



13 July 2022

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Dear Kate,

HUNTLY MANAGED FILL - ASBESTOS AIR MONITORING PLAN

1.0 Introduction

Pattle Delamore Partners (PDP) has been engaged by Paua Planning on behalf of Gleeson Managed Fill Limited (GMFL) to prepare an Asbestos Air Monitoring Plan (AAMP) north of the Gleeson Huntly Quarry, located at 300 Riverview Road, Huntly ('the Site'). This AAMP has been prepared in support of a resource consent application to permit the construction of a Managed Fill facility (Managed Fill) at the site. It is proposed that this Managed Fill accepts Asbestos Containing Material (ACM) waste, and asbestos-in-soil, including from Class A asbestos removal activities, as part of its waste acceptance to provide support for land development and materials disposal within the local Waikato region in which it will operate. The AFMP is intended to provide flexibility through tiered site management controls commensurate with the category and concentration of asbestos wastes being accepted to the site and disposed of at the time.

This AAMP has been prepared to guide GMFL in compliance with the Health and Safety at Work (Asbestos) Regulations 2016 (the 'Asbestos Regulations'), and the anticipated conditions of the proposed resource consent during the acceptance and disposal of these asbestos wastes onsite. The management procedures included in the AFMP endeavour to eliminate or minimise exposure of workers and neighbouring site users to asbestos fibres during the disposal of asbestos/ACM waste and asbestos-in-soil.

To achieve compliance with the Asbestos Regulations and appropriate management of asbestos, the AAMP and AFMP draws on supporting information from the Building Research Association New Zealand (BRANZ) New Zealand Guidelines for Assessing and Managing Asbestos in Soils (BRANZ, 2017), and the WorkSafe NZ Approved Code of Practice (ACOP) for the Management and Removal of Asbestos (WorkSafe NZ, 2016).

2.0 Objectives and Scope

2.1 Objectives

The objectives of this AAMP are:

- to provide a performance-based structure of reassurance and maintenance monitoring of airborne asbestos fibres at key locations, as a result of filling operations including ACM/asbestos-in-soil at the site; and,



- ∴ to provide the template documentation – sample locations and required information – to provide satisfaction that the air monitoring events are achieving the desired outcomes.

2.2 Scope

The scope of these works includes:

- ∴ Preparing a framework for performance-based air monitoring at the site for airborne asbestos during episodes of ACM/asbestos-in-soil filling operations; (This framework will indicate the preferred position of air monitors during filling operations in the various fill areas of the site, accounting for the filling of one or more of these areas concurrently).
- ∴ Contingency and/or emergency response actions – i.e. repeat sampling, TEM analysis, swab samples and/or activity-based sampling; and,
- ∴ Recommendations on fieldsheets and required information, and regular reporting of results (i.e. annual and/or on-demand).

The scope of this AAMP is limited to the extent of Fill Areas 2, 3 and 4 (as indicated on appended Figure 1).

3.0 Site Description of Operational Asbestos Work Zones

The site is located on the properties adjacent to and north of the existing Huntly Quarry; located at 300 Riverview Road, Huntly. Currently operates as an aggregate quarry owned and operated by Gleeson Quarries Huntly Limited. There are four main gullies within the site boundaries which have been identified as key areas where filling of soils containing ACM/asbestos could be undertaken to optimise GMFLs use of the land area (Figure 2 below).

The site is located approximately 4.5 km south of the Huntly township on the western side of the Waikato River (which is located approximately 150 m from the nearest Managed Fill area; Fill Area 4). The site is located within a rural residential setting with the nearest site neighbour (a rural residential dwelling) located approximately 300 m to the east of the nearest Managed Fill area; Fill Area 4 (Figure 2, Table 1).

The complete Managed Fill operation is proposed to occupy three main areas of the site: Fill Area 2, Fill Area 3 and Fill Area 4 (as shown on Figure 1) totalling approximately 2 million cubic metres of fillable volume. It is expected that these areas will be filled consecutively, and asbestos/ACM waste and asbestos-in-soil disposal works will not be occurring simultaneously across multiple Fill Areas.

