

**IN THE MATTER**

of the Resource Management Act 1991

**AND**

**IN THE MATTER**

of Resource Consents and Notices of Requirement for the Central Interceptor main project works under the Auckland Council District Plan (Auckland City Isthmus and Manukau Sections), the Auckland Council Regional Plans: Air, Land and Water; Sediment Control; and Coastal, and the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

**STATEMENT OF EVIDENCE OF LEO DONALD HILLS ON BEHALF  
OF WATERCARE SERVICES LIMITED**

**TRAFFIC/TRANSPORT**

**1. INTRODUCTION**

- 1.1 My name is Leo Donald Hills. I am an Associate at the firm Traffic Design Group Ltd ("**TDG**"). I hold a Masters of Civil Engineering and a Bachelor of Engineering with Honours from the University of Auckland.
- 1.2 I have over 16 years of experience as a specialist traffic and transportation engineer. During this time I have been engaged by both local authorities and private clients to provide advice on traffic and development issues covering safety, management and planning matters on many kinds of projects. Recent projects of relevance include the Transpower 220kV underground cable project in Panmure/Pakuranga; the KiwiRail/ONTRACK traffic management for electrification projects in Auckland and the Dominion Road light rail Notice of Requirement.

- 1.3 I am a member of the Institute of Professional Engineers New Zealand and a Chartered Professional Engineer.

#### **Involvement in the Central Interceptor Project**

- 1.4 I have been involved in the Central Interceptor Project ("**Project**") since early 2011 when TDG was first commissioned by Watercare to take part in initial site investigations and scoping reports, specifically in terms of traffic engineering and safety implications for a list of potential construction sites.
- 1.5 Since then, I have undertaken full traffic impact assessments for 18 of the 19 construction sites. I did not undertake a full traffic assessment of the proposed construction site at the Mangere Wastewater Treatment Plant ("**Mangere WWTP**") as this work is within the existing designation, which meant a traffic assessment was not required.
- 1.6 I am the primary author of the TDG Traffic Impact Assessment which was attached as Technical Report E of Part D ("**Traffic Report**") to the Central Interceptor Main Project Works Assessment of Effects on the Environment, dated August 2012 ("**AEE**").
- 1.7 I have also prepared responses to the Section 92 requests for further information in relation to the Project. I am the primary author of the Section 92 further information reports regarding traffic, dated 12 December 2012 ("**December Section 92**") and 6 May 2013 ("**May Section 92**"), as well as the subsequent Traffic Assessment for the Mount Albert War Memorial Reserve Car Park site, dated 8 March 2013. These all form part of the application documents.

#### **Code of Conduct**

- 1.8 I have been provided with a copy of the Code of Conduct for Expert Witnesses contained in the Environment Court's Updated Practice Note 2011 which took effect on 1 November 2011. I have read and agree to comply with that Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

### **Scope of evidence**

- 1.9 The purpose of my evidence is to outline the transportation implications or effects that could potentially arise as a consequence of the scale and intensity of the proposed works (both during construction and post construction) at various locations. I will also discuss the methodology of the transportation assessments that have been carried out, the conclusions and recommendations made for each site location and the proposed mitigation measures and conditions. I have reviewed the submissions received in regards to the Project and address submissions related to traffic / transport issues.
- 1.10 In my evidence, I do not provide specific detail on my assessments as these have already been provided as part of the application documents. Rather, I set out a summary of the analysis undertaken, together with a summary of the results and conclusions found, and conditions and mitigation proposed. I have also provided some additional information at key sites of submitter interest, such as at the Mount Albert War Memorial Reserve, Lyon Avenue and May Road sites.
- 1.11 My evidence is structured as follows:
- (a) Executive Summary;
  - (b) Central Interceptor main project works initial investigation;
  - (c) Central Interceptor main project works traffic assessment;
  - (d) Response to submissions;
  - (e) Response to the Council Pre-hearing Report; and
  - (f) Conclusions.

