



21/11/2012

Wellington Inner City Improvements

National War Memorial Park (Pukeahu)

# CONSTRUCTION AIR QUALITY (DUST)

# MANAGEMENT PLAN – TEMPORARY ROAD (CAQMP1-TR)

Rev.	Status	Prepared by	Checked by	Date
1	Draft	Andrew Curtis	Michelle Brock	25 October 2012
2	Final Draft	Andrew Curtis	David Grant	31 October 2012
3	Final	Andrew Curtis	Dr Bruce Graham	5 November 2012
4	Final	Andrew Curtis	Dr Bruce Graham	21 November 2012

Name	Position	Date	Signature
Andrew Curtis	Air Quality Leader	21 November 2012	
Ed Breese	Environmental Manager	21/11/12	

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## ACRONYMS

Term	Definition
(CAQMP1-TR).	Construction Air Quality (Dust) Management Plan – Temporary Road
CPM	Construction Management Plan
SH1	State Highway 1
TSP	Total Suspended Particulate
WICI	Wellington Inner City Improvement



## 1 INTRODUCTION

A requirement of the National War Memorial Park (Pukeahu) Empowering Act 2012 is the preparation of a Construction Air Quality (Dust) Management Plan – Temporary Road (CAQMP1-tr), which is intended to outline how the project team will manage the potential for dust, generated by the construction of the Temporary Diversion of Buckle Street from Sussex Street to Taranaki Street, which is required to enable the undergrounding of Buckle Street in front of the National War Memorial.

This document forms part of the wider Construction Environmental Management Plan (CEMP) that has been developed for the site.

This document has been developed using guidance from a number of sources including:

- The Ministry for the Environment Good Practice Guide for Assessing and Managing the Environmental Effects of Dust Emissions
- The Draft London Code of Practice, Part 1: The Control of Dust from Construction
- New Zealand Transport Agency (2012). Draft Guide to Assessing Air Quality Effects for State Highway Asset Improvement Projects. V 0.6.

## 2 PROJECT OVERVIEW

As part of the Wellington Inner City Improvements, the alignment of State Highway 1 (SH1) in the vicinity of the Basin Reserve and the National War Memorial Park is being altered. The current SH1 at Buckle Street will be re-aligned through an underpass below the new National War Memorial Park. While the underpass is being constructed, roughly in the position of the current alignment of Buckle Street, SH1 will be diverted to a temporary road. This temporary road will be located to the north of the current alignment as shown approximately in

Figure 1. Table 1 provides an outline of the construction of the temporary road.

**Table 1 - Outline construction methodology**

Activity	Description
1	Archaeological investigations along route of temporary road
2	Construction of noise fence adjacent to Mount Cook School
3	Remove concrete apron at the Wellington Tunnels Alliance site
4	Remove surface of ground on the alignment of the temporary road. Excavation will be required to a depth of between 0.5 and 1.2 m.
5	Lay and compact base course for new road
6	Construct road surface
7	Connect temporary road to existing roads at either end