As noted above and in the AFMP:

- ∴ Asbestos/ACM waste and asbestos-in-soil (and other managed fill soils not containing asbestos/ACM) are intended to be deposited in Fill Area 2, 3 and 4.
- ∴ No asbestos/ACM waste and asbestos-in-soil to be deposited in Fill Area 5.

Several other specific controls and relevant roles and responsibilities are noted within the AFMP which correspond to this AAMP, and both documents should be adhered to during any placement of asbestos/ACM waste and/or asbestos-in-soil.

3.1 Nearby Receptors

3.1.1 Onsite Receptors

Onsite receptors (excluding those who are considered to be protected from the airborne asbestos hazard due to their ongoing compliance with the AFMP controls) could include managed fill and quarry workers, cartage truck drivers and site visitors. Each of these individual groups of site workers and visitors has roles and responsibilities with respect to asbestos processes (such as wearing or having available the correct PPE/RPE) when ACM/asbestos-in-soil materials are being disposed of at the site. Each of these receptors could be considered to be anywhere from with 50 – 100 m from the active disposal site at the time of ACM/asbestos-in-soil deposition occurring.

3.1.2 Offsite Receptors

The below Figure 2 and Table 1 indicate the nearest residencies to the site which could be occupied during the placement of any ACM/asbestos-in-soil fill materials. Other offsite receptors, such as public use areas of the Waikato River, are not considered to constitute areas of persistent use where receptors could congregate in the same location long enough to warrant the requirement for airborne asbestos exposure assessment.

