Arrowsmith North Silica Sand Project

Phytophthora Dieback Management Plan

September 2022

Client	*VRX Silica*
Report name	*Arrowsmith North Silica Sand Project: Phytophthora Dieback Management Plan*

This report has been prepared following the scope of work agreed between VRX Silica and Glevan Consulting and contains results and recommendations specific to the agreement; therefore, results and recommendations in this report should not be referenced for other projects without the written consent of Glevan Consulting.

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Executive Summary

VRX Silica Limited (VRX) is seeking to develop a silica sand mine within the Shire of Irwin, Western Australia, referred to as the 'Arrowsmith North Silica Sand Project' (The Project; Figure 1). This Dieback Management Plan (DMP) has been produced to support approval, construction, and operation of The Project.

The DMP aims to identify and implement strategies to mitigate the risk of introducing Phytophthora pathogens into The Project, particularly *Phytophthora cinnamomi*.

In this document, 'Phytophthora species' refers to the pathogen that causes Phytophthora Dieback disease, primarily *Phytophthora cinnamomi*. The DMP identifies the necessary hygiene requirements, including clean down procedures, training requirements, and the timing of proposed vehicle and soil movement operations.

Phytophthora Dieback assessments conducted by Glevan Consulting have determined The Project to contain vegetation that is both uninfested and protectable from incursion of *Phytophthora cinnamomi*. Introduction of the *Phytophthora cinnamomi* pathogen could cause significant vegetation decline and impact upon the successful rehabilitation of the mined area.

Key strategies identified to mitigate the risk of *Phytophthora cinnamomi* introduction to The Project are:

- All vehicles, machinery, footwear, and tools must arrive at site clean of soil and plant materials.
- Vehicles will be cleaned prior to accessing tracks, drill lines and vegetation. Clean downs may be conducted via dry brushing in dry soil conditions.
- Relevant personnel to undertake Green Card training for Phytophthora Dieback hygiene.
- Where possible, works should be conducted in dry soil conditions.
- Materials brought into the Access and Mine Development Envelope's for the duration of The Project must be sourced from certified disease-free sources or have been certified as clean by a registered Dieback Interpreter.

Table of Contents

List of Figures

List of Tables

Glossary

Term	Definition
Clean Down	The practice of physically removing any material from a carrier that could harbor Phytophthora and other contaminants. There are two main types of clean down; wet (e.g. washing) and dry (e.g. brushing).
Clean On Entry (COE)	Any person, machine and/or equipment is to be and remain free of all material that could be carrying Dieback prior to entry, preventing opportunities for the disease to be introduced and spread.
Consequence	The potential impact of Phytophthora if it is introduced to and becomes established in an uninfested area.
DBCA	Department of Biodiversity, Conservation and Attractions.
Dieback status	Refers to whether an area is Infested, Uninfested, Uninterpretable or Unknown as assessed by a registered Phytophthora Dieback Interpreter.
DMP	Dieback Management Plan.
ERD	Environmental Review Document.
Hygiene	Practices centered around the cleaning and standards of cleanliness of carriers to reduce the likelihood that Phytophthora will be introduced to non-infested areas and spread from Infested areas.
Likelihood	The chance that Phytophthora will be introduced to an uninfested area.
Consequence	The potential impact of Phytophthora if introduced to an uninfested area and it becomes established.
Phytophthora Dieback risk	Likelihood and consequence of Phytophthora being introduced to an uninfested area and becoming established to cause Phytophthora Dieback.
Phytophthora occurrence assessment	A systematic assessment is undertaken by an Interpreter, to detect, diagnose and map the presence of Phytophthora and also referred to as 'interpretation'.
Protectable	Protectable areas are deemed to be uninfested or uninterpretable and protectable from an incursion of Phytophthora species.
Registered Phytophthora Dieback Interpreter (Interpreter)	Refers to a trained, experienced individual who has been registered by DBCA to undertake occurrence assessments to detect, diagnose and map the presence of Phytophthora Dieback on land vested with the Department.
VDT	Vegetation Direct Transfer.

Introduction

1.1 Project Overview and Locality

VRX Silica Limited (VRX) is seeking to develop a silica sand mine at Arrowsmith North (Figure 1), within the Geraldton Sandplain bioregion. The Arrowsmith North Silica Sand Project (The Project) site is located within the Shire of Irwin, approximately 270 kilometres north of Perth, Western Australia.

The mining operation will remove 8-15 metres of sand from the base of the soil profile over the mining area, at an approximate rate of 12 hectares per year. Further ground disturbance is required for ancillaries such as roads, pipelines, dams, process plants, stockpiles, laydown, and train load out. The mining operation will produce high grade silica sand according to the following process:

- Vegetation is mulched in preparation for removal.
- Vegetation and topsoil are translocated in preparation for Vegetation Direct Transfer (VDT).
- Silica sand is mined in panels allowing for continuous rehabilitation of the site.
- Topsoil and vegetation are translocated to previously mined areas for VDT.
- Silica sand is mined and processed in a mobile collection site located at the mine face.
- The sand is mixed with water to form a slurry and pumped to a processing plant via a movable surface pipeline.
- The sand is upgraded to a commercial grade using attrition mills and a floatation circuit.
- The upgraded sand is dried and then hauled by truck to Geraldton Port for export.