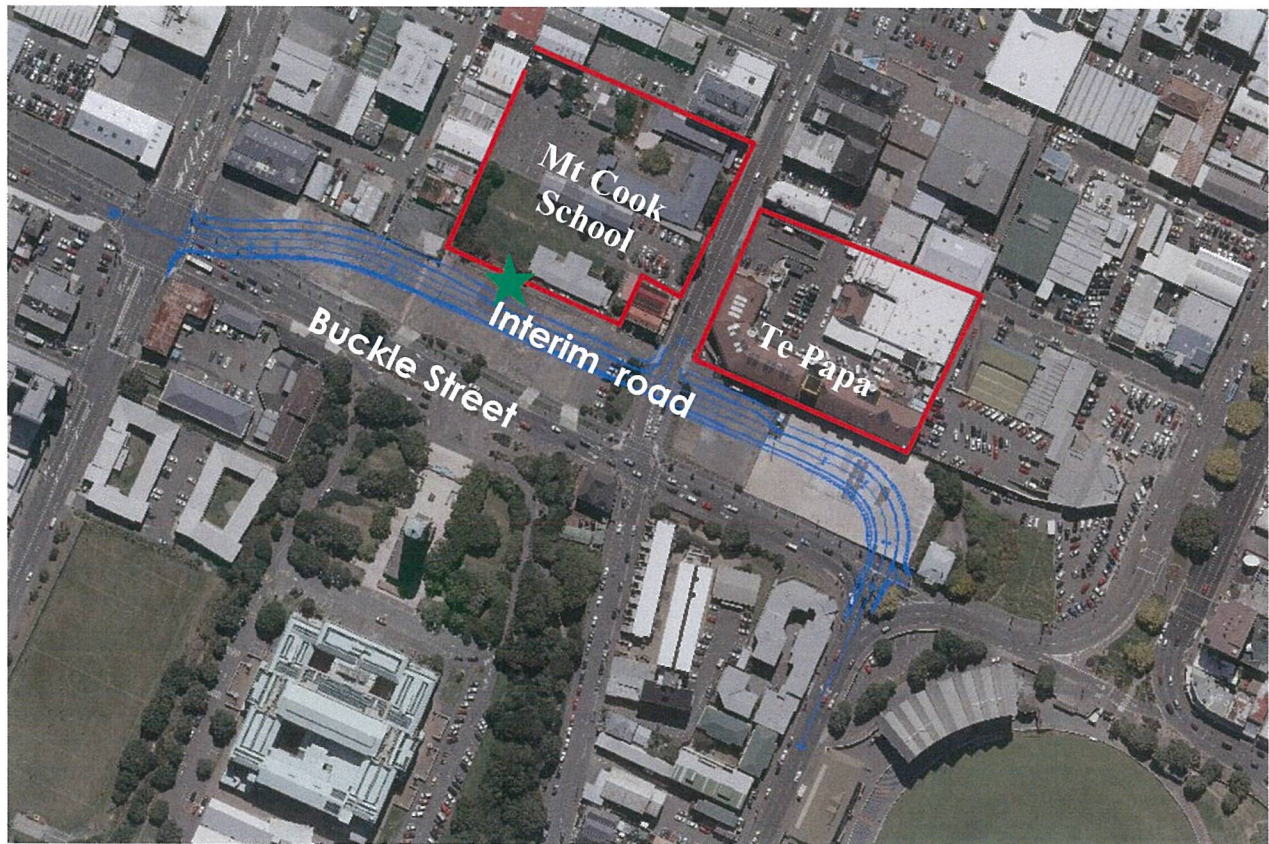
### 2.1 Timeframe

Table 2 presents the outline programme for the works. This will be updated as the construction methodology is refined.

**Table 2 – Programme (outline)**

Activity	Duration	Start date	End date
Archaeological investigations	7 weeks	3 October 2012	18 November 2012
Fence construction	5 weeks	3 October 2012	4 November 2012
Concrete apron removal	2 weeks	3 October 2012	17 October 2012
Existing ground excavation	5 weeks	8 October 2012	11 November 2012
Base course	6 weeks	5 November 2012	16 December 2012
Road surface construction	6 weeks	12 November 2012	23 December 2012
Tie-in to existing roads	3 weeks	3 December 2012	23 December 2012

**Figure 1 – Site layout**



The green star denotes the location of the dust monitor and weather station.



### 3 POTENTIALLY SENSITIVE PARTIES

There are potentially a number of parties that will be affected by dust during the construction of the temporary road. Those identified on Figure 1 are considered to be at the greatest risk. Below is a brief outline of the reason for identifying these parties.

#### 3.1 Te Papa

Te Papa occupies a property on Tory Street immediately adjacent to the northern boundary of the temporary road. There are a number of air intakes along the southern side of its premises, and consequently Te Papa staff have concerns that dust entering the buildings could result in the need for additional cleaning of its collection.

The potential for any effect on Te Papa will occur while any works are occurring adjacent to the site.

#### 3.2 Mt Cook School

Mount Cook School is located immediately adjacent to the northern boundary of the temporary road. The closest buildings to the temporary road are classrooms used to teach technology, and are used by students from other schools as well as Mt Cook. Adjacent to these classrooms is the school field which is used both in break times by pupils and for more formal physical education at other times.

The potential for effects on the school will occur as long as construction works are adjacent to it.

### 4 CONSTRUCTION ACTIVITIES

Set out are the three broad categories that the proposed construction activities fall into and the potential for dust nuisance.

#### 4.1 Site Investigation

The first phase of work will involve site archaeological investigations, which will require the removal of the concrete slabs where these overlay the investigation area.

The concrete will most likely be removed by cutting and lifting the slabs, in order to minimise the potential for any damage to underlying archaeology.