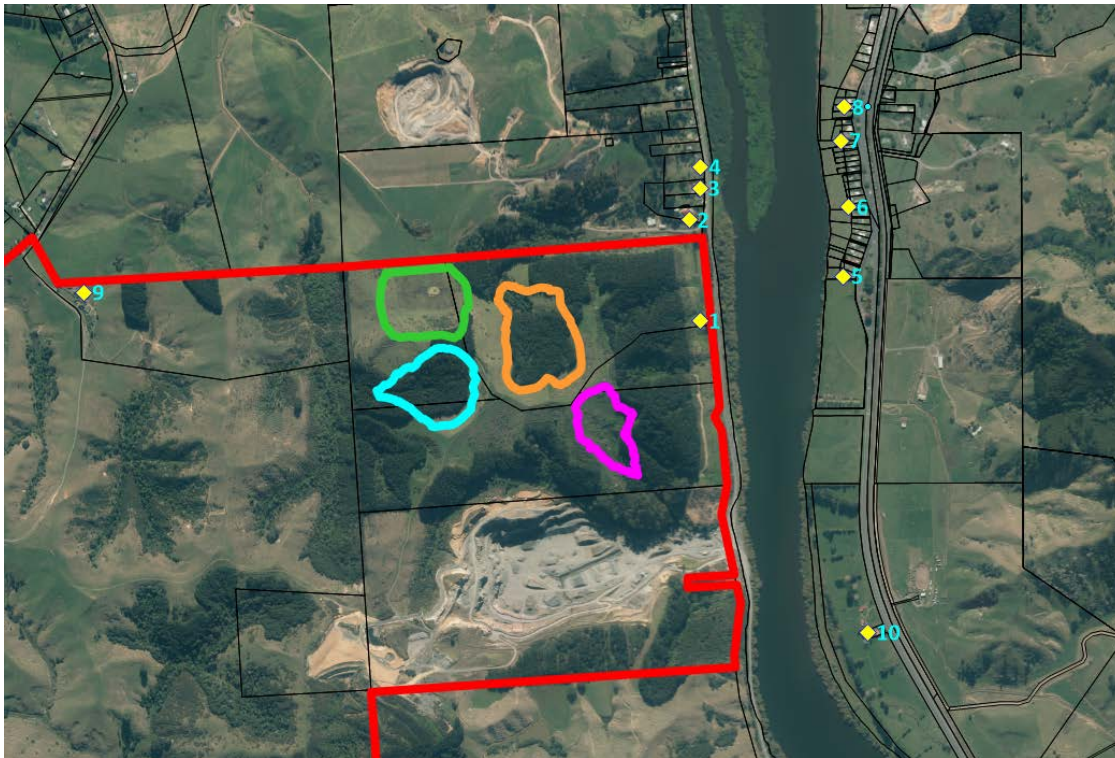


Figure 2: Nearest residences location map

Table 1: Sensitive receptors nearest to Fill Areas

Receptor ID	Address	Minimum distance from Fill Areas	Direction
1	232 Riverview Road	300 metres	Directly east of Fill Areas
2	206 Riverview Road	400 metres	Northeast
3	204 Riverview Road	500 metres	Northeast
4	200 Riverview Road	520 metres	Northeast
5	580 Great South Road	700 metres	East
6	558 Great South Road	850 metres	East
7	540 Great South Road	900 metres	Northeast
8	526 Great South Road	930 metres	Northeast
9	95A Hillside Heights Road	820 metres	West
10	4566 State Highway 1	770 metres	Southeast

3.2 Topography and Wind Direction

The surrounding topography is generally hilly, with elevations of the Fill Areas ranging from 45 to 115 metres above sea level. The dominant feature of the landscape is the Waikato River which bounds the Site to the east, running south to north.

The nearest meteorological stations are located at Ruakura in Hamilton (approximately 25 kilometres to the southeast) and Whatawhata (approximately 23 kilometres to the southwest). Wind roses for the six-year 2012-2017 period are provided as Figure 3. Average wind speeds for the period were 2.5 m/s at Ruakura and 2.9 m/s at Whatawhata. Calm periods (winds less than 0.5 m/s) occurred 7.6% of the time at Ruakura and 4.7% of the time at Whatawhata.

Strong wind conditions (wind speeds greater than 5 m/s) are most relevant for generation of dust from exposed surfaces and transporting the dust (including asbestos) offsite. Strong winds occurred around 12% of the time at Ruakura and 18% of the time at Whatawhata over the 2012-2017 period. Wind roses for the six-year period showing only strong winds are provided as Figure 4 and indicate that strong winds occur almost entirely from the westerly and south-westerly directions at both meteorological stations.

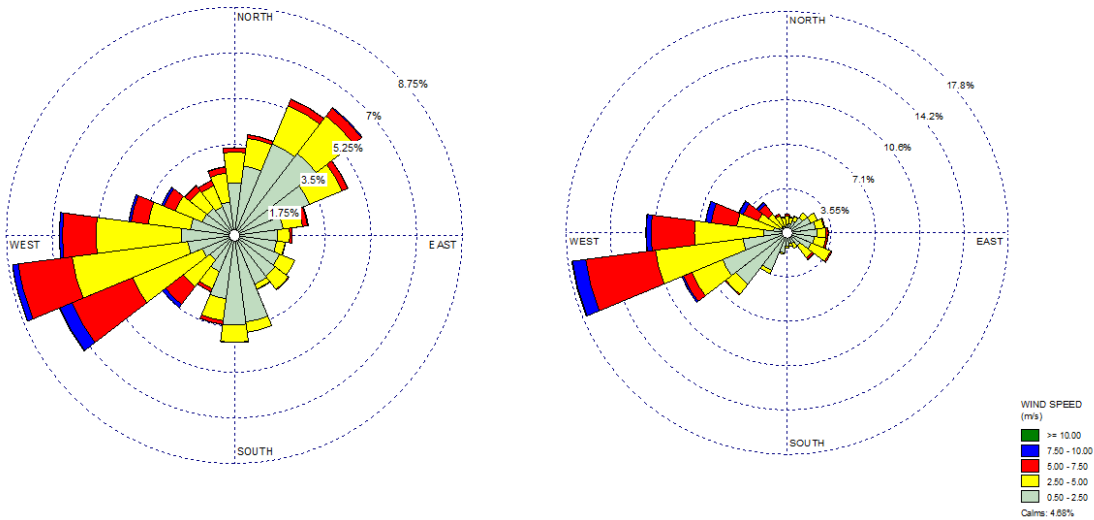


Figure 3: Ruakura (left) and Whatawhata (right) wind roses, 2012-2017.