## **2. EXECUTIVE SUMMARY**

- 2.1 By way of summary, I consider that, provided the proposed mitigation measures and conditions are implemented, the extent of the works proposed by Watercare can be accommodated by the surrounding road network while maintaining appropriate levels of safety and

performance and potential traffic effects associated with the Project can be effectively managed.

- 2.2 For all of the reasons outlined in this evidence, and in my earlier documents that form part of the application, I support the Notices of Requirement and Resource Consents sought by Watercare relating to the Project and confirm Watercare's Proposed Conditions are appropriate.
- 2.3 There is nothing in the Council Pre-hearing Report, or in any of the submissions, that would lead me to change my views and conclusions expressed in the earlier information provided to the Council and other parties.
- 2.4 Accordingly, I have concluded that construction can occur in such a way that the effects on the function, capacity and safety of the surrounding road network are minimal. Once completed, there would be negligible traffic issues associated with the operation of the Central Interceptor.

### **3. CENTRAL INTERCEPTOR MAIN PROJECT WORKS INITIAL INVESTIGATION**

- 3.1 In May 2011 I was engaged by Watercare to undertake an initial transportation site inspection of the various construction site options associated with the Project.
- 3.2 This assessment paid particular attention to site access, the surrounding road network and how the expected traffic generation could be accommodated on the road network. This assessment included the following:
- (a) The road environment of each proposed site was reviewed in terms of its road classification in the operative Auckland Council District Plan – Auckland City Isthmus Section.
  - (b) The latest traffic volumes of the roads surrounding each site were obtained from the road controlling authorities.
  - (c) A site inspection was then carried out for each site which included:

- Observing and measuring vehicle speeds and available sight distance at each access.
- Examining the proposed access(es) for each site.
- Reviewing available parking on-site and on-street around each site.
- Noting other observations / concerns such as nearby infrastructure, education facilities and places of assembly.

(d) Truck routes between the proposed sites and the nearest motorway interchange were also reviewed and recommendations were given to avoid uncontrolled right turns as well as potential areas of congestion.

3.3 This work was used to help refine the site options and proposed sites for the Project.

#### 4. **CENTRAL INTERCEPTOR MAIN TUNNEL TRAFFIC ASSESSMENT**

4.1 My next involvement in the Project was to provide a detailed Traffic Impact Assessment (Traffic Report) for each of the 18 construction sites outside of the Mangere WWTP designation. This included refinements of the site layouts and designs. In addition (and separate to the 18 sites), I have also assessed the traffic effects of an alternative site at Mount Albert War Memorial Reserve, referred to as the Car Park site, in an additional traffic report dated 8 March 2013.

4.2 A summary of my assessment is set out below. Where a site is of particular interest to submitters, I have provided further detail in a later section responding to submissions.

##### **Construction Traffic Information**

4.3 The Traffic Report classified all of the construction sites as either "major", "intermediate" or "small" sites in terms of construction traffic. All three categories involved different construction traffic information due to the amount of activity proposed to occur at those sites. **Plan 1**

on Page 6 of the Hearing Drawing Set illustrates the classifications and locations for each site.

4.4 Each site, together with its classification and description are outlined in the following table.

Sites	Classification	Description
Western Springs	Major	Primary Construction Site, launching / retrieving of tunnel boring machine
Mount Albert War Memorial Reserve	Intermediate	Secondary site for the main tunnel
Lyon Avenue	Intermediate	Secondary site for the main tunnel
Haverstock Road	Intermediate	Secondary site for the main tunnel
Walmsley Park	Intermediate	Secondary site for the main tunnel
May Road	Major	Primary Construction Site, launching / retrieving of tunnel boring machine
Keith Hay Park	Intermediate	Secondary site for the main tunnel
Pump Station 23	Intermediate	Secondary site for the main tunnel
Kiwi Esplanade	Intermediate	Secondary site for the main tunnel
Motions Road	Intermediate	Secondary site for the link sewer
Western Springs Depot	Small	Secondary site for the link sewer
Rawalpindi Reserve	Intermediate	Secondary site for the link sewer
Norgrove Avenue	Small	Secondary site for the link sewer
Pump Station 25	Intermediate	Secondary site for the link sewer
Miranda Reserve	Small	Secondary site for the link sewer
Whitney Street	Small	Secondary site for the link sewer
Dundale Avenue	Small	Secondary site for the link sewer
Haycock Avenue	Small	Secondary site for the link sewer