##### 4.1.1 Nuisance Dust Potential

There is a high potential for dust nuisance to be generated by both concrete cutting and removal unless appropriate mitigation is used. The dust particles associated with this activity are generally large (100 microns or greater) and result in a gritty feeling on surfaces. In addition concrete dust is quite abrasive and can result in a pH increase in water.

#### 4.2 Site Preparation

This will involve the removal and off-site disposal of any existing concrete or bitumen. This will occur using standard deconstruction techniques most likely involving excavators loading directly into trucks.

In addition sound walls will be installed along the site interface with the Mount Cook School.

##### 4.2.1 Nuisance Dust Potential

It is considered that the greatest potential for dust nuisance from this activity occurs during the removal of the concrete with the effects as described above. It is unlikely that the sound fence installation will result in any nuisance dust.

### 4.3 Road Construction

Because of the relatively short length of the temporary road (350 m) it is probable that construction will occur along the entire road at one time.

The work will involve the removal of any unsuitable material that may underlay the surface, and the placement of basecourse. This will be placed and compacted using standard construction techniques (e.g. graders and rollers). The road will then be formed using similar techniques before the pavement is laid.

#### 4.3.1 Nuisance Dust Potential

It is considered that the greatest potential for dust nuisance from this activity occurs during the placement and compaction of base course and subgrade aggregates, and from construction vehicles running over the unsealed surfaces. There is also some potential for dust to be generated as excavated material is placed into trucks for disposal off-site.

## 5 MITIGATION

As the works being undertaken are all standard, the mitigation measures that will be used on the site are all ones that are commonly used. This section outlines the basic mitigation measures that are to be used as well as the responsibilities.

### 5.1 Dust Mitigation Measures

The following identifies mitigation measures that will be used to control the potential for dust nuisance.

#### 5.1.1 Vehicle Speed

All vehicles moving within the site will be limited to 10 kilometres per hour.

#### 5.1.2 Water Truck

A water truck will be available on site at all times to control dust from unconsolidated surfaces. Apart from the instrumental monitoring triggers discussed in Section 6, the water truck will be used at any time visible dust is higher than a vehicle. Hand held hoses and or sprayers will be available to control peripheral areas that cannot be reached by the water trucks.

#### 5.1.3 Concrete Cutting

All concrete cutting will occur using wet cutting equipment.

#### 5.1.4 Concrete Removal

In dry conditions the surface of any concrete being removed will be dampened to prevent dust being generated.

#### 5.1.5 Removal of Excavated Material

As far as practical material that is being excavated shall be placed directly into trucks for off-site disposal.

When material is being excavated from the section between Tory and Taranaki Streets, it will be dampened prior to removal if the wind is from the southern quadrant (145° to 225°) and the speed is greater than 10 m/s.

Where practical, trucks carrying potentially dusty material will be covered or otherwise controlled by dampening the material with a hose prior to leaving site.



#### 5.1.6 Placement of Fill Material

Trucks delivering material to site that has the potential to be dusty will be covered.

Fill material will not be placed when wind speeds are greater than 10 m/s (as measured by the onsite weather station) unless the material being placed is damp or free from fines that could give rise to dust.

#### 5.1.7 Truck Exit

There will be the facility to wash vehicle wheels prior to leaving site to avoid the tracking of material onto public roads that could give rise to dust.

Periodically the section of public road adjacent to the site exit will be swept to remove any material that may have built up.

#### 5.1.8 Stabilisation of Exposed Areas After Construction

Where possible stabilise exposed areas remaining after construction as soon as practical using techniques such as: revegetation; mulch; or hydroseeding.

#### 5.1.9 Stockpiling

While it is not anticipated that there will be a need for stockpiles of material that could generate dust, if any such stockpiles are required, they will be covered or otherwise controlled to prevent dust emissions in dry windy conditions.

### 5.2 Odour Mitigation

While it is not anticipated that odour will be a significant issue, there is some contaminated material within the proposed alignment, and there is the potential that there may be some odour associated with its removal. The following mitigation measures can be used to deal with this potential in the event that odour is an issue:

- Material will be transported from the site to an appropriate facility for disposal as soon as practicable. Trucks used to transport the material will be covered by a tarpaulin or clean soil/fill to reduce the potential odour effects as the material is being disposed of;
- Minimising the open areas of excavations as much as practicable at all times, including ensuring that odorous sources are covered or temporarily backfilled when not excavating; and
- Having the ability to use an odour masking agent or deodoriser such as "Power Green", on to the surface of odorous material as it is encountered. The deodoriser can be applied by a worker using a back-pack pressurised sprayer.

