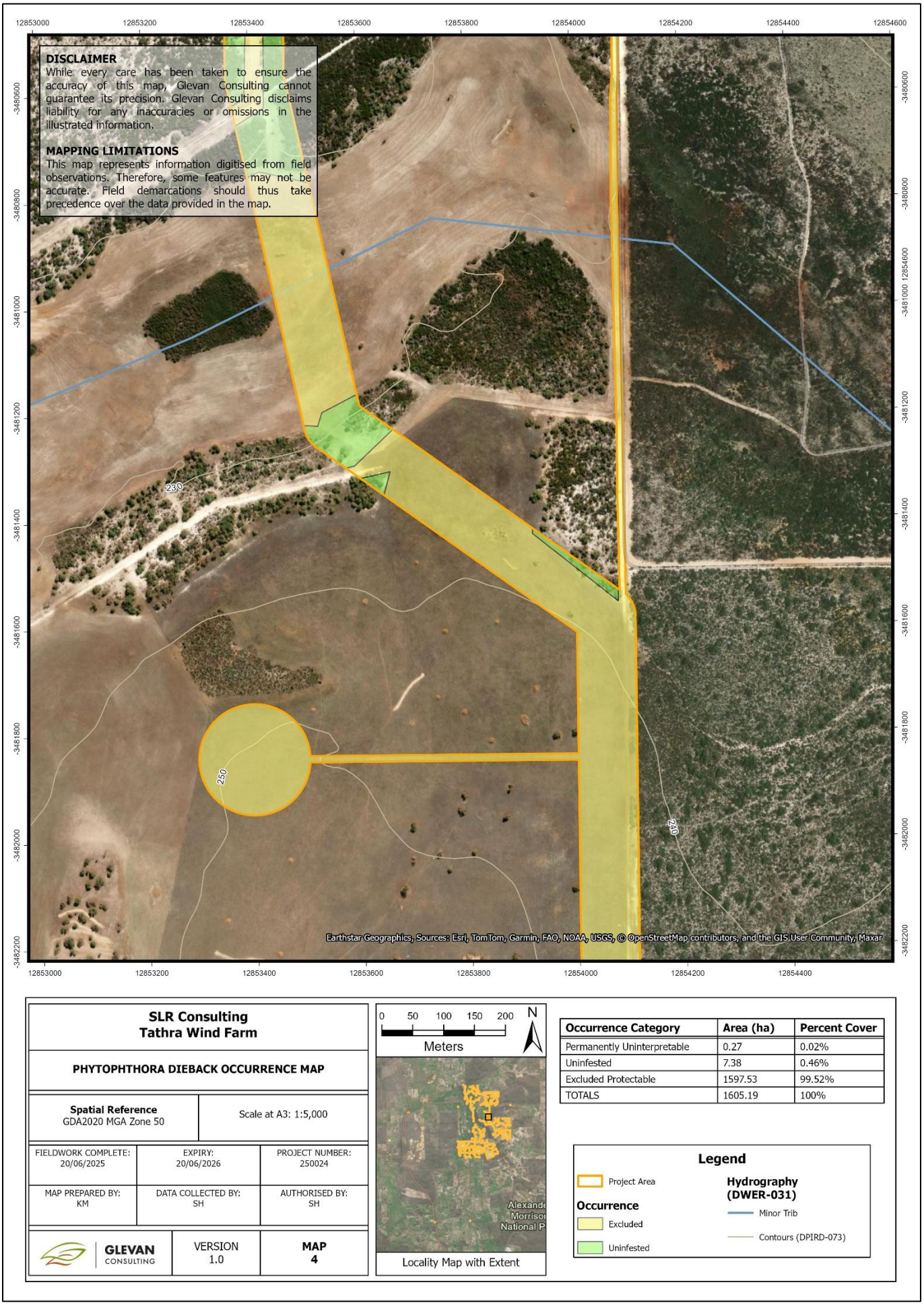

Figure 5 – Phytophthora Dieback Occurrence Map 4.