Initial works will include the clearing of an access corridor to connect the Arrowsmith North mine with Brand Highway (Access Development Envelope; Figure 1). Further clearing will be undertaken for supporting infrastructure and the locality of the processing plant (Mine Development Envelope; Figure 1).

The Project is expected to commence mid-2023 and has a proposed mine life of 30 years.

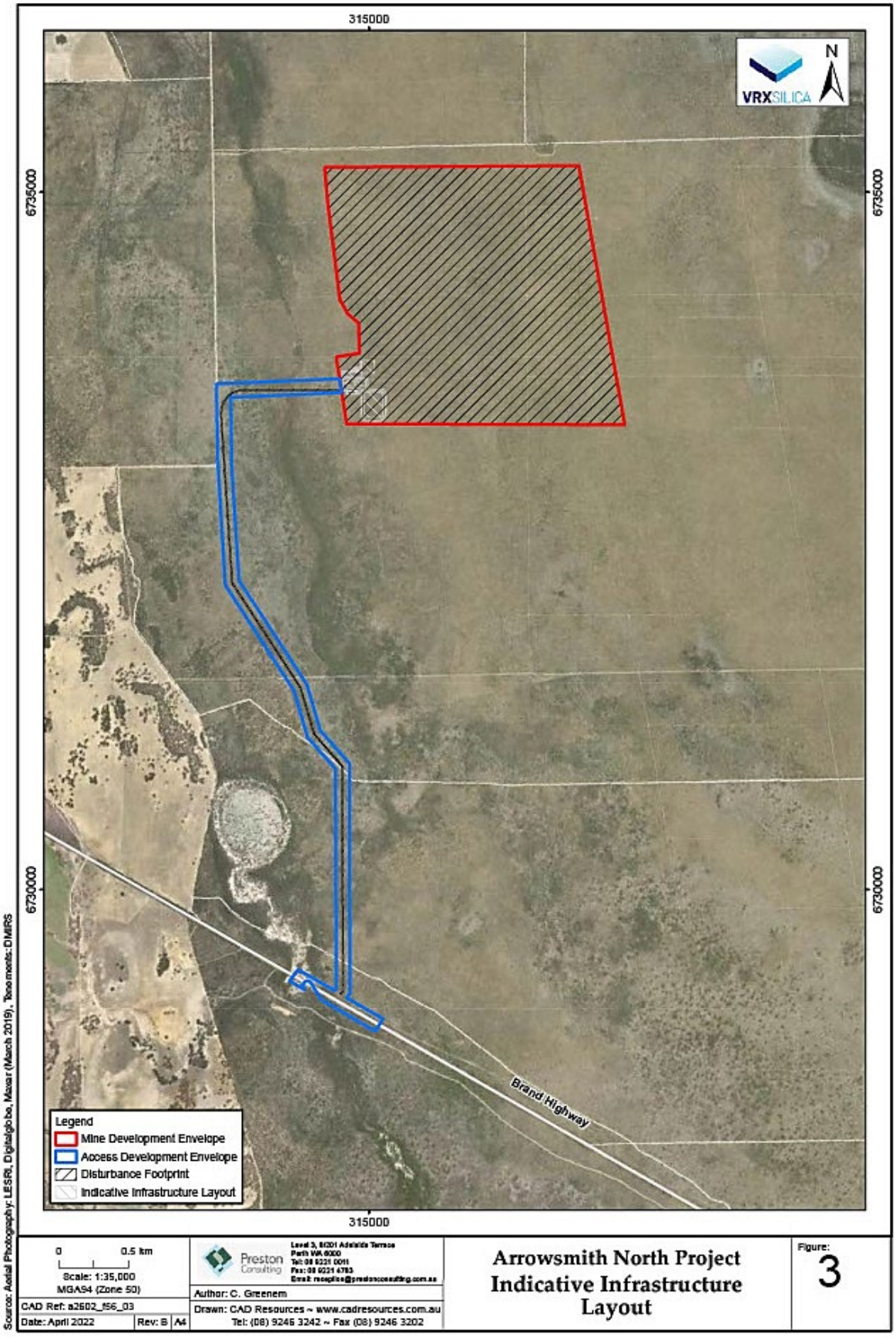

Figure 1 Arrowsmith North Project Indicative Infrastructure Layout.

1.2 Purpose and Scope

Glevan Consulting was commissioned by VRX Silica Limited to produce a Dieback Management Plan (DMP) to support approval, construction, and operation for The Project.

The Dieback Management Plan set out in this document aims to identify and implement strategies to mitigate the risk of introducing Phytophthora pathogens into The Project site, particularly *Phytophthora cinnamomi*.

Background

Thousands of Australian native plant species are susceptible to Phytophthora Dieback—a destructive disease caused by the pathogenic *Phytophthora cinnamomi* and other Phytophthora species. This disease poses a significant threat to Australia's biodiversity, placing important plant species at risk of death, local extirpation, or extinction. Its dramatic impact on plant communities can also result in significant declines in some insect, bird and mammal 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 quickly spread the pathogen will help prevent an increase in the extent of this disease (Commonwealth of Australia, 2018).