**Table 1: Site Classification**

- 4.5 "Major" sites are primary construction sites; being at Western Springs and May Road. These sites would typically be served by large "truck and trailer" units with a typical capacity of up to 15m<sup>3</sup>. Secondary sites for the main tunnel and link sewers are classified as either "intermediate" or "small" scale sites from a traffic perspective. Single unit (7m<sup>3</sup>) trucks would generally be accessing these sites with some large "truck and trailer" units. Intermediate sites will have a construction duration of 12 to 18 months, while small sites will have a construction duration of 6 to 8 months.
- 4.6 The assumed peak traffic movements were developed based on information provided by Watercare's Principal Engineering Advisors. The information included expected truck / light vehicle volumes for each of the major sites as well as the Lyon Avenue site (which will represent a worst case scenario for the secondary sites) based on the proposed site operations.
- 4.7 Based on above information, the traffic generation of each major site was assessed using the estimated peak traffic movements of the Western Springs site. The traffic generation of each small or intermediate site was assessed based on the estimated peak traffic movements of the Lyon Avenue site which was determined by Watercare's Principal Engineering Advisors to be one of the small/intermediate sites with the highest traffic generation. This represents a worst case scenario as in reality not all small/intermediate sites will generate this level of traffic. This was detailed in Section 4.3.9 of the Traffic Report and will be later outlined under the Trip Generation section of my evidence.
- 4.8 Detail relating to the actual works proposed at each of the construction sites is set out in the evidence of Mr Cantrell and Mr Cooper.

### **General Assessment**

- 4.9 I have undertaken site visits for each of the proposed sites, with several sites being visited multiple times. For the majority of sites I also undertook a night-time and weekend site visit.

- 4.10 The Traffic Report provides a detailed description of each site and the surrounding road network, including traffic volumes and detail of the traffic count surveys undertaken at intersections surrounding the major sites at Western Springs and May Road, where the expected traffic generation associated with the Project is greater.
- 4.11 The site layouts, site operation, and vehicle and pedestrian access, (including available sight distance for each site), was assessed and reviewed and is set out in the Traffic Report.

### **Road Safety**

- 4.12 A road safety assessment was also carried out for each construction site using the New Zealand Transport Agency's Crash Analysis System for the five year period from 2006 to 2010.<sup>1</sup>
- 4.13 Generally no inherent specific safety issues were identified at any of the sites, except for the Great North Road / Bullock Track intersection (associated with the Western Springs site), where 52 crashes have been caused by vehicles failing to give way when turning right onto Great North Road from the Bullock Track and heading southbound. The proposed truck route and site layout at the Western Springs site was adjusted to avoid any vehicles undertaking this manoeuvre or to avoid increasing the risk of this accident occurrence from occurring, i.e. no right turns would be allowed from the Bullock Track onto Great North Road by site traffic.

### **Trip Generation**

#### *Major sites*

- 4.14 The trip generation for each major construction site was assessed based on the estimated traffic information provided by Watercare's Principal Engineering Advisors. The provided information suggested that the Western Springs site would produce more traffic movements. Thus the traffic information provided for the Western Springs site had been used to analyse the trip generation for both the Western Springs and the May Road sites to assess a worst case scenario for the May Road site. The following table shows the provided information for the Western Springs site:

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<sup>1</sup>

This was inclusive of all available data from 2011 at time of assessment.

