APPENDIX F

Quarry and Cleanfill Management Plan

MITCHELL DAYSH

an EMM Global company

SHAWS QUARRIES LIMITED

WHAKANUI STUD SAND QUARRY

Draft Quarry and Cleanfill Management Plan

June 2026

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REPORT INFORMATION

Report Status	Final
Our Reference	MDL002978
File Location	Whakanui Stud - Quarry and Cleanfill Management Plan Draft .docx
Author	Madi Lawry
Review By	Mark Henry

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1. PURPOSE

The primary purpose of this Quarry and Cleanfill Management Plan ("**QCMP**") is to document all management, monitoring and operational procedures that will be implemented at the Whakanui Stud Sand Quarry and Cleanfill site to minimise environmental effects both within and beyond the boundary of the site.

This QCMP also provides objectives and measures to ensure ongoing compliance with the site's resource consents. To this extent, this QCMP is to be read in conjunction with all regional and district council consent summarised below.

2. RESOURCE CONSENTS

<summary of consents>

Copies of the Site's Resource Consents are provided in **Appendix A**.

3. RESPONSIBILITY

The Site Manager is responsible for reviewing operations, developing and implementing management systems and providing sufficient resources to ensure compliance and appropriate training.

The Site Manager is also responsible for day-to-day operations, including implementation and enforcement of the owner's health and safety programme, environmental management, compliance with the site's resource consents and responding to complaints.

The Site Manager will also control this QCMP and ensure it is reviewed no less than once every five years and any amended versions are submitted to the Waikato Regional Council ("**WRC**").

The site will have sufficient staff at all operating times so that the measures set out in this QCMP can be implemented to ensure full compliance with consent conditions.

4. CONTACT DETAILS

Contact details for the site and key personnel are set out below:

Physical Address:	1466 Cambridge Road, Cambridge 3283
Site Manager	<insert name>
E-mail:	<insert e-mail>

Mobile:	<insert mobile number>
Alternate / Delegate	<insert name>
E-mail:	<insert e-mail>
Mobile:	<insert mobile number>

5. BACKGROUND

The existing property at 1466 Cambridge Road is currently operated as a dairy farm. The purpose of the quarry is to extract sand from the ground for use in building and roading construction. The quarry will operate in stages, limiting the area of exposed ground and operations at any one time. In addition to the sand extraction, the site will also accept cleanfill onto the property. This will be used for filling the land once the sand has been extracted. The current (existing) ground levels will be reinstated as part of the cleanfilling and rehabilitation / landscaping works.

5.1 LOCATION

The application area is a rural property located at 1466 Cambridge Road, Cambridge ("**the Site**"). The Site is located approximately 3 km from the Cambridge Town Centre. The Site adjoins the Waikato River to the south, Cambridge and Hooker Roads to the north and farmland to the east and west.



Figure 1: Location of the application site

6. SITE DESCRIPTION

The quarry area comprises of seven titles[1] and is currently operated as a dairy farm. Surrounding land use activities include farming, horse training and lifestyle blocks.