Phytophthora is a microscopic water mould that belongs to the class Oomycetes. Organisms of this class are filamentous, absorptive and reproduce both sexually and asexually. Phytophthoras are considered parasitic. They behave mainly 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.

Phytophthora Dieback results from the interaction between three physical components forming a 'disease triangle': the pathogen (Phytophthora species), the environment, and the host. All three elements are needed for the disease to develop over time.

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

1.3 Phytophthora Dieback Occurrence and Potential Impact

Glevan Consulting has previously conducted a Phytophthora Dieback assessment of the Arrowsmith North Silica Sand Project. The assessment included a preliminary desktop survey to determine susceptible vegetation types located within The Project, environmental conditions that would support the presence of Phytophthora pathogens, and a review of historical recovery data available for the region. Additionally, a Dieback site investigation was undertaken according to relevant Department of Biodiversity, Conservation and Attraction (DBCA) guidelines.

Desktop Survey Results

The Project experiences a long-term average annual rainfall of 492mm recorded at the Green Grove station (008057) (Bureau of Meteorology, n.d) although this mean has not been reached since 2016. The long-term average is trending toward 400mm which places the site as being marginally vulnerable to *Phytophthora cinnamomi* (Department of Parks and Wildlife, 2015), but still vulnerable to other Phytophthora species. The historical review determined that *Phytophthora arenaria* had been recorded from six locations within The Project.

The Arrowsmith North Project Area is over the Erindoon-378 vegetation association (SouthCoast NRM, 2013). This association is described as 'Mixed heath with scattered tall shrubs Acacia spp., Proteaceae and Myrtaceae'. The vegetation generally contains sufficient species that are susceptible to Phytophthora and will therefore show disease presence. Species found in the area that will display Phytophthora Dieback symptoms include *Adenanthos cygnorum*, *Banksia candolleana*, *B. dallanneyi*, *B. menziesii*, *Isopogon tridens* and *Stirlingia latifolia*.

Field Assessment Results

Sampling conducted during the field assessment by Glevan Consulting identified *Phytophthora arenaria* in three locations. *Phytophthora arenaria* has been isolated in Western Australia from Kwongan heathland stands since the early 1980s. *Phytophthora arenaria* has been isolated exclusively from the northern sand plains and was named based on its association with sandy soils. Most isolates were associated with dead or dying Banksia spp. (Proteaceae). When active, symptomatic plants are scattered in the landscape. However, the overall impact of this species within

the natural environment is low due to the low rainfall in the region and the sporadic nature of the disease (Burgess, 2013).

The Project was assessed by Registered Phytophthora Dieback Interpreters according to the DBCA guidelines as stipulated by the *Phytophthora Dieback Interpreter's Manual for lands managed by the department* (Department of Parks and Wildlife, 2015). The assessment categorised vegetation according to the Phytophthora Dieback categories in Table 1.

Table 1 Phytophthora Dieback Occurrence Categories.

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*
	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 - Areas devoid of vegetation are excluded from the assessment area.

The field assessment concluded that the 347.3 hectares of assessable vegetation was uninfested within the Mine Development Envelope (Table 2), with an additional 51.3 hectares of protectable uninfested vegetation within the Access Envelope. The southern end of the Arrowsmith North access route was classified as uninterpretable, with the firebreak between the uninfested and uninterpretable vegetation delineating the disease categories. This section encompasses a low-lying area of vegetation with limited Phytophthora Dieback indicating species. See Appendix 1 for the *Phytophthora cinnamomi* Occurrence Map produced during the assessment for the Access and Development Envelopes of The Project.

Table 2 Assessment Area Statement.

Category	Access Development Envelope	Mine Development Envelope	Total Development Envelope	
			Protectable Area (ha)	Unprotectable Area (ha)
Infested				
Uninfested	51.3	347.3	398.6	0
Uninterpretable	9.1		9.1	0
Assessed Area	30.6	347.3	407.7	0

All vegetation within The Project, even sites infested with *Phytophthora arenaria,* are considered protectable. *Phytophthora arenaria* is regarded as native to the Geraldton sandplains and causes minor detrimental impact to the vegetation.

1.4 Assessment Conclusions

The assessments of the Access and Mine Development Envelopes determined that whilst *Phytophthora arenaria* infestations are not having a significant impact on the vegetation, it is anticipated that the introduction of *Phytophthora cinnamomi* to Arrowsmith North would cause significant vegetation decline. Phytophthora Dieback caused by *Phytophthora cinnamomi* is having significant impact on vegetation in the Eneabba region. Although this area is nearly 40 kilometres south of The Project, the Eneabba long-term average annual rainfall of 492mm (Green Grove 492mm) and the vegetation (Erindoon-378) at both sites suggests that the environmental conditions are very similar.

The assessment concluded that the vegetation within the Arrowsmith North Silica Sand Project area is considered largely uninfested and protectable from the introduction of *Phytophthora cinnamomi*. A single area of protectable uninterpretable vegetation exists in the south of the Mine Access Envelope.