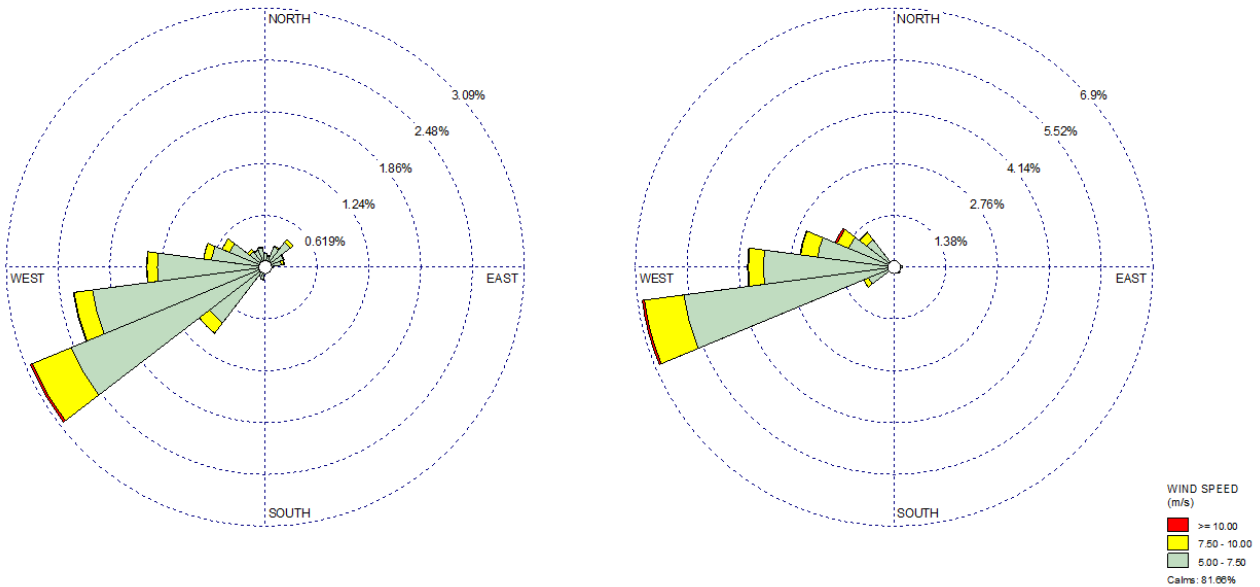


Figure 4: Ruakura (left) and Whatawhata (right) wind roses (strong winds > 5 m/s), 2012-2017.

4.0 Asbestos Regulations – Air Monitoring and Surface Sampling

Duties of care under the HSWA Asbestos Regulations to be fulfilled at the proposed Managed Fill with regards to air monitoring and testing are highlighted below:

- ∴ Duty to carry out air monitoring (if there is uncertainty as to whether the airborne contamination standard is likely to be exceeded; Reg 51). During any disposal of ACM waste or asbestos-in-soil classified as Class A (friable) materials, air monitoring is a mandatory requirement and must be completed by a Licensed Asbestos Assessor (Reg. 43).

- Surface wipe sampling for cabs of excavators and tipping trucks, and site vehicles may be undertaken if determined appropriate.
- ∴ Air monitoring and regular reporting requirements, and any notification of these results to neighbouring residents/site users (as required).

Every effort must be made by GMFL to ensure that asbestos in air will not exceed 'trace level' (presently set at 0.01 fibres/mL of air in the Asbestos Regulations); either at the boundary of the operational asbestos work zone, or within the breathing zone of any worker not wearing PPE/RPE (or a vehicle fitted with High-Efficiency Particulate Air (HEPA) filter).

5.0 Proposed Fill Management Plan

Information obtained from GCMF notes that a staged fill operation is proposed, commencing with Fill Area 2 and progressing to Fill Areas 3 then 4. Each stage involves the deposition of imported managed fill in accordance with geotechnical engineering recommendations with maximum deposits of 300,000 m³ per annum; including the *importation of managed construction & demolition material which may include asbestos containing soil and material, peat, marine sediment, and acid sulphate soils.*

6.0 Sampling Locations and Rationale

The performance-based asbestos air monitoring programme is established on three main principles:

1. All of the commensurate AFMP controls for disposal and handling of asbestos/ACM waste and/or asbestos-in-soil are applied and adhered to (specific to the nature of asbestos/ACM waste being deposited at the time);
2. Asbestos air monitoring is conducted by a Licensed Asbestos Assessor (LAA; for Class A materials) or a or a suitably competent and trained person (Asbestos Related Work or Class B materials) who is independent of the Managed Fill operation (dependent on the nature of the asbestos waste being disposed of at the time); and
3. The monitoring is *performance-based* (as confirmed by the LAA) indicating that continued favourable results (i.e. <0.01 fibres/mL) over several monitoring events and varying types of asbestos filling are the result of ongoing compliance with the AFMP controls for the relevant asbestos/ACM waste and/or asbestos-in-soil product. (Unfavourable results would revert to the contingency or emergency actions noted below.)