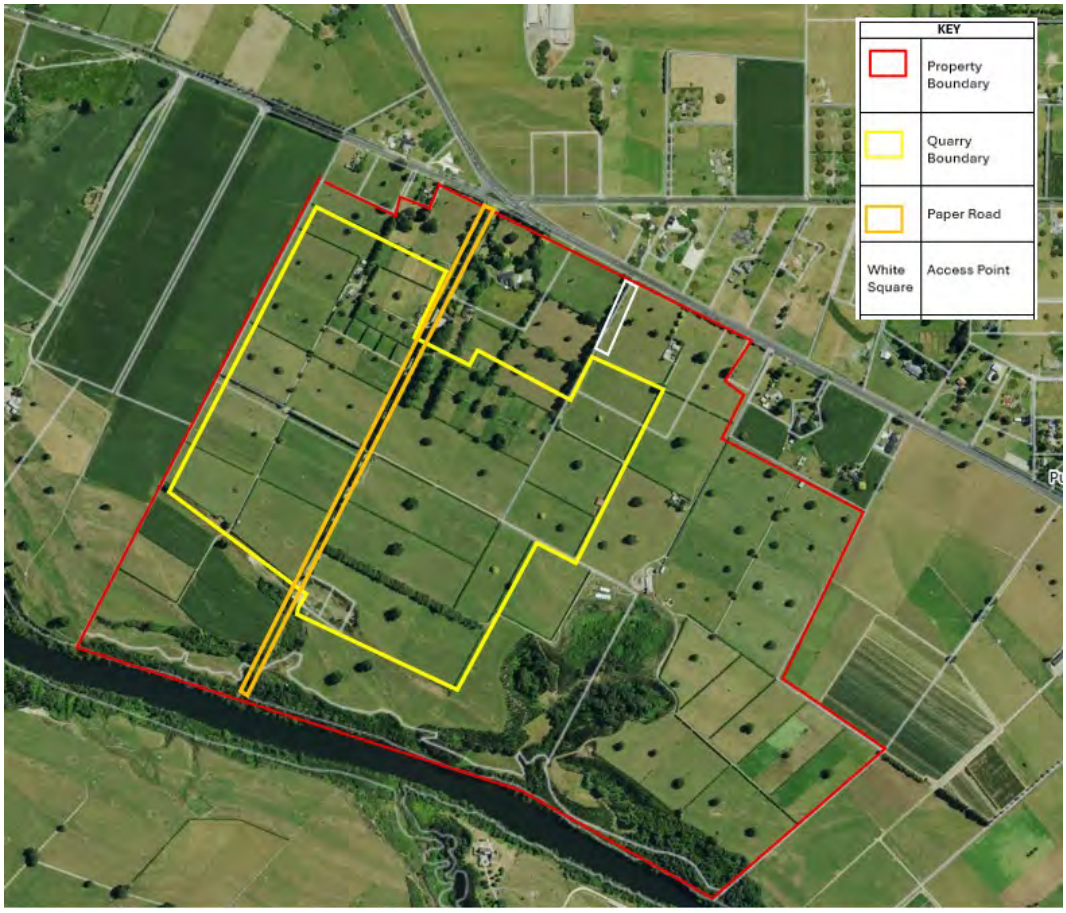


Figure 2 shows the location of the Site and surrounding rural areas. The yellow line depicts the extent of the sand quarry.

[1] Lot 3 DP 571795, Lot 4 DP 571795, Lot 3 DP 572677, Lot 1 DPS 71331, Lot 1 DP 59067, Part Lot 3 DP 26177 and Lot 1 DPS 11673