On the basis that the area is protectable from Phytophthora Dieback, the development of a Dieback Management Plan was recommended for The Project. Critical components to be addressed were identified as:

- All vehicles arrive at site clean of soil and plant materials. Initial clean downs will be performed off-site.
- Vehicles will be cleaned prior to accessing drill lines and vegetation.

1.5 Objectives

The objective of the Dieback Management Plan for the Arrowsmith North Silica Sand Project is to prevent the introduction of the *Phytophthora cinnamomi* pathogen - responsible for Phytophthora Dieback disease - into the Access and Mine Development Envelopes of The Project, attributable to The Project's activities.

1.6 Risk Management

Introduction of the *Phytophthora cinnamomi* pathogen could cause significant vegetation decline and impact upon the successful rehabilitation of the mined area. A risk assessment was conducted for The Project based on the 'Likelihood' and 'Consequence' of introducing *Phytophthora cinnamomi* during the construction and operation phases of The Project. The risk assessment was undertaken according to the requirements set out in the *Phytophthora Dieback Management Manual* (Department of Biodiversity, Conservation and Attractions, 2017).

The overall risk rating of the Arrowsmith North Silica Sand Project in reference to the introduction of the *Phytophthora cinnamomi* pathogen is 'High'. The Likelihood of the pathogen's introduction with no mitigation strategies implemented is considered to be 'Almost certain', with the Consequence of introduction 'Significant'.

Phytophthora cinnamomi is most likely to be introduced to Arrowsmith North during the construction phase of The Project, however the risk remains 'High' during both phases of the project due to the disturbance type utilising heavy earth moving machinery and the number of susceptible flora species within the vegetation complex (Erindoon-378 vegetation association).

1.7 Management Strategies

Planning of Works

Where possible, works should be conducted in dry soil conditions. Soil conditions can be assessed for soil moisture as described in Table 3. Conducting works under dry soil conditions will reduce the need for wet wash downs of vehicles and machinery, enabling the implementation of the 'Clean on entry' (COE) principle as defined by the DBCA *Phytophthora Dieback Management Manual*. The COE principle stipulates that "any person, machine and/or equipment is to be and remain free of all material that could be carrying dieback prior to entry, preventing the opportunity for dieback to be introduced and spread" (Department of Biodiversity, Conservation and Attractions, 2017).

See Clean Down Requirements for further details.

Table 3 How to Assess Soil Conditions.

Dry soil	Where dust forms when exposed soil is disturbed
Moist soil	Where soil is damp but does not stick to tyres, equipment and/or footwear
Wet soil	Where soil and moisture combine so that soil sticks to tyres, equipment and/or footwear

No road-building materials, soil, fill or plant matter potentially containing Phytophthora species is to be brought into The Project site, including the Access and Mine Development Envelopes. Evidence of a disease-free status for required materials must be obtained prior to being brought on-site. Vehicles utilised in the transport of raw materials must be certified as clean prior to the loading of raw materials.

See Appendix 4 for an example "Vehicle and Machinery Inspection Register" for the certification of a clean vehicle or machine[1].

Training and Inductions

Personnel undertaking tasks requiring access to native vegetation are required to complete Green Card training for Phytophthora Dieback hygiene from an approved training provider prior to works

[1] It is recommended that the attached example be adapted to the specific vehicles and machinery utilised as part of The Project to ensure relevance to the operators and work crews.

commencing. Green Card training is a requirement by the DBCA for external proponents or contractors operating on approved disturbance activities within the Phytophthora Dieback vulnerable zone in Western Australia (Department of Biodiversity, Conservation and Attractions, 2017).

Relevant inductions for all site personnel should be updated to incorporate hygiene management practices, with emphasis on clean down procedures.

Clean Down Requirements

Vehicles and machinery must be certified as 'Clean on Entry' upon arrival and departure from the Project by personnel having undertaken Green Card training. VRX has incorporated a dedicated washdown and inspection area adjacent to the processing plant area. The washdown and inspection area is pending final design however it is proposed to include a semi enclosed 12 tonne wash bay with ramps and containerised water treatment plant. The treatment plant will contain a continuous media system, deep bed media filtration system, oily water separator and pH and Chlorine dosing system. Refer to document 'Silica Sands Mine Processing, NPI, Stacking & Load out Layout (Document Number AN-00-0003rL; Appendix 2)' for the location of washdown and inspection facilities. The washdown and inspection facilities are situated to ensure all vehicles and machinery are inspected and cleaned (if required) on arrival and departure from the mine area. This approach quarantines the mine area by ensuring no soil movement between the mine area and other parts of the Project.

A "Vehicle and Machinery Inspection Register" must be completed and signed by the vehicle operator on arrival, with the register collected and filed by the Project Manager or Representative. Vehicles or machinery deemed not compliant with hygiene standards are not permitted on-site and must undertake a clean down process at the available clean down facilities. The term 'clean' means that vehicles, machinery, footwear, and tools are not carrying any clods and/or slurry of soil or plant material. A thin, dry layer of dust or grime is not considered to present a risk and does not need to be removed.