Independent air monitoring audits should be completed by the LAA/Competent Person at a frequency of 1 audit per quarter to confirm ongoing compliance with the AFMP controls. Daily air monitoring field sheets collating all of the required information from the sections below will be completed by the LAA/Competent Person for each day of air monitoring.

6.1 Air Monitoring Location, Frequency and Target Receptor(s)

The monitoring will comprise a number of monitoring points during each 'monitoring day', and the locations may vary daily based on the location of works, direction of the prevailing wind direction, and wind speed. Monitoring is intended to provide a 'real-time' assessment of the effectiveness of site controls (and adherence with this plan, the AFMP, and the Asbestos Regulations) during varied asbestos disposal conditions and over a number of working days.

Air monitoring analysis is to be completed by an IANZ laboratory in accordance with the NOHSC:3003 (2005) method.

Table 2: Air Monitoring Number and Location					
Fill Area #	Air Monitoring Number and Location ^{1,2}				
	Fill Area Boundary	Site Personnel / Plant	Neighbouring Residential Sites	Optional / Contingency ³	Emergency ³
2 (i.e. Blue)	Boundary air monitoring for each specific fill area (minimum 4x air monitors per day), with 1-2 downwind of asbestos zone (to be placed depending on prevailing/forecast wind direction on the day of monitoring)	Personnel air monitoring within the cab of at least one machine operating in the nearest vicinity of an operational asbestos zone.	A minimum of 1-2 air monitors at/near the property boundaries closest to the neighbouring residential sites (i.e. to the north and east of the site).	1 monitor at the site weighbridge	All of the nominated sample positions plus: Optional / Contingency monitoring locations.
3 (i.e. Green)				Adjacent to any simultaneous work that may be occurring within the wider fill area.	
4 (i.e. Orange)				Surface wipe samples collected from cab of non-asbestos plant.	

Notes:

1. Air Monitoring Locations may overlap based on specific receptors being assessed during any monitoring event.
2. Air monitoring locations are shown as 'indicative' on Figure 1 – with actual locations determined by the LAA or competent person on the day of monitoring, taking into account access constraints present at the site.
3. Contingency/Emergency Actions may include the preparation of a custom monitoring plan to assess the risk of exposure as a result of an exceedance of 0.01 fibres/mL.

Air monitoring locations would be consistent with the measured and forecast downwind direction on the day. Noting that strong winds occur almost entirely from the westerly and south-westerly directions (Figures 3 and 4).

6.2 Air Monitoring Programme

Air monitoring sampling is planned to be undertaken over 10 days within the first 3 months of filling (monitoring events do not have to be consecutive) – with a minimum of two monitoring events coinciding with Class A material disposal (wherever possible) – supplemented by swab sampling/personnel monitoring on the inside of machine cabs, where relevant) to confirm that controls are appropriate and are working effectively. During the course of the monitoring events, notation will be kept and maintained on the type/classification/volume of asbestos/ACM waste and/or asbestos-in-soil disposed for each individual days’ monitoring (refer to Appendix A for air monitoring field sheet to be completed during each monitoring day).

- ∴ Favourable results – i.e. all or majority of results complying with <0.01 fibres/mL concentrations, and WDC/WRC approval – will allow this air monitoring programme to be reduced to monitoring

on a quarterly basis (when asbestos/ACM waste and/or asbestos in soils filling is occurring) for the remainder of the first year of operation¹.

- ∴ Unfavourable results – i.e. one or more results consistently exceeding trace level concentrations – will result in Contingency/Emergency Actions being required (refer below), with the implementation of an updated AAMP requiring more involved monitoring during asbestos/ACM waste and/or asbestos-in-soil filling and linkages to the nature of compliance with AMFP controls.