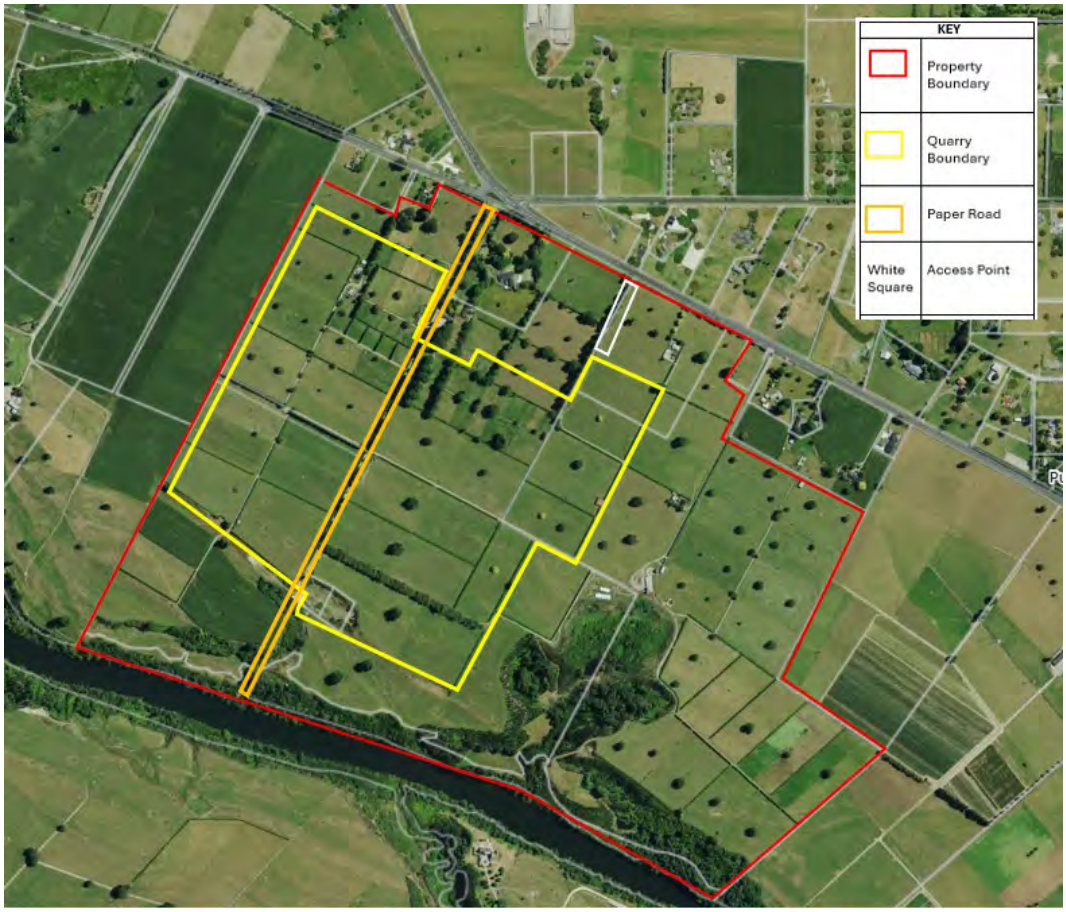


Figure 2: Aerial Photo showing the location of the application site and neighbouring land / dwellings

6.1 LOCAL RECEPTORS

The Site adjoins Cambridge Road and other rural properties to the north-east. Error! Reference source not found. lists the landowners' details (where known) along with the setback distances between dwellings and the extent of the work boundary (where relevant). Most of the sensitive receptors (dwellings) are located to the north-east and north-west of the Site. Dwellings 2, 3 and 4 are closest to the extent of works boundary.

Table 1: Neighbouring Landowners / Dwelling Details

Address	Identifying Number in Figure 3	Distance to quarry boundary (m)
256B /276A/276B/276C Hooker Road	1	420
298 Hooker Road	2	90

Address	Identifying Number in Figure 3	Distance to quarry boundary (m)
306 Hooker Road	3	50
316 Hooker Road	4	90
371 Racecourse Road	5	240
357 Racecourse Road	6	200
347 Racecourse Road	7	220
1/347 Racecourse Road	8	290
331 Racecourse Road	9	330
325 Racecourse Road	10	270
1534 Cambridge Road	11	190
1532 Cambridge Road	12	130
1544 Cambridge Road	13	270
1560 Cambridge Road	14	420



Figure 3: Nearby dwellings and properties

6.2 ARCHAELOGICAL SITES

There are a number of archaeological sites present within the site boundary as shown in **Figure 4** below. These sites are identified as S15/553, S15/554, S15/555, S15/556, S15/557, S15/558 S15/614, S15/615, S15/795, S15/796, S15/797, S15/798, S15/799 and S15/800.