Vehicles, tools, and machinery are to be cleaned prior to accessing drill lines and vegetation. Clean downs may be conducted via dry brushing in dry conditions. If works are conducted in wet weather conditions, where soil and moisture combine so that soil sticks to tyres, equipment and/or footwear, wash downs will need to be conducted. All run-off and potentially infested material resulting from

the wash down area must be retained at the clean down site and not be permitted to disperse into uninfested vegetation. Details of the available washdown facilities are documented in Appendix 3.

Record Keeping

Maintain a vehicle clean down log on-site in the form of a "Vehicle and Machinery Inspection Register". The register should record the vehicle or machinery check for plant and soil material prior to entry into The Project, and whether a clean down process was undertaken due to the presence of organic matter. Each check and clean down should be signed by driver or nominated responsible person. Vehicles or machinery that have left The Project will need to undergo additional checks for organic material and clean down where required on return to The Project.

Records of the accreditation status for the supply of disease-free raw materials should be maintained in a "Raw Material Register" when materials are to be transported into the Mine Access and Development Envelopes from external sources. Suppliers should have their accreditation status determined once per supplier per material type. Annual audits should be conducted to ensure up-to-date certifications have been maintained for the duration of the construction and operation phases of The Project.

An incident form for environmental incidents should be completed for any instance of a breach of Phytophthora Dieback management. Events that should be recorded as an environmental incident include but are not limited to:

- The unauthorised entrance of a vehicle or machine into vegetated areas,
- Discrepancies found during audits of the "Vehicle and Machinery Inspection Register",
- Discrepancies found during audits of internal records for raw material supplier accreditation.

A summary of the Phytophthora Dieback management strategies and responsible personnel is documented in Table 4.

Table 4 Phytophthora Dieback Management Strategies and Monitoring Conditions.

Objective/s: No introduction of *Phytophthora cinnamomi* to The Project Area attributable to construction or operation of The Project.
EPA environmental factors and objectives: To protect flora and vegetation so that biological diversity and ecological integrity are maintained.
Key environmental values:

- Uninfested and Protectable vegetation status; and
- Susceptible species present.

Key impacts and risks:

- Vegetation type and annual rainfall result in The Project having a risk rating of "High" for the introduction of the pathogen**;**
- Reduction in biomass of susceptible vegetation, with subsequent changes to the vegetation composition; and
- Reduction in rehabilitation success.

Objective-based				
Management targets	**Management actions**	**Monitoring**	**Timing / frequency of actions**	**Reporting and Responsibility**
	Phytophthora Dieback field assessment completed annually to ensure availability of current data and for the determination of appropriate Clean on Entry locations. Site assessments to include laboratory testing of soil and tissue samples by Vegetation Health Services. Identification of the *Phytophthora cinnamomi* pathogen during a Phytophthora Dieback field assessment will result in a review of the DMP.	Phytophthora Dieback occurrence report and applicable mapping, identifying occurrence categories, sample locations and Clean on Entry locations.	Annually, preferably two months post a warm weather rainfall event. Clean on Entry locations to be determined prior to works beginning and reviewed as required.	Phytophthora Dieback occurrence assessment and Clean on Entry locations to be completed/determined by DBCA registered interpreter. Internal record keeping and reporting.
Phytophthora cinnamomi is not introduced into The Project Area as a result of The Project during construction or operation via: • Importation of infested raw material • Importation of vegetation or soil into The Project via machinery or vehicle movement	Works to be conducted under dry soil conditions where possible[1]. Risk rating: High Priority: High	Monitor daily weather conditions and projected fortnightly weather, schedule works accordingly. For works planned to be conducted when moist or wet soil conditions are predicted, see wash down requirements and adjust management action accordingly.	Daily weather checks with appropriate clean down procedures applied.	Responsibility of the Project Manager or Representative. Internal record keeping and reporting.
	Road-building materials, soil, fill or plant matter must be disease-free. Evidence of a disease-free status for required materials must be obtained prior to being brought on-site. Imported water must be from disease-free sources only. Transport vehicles for raw materials must be certified clean prior to the loading of raw materials. Risk rating: High Priority: High	Check the accreditation and certification of suppliers for any materials being brought onto The Project site. Complete internal record keeping, for example a "Raw Materials Register" form. Complete "Vehicle and Machinery Inspection Register" prior to the loading of raw materials.	Conduct check once per supplier, per material type. Re-check supplier accreditation on an annual basis following initial check. Clean down and "Vehicle and Machinery Inspection Register" completion prior to every raw material loading event.	Conduct audit of internal record keeping for raw materials forms annually. Conduct field assessment for Phytophthora Dieback should discrepancies be found during audit. Lodgement of Environmental Incident Form if discrepancy identified. Original completed and signed "Vehicle and Machinery Inspection Register" forms to be collected and filed by Project Manager or Representative.