## 6 RESPONSIBILITIES

The primary responsibility for dust control during the construction process will lie with Nigel McCreight as the Construction Manager.

He will delegate, as appropriate, responsibility for day to day dust control on the site to the Site Manager Ian Taylor, and the Site Engineer Michelle Brock.

In addition Ed Breese as Environment Manager will also have responsibility for ensuring that the construction activities are carried out in a way that is compliant with all environmental and legislative requirements.

The responsibilities are presented in Table 3.

**Table 3 – Responsibilities**

Title	Responsibility	Contact Number
Construction Manager Nigel McCreight	Overall Responsibility for ensuring that construction activities do not result in air quality nuisance	027 5027786
Environmental Manger Ed Breese	Overall responsibility for ensuring that all environmental effects including air quality are managed within the requirements of the enabling legislation. Responsible for investigating environmental incidents.	021 333726
Site Manager Ian Taylor	Responsible for the day to day operation of the site and implementing dust mitigation	027 4472802
Site Engineer Michelle Brock	Responsible implementing dust mitigation	0274 756892
All Construction staff	Carry out activities in a manner consistent with the requirements of this plan. Report any dust generation, and initiate mitigation.	

Table 4 contains a list of the regular checks that should be carried out by the site supervisors.

**Table 4 – Regular On Site Checks**

Monitoring Activities	Frequency
Check weather forecasts for strong winds and rainfall to plan appropriate dust management response (7 day forecasts available on <a href="http://www.metvuw.co.nz">www.metvuw.co.nz</a> )	Daily
Inspect land adjacent to the site, construction exits and adjoining roads for the presence of dust deposits.	Twice daily
Observe weather conditions, wind via observations and data outputs from weather stations and presence of rain.	Daily and as conditions change
Inspect all unsealed surfaces for dampness and to ensure that surface exposure is minimised.	Daily and as conditions change
Inspect dust-generating activities to ensure dust emissions are effectively controlled.	Daily and as new activities are commenced
Inspect watering systems (sprays and water carts) to ensure equipment is maintained and functioning to effectively dampen exposed areas.	Weekly
Monitor dust generating activities and water application rate.	In winds over 5.5 m/s (11 knots or Beaufort scale 3)

## 6.1 Emergency Contacts for Dust Mitigation

Should emergency dust mitigation be required at any time during the temporary road construction activities identified within this management plan, these measures as necessary will be arranged by either the Construction Manager (Nigel McCreight – 027 5027786) or the Site Manager (Ian Taylor – 027 447 2802).

## 7 COMPLAINT INVESTIGATION

The following procedure shall be followed for all air quality complaints:

- All air quality complaints should be immediately directed to Miranda Greer (Stakeholder Liaison 027 270 0593), and Ian Taylor or Michelle Brock.
- An initial response will be made and recorded. Depending on the nature of the complaint the initial response could be to immediately cease the activity pending investigation, or to replace an item of equipment. However, in some cases it might not be practicable to provide immediate relief. The complainant and the council will be informed of actions taken.
- Where the initial response does not address the complaint, further investigation, corrective action and follow-up monitoring shall be undertaken as appropriate. The complainant and the Council will be informed of actions taken.

All actions will be recorded on the project web page and the complaint will then be closed.

## 8 MONITORING

As part of this project a continuous total suspended particulate (TSP) dust monitor and weather station have been installed immediately between the project and Mt Cook School. The location of the monitor is shown as the green star on Figure 1. This monitor will be used to provide immediate feedback to the project team on the effectiveness of dust control. The weather station is at the same location, with the located approximately 5 m above the ground.

### 8.1 Dust Trigger Levels

This section sets out the preliminary trigger levels that will be used in this project and the actions that will be undertaken in the event that the trigger levels are exceeded.

Note these trigger levels have been identified as preliminary as there is currently no background TSP information available to identify what the baseline concentrations are. The baseline data will be established over the coming months and the trigger levels modified as appropriate to account for this data.

#### 8.1.1 Alert Level 1

Alert Level 1 has been developed to identify that dust concentrations have reached a point where dust nuisance is likely to occur if action is not taken to implement mitigation measures. It would not be expected that dust concentrations would reach this level unless there are adverse weather conditions in conjunction with a failure of mitigation.