Air monitoring must be undertaken by a LAA anytime that Class A asbestos materials are being disposed of at any of the fill areas (as per Reg. 43).

Quarterly monitoring would follow the above process for one day each quarter year.

6.3 Reporting of Results

Air monitoring results are to be reported to GMFL and stakeholders by the Competent Person/LAA within 24 hours. If required, follow-up actions are to be advised by the Competent Person/LAA if control levels exceed the indicative fibres/mL triggers set in Table 3.

Typical ranges of results (of airborne asbestos fibres per mL of air) and the required actions regarding site control measures during the soil disturbance works are provided below for reference.

A summary of air monitoring results including any corrective actions taken for results above the trigger levels indicated <0.01 f/mL, will be included in Annual Monitoring reporting.

Table 3: Asbestos in Air Concentrations and Associated Actions	
Concentration (Asbestos fibres/mL of air)	Actions
≤ 0.01	Current control measures working effectively to keep airborne asbestos fibres < trace level. Continue with control measures.
> 0.01 State of Caution	Current control measures are not working effectively to keep airborne asbestos fibres below trace level. Notify WDC/WRC (as required) of the possible exceedance. Analyse sample using Transmission Electron Microscopy (TEM) method to confirm concentration of asbestos fibres. Confirm actual result with WDC/WRC. Investigate the cause of the respirable asbestos fibre level, implement controls to minimise exposure to asbestos, and minimise the further release of respirable asbestos fibres (Reg 44).
> 0.02 State of Urgency	Current control measures are not working effectively to keep airborne asbestos fibres below trace level. Stop work; notify WorkSafe (and WDC/WRC) of the potential exceedance.

¹ The frequency of the air monitoring programme may be further reduced in time under the direction of a competent person/LAA, and possible WDC/WRC and WorkSafe NZ approval, if quarterly results are consistently at or below trace level (i.e. 0.01 fibres/mL of air) across all monitoring points.

Table 3: Asbestos in Air Concentrations and Associated Actions	
Concentration (Asbestos fibres/mL of air)	Actions
	<p>Analyse sample using TEM method to confirm concentration of asbestos fibres.</p> <p>Confirm actual result with WorkSafe.</p> <p>Investigate the cause of the respirable asbestos fibre level, agree and implement controls to minimise exposure to asbestos, and minimise the further release of respirable asbestos fibres (Reg 45).</p> <p>Only resume work when air monitoring results show that the recorded respirable asbestos fibre level is at or below trace level (i.e. <0.01 fibres/mL).</p>

Summary reporting of performance-based and quarterly monitoring results, along with any exceedances, corrective actions taken and further investigation findings and results will be prepared by GMFL as part of the Annual Monitoring Report expected to be provided to WDC/WRC each year of the Managed Fill operation.

6.4 Contingency/Emergency Actions

Contingency actions may be undertaken during any air monitoring at the discretion of the LAA/Competent Person. These actions may be undertaken in response to observed behaviours and/or compliance-related assessments of the AFMP controls.

Contingency actions may also be undertaken in response to airborne asbestos fibres being measured above trace level, as a means to better understand the likelihood of exposure risk to certain on- or off-site receptors (refer to Table 3). This can be to undertake reassurance monitoring to investigate the cause of the respirable asbestos fibre level, implement controls to minimise exposure to asbestos, and minimise the further release of respirable asbestos fibres (Reg 44), analysis of samples using Transmission Electron Microscopy (TEM) method to confirm concentration of asbestos fibres, or undertaking surface sampling of dust collected from cab of non-asbestos plant to confirm the presence or absence of asbestos.

Emergency actions will be undertaken in response to airborne asbestos which exceeds >0.02 fibres/mL. This will include cessation of works, and undertaking investigative monitoring to determine the cause of the respirable asbestos fibre level exceedance and minimise the further release of respirable asbestos fibres (Reg 44). This investigative sampling could include further air monitoring of plant/personnel and/or surface wipe sampling as directed by the LAA.