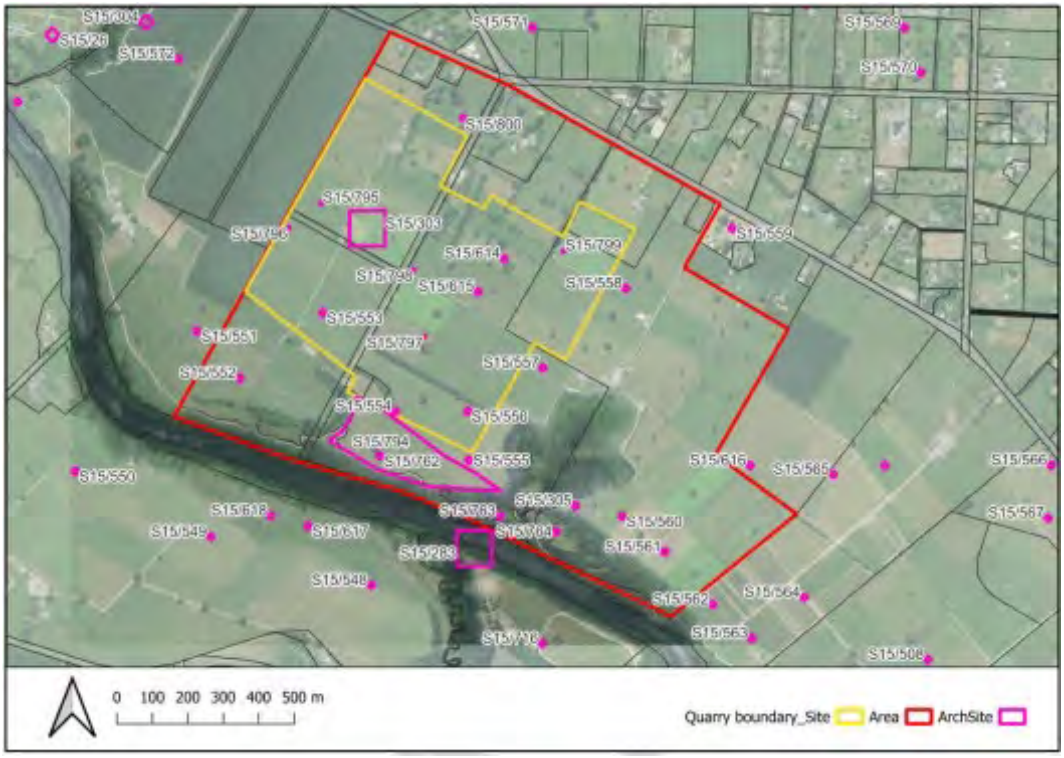


Figure 4: Archaeological Site

Separate authorisations are to be sought under the Heritage New Zealand Pouhere Taonga Act ("**HNZPTA**") before these sites can be modified.

7. QUARRY OPERATIONS

7.1 HEALTH AND SAFTEY

All operations and activities at the quarry will be regulated under the Health and Safety at Work Act 2015. The Act and related regulations require that workers and others are given the highest level of protection from workplace health and safety risks, so far as reasonably practicable.

7.2 HOURS OF OPERATIONS

Opening of the Quarry for general sales will be restricted to the following hours:

> Monday to Friday: 7:00am – 5:30pm

> Saturday: 7:00am – 1:00pm

> Sunday & Public Holidays: Closed

7.3 STAGING

To minimise potential visual and amenity effects, and effects from dust, erosion and sediment runoff, active construction activities will be limited to a maximum open area of 4 ha (for both cleanfill and sand extraction) at any one time. The staging takes the following into account:

- **Groundwater levels:** No works are to be undertaken below groundwater (no dewatering) and excavations will maintain 0.5 m freeboard from groundwater levels identified in the Groundwater Report; and
- **Noise and visual impacts:** Extraction/cleanfilling will begin from the southern corner of the site and expanding to the north.

Refer to the Staging Plan in **Appendix B** for the proposed order of operations.

8. SAND EXTRACTION

8.1 MINING PROCESS

The process of extracting sand involves using heavy machinery for the following processes:

- **Remove existing vegetation:** Using bulldozers and/or excavators and trucks, any existing vegetation, trees and structures within the extent of works will be removed.
- **Topsoil stripping and stockpiling:** Topsoil and organic materials will be stripped, transported and stockpiled using motor scrapers, bulldozers and/or excavators and trucks. These materials will be stockpiled on site. Some of this material will be used for construction of bunds for landscaping, noise control and erosion & sediment control.
- **Sand Extraction, processing and stockpiling:** Quarrying of the sand uses excavators and trucks and/or loaders to excavate and transport the sand materials to the processing plant or stockpiles. Any unsuitable materials will be added to cleanfill for landscaping/rehabilitation.
- **Storage and distribution:** Sand products will be stockpiled onsite, where loaders are used to load customers trucks for transportation off site. Records will be kept of individual truck volumes taken from site.

9. CLEANFILL MANAGEMENT

9.1 CLEANFILL PROCESS

The process of receiving cleanfill involves using heavy machinery for the following processes:

- **Receipt of material to site:** Trucks will discard their loads and material will be spread and compacted on site, using loaders, bulldozers, rollers and/or excavators and trucks.
- **Compaction of material:** The cleanfill will be placed in layers approx. 300mm deep and compacted using loaders, bulldozers, rollers and/or excavators and trucks. Compaction shall produce an in-situ density no less than that of the original material prior to excavation. There shall be a minimum of 4 tests per 1Ha in a 50m grid. Backfill will be tested using Scala Penetrometer. The Applicants may seek to compact the cleanfill to a standard that provides sufficient compaction to enable buildings to be developed on the rehabilitated land in the future if desired.