**Alert Level 1 is 120 µg/m<sup>3</sup> as a 1 hour average**



### 8.1.2 Alert Level 2

Alert Level 2 indicates that dust concentrations have reached a level which is unacceptable, and dust nuisance will occur. All activities that have the potential to generate dust on site, apart from dust mitigation, must cease until such time as dust concentrations drop below Alert Level 1.

If an investigation identifies that site activities are not responsible for the high dust concentrations on site activities may resume prior to concentrations dropping to below Alert Level 1.

**Alert Level 2 is 150 µg/m<sup>3</sup> as a 1 hour average or 80 µg/m<sup>3</sup> as a 24 hour average**

### 8.2 Individuals to be Alerted

The dust monitor has been configured to alert the following individuals on their cell phones if Alert Level 1 or 2 is reached.

Title	Individual	Contact Number
Construction Manager	Nigel McCreight	027 5027786
Site Manager	Ian Taylor	027 4472802
Site Engineer	Michelle Brock	0274 756892

In the event that these individuals are going to be off-site for extended periods of time then it is their responsibility to provide information on their approved delegate to Peter Stacey on 09 355 1331 or 021 644842 or by email to [peter.stacey@urs.com](mailto:peter.stacey@urs.com). At least 24 hours notice is required to ensure that the individuals can be added to the alert system.

### 8.3 Monitoring Data

All monitoring data from the dust monitor and the onsite weather station are available on line at the following URL

<http://www.harvestnz.com/w.cgi?hsn=40409>

If required      User name = wici  
                          Password = envdata

### 8.4 Monitoring Equipment Maintenance

Peter Stacey is responsible for the operation and maintenance of the monitoring equipment. If there are any issues or problems with the equipment or data then contact him on 09 355 1331 or 021 644842 or [peter.stacey@urs.com](mailto:peter.stacey@urs.com).

Alan Benton will be assisting Peter Stacey and can be contacted on 021 537 523.

### 8.5 Wind Speed Monitoring

At this stage the wind speed data is being displayed on the WICI monitoring web page as both hourly average and wind gusts. Typically it is the wind gusts that are responsible for dust generation, therefore construction staff will regularly monitor the wind data and when wind gust speed approaches or exceeds 10 m/s ensure appropriate mitigation is being undertaken.



## 8.6 Contingency Plan for Instrument Downtime

Periodically there will be the need for the TSP monitor to be shut down for periods for regular maintenance and from time to time the instruments fail. During these times when the monitor is not operating, the following contingency plans should be implemented.

### 8.6.1 Planned shutdowns

Peter Stacey will advise the Site Manager prior to shutting down the TSP monitor for regular maintenance. During the shutdown period, site personnel should take the following steps, unless it is raining or wind speeds are less than 5 m/s:

- Water any potentially dusty surfaces whether or not dust is being generated. If the instrument is to be off-line for more than 2 hours, the surface may need to be rewatered.

### 8.6.2 Unplanned shutdowns

Unplanned shutdowns can occur due to power failures or instrument faults. The system monitoring the data will alert Peter Stacey in the event that an instrument failure has occurred. He will then inform the Site Manager and Site Engineer by phone. As soon as site management becomes aware that the dust monitor has failed, the following steps should be taken unless it is raining steadily or the wind speed is less than 5 m/s: -

- Water all potentially dusty surfaces whether or not dust is being generated. Periodically rewater areas until the monitor is back on line.

Wind data can be obtained from the web page mentioned in Section 7.3 on computer or smart phone. Alternately the Beaufort Wind Scale can be used to estimate wind speed. A copy of the Beaufort scale is attached as Appendix A. If manual wind speed and direction observations are made these observations should be kept in the site log, as they may be required for investigation of complaints.

## 9 TRAINING

Environmental training for all staff will be undertaken as part of the site induction programme. The environmental induction will include the following information specific to this Plan:

- Information about the activities and stages of construction that may cause dust and odour impacts within the construction area
- Consent requirements
- Complaints management procedures
- Dust and odour monitoring and management procedures
- Description of dust monitoring for the Project.

## 10 EXTERNAL REVIEW

As part of the certification process this Management Plan has been externally reviewed by Dr Bruce Graham of Graham Environmental Consulting. A copy of his review is included as Appendix B.

In addition, a copy of the draft Management Plan was provided to Wellington City Council and Greater Wellington Regional Council for comment. Neither of these organisations raised any concerns about the Management Plan. A copy of their emails to this effects re also included in Appendix B.

