

5th February 2013

The Manager – Air Quality
 Auckland Council
 Private Bag 92 300
 Auckland 1142

Dear Sir / Madam

Re: Investigation of Total Suspended Particulate Trigger at Three Kings Quarry

With regard to condition 20 of the Three Kings Quarry Air Discharge Consent (Permit Number 21875), this is to confirm that a result greater than 80µg/m³ as a 24 hour average was recorded by one of the HiVol samplers on the 8th January 2013.

The trigger is as follows:

- 8th January 2013 - 119µg/m³ at the monitor located at the Office blocks of the site.

As required by condition 21 of the Air Discharge Permit, an investigation has been undertaken. This letter details the results and conclusions of the investigation.

Air quality monitoring at Three Kings Quarry consists of:

- Two Lear Siegler Flow Set HiVol (HiVol) samplers. These units are located at the Office and the Northern Boundary.
- Two Beta Accentuation Monitors (BAM) units. These units are located at the Office and the Southern Boundary.
- A meteorological monitoring station located at the site offices that records wind speed, wind direction and rainfall on a continuous basis.
- Video cameras that monitor the site from the north and south.
- Visual inspections of air quality carried out by site staff.
- Recording of dust suppression equipment use and malfunctions.

All relevant air quality monitoring results collected on the day of the trigger have been summarised in Table 1.

Table 1: Air Quality Monitoring Results

Date	08/01/2013
HiVol - Office (µg/m³)	119
HiVol - Northern Boundary (µg/m³)	75
BAM - Office (µg/m³)	38.8
BAM – Southern Boundary (µg/m³)	30.8
Daily Rainfall (mm)	0.0
Daily Average Wind Speed (m/s)	5.139
Daily Average Wind Direction (degrees)	231.622
Sprinklers Operational? (yes/no)	yes
Video Monitors Operational (yes/no)	yes
BAM Text Alarm Received (yes/no)	Alarms triggered but a fault with the system meant the text messages were not sent.

Investigation of the Trigger:

- The daily average wind speed on the day of the trigger was recorded as 5.139m/s which was the second highest value for the month. The highest value being the day before (7th January 2013) recorded as 5.381m/s. The average daily wind speed over the month was recorded as 3.1m/s with the monthly value for the previous year (January 2012) came in under that at 2.9m/s.
- There was no rainfall recorded on the day of the trigger. The total rainfall recorded for the entire month of January 2013 was only 3.4mm. This is significantly lower than the total rainfall recorded for the month of January over the past 5 years (2008-2012) which on average is documented in our records as 77.72mm. Over this period the lowest total rainfall for the month of January was in 2008 at 24.00mm while the highest was in 2011 at 200.4mm.
- The daily average wind direction on the day of the trigger was recorded more in the direction of the Office Blocks located in the North-East corner of site (231.6°) in comparison to the prominent average wind direction for the month (187.8°).
- The sprinkler system and water cart were operational on the day of the exceedance. However improvements have been identified and have been implemented in regard to both of these as a result of this trigger. Please refer to the following section for more details on this.
- The HiVol monitor located at the Office Block was the only unit showing levels above the trigger value of 80µg/m³. The HiVol unit located at the Northern Boundary and both BAM Monitors did show elevated results but not in excess of the trigger value.
- The BAM monitors are set to send out text messages to the Site Manager and Environmental Coordinator at levels which provide an early warning of potential dust issues if action is not taken. No texts were received on this date. However, triggers to send the text messages were reached but due to a technical error with the system they were not sent out. Upon investigation five alarms were showing on the system and they were recorded during working hours between 9am and 1pm. Please refer to the following section for more details on this.
- Video monitors of the site were reviewed and there was an area on site (North-West corner of the pit) that could be better managed in regards how the water cart ensures this area is sufficiently dampened when trucks are traversing this part of site. Please refer to the following section for more details on this.
- When the filter from the Office Block HiVol was collected it was noted that there was concentrated amounts of fine granular particles visibly present on the filter.
- It is noted that works were being undertaken by Council contractors on the date of the trigger at the base of the cliff of 10 Barrister Ave. On this date a long reach excavator was on site stripping the face of the cliff. There is the potential that this type of works could generate dust but this would have only added to our exceedance and it is unlike it would have been a sole factor.

Cause of Trigger and Corrective Actions:

The investigation into the result greater than 80µg/m³ as a 24 hour average recorded at the Office Block HiVol samplers on the 8th January 2013 was due to the exceptionally dry and windy conditions on this day.

Our standard daily management practices were not able to cope with the extreme conditions on the day and we did not react quickly enough in altering our techniques to handle the intense conditions of this day. Our delayed response was due to us not receiving the text alarms to give

us an early warning of the issue. If the alarms had been received, we are confident this trigger could have been prevented by implementing the changes that we undertook in a timelier manner.

The modifications that were made are:

- Changed the person responsible for managing the rounds of the water cart to create a stronger accountability for the effectiveness of this task in dust management
- Provided additional training to staff that drive the water cart specifically in the management on days which are dry and windy as well as when we are faced with consecutive days of dry and windy weather
 - The items addressed included but are not limited to:
 - Increased use and frequency of the water cart
 - Altering staff duties so that one person is dedicated solely to the running of the water cart
 - Expanding the area of coverage (i.e. not just the work areas and haul roads but the wider area in which trucks completed their turning circle and areas not being worked on that day)
- Altered the pressure on the sprinkler system to provide increased coverage at the site entrance area in the vicinity of the Office Block

Furthermore, the early warning text message alarms are back up and running and the system is being checked on a regular base to catch any faults so that they are identified and addressed prior to an issue. The site's Leading Hand has also now been issued a mobile and has been added to the text message alarm list. This will assist to ensure any issues in this regard in the future are quickly responded to.

With the implementation of the above changes we are confident that we can continue to manage the site to minimise the occurrence of such triggers.

Closing:

No complaints to date have been received as a result of this exceedance.

With the implementation of the above changes we are confident that we can continue to manage the site to minimise the occurrence of such triggers.

If there are any further queries or comments on this investigation please do not hesitate to contact me on 027 504 3624 or at elyse.laface@winstoneaggregates.co.nz

Yours faithfully



Elyse LaFace

Environmental Coordinator