9.2 CLEANFILL ACCEPTANCE CRITERIA

In accordance with the WasteMinz Guidelines, the cleanfill site is defined as a Class 5 landfill, with the following Waste Acceptance Criteria ("**WAC**"):

- Virgin excavated natural materials, including soil, clay, gravel and rock;
- Maximum incidental[2] inert manufactured materials (e.g. concrete, brick, tiles) to be no more than 5% by volume per load;
- Maximum incidental[2] or attached biodegradable materials (e.g. vegetation) to be no more than 2% by volume per load; and
- Maximum chemical contaminant limits are local natural background soil concentrations.

9.3 RECORDS, VERIFICATION AND MONITORING

9.3.1 Cleanfill Protocol

The process for accepting cleanfill into the Site will be undertaken in accordance with the following protocol:

[2] Incidental items or materials are those present in small quantities that cannot practically be separated from the materials intended for disposal.

- Suppliers will be required to sign a declaration as a condition of entry to the site stating that the cleanfill they provide meets the Waikato Regional Council and WasteMinz definition of 'clean fill' and that no material has come from a HAIL site.
- All cleanfill will be visually inspected upon entering the site with a focus on checking the colour, texture, smell, and looking for powders, liquids and other material that would indicate the cleanfill does not meet the Sites requirements. Where visual inspection cannot be undertaken, video equipment will be utilised.
- Daily records of cleanfill material delivery will require:
  - The declaration to be signed;
  - A record of where the material has originated from; and
  - Confirm that the load has been visually inspected and meets the conditions of entry, being that the material meets the WRP and WasteMinz definition of 'clean fill' and has not been sourced from a HAIL site.

Where the Site has been notified by WRC or the District Councils that an operator has been identified as not meeting cleanfill requirements or visual inspection identifies material of concern, the material will be quarantined for testing with the supplier on charged for the test and required to remove the material from the Site for appropriate disposal.

10. MODIFICATION OF ARCHAEOLOGICAL SITES

As recorded archaeological sites S15/553, S15/554, S15/555, S15/556, S15/557, S15/558 S15/614, S15/615, S15/795, S15/796, S15/797, S15/798, S15/799 and S15/800 cannot be avoided, an Authority must be applied for under Section 44(a) of the HNZPTA and granted by Heritage New Zealand ("**Heritage NZ**") prior to the start of any works that will affect those sites. (Note that this is a legal requirement).

That the authority should cover all areas of works subject to the staging of the project, as authorities are usually granted for a term of five years.

Because it is possible that additional unrecorded sites may be exposed during earthworks, the Authority application will include any additional sites that may be discovered when works are under way.

11. ACCIDENTAL DISCOVERY PROTOCOL

In the event of any archaeological site, koiwi or waahi tapu being discovered or disturbed, while undertaking earthworks, the activity shall cease immediately in the area of the discovery, and mana whenua, Waipā DC, Waikato DC, Heritage NZ, WRC, and in the case of

koiwi, the NZ Police shall be notified within 48 hours. Works may recommence with the written approval of the Waipā DC, Waikato DC and WRC.

12. EROSION AND SEDIMENT CONTROLS

Erosion and Sediment Control is an integral part of quarrying and cleanfilling on site and all activities involving soil disturbance shall incorporate erosion and sediment controls. Erosion and sediment control measures shall be in place prior to commencement of any earthworks and will only be removed after the site/stage has been stabilised to protect it from erosion.

All sediment and erosion controls will be designed, installed, maintained and removed in accordance with the WRC's "Erosion & Sediment Control Guidelines for Soil Disturbing Activities January 2009."

The Erosion and Sediment Control Plan for the initial stage of the site's operation is provided in **Appendix C**.

12.1 STORMWATER & SEDIMENT CONTROLS

The proposed erosion and sediment control philosophy is to contain all stormwater runoff within the site. The mining operation will excavate down, effectively bunding around the perimeter of the works removing the risk of damage to surrounding properties, while also providing stormwater storage and soakage through the underlain sandy subsoils.

12.1.1 Cleanfill Runoff

To minimise the volume of stormwater to be managed onsite, perimeter controls (diversion drains, silt fences and/or earth bunds) will be implemented to divert clean water away from the proposed works area.