## 11 APPENDIX A BEAUFORT SCALE

Beaufort Force	Description	Specification on land	Speed		
			Knots	km/h	m/s
0	Calm	Smoke rises vertically.	Less than 1	Less than 1	Less than 1
1	Very Light	Direction of wind shown by smoke drift but not by wind vanes.	1 - 3	1 - 5	0.3 - 1.4
2	Light breeze	Wind felt on face, leaves rustle, ordinary wind vane moved by wind.	4 - 6	6 - 11	1.67 - 3
3	Gentle breeze	Leaves and small twigs in constant motion, wind extends light flag.	7 - 10	12 - 19	3.3 - 5.3
4	Moderate breeze	Wind raises dust and loose paper, small branches move.	11 - 16	20 - 29	5.6 - 8
5	Fresh breeze	Small trees in leaf start to sway, crested wavelets on inland waters.	17 - 21	30 - 39	8.3 - 10.8
6	Strong breeze	Large branches in motion, whistling in telegraph wires, umbrellas used with difficulty.	22 - 27	40 - 50	11.1 - 13.9
7	Near gale	Whole trees in motion, inconvenient to walk against wind.	28 - 33	51 - 61	14.2 - 16.9
8	Gale	Twigs break from trees, difficult to walk.	34 - 40	62 - 74	17.2 - 20.6
9	Strong gale	Slight structural damage occurs, chimney pots and slates removed.	41 - 47	75 - 87	20.8 - 24.2
10	Storm	Trees uprooted, considerable structural damage occurs.	48 - 55	88 - 101	24.4 - 28
11	Violent storm	Widespread damage.	56 - 63	102 - 117	28.3 - 32.5
12	Hurricane	Widespread damage.	>64	>119	>33

**From:** Richard Percy [<mailto:Richard.Percy@gw.govt.nz>]  
**Sent:** Thursday, 8 November 2012 1:26 p.m.  
**To:** David Grant  
**Subject:** RE: Memorial Park - Construction Air Quality (Dust) Management Plan (TR)

Hi David, thanks for the reminder. Our internal air quality scientist does not have any comments on the management plan. We are comfortable if WCC are happy with the content of the plan.

Thanks  
Richard

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**From:** David Grant [<mailto:David.Grant@nzta.govt.nz>]  
**Sent:** Thursday, 8 November 2012 8:48 a.m.  
**To:** Richard Percy  
**Subject:** RE: Memorial Park - Construction Air Quality (Dust) Management Plan (TR)

Hi Richard

Have you any feedback comments for us on the draft management plan?

Comments received from WCC were as follow:

Hi David,

I am the Compliance Monitoring Officer who has been assigned this project for Wellington City Council. I will hopefully be meeting with you next week, but I have the following comments on the draft Construction Air Quality (Dust) Management Plan (TR) that has been submitted for comment:

- *If the Programme in Table 1 is strictly adhered to and the Dust Mitigation measures in Table 4 are implemented by the nominated Site Supervisors in Table 3, then I am confident of a successful outcome for the project.*

The dust mitigation measures outlined in the document are therefore considered suitable for this part of the project.

Any queries in the meantime, please contact me on the details below.

**Regards,**

**Amanda Staddon-Smith** | Compliance Monitoring and Enforcement Officer | Development Planning & Compliance

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**Wellington Inner City Improvements -  
National War Memorial Park (Pukeahu)**

**Peer Review of the Construction Air  
Quality (Dust) Management Plan –  
Temporary Road**

**Prepared by Dr Bruce Graham**

**November 2012**

**GRAHAM  
ENVIRONMENTAL  
CONSULTING LTD**



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# Wellington Inner City Improvements - National War Memorial Park (Pukeahu): Peer Review of the Air Quality (Dust) Management Plan – Temporary Road

## 1. Introduction

A National War Memorial Park is to be created in inner Wellington, on the area of land known to Maori as Pukeahu. One part of that development involves the creation of an underpass to replace the section of Buckle Street between Taranaki and Tasman Streets. The first stage of the works for the underpass involves the construction of a temporary bypass road on the vacant land adjacent to the north side of Buckle Street.

This report provides a peer review of the draft air quality management plan that has been prepared in support of the construction activities for the temporary road<sup>1</sup>. The management plan (CAQMP1-TR) is required under the conditions (specifically NZTA 30) applying to the exercise of the Designation authorised by the *National War Memorial Park (Pukeahu) Empowering Act 2012*.