	Activity	Vehicle Type	Assumptions	Peak vehicles per Day	Peak Movements per Day
Stage 1 – Shaft Excavation and support	Shotcrete delivery	6m <sup>3</sup> concrete truck	Total volume of shotcrete at Western Springs =120m <sup>3</sup>	4	8
			Intermittent over 5 week period		
	Labour	Standard vehicle	Constant duration of project	7	14
	Site supervision	Standard vehicle	As needed	2	4
	Maintenance	3-axle truck		1	2
	Rock bolt, soil nail and steel delivery	Semi-trailer truck with flatbed	Intermittent over 18-20 week period and does not occur on the same day as concrete delivery	-	-
	Spoil removal	15m <sup>3</sup> spoil removal truck	Average excavation rate of 400m <sup>3</sup> per day	27	54
6-day work week					
Constant for 20 week period					
Stage 2 – Tunnel Excavation	Spoil removal	15m <sup>3</sup> spoil removal truck	Bulk spoil volume MT-1 and Link Sewer 3 = 248,830m <sup>3</sup>	42	84
			Average excavation rate of 16m per day		
			Constant for 58 week period		
	Segment delivery	Semi-trailer truck with flatbed	Average TBM advance rate of 16m/day	8	16
			Constant for duration of stage 2		
	Material delivery	Semi-trailer truck with flatbed	Materials for Tunnel boring machine	1	2
	Labour	Standard vehicle	Constant duration of stage 2	20	40
	Site supervision	Standard vehicle	Constant duration of stage 2	10	20
Other	3-axle truck	As needed	1	2	

**Table 2: Major Site Trip Generation Breakdown**

- 4.15 From the above table, the trip generation of the major sites at Western Springs and May Road were estimated as follows:

Stages	Shaft Excavation		Tunnel Excavation	
	Daily	Peak Hour	Daily	Peak Hour
Standard Vehicle Trips	18	6	60	18
Heavy Vehicle Trips	64	6	104	9
<b>Total</b>	<b>82</b>	<b>12</b>	<b>164</b>	<b>27</b>

**Table 3: Major Site Trip Generation Summary**

- 4.16 In total, it is estimated that the proposed works will generate approximately 164 vehicle movements per day (at worst time), with 27 vehicle movements during the peak hour.
- 4.17 The traffic effects on the intersections surrounding the major sites were modelled using SIDRA, an industry standard tool for assessing the performance characteristics of intersections. Assessments of the weekday AM and PM and Saturday midday peak hours were carried out for:
- (a) the existing scenario;
  - (b) a 2016 base scenario with data obtained from the Beca Western Ring Route model; and
  - (c) a 2016 scenario with the proposed works (both with and without consideration of cumulative effects of nearby construction sites being in operation simultaneously).
- 4.18 The traffic modelling indicated that the proposed works at the Western Springs and May Road major sites would have a minor impact on the operation of the local road network. This conclusion includes the cumulative effects of nearby small or intermediate sites operating during the same period.
- 4.19 The Western Springs site would generate a peak of 27 vehicle movements during the peak hour and the five secondary sites nearby will, at worst, produce nine vehicle movements individually. Cumulatively all six sites would generate a peak of 72 vehicle movements during the peak hour.

- 4.20 It is expected that, at most, only an additional 5 - 6 seconds delay would be caused at one intersection (St Lukes Road / Westbound SH16 on/off ramp intersection), having taken into account the cumulative effects of multiple sites. As an example, the predicted 2016 peak hour traffic volumes with the Waterview Connection in operation for the Great North Road / St Lukes Road intersection is approximately 3810 vehicles per hour. The additional traffic would be less than 2% of this background traffic volume. I therefore consider the effects as a result of these additional vehicles to be similar to the typical day to day variations in traffic flow on the road network and indiscernible to the average driver.
- 4.21 Similarly for the major site at May Road, results from the SIDRA analysis showed that the proposed works will cause minimal traffic effects at the major nearby intersections of SH20 / Maioro and May Road / Stoddard Road / Denbigh Avenue. The level of service would remain unchanged for both the AM and PM peak periods and the average delay is expected to increase by no more than three seconds. I therefore consider that the increase in traffic volumes due to construction traffic does not affect the ability of these intersections to operate efficiently at any material level.