12.1.2 Contaminated Runoff

Protection of the Waikato River from any disturbance/contamination/sediment is a key driver for managing and controlling potentially contaminated runoff from the site. It is proposed to utilise the sandy soils and sub-soils and the working quarry pit, and associated high soakage capabilities, as the primary destination for the majority of runoff generated from unstabilised surfaces on site. The soakage capacity of the quarry pit, and the limitation on unstabilised ground surface area are such that avoidance of any sediment discharge from active quarry / cleanfill areas to the Waikato River is expected.

Protection of the Waikato River and associated gully is further protected by a "buffer" distance of 5 metres between the existing boundary fence, that demarcates the edge of the gully, and the sand quarry pit edge.

Any overburden or topsoil disposal /stockpile sites located beyond the working quarry pit will include appropriately designed devices to control potential sediment loss from these areas. Any soakage basins installed specifically for these areas will be designed to manage a 5 percent AEP rainfall event (in line with WRC guidelines) and maintained regularly, with trapped sediment being removed and disposed as cleanfill on site.

12.1.3 Hazardous Substances

Fuel storage and vehicle maintenance facilities shall include containers or bunds to contain any spillages and prevent spillages from entering groundwater or surface water.

12.1.4 Wheel Wash

A wheel washing facility will be used at the exit of the facility will be installed to reduce the potential of material from trucks to be deposited on the roadway outside the site. The wheel wash will be located approximately 100m before the exit to the main road, with the remaining area between the wheel-wash and Cambridge Road to be chip-sealed. This will minimise the amount of sediment tracking onto Cambridge Road.

Sediment laden water from the wheel wash will be discharged to the active quarry pit (or appropriately sized soakage basin) and soaked to ground.

12.1.5 Monitoring and Maintenance

All erosion and sediment control measures will be inspected on a weekly basis and within 24 hours of each rainstorm event.

13. DUST MANAGEMENT

Sand extraction and cleanfilling activities have the potential to generate dust – particularly during dry and windy conditions. This section of the QCMP documents all management, monitoring and operational procedures that will be implemented on site to minimise dust emissions beyond the boundary of the site and avoid objectionable or offensive dust effects on neighbouring landowners and/or residents (refer receptor locations in **Figure 5**).



Figure 5 Surrounding landowners

13.1 POTENTIAL SOURCES OF DUST

Site activities will involve the removal of topsoil and the creation of an open sand quarry below the existing ground level. This exposes the ground to the elements and inherently increases the risk of dust being generated. In turn, this also increases the risk of dust migrating beyond the site boundary where it may create a nuisance effect for local receptors.

The risk of dust generation can also be exacerbated on site as a result of:

> On site traffic movements

> Earthworks and sand excavation work

> Cleanfill placement and compacting activities

> High winds

> Dry summer conditions.

13.2 WIND ENVRIONMENT

Assuming wind conditions at the site are similar to Hamilton Airport, the wind rose at **Figure 5** shows the predominant wind is from the westerly quarter. This figure also shows the strongest (higher velocity) winds are from the west.