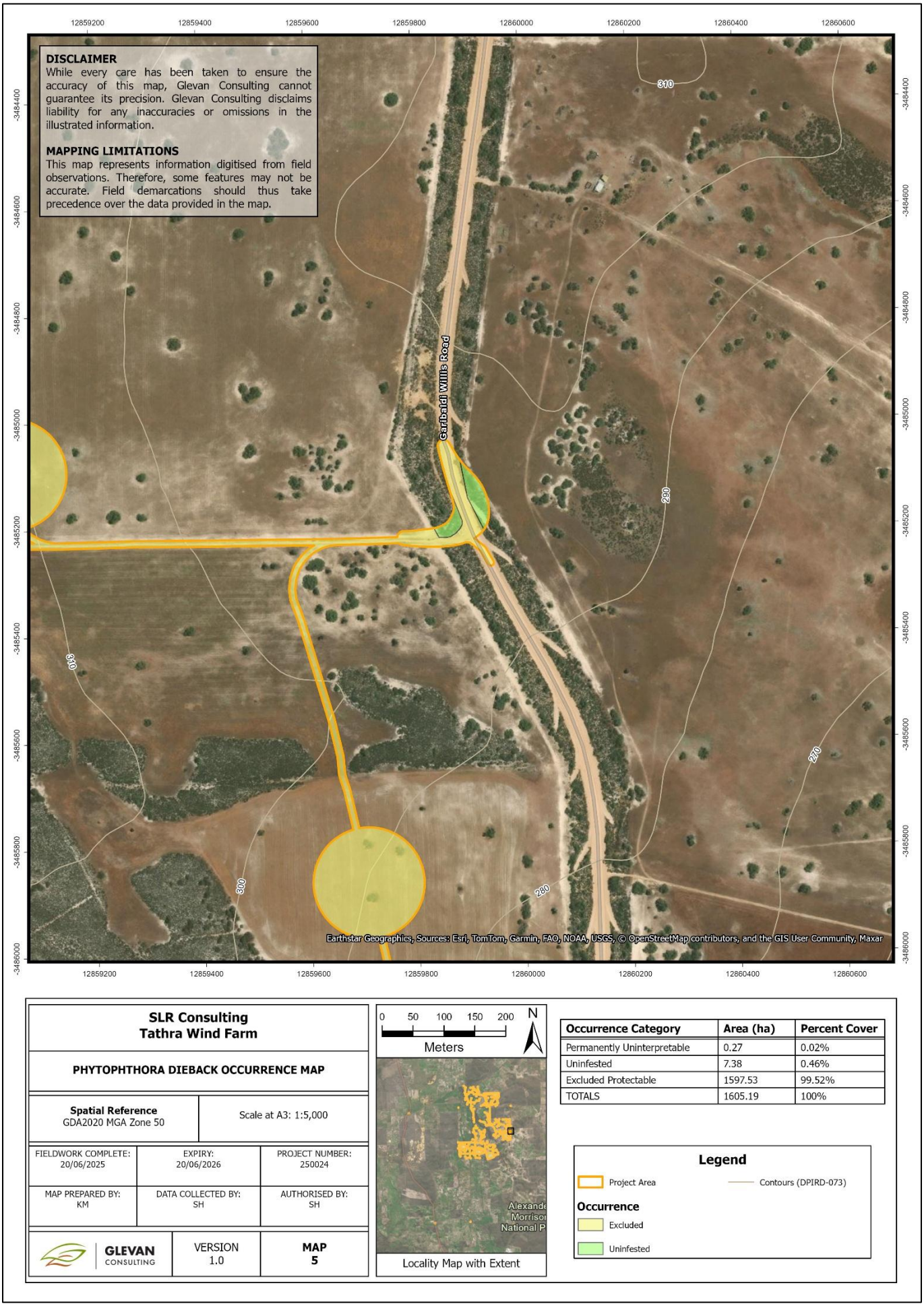

Figure 6 – Phytophthora Dieback Occurrence Map 5.