### 1.1 Outline of the Proposal

The construction of the temporary bypass road will involve the following activities:

- (i) cutting and removal of the existing concrete slabs over part of the site for the purposes of archaeological investigations;
- (ii) removal and off-site disposal of all existing concrete and bitumen from the site;
- (iii) excavation of underlying material, as necessary, from the site to create a level surface, followed by the placement of base-course material and pavement construction.

The length of the temporary road will be about 350 m, and the excavations will be down to a depth of between 0.5 and 1.2 m.

### 1.2 Potential for Discharges to Air

#### Dust Effects

The air discharges of most relevance to the construction activities are dust emissions. These have the potential to cause a variety of nuisance effects beyond the site boundaries although, in this case, the effects should be mainly limited to within a few tens of metres of the site activities, because of the built-up environment. The potential for dust nuisance effects is strongly related to weather conditions, with strong winds increasing the potential for dust releases, while wet weather will have the opposite effect.

#### Odour

Some of the areas within the work site are known to be contaminated. This raises the possibility of odour releases while the material is being disturbed. However it is not known at this stage whether there is any potential for significant odour problems to arise. This will only become clear as the excavation work proceeds

### 1.3 Potentially Sensitive Parties

Two potentially sensitive locations are identified in the management plan; namely a building used by the National Museum (Te Papa) – presumably for storage - and Mt Cook School. Both of these

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<sup>1</sup> Wellington Inner City Improvements - National War Memorial Park (Pukeahu): Air Quality (Dust) Management Plan – Temporary Road, (CAQMP1-TR). Prepared by URS New Zealand Ltd for the WICI Alliance, rev. 3, dated 5 November 2012.

properties are immediately adjacent to the northern side of the temporary road site, and I agree that they have the greatest potential for adverse effects, especially due to dust.

There are a number of other nearby properties that may also be affected by dust. However the proposed dust mitigation measures are to be applied across the entire work site, as necessary. Hence, I don't see any reason for singling out any other properties for particular attention.

#### **1.4 Report Content and Scope**

This report is laid out as follows:

Section 2 summarises the measures proposed for controlling the air quality impacts of the development along with an assessment of their likely effectiveness.

Section 3 summarises and assesses the systems and procedures that will be used for managing the air quality aspects of the development.

Section 4 provides an overall summary and conclusions.

As required by section 21(2)(a) of the *National War Memorial Park (Pukeahu) Empowering Act 2012*, the main purpose of this review is to certify that the management plan is consistent with, and gives effect to condition NZTA 30 of the Designation. This condition required that the plan should provide a methodology for managing the effects of dust, and should include as a minimum:

*c) identification and implementation of dust suppression measures appropriate to the environment in which the works are located, and the sensitivity of nearby receptors; and*

*(d) identification of contingency measures to address identified and verified adverse effects on sensitive receptors. Contingency measures may include options such as:*

*(i) cleaning of houses; and*

*(ii) cleaning of other buildings and infrastructure*

These requirements have been kept in mind while carrying out this review.

## 2. Measures Proposed for Managing the Air Quality Impacts

### 2.1 Potential for Dust Releases

Section 4 of the management plan provides an assessment of the potential for dust releases during each stage of the proposed works. The key elements of this assessment are summarised below.

#### Site Investigations

The activity with the greatest potential for dust generation here is concrete cutting. There may also be some dust releases when the concrete slabs are lifted and placed onto trucks for removal.

#### Site Preparation

Dust may be generated during this phase when slabs of concrete are lifted and placed onto trucks.

#### Road Construction

The main dust sources in this case will be the placement of excavated soil and other materials onto trucks, dumping and spreading of roading materials onto the ground, especially the base-course, and vehicle movements over the unsealed surfaces.

I agree that these are the activities with the greatest potential for dust releases.

### 2.2 Dust Mitigation Methods

The procedures to be used for dust mitigation are described in section 5 of the management plan, and are summarised below.