*Intermediate and small sites*

- 4.22 The intermediate or small construction sites are expected to have a smaller scale of works prepared to the major sites as detailed in the evidence of Mr Cantrell and Mr Cooper. Consequently, the number and size of trucks accessing these sites would be much lower than that of the major construction sites. However, in saying that, the sizes and scale of works are different at each site and the trip generation at each site would therefore also vary. In assessing these sites I adopted a very conservative approach by assessing all small and intermediate sized sites based on the expected trip generation at the Lyon Avenue site as I was informed by Watercare's Principal Engineering Advisors that this site was considered to be one of the sites which reflect the upper end of traffic generation rates for all the secondary sites (which the Traffic Report classified as either small or intermediate sites). For this reason, the trip generation figures used, and the modelling results reflect a very conservative scenario for all secondary sites. In reality,

trip generation and the associated effects on the roading network would be much less.

4.23 The following table shows the predicted traffic generation information for the Lyon Avenue site provided by Watercare's Principal Engineering Advisors.

	Activity	Vehicle Type	Assumptions	Peak vehicles per Day
Stage 1 – Diaphragm Wall Construction	Shotcrete delivery	6m <sup>3</sup> concrete truck	Total volume of shotcrete at Lyon Avenue = 1,280m <sup>3</sup>	16
			Intermittent over 2-3 week period	
	Labour	Standard vehicle	Constant duration of project	5
	Site supervision	Standard vehicle	As needed	2
	Maintenance	3-axle truck		1
	Steel delivery	Semi-trailer truck with flatbed	Intermittent over 2-3 week period and does not occur on the same day as concrete delivery	
Stage 2 – Shaft Excavation	Spoil removal	15m <sup>3</sup> spoil removal truck	Bulk spoil volume Lyon Avenue= 9,000m <sup>3</sup>	27
			Average excavation rate of 16m per day	
			Constant for 58 week period	
	Labour	Standard vehicle	Constant duration of stage 2	4
	Site supervision	Standard vehicle	Constant duration of stage 2	2
	Other	3-axle truck	As needed	1

**Table 4: Lyon Avenue Site Trip Generation Breakdown**

4.24 Based on the above information I estimated the following (assume 30% of light vehicle trips occur during the peak hour).

	Shaft Excavation		Tunnel Excavation	
	Daily	Peak Hour	Daily	Peak Hour
Standard Vehicle Trips	14	4	12	4
Heavy Vehicle Trips	34	3	56	5
<b>Total</b>	<b>48</b>	<b>7</b>	<b>68</b>	<b>9</b>

**Table 5: Small / Intermediate Site Trip Generation Summary**

- 4.25 I estimated that the proposed development at the Lyon Avenue site would generate a peak of no more than 68 vehicle movements per day,<sup>2</sup> with nine vehicle movements during the peak hour of the road network. This conservative estimated trip generation has also been applied to all secondary sites (both small and intermediate sites) even though trip generation is likely to be less at those sites.
- 4.26 I consider that these additional traffic volumes are well within the capacity of the surrounding roads at each site and are well within the typical hourly fluctuations of the nearby roads. Heavy vehicle movements are proposed to be controlled via compulsory truck routes and light vehicles would travel on a number of routes to and from the site. The peak hour light vehicle movement only adds an additional four movements per hour and therefore any safety or delay effects as a result of these additional vehicles are considered to be indiscernible. I therefore expect minimal effects on the surrounding road network.

### **Trip Distribution**

- 4.27 In terms of the inbound and outbound distribution of vehicle movements at every site, the light vehicle movements are likely to be tidal due to staff arrivals and departures (predominantly inbound in the morning and outbound during the evening), while the heavy-vehicle movements would be relatively even throughout the day. In terms of the distribution, I made the following assumptions for all secondary sites (my intermediate and small sites):
- (a) 80% inbound / 20% outbound distribution for light vehicles during the morning peak hour and vice versa during the evening peak commuter hour.
  - (b) 50% inbound / 50% outbound distribution for heavy vehicles during both morning and evening peak commuter hours.