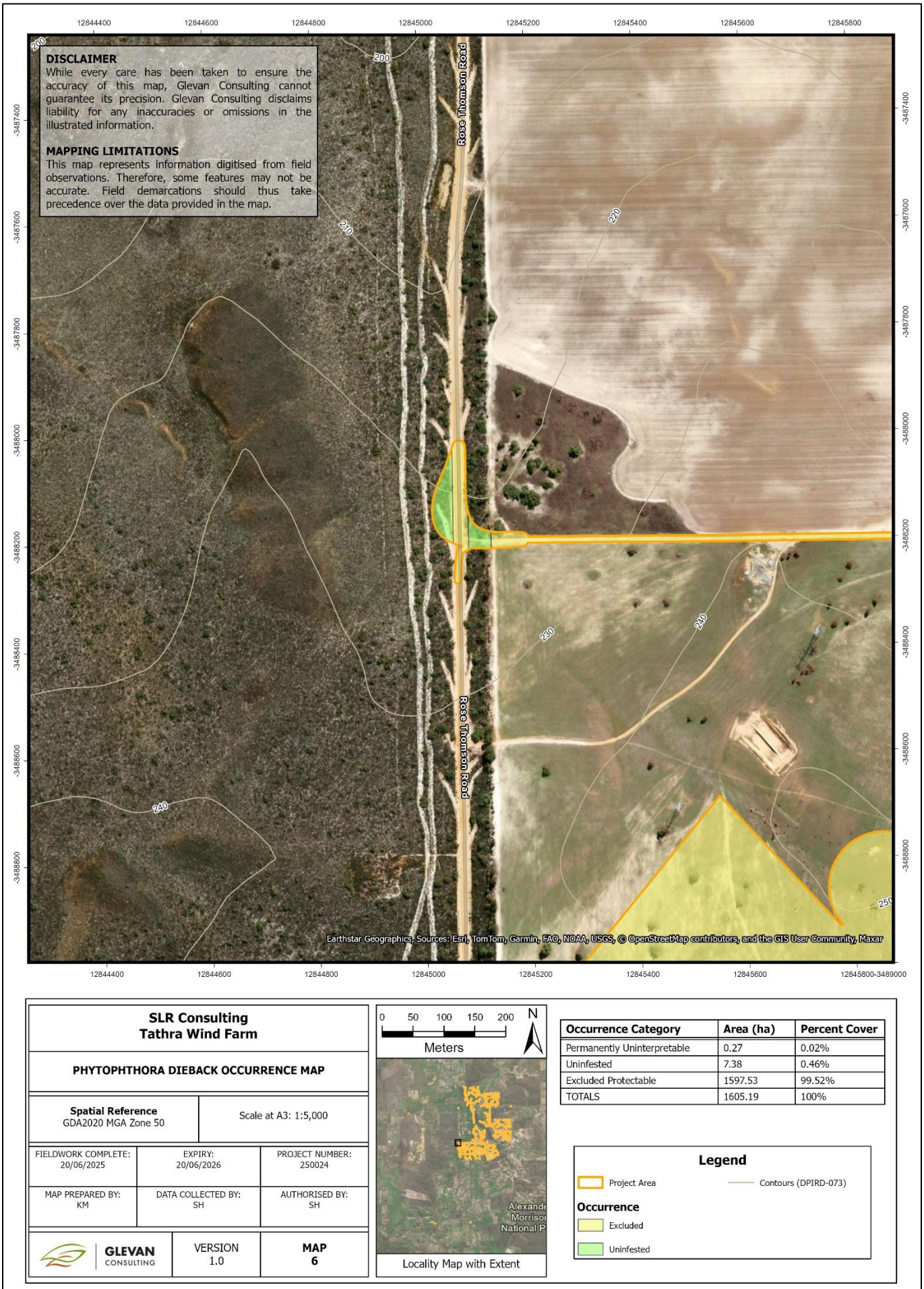

Figure 7 – Phytophthora Dieback Occurrence Map 6.