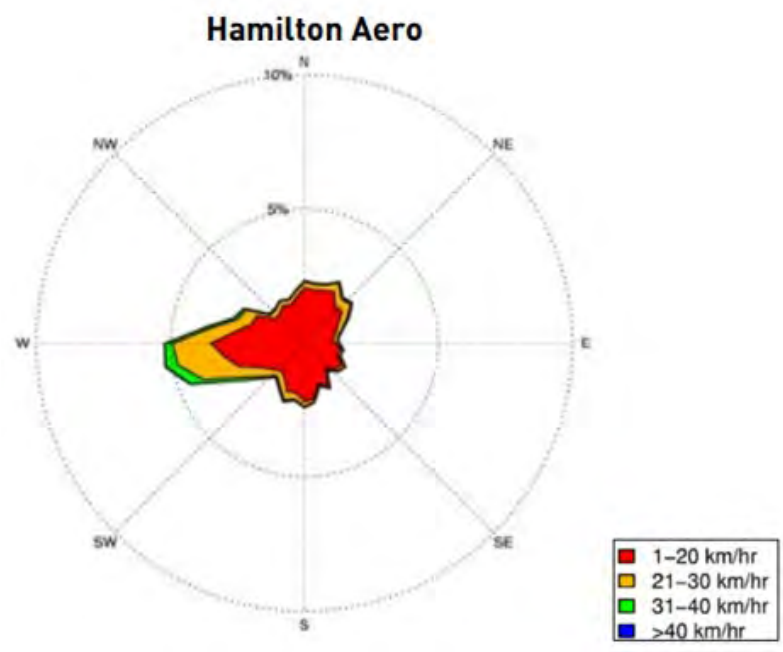


Figure 6: **Mean Annual Wind frequency (%) of surface wind direction from hourly observations at Hamilton Airport. Plot shows direction from which the wind blows (Source: NIWA Report "The Climate and Weather of the Waikato" Second Edition, P.R.Chappell).**

Hamilton also experiences a very marked diurnal variation in wind speed, with greatest wind speeds occurring in the early part of the afternoon. This is because at that time of day heating of the land surface is most intense and stronger winds aloft are brought down to ground level by turbulent mixing. Cooling at night generally restores a lighter wind regime.

Table 4 gives average wind speeds at three-hourly intervals for the Hamilton Airport location.

Table 2: **Average wind speed (km/hr) for selected hours at Hamilton Airport**

Hour	00	03	06	09	12	15	18	21
Wind Speed	8	7	7	9	14	16	14	9

Given the closest sensitive receptors are located to the north-east and west of the site's extent of works, the risk of causing nuisance and/or objectionable dust will be highest during the following conditions / periods:

- High speed southerly or south westerly winds;
- Dry weather;
- Early afternoons (generally); and

- Periods of higher traffic and/or excavation or earth moving activities.

13.3 DUST CONTROL MEASURES

Dust will be controlled on site through a combination of dust minimisation and mitigation methods based on the following key site design and operation principles:

Design Principles:

- Minimising the open quarry area to no more than 4 hectares;
- Implementation of a secure supply of water (bore);
- Establishment of contingency water carts for dust suppression;
- Establishment of a truck wheel wash;
- Retaining existing shelter belt vegetation that acts both as a barrier to wind exiting the site and a filter to intercept any entrained dust; and
- Sealing the site entrance and first 100m of the site access road.

Operational Principles

- Staff training and awareness of dust generation risk factors and mitigation measures;
- Employment of water spray or water carts to dampen dust in dry / windy conditions;
- Regular visual monitoring;
- Enforcement of on-site speed restrictions;
- Set of a truck wheel wash to minimise tracking of sediment by outbound trucks; and
- Neighbours feedback / complaint response.

13.4 WATER SUPPLY

A bore with a 900 m^3 per day water take will be established on site, this will be the primary source of water for dust controls on site. The following has been assumed for the proposed water usage on site:

- Sand Processing – 652 m^3;
- Dust Suppression / Wheel Washing – 200 m^3; and
- A contingency amount - 48 m^3.

13.5 DUST MITIGATION METHODS AND CONTINGENCIES

Drawing on the dust management principles outlined above, the initiatives set out in **Table 5** will be implemented on site to mitigate dust generation from specific sources and specific site related activities.

Table 3: Specific dust management mitigation and controls

Dust Source or Activity	Mitigation / Control
General observation and risk management	All staff will be trained on site specific dust risk factors and will be encouraged to be vigilant in identifying conditions that could result in objectionable dust spreading beyond the boundary of the site and to plan site works appropriately given particular environmental conditions. Examples include: > Monitoring site conditions (weather/soil conditions) to anticipate and prevent dust effects > Planning activities with higher dust generation potential in the morning > Limiting or avoiding operations which have the potential to cause high dustduring high wind conditions.
Observed dust issue	The process following identification of a dust issue, or potential dust issue, is that the quarry site manager (or acting site manager) is immediately advised and he or she then implements an appropriate management response. Options for resolving the dust issue may include: > Directing the site water cart to the problem area or activating water sprays in that area to dampen down the dust > Stopping the on-site activity that is causing the dust issue > Halting and rescheduling certain high dust generation activities until wind has reduced or changed direction away from receptors > Cleaning paved surfaces if affected by tracking of transported dust.