7.0 Discussion

The sensitivity of the receiving environment is considered to be moderate, given the public receivers considered to be ‘at risk’ are rurally zoned properties typically 300 metres or more distant from the ACM/asbestos-in-soil disposal activities. The properties immediately to the east and northeast of the site (no’s 1-4) are required to be assessed due to the higher frequency of strong winds occurring from the west and south-southwest, whereas properties in other directions from the site will be at a significantly lower risk of experiencing windblown dust.

Given the proximity to other dust-generating activities in the area (i.e. three active quarries to the south of the fill areas), it is likely that the contribution of dust from the proposed works will be low compared to these other sources. To ensure that the actual impacts of discharged dust and dust containing asbestos are minimised, dust mitigation measures are required by the AFMP.

PDP notes that performance-based air monitoring is proposed at the site, with 10 days of monitoring to be undertaken in the first 3 months of filling to assess the effectiveness of AFMP controls. It is further noted that these monitoring days do not have to be consecutive and should coincide with a variety of ACM/asbestos-in-soil categories for disposal, including at least 2 days where Class A materials are being disposed. Any disposal of Class A type asbestos materials requires a LAA to complete the air monitoring.

PDP notes that audits should be undertaken in order to achieve the objectives outlined in the scope, including to independently verify that the processes of the AFMP are being utilised correctly during the disposal of ACM/asbestos-in-soil waste materials. It is recommended that audits including asbestos air monitoring and surface sampling be undertaken on a quarterly basis when asbestos/ACM waste and/or asbestos in soils filling is occurring to confirm the maintenance of habits at site and compliance of the AAMP.

8.0 References

Health and Safety at Work Act 2015.

Health and Safety at Work (Asbestos) Regulations 2016.

BRANZ 2017. Guidelines for Assessing and Managing Asbestos in Soil.

WorkSafe New Zealand, 2016. Code of Practice for the Management and Removal of Asbestos.

9.0 Limitations

This report has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by Paua Planning and Gleeson Managed Fill Limited. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the report. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This report has been prepared by PDP on the specific instructions of Paua Planning and Gleeson Managed Fill Limited for the limited purposes described in the report. PDP accepts no liability if the report is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