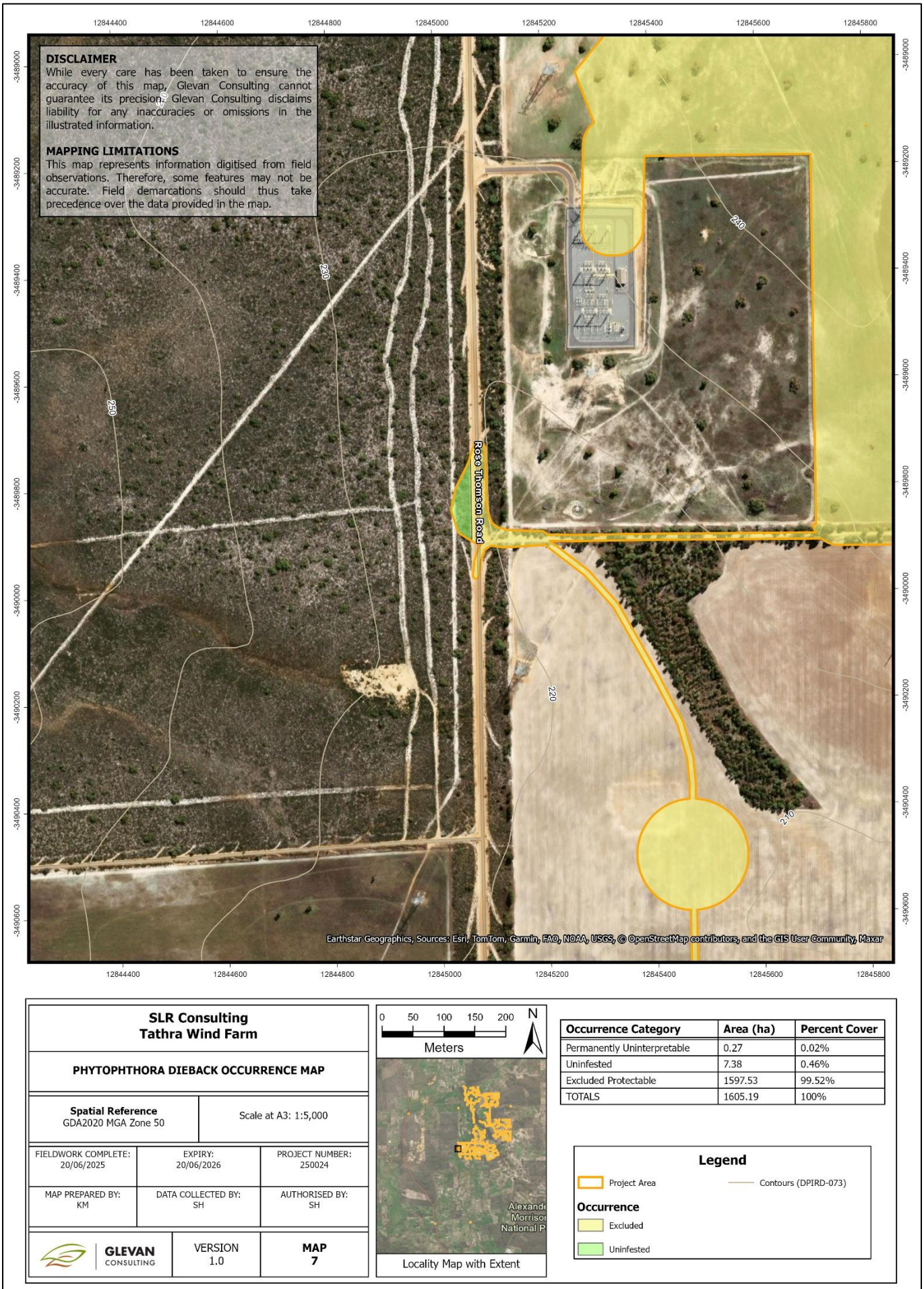

Figure 8 – Phytophthora Dieback Occurrence Map 7.