				Conduct audit of “Vehicle and Machinery Inspection Register” quarterly.
	All vehicles, machinery, footwear, and tools must arrive at site clean[2] of soil and plant materials. Vehicles, tools, and machinery are to be cleaned prior to accessing drill lines and vegetation. Under dry soil conditions where vehicles are clean or contain a thin layer of dust or grime, clean downs are not required. Dry brush down procedure required when dry clumps of soil/mud or moist sand are present. Wash down procedure required when moist clods or slurry of soil or plant material are present. Signage to be installed at all designated clean down locations within the access and development envelopes. Risk rating: High Priority: High	Appropriate clean down method chosen and implemented for every vehicle/machine crossing into uninfested and protectable vegetation. Completion of a “Vehicle and Machinery Inspection Register” for every vehicle/machine crossing into uninfested and protectable vegetation. May be stored in the form of a logbook within each vehicle/machine. “Vehicle and Machinery Inspection Register” to be signed by vehicle operator/driver. Breaches related to Phytophthora Dieback management reported to Project Manager or Representative. Environmental incident form completed. Incident reported to relevant DBCA district office. Environmental officer to conduct random inspections as appropriate for The Project.	For the duration of The Project in the construction and operating phases. Checks and relevant clean down method must be completed prior to every instance of entering uninfested and protectable vegetation. Form completion for all vegetation entrance events. Breaches related to Phytophthora Dieback management reported immediately as required. Signage to be installed at clean down locations prior to works beginning.	Responsibility of all works personnel and other relevant personnel entering uninfested and protectable vegetation within The Project. Original completed and signed “Vehicle and Machinery Inspection Register” forms to be collected and filed by Project Manager or Representative. Conduct audit of “Vehicle and Machinery Inspection Register” quarterly. Internal record keeping required for random hygiene inspections. Lodgement of an environmental incident form via internal record keeping if discrepancy identified during audit, or in the event of a hygiene breach.
	Green Card training undertaken by all relevant site personnel accessing vegetated areas. Inductions and site familiarisation procedures updated to include hygiene management with a focus on correct clean down procedures. DMP made available to all relevant personnel.	Internal induction registers and record on personnel file.	Prior to commencing works both in the construction and operation phase of The Project.	Responsibility of relevant works crew leaders or designated personnel to ensure team compliance with training requirements. Completion of Green Card training and inductions recorded on personnel file as completed. Quarterly review of personnel training to ensure compliance with DBCA requirement for Green Card training.

[1] Wet conditions are defined as conditions where soil and moisture combine so that soil will stick to carriers such as vehicles and machinery.

[2] The term ‘clean’ means that vehicles, machinery, footwear, and tools are not carrying any clods and/or slurry of soil or plant material. A thin, dry layer of dust or grime is not considered to present a risk and does not need to be removed.

Review and Adaptive Management

It is recommended that this DMP be reviewed every two years to ensure a continual improvement practice, or:

- Following the identification of the *Phytophthora cinnamomi* pathogen during an annual field assessment,
- Following any significant changes to the scope of works for The Project,
- Following any incidents of non-compliance.

A comprehensive Phytophthora Dieback assessment of remaining vegetation within The Project should be conducted annually from the completion of the previous assessment for the life expectancy of activity within The Project. Re-assessments would ideally occur two months after a significant warm weather rainfall event to ensure the best environmental conditions for disease expression.

Any changes to the disease status of vegetation within The Project following the site assessment should result in the revision of the DMP as applicable.

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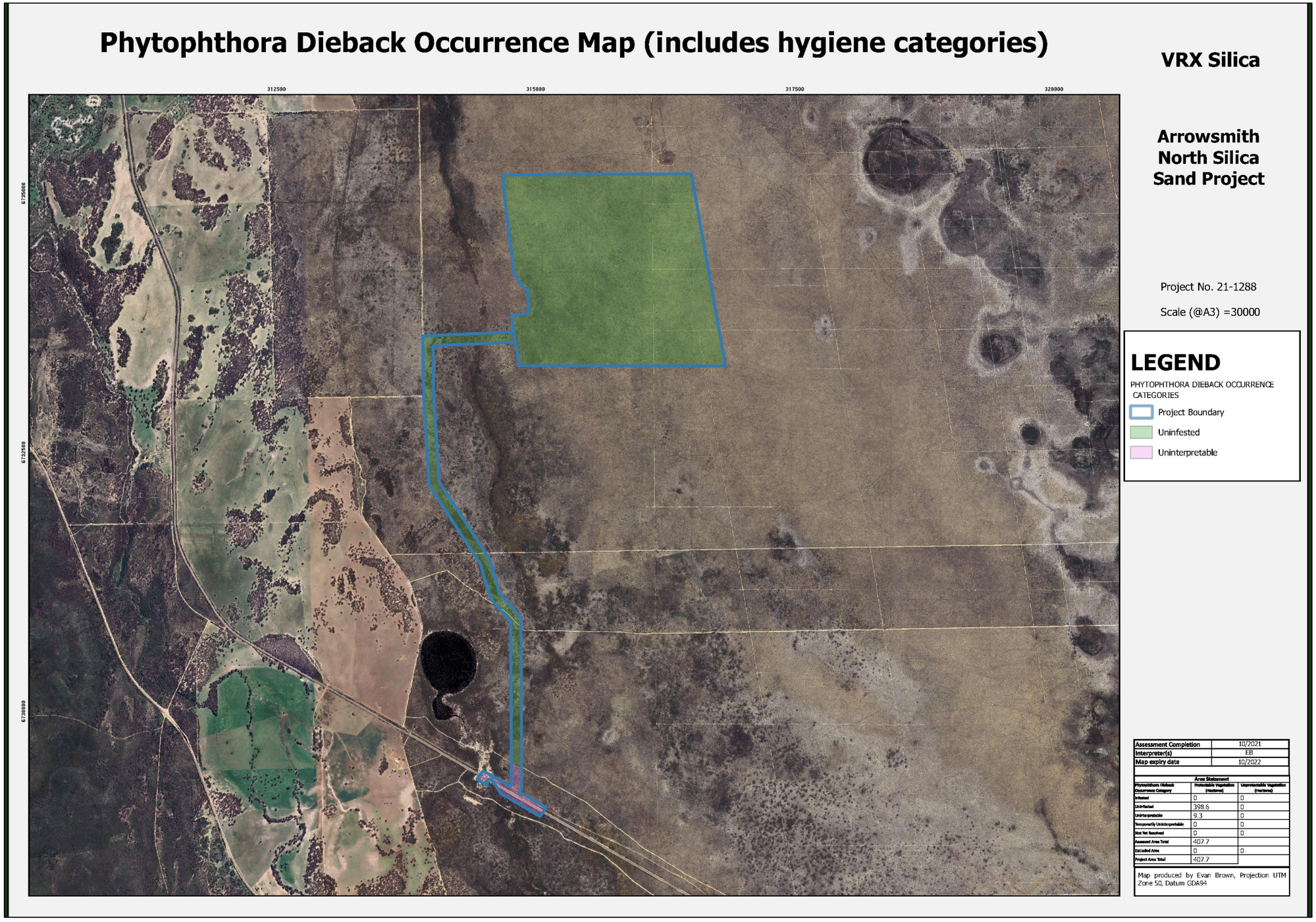