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Yours faithfully

PATTLE DELAMORE PARTNERS LIMITED

Prepared by



Matthew Ryan

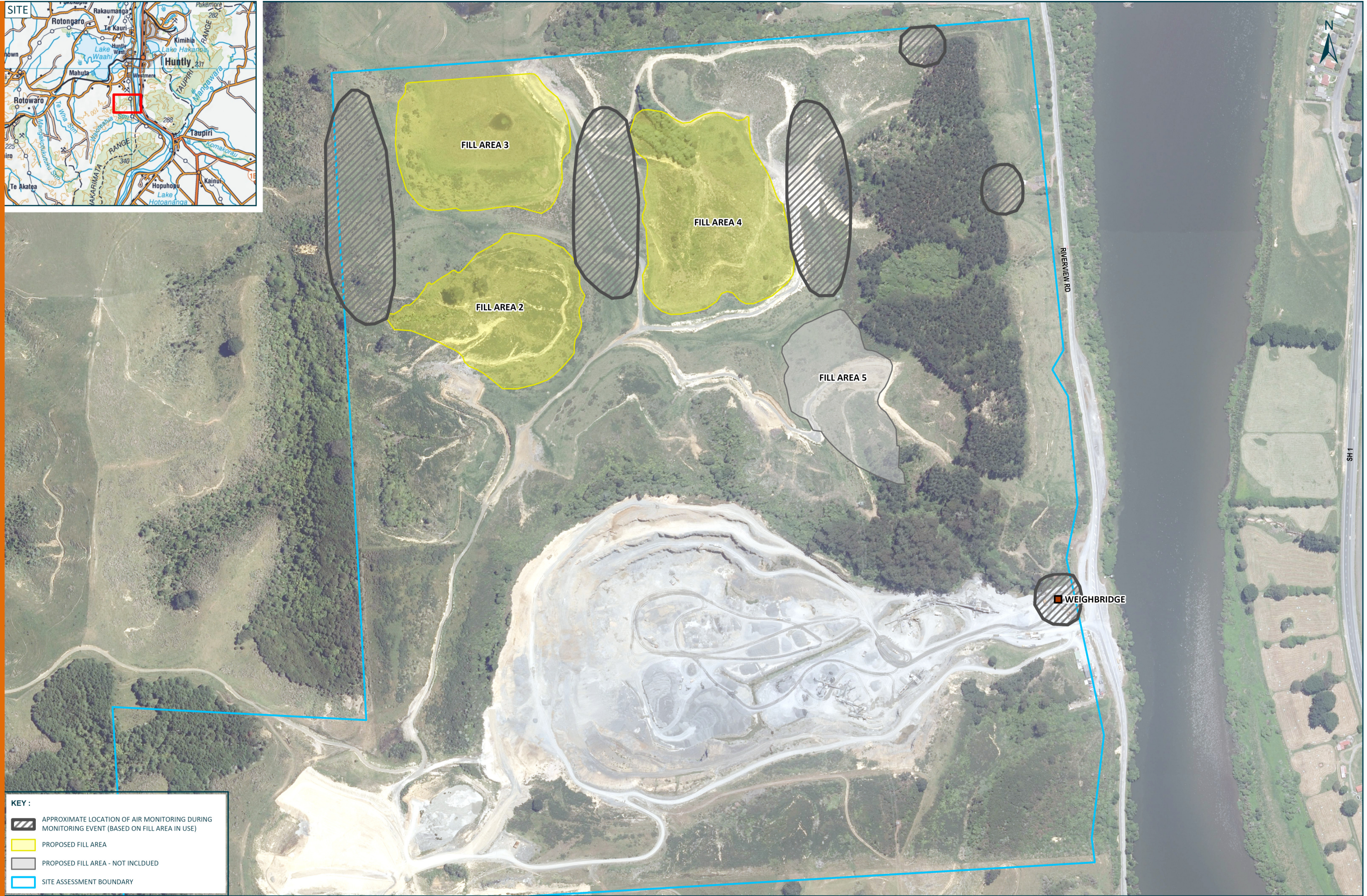
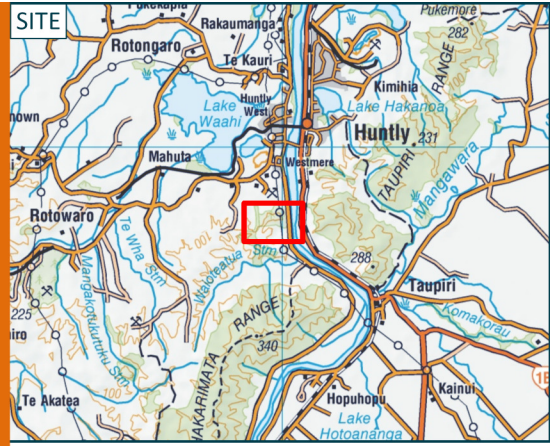
Senior Environmental Geologist

Reviewed and Approved by



Rod Lidgard, CEnvP SC, LAA

Technical Director – Contaminated Land



KEY :

	APPROXIMATE LOCATION OF AIR MONITORING DURING MONITORING EVENT (BASED ON FILL AREA IN USE)
	PROPOSED FILL AREA
	PROPOSED FILL AREA - NOT INCLUDED
	SITE ASSESSMENT BOUNDARY



0 50 100
METRES
SCALE : 1:5,000 (A3)
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NO.	REVISION	DATE	BY
A	ISSUED FOR REVIEW	JUL 22	TK

SOURCE:
1. AERIAL IMAGERY (FLOWN 2019) SOURCED FROM THE LINZ DATA SERVICE www.linz.govt.nz/about/linz/linz-data-service/help/using-linz-data/attribution-aerial-imagery-data AND LICENCED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENCE.
2. PROPOSED FILL AREAS SUPPLIED BY TERRA MINING CONSULTANTS LTD, DWG no GCH-001 DATED APRIL 2019.
3. CADASTRAL/TOPOGRAPHICAL INFORMATION AND INSET DERIVED FROM LINZ DATA.



FIGURE
FIG 1: SITE LAYOUT AND MONITORING LOCATION PLAN

PROJECT
HUNTLY QUARRY MANAGED FILL - ASBESTOS AIR MONITORING PLAN