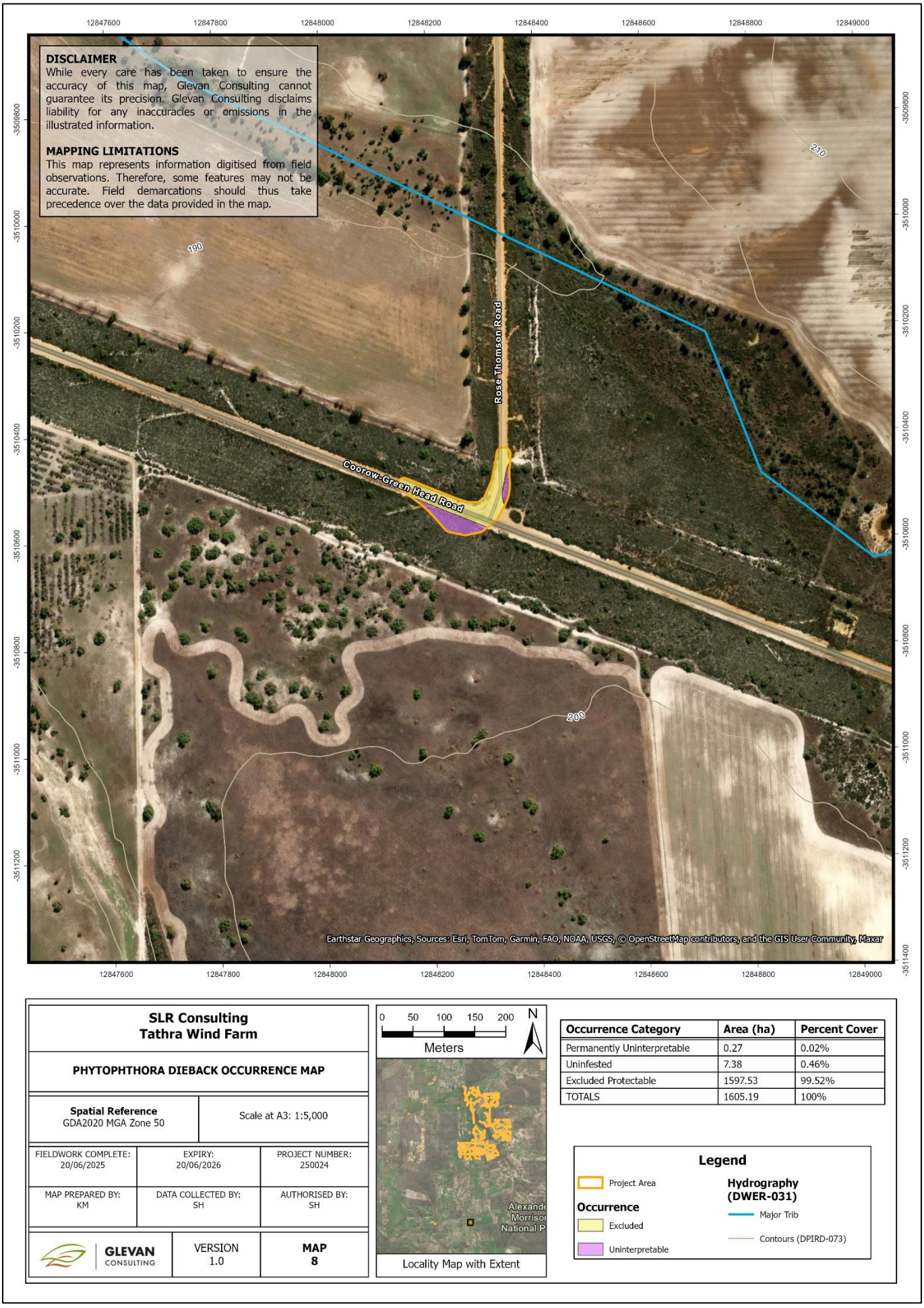

Figure 9 – Phytophthora Dieback Occurrence Map 8.