Dust Source or Activity	Mitigation / Control
Stockpiles (including material placement and removal)	> Making sure stockpiles exist for the shortest possible time > Stockpiles oriented to maximise wind sheltering where possible > Stockpiles positioned as far as practical away from property boundaries > Limiting the height and slope of stockpiles > Surfaces of stockpiles to be kept damp to reduce dust emissions (e.g. through wet suppression systems) or covered or stabilised to reduce dust generation in areas adjacent sensitive receptors.
Unpaved surfaces, such as haul roads and construction yards	> Unsealed surfaces kept damp to reduce dust emissions (e.g. by use of water carts) > Stabilisation of surfaces when works are completed by grassing, metalling or sealing surfaces to reduce dust emissions > Consideration to use of polymers for surface stabilisation where there is a high risk of effects.
Vehicle movements	> Setting lower vehicle speed limits on unsealed surfaces in areas near sensitive receptors > Reducing transportation of dust through regular cleaning of vehicles including wheels (e.g. wheel wash).

14. TRAFFIC

Daily traffic movements will be recorded.

15. NOISE

All machinery equipment shall be operated and maintained in accordance with the manufacturer's specifications to ensure that the emission of noise does not exceed a reasonable level at the nearby receivers (**Figure6**).

The following limits are not to be exceeded within the notional boundary (20 m from the most exposed external walls of any dwelling or any building used for accommodation) of any dwelling (excluding dwellings within mineral extraction sites):

> 7am to 5.30 pm - 50dBA Monday to Friday; and

> 7am to 1pm - 50dBA Saturday.

In accordance with the Marshall Days Noise Assessment, a 2 m earth bund is required along the northern boundary of Stage 3.



Figure 7: Location of Sensitive Receivers

16. COMPLAINTS

All verbal and written complaints will be recorded and kept on site. Upon receiving a complaint, the following process will be undertaken:

> Records taken of the time and date of the complaint/s, the identity and contact details of the complainant (if offered) and entered on a Complaint Form.

> The complainant will be asked to describe the nature and timing of effect being experienced

> Is it constant or intermittent,

  > How long has it been going on for

  > Is it worse at any time of day

  > Does it come from an identifiable source

- Information on the nature and timing of the effects to be recorded in the Complaint Form
- If known, wind direction, strength and weather conditions at the time of the incident resulting in the complaint to be recorded in the Complaint Form
- As soon as possible after receipt of a complaint, undertake a site inspection. Note all dust generating activities taking place and the mitigation methods being used. If the complaint was related to an event in the recent past, and if possible, note any dust generating activities that were underway at that time. Initiate any remedial action necessary
- As soon as possible (within 2 hours, where practicable), visit the area from where the complaint originated to ascertain if dust is still a problem
- If it becomes apparent there may be a source of dust other than the construction project causing the complaint, it is important to verify this. Photograph the source and emissions
- As soon as possible after initial investigations have been completed, contact the complainant to explain any problems found and remedial actions taken. Record this information on the Complaint Form

All complaints received and investigated will be included in the site's Complaints Register. All records within the Complaints Register will be kept for no less than five years.

17. REHABILITATION AND LANDSCAPE WORKS

As the quarry expands throughout the property, the disturbed areas will be rehabilitated with the placement of unsuitable and imported (cleanfill) material in general accordance with the Staging Plan (**Appendix B**). This land will be top soiled and re-grassed and/or revegetated, for the return to pasture as soon as practicable.

The Applicants may seek to compact the cleanfill to a standard that provides sufficient compaction to enable buildings to be developed on the rehabilitated land in the future if desired.

18. REPORTING

Compliance reports will be prepared in accordance with the site's resource consents. These are summarised in **Table 5** <update post consenting>.

Table 4: Site Reporting Schedule

Report	Consent / Condition Number	Frequency	Recipients	Submission Date

19. DOCUMENT REVIEW

This QCMP, inclusive of the Erosion & Sediment Control Plan and Staging Plan will be reviewed at least once every two years. Any amended versions will be submitted to WRC, Waipā DC and Waikato DC.

When reviewing this document, the following matters should be considered:

- Records of any incident reports (Health and Safety and Environment), any monitoring results and any complaints or feedback received from neighbours
- Any internal and external audit results (health and safety or environmental)
- Records of compliance with the site's resource consents, regional and district plans and other relevant legislation
- Any changes to the regulatory environment.