Figure 2 Arrowsmith North Silica Sand Project Phytophthora Dieback Occurrence Map.

Appendix 2 Silica Sands Mine Processing, NPI, Stacking & Load out Layout.

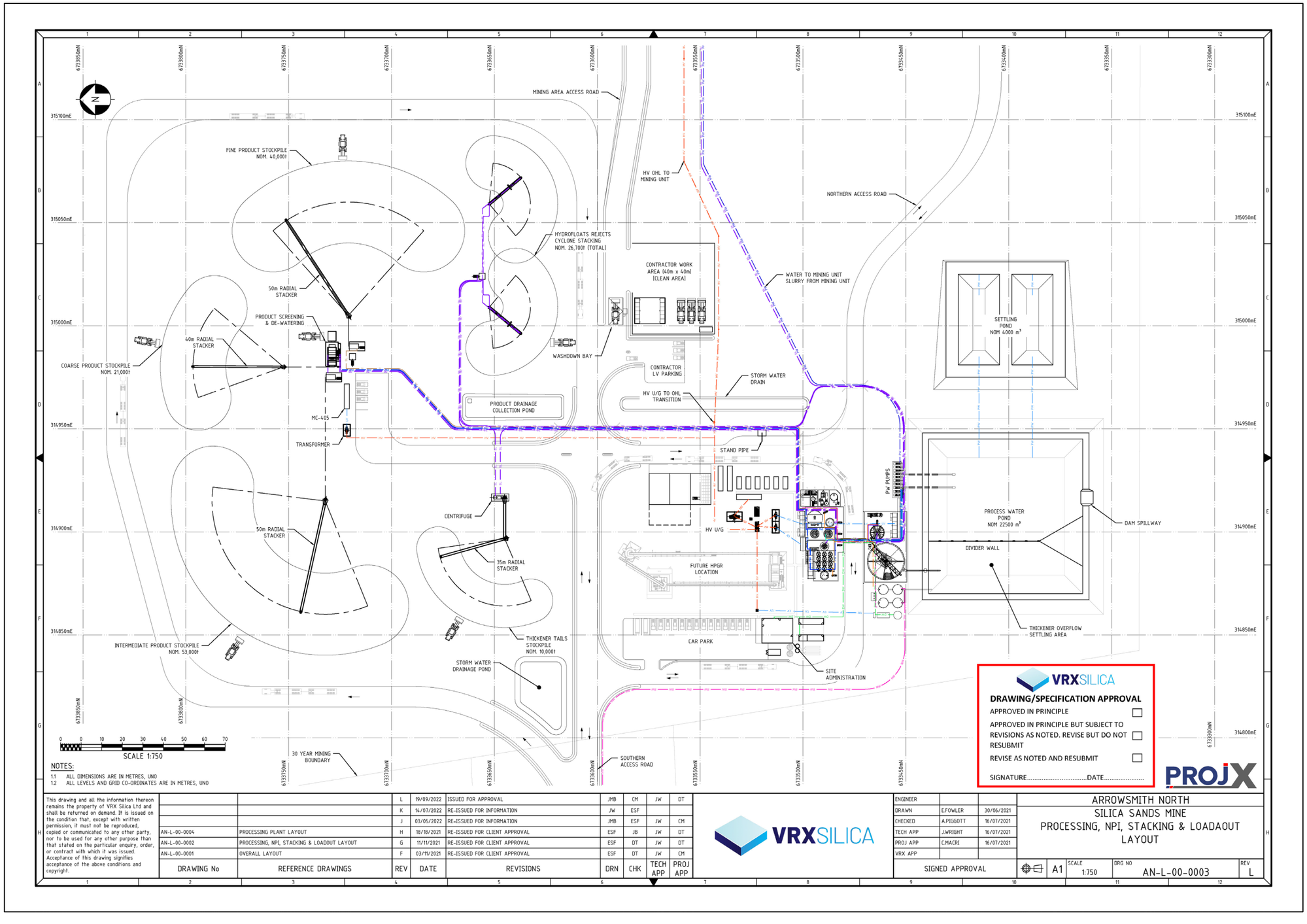

Figure 3 Silica Sands Mine Processing, NPI, Stacking & Load out Layout.