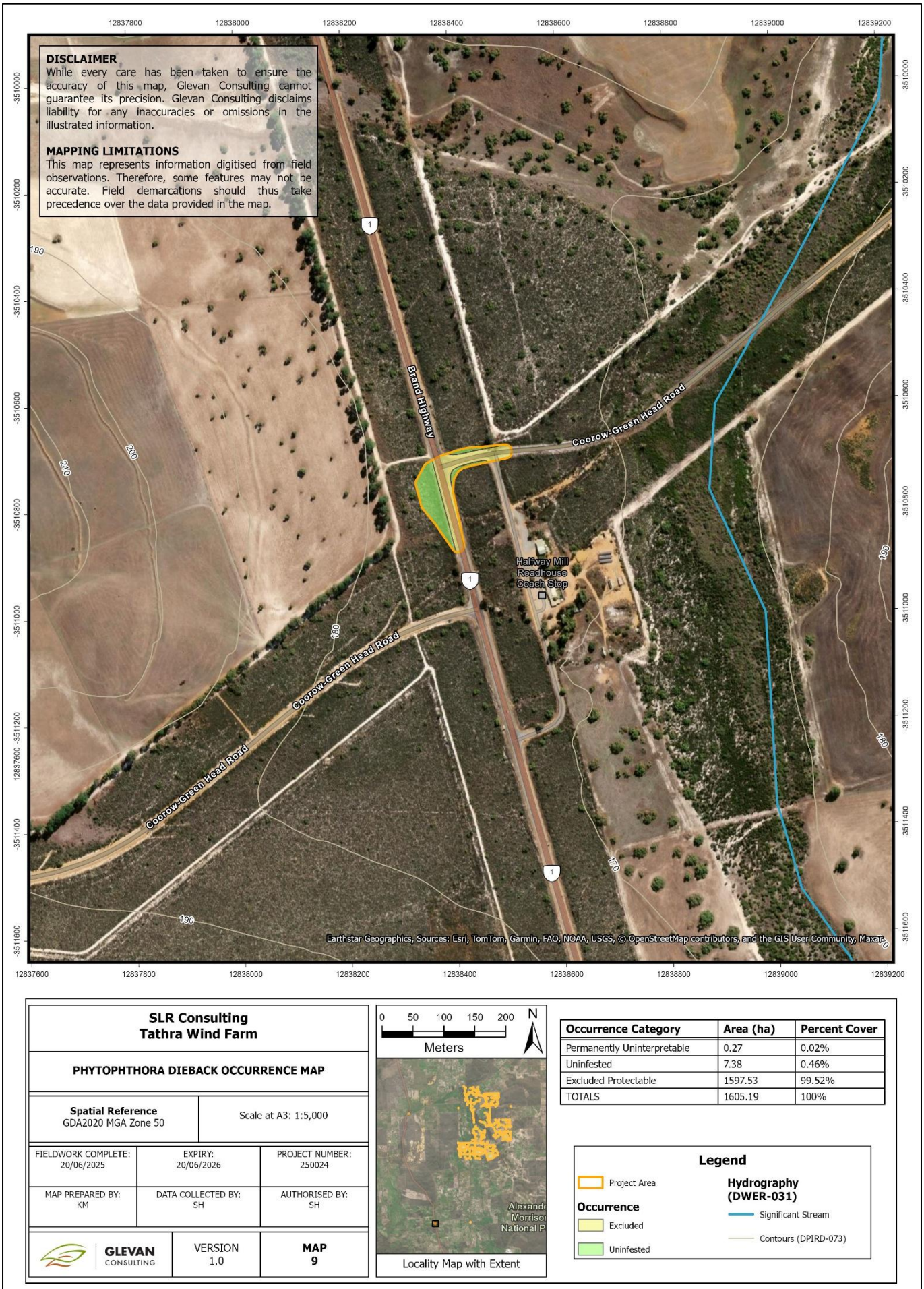

Figure 10 – Phytophthora Dieback Occurrence Map 9.