1. Vehicle speeds will be limited to no more than 10 km per hour;
2. A water truck will be available on site at all times and will be used as necessary to control dust from unconsolidated surfaces. Hand-held hoses or sprinklers will also be available for damping down any surfaces not accessible by the water truck;
3. All concrete cutting will be done using wet cutting equipment;
4. Water will also be used for dust control during the removal of concrete during dry weather conditions;
5. As far as practicable excavated material will be placed directly into trucks rather than being stored on site, and the material will be sprayed with water prior to removal if the wind is blowing from the south and stronger than 10 m/s;
6. Trucks exiting the site with potentially dusty materials will be covered wherever practicable, as will trucks delivering dusty fill materials;
7. Fill material will not be placed when wind speeds are greater than 10 m/s unless the material is damp and/or unlikely to give rise to dust;
8. Wind fencing will be established where needed, particularly adjacent to sensitive areas;
9. A vehicle wheel wash facilities will be available at the site exit to minimise the potential for tracking of materials onto public roads, and the section of road adjacent to the site exit will be swept from time to time;
10. It is not expected that there will be any stockpiling done on site. However if any stockpiles are needed, they will be covered or otherwise controlled to prevent dust emissions during dry windy conditions;
11. Any exposed areas remaining after the works will be stabilised using re-vegetation, covering with mulch or hydroseeding.



The above measures are all appropriate for the construction activities and, if applied consistently and conscientiously, will be effective in minimising any nuisance effects due to dust.

### **2.3 Dust Monitoring**

Section 8 of the management plan addresses the use of a continuous dust monitor to assist with dust control. The dust monitor will be linked to an alarm system and operated around alert levels; the first of these will give a warning that dust concentrations may be rising to unacceptable levels, while the second will indicate that all dust generating activities should cease.

There will also be an on-site weather station, which will provide the wind speed and direction information relevant to some of the control measures noted above.

The use of real-time dust monitoring can be a very effective way of managing potential dust emissions because it allows for a rapid response to increasing dust concentrations. In combination with the on-site weather station, this should help to ensure that the dust emissions from the site are effectively controlled.

### **2.4 Potential for Odour Releases**

As indicated previously, there is some potential for odour emissions from the site when contaminated materials are being excavated. However, the specific nature of the contaminants and the extent of the contamination are currently uncertain. These will only become clear as the excavations proceed.

### **2.5 Odour Management Methods**

The measures proposed for odour mitigation are as follows:

1. Minimising the open areas of excavations as much as practicable, including covering or temporary backfilling when necessary;
2. Holding supplies of an odour masking agent or deodoriser on site for use as and when necessary;
3. Removal of odorous materials off-site as soon as practicable after excavation using covered trucks and/or covering the materials with clean spoil or fill material.

These measures should be quite adequate for the majority of odorous materials likely to be encountered on the site. More extensive measures would only be required if extreme levels of contamination were revealed, such as a pooled concentrated liquid. Any necessary responses to that sort of situation would be best developed on a case-by-case basis, at the time it arises.

### 3. Management Systems and Procedures

The overall systems and procedures for managing the air quality aspects of the project are covered under sections 6, 7 and 9 of the management plan, which deal with, respectively, staff responsibilities, complaint investigation, and training. These are all essential components of an effective dust management system.

The day to day responsibilities for dust control on the site are clearly laid out in section 6, along with a list of the regular checks that should be carried out by the site supervisors. Emergency contact details are also provided.

The maintenance of a complaints register and the associated investigation and response procedures are an essential element of activities such as those proposed here. Procedures for complaint recording and investigation are laid out in section 7 of the management plan and cover all of the steps that I would expect to see. The use of a website for recording each of the complaints, and the resulting actions, is a potentially useful innovation.

All staff are to be given a site induction program which will include specific training on environmental matters including those relating to dust and odour management. Section 9 of the management plan gives a list of the information to be covered under the training. This should provide an adequate coverage of all of the relevant matters.

### 4. Summary and Conclusions

The construction activities for the development of the temporary bypass road have the potential to cause off-site dust nuisance effects and there may also be some potential for odour nuisance effects. The systems and procedures to be applied for managing and mitigating these potential effects are laid out in the Air Quality (Dust) Management Plan - Temporary Road, CAQMP1-TR. Having reviewed this plan, my conclusions are as follows:

1. The range of dust management methods proposed for the site, if applied consistently and conscientiously, should be effective in minimising any nuisance effects due to dust.
2. The potential for odour releases from the site is highly uncertain. However, the range of measures proposed for responding to any such releases should be quite adequate for dealing with most situations.
3. The systems and procedures that will be used for managing the air quality aspects of the operation are described with an appropriate level of detail in section 6, 7 and 9 of the plan.

I consider that that the management plan is consistent with, and gives effect to condition NZTA 30 of the Designation authorised under the *National War Memorial Park (Pukeahu) Empowering Act 2012*.



Bruce W Graham

12 November 2012