Appendix 3 Clean down on-site.

Proposed Clean Down Facilities for The Project:

Wash down facilities will incorporate:

- Enviro Concept heavy duty structural washpads with 12T per axle weight rating,
- Enviro Concept galvanised steel walls to prevent overspray,
- Enviro Concept galvanised steel rumble grid ramps to permit one-way travel,
- Enviro Concept ECO Recycling EL25 facilities (Containerised 25LPM Water Treatment Plant) incorporating a Continuous Media System, Oil and Water Separators, EL Water Recycling Plant, Disinfection and pH Control systems and Deep Bed Media Filtration kits.

Clean Down Locations

Designated wash down point ensures:

- All effluent and potentially infested material resulting from a wash down is collected and stored on site, and not permitted to disperse into vegetation surrounding the wash down area. Captured effluent is then treated prior to re-use.
- Clean down and wash down sites are be located on hard, well-draining surfaces such as limestone or blue metal where purpose built clean down facilities are not available.
- Cleaned objects must be able to enter protectable areas without becoming re-contaminated; and
- Safe entry and departure of vehicles and plant and use by operators.

Safety

Ensure all safety precautions are taken when performing a clean down. Refer to the relevant operating manual for specific safety instructions before cleaning.

- Place the vehicle or machinery in a safe position. It should be stable and immobile.
- Stop the engine, apply the park brake, chock the wheels, and lower all implements or secure/chock them if they need to be up for cleaning.
- Ensure the area is free of obstructions and objects that may cause injury.
- Have a qualified operator present if parts of the vehicle or machinery need to be moved during cleaning.
- Move the vehicle or machinery with caution.

General Clean Down Guidelines

The following points are general guidelines only:

- Examine the item to determine how much mud, soil and plant material has built up.
- Perform dry brush down where possible, only perform wash down when necessary, I.e., when dry brush down method will not successfully remove build-up (such as moist or wet soil or plant matter).
- Identify areas that require special attention (e.g., radiators, spare tyres, behind guards and protective plates). Some of these may be difficult to locate and access. Remove the necessary guards or belly plates to access these areas for cleaning.
- Identify any areas that may be cleaned with compressed air rather than water. Clean these first.
- Check that all areas have been cleaned.
- Replace the guards or belly plates.
- Move the clean vehicle or machinery carefully, avoiding recontamination. If necessary, wash any remaining mud, soil or plant material from the tyres or tracks.
- Record the details of the cleaning on the appropriate forms or in the "Machinery and Vehicle Inspection Register".
- Present the vehicle or machinery to an inspector if required.

No clean-down guidelines can detail all the parts to check. This is because there are:

- Numerous different models and new models
- Different attachments (e.g., different types of blades on dozers)
- Different modifications, either in the factory or by previous owners
- Varying conditions of the machinery (e.g., rusted parts allowing entry of contaminants into sections that are usually sealed).

Examine the item you are cleaning very carefully for any areas that could be contaminated, even if these areas are not listed in the guidelines and clean thoroughly.

Appendix 4 Machinery and Vehicle Inspection Register

Section 1: Vehicle/Machinery Details	
Registration/ID:	
Make & Model:	

Section 2: Clean Down Location / COE Point	
Clean Down Location / COE Point:	

Section 3: Hygiene Inspection (tick where appropriate)					
Item	**Type/Examples**	**Not Applicable**	**Not Compliant**	**Compliant**	**Initial**
Inside vehicle/machine	Cab interior, floor mats, seats, trays etc.				
Scrub bar	Front, Rear, Side				
Fenders	Front, Rear, Side				
Radiator area					
Belly plates / Underside Protection					
Bucket /blade /forks					
Rippers					
Suspension					
Spare wheels					
Wheels / tracks	Tyre tread, inside wheel, arches, behind protection plate etc.				
Mud flaps					
Flat sections	Esp. horizontal				
Cupped sections					
Chassis areas	H- or C- sections				
Hinged Points:	Esp. articulated areas e.g., FEL / Truck/ Crane/ Excavator arm				

Section 4: Clean Down Undertaken (tick where appropriate)		
	Yes	No
Clean Down Required?		
Clean Down Performed?		

Assessing Person (Vehicle Driver/Operator or Approved Representative):					
The above vehicle/machine has been declared free of soil and plant matter and verified as clean prior to entry to vegetation.					
Signature	**Name**	**Date**	**Time**	**Company/Agency**	**Contact Details:**