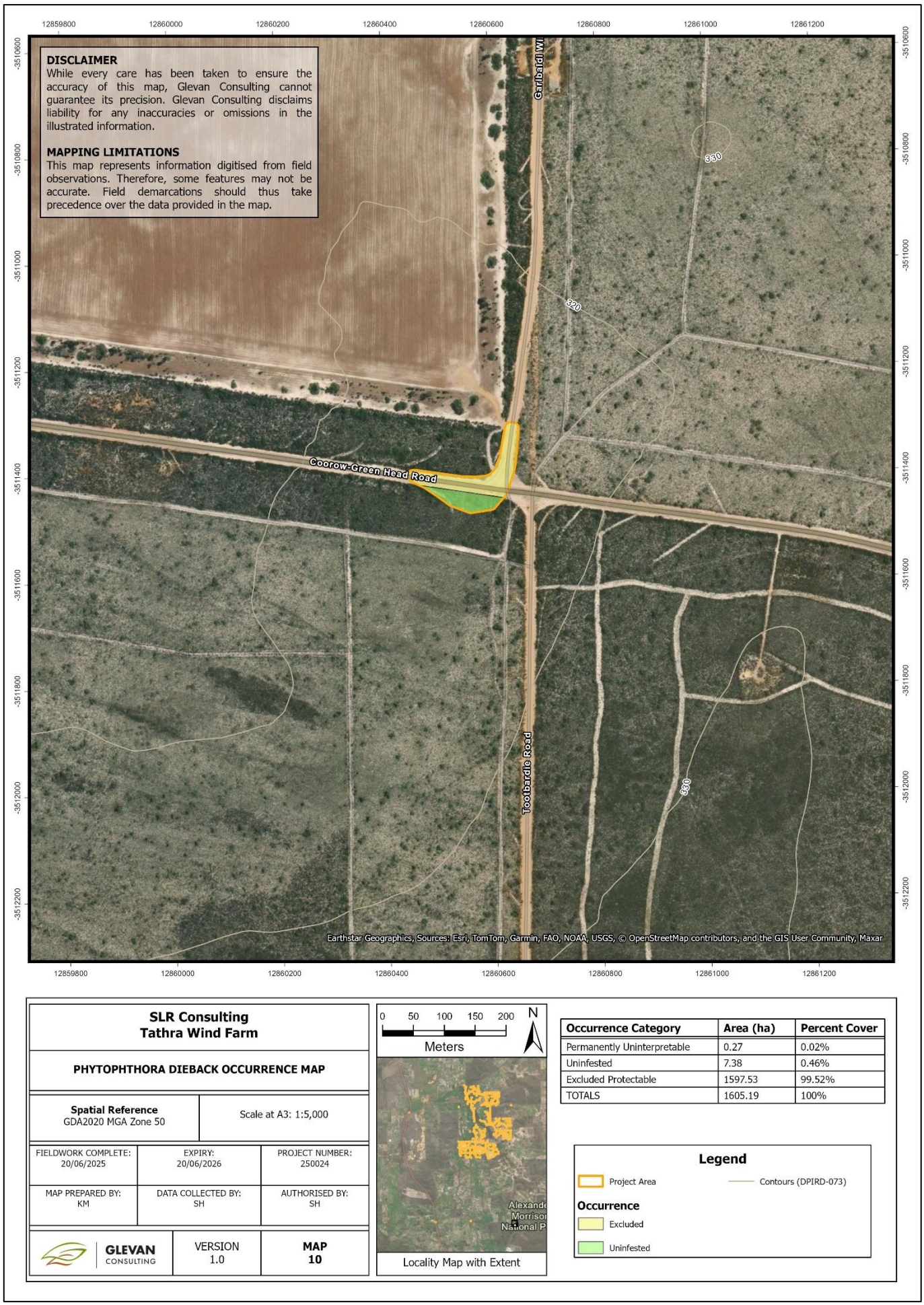

Figure 11 – Phytophthora Dieback Occurrence Map 10.

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