### **Truck Routes**

- 4.28 A proposed truck route diagram for each of the construction sites was provided as part of the Traffic Report. These routes have been chosen to avoid residential suburbs and uncontrolled right turns where possible

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<sup>2</sup> Addition of 12 standard vehicle movements and 56 heavy vehicle movements estimated per day during the tunnel excavation stage.

in order to minimise disruptions to the surroundings as much as possible. However, several construction sites are located in residential areas such as the Haverstock Road site and Rawalpindi Reserve site, and in these instances proposed truck routes follow arterial routes closest to the subject site, and right turns occur at either signalised intersections or roundabouts when available. These examples are shown in **Plan 9**, page 80 and **Plan 25v2**, page 172 of the Hearing Drawing Set.

- 4.29 These truck route diagrams are proposed to be utilised in the development of the detailed Traffic Management Plan ("**TMP**") required by Proposed Designation Conditions TM.1 - TM.3 to determine preferred routes at each site.
- 4.30 Truck tracking curves of the largest sized truck designed to serve each site have also been developed for the access(es) of each site to ensure that each site can be safely accessed by the largest expected vehicles. These are included in the Traffic Report. Where adjustments to the existing kerblines or driveway widths are required, for example for the Pump Station 23 site, these are also identified by the tracking curves. This example is shown in **Plan 16v2** on page 123 of the Hearing Drawing Set.

#### **Permanent Access**

- 4.31 A permanent vehicle access is required post construction at each construction site, for inspection and maintenance purposes. While permanent access would need to cater for heavy vehicles and all weather, the permanent accesses are generally expected to be used by smaller vehicles (up to single unit trucks) for on-going inspection and maintenance which generally occurs no more than once per month for most sites. The temporary site facilities and access paths would largely be removed and the surplus land would be reinstated on completion of the construction works. I consider that traffic generation associated with the proposed permanent accesses would have negligible effects on the surrounding network.

### **Road Reserve Sites**

4.32 Three of the construction sites are fully or partially located within the road reserve. These sites are as follows and their locations are shown on pages 182, 213 and 233 of the Hearing Drawing Set:

- (a) Norgrove Avenue;
- (b) Whitney Street; and
- (c) Haycock Avenue.

4.33 Construction at these sites would have more of an effect on the operation of the local road network than at the other 15 sites.

4.34 I have provided a draft Construction Traffic Management Plan ("CTMP") section within the Traffic Report for these sites which discusses the proposed changes to vehicular and pedestrian movements required to manage potential effects. Supplementary to the Traffic Report (as part of the December Section 92), I have also provided a Generic Outline for the CTMP document to assist in minimising the potential effects on both the operating traffic environment, and the local residents, due to the proposed construction operations. With the implementation of these measures as well as the execution of Proposed Designation Conditions TM.1 - TM.3 regarding traffic and pedestrian management, works can occur with minimal adverse effects.

### **Cumulative Effects**

4.35 I have considered the potential for cumulative traffic effects associated with numerous construction sites being active at the same time and the fact that trucks from a number of sites would travel through the same intersections/interchanges. In this regard, I anticipate (and have been advised by Watercare's Principal Engineering Advisors) that not all of the sites would be under construction at the same time and that the timing of construction at each site would vary with different sites at different stages. This would spread the traffic loading. Furthermore, the trip generation for each of the construction sites would be fewer in reality as traffic generation figures have been conservatively estimated

to examine a worst case scenario (based on the Lyon Avenue site), and therefore potential effects are likely to be less than assessed.

- 4.36 On this basis, there is limited opportunity for cumulative effects of multiple sites to present an issue. Notwithstanding this, an additional SIDRA analysis, described in Section 1.1 and 1.4 of the December Section 92, has been undertaken to examine any cumulative effects generated by multiple construction sites operating simultaneously. The two groups of sites subject to potential cumulative effects are shown in **Plan 1a** on page 8 of the Hearing Drawing Set. Each group consisted of one major site (Western Springs site and May Road site respectively) and multiple small / intermediate sites. This is considered an appropriate and conservative approach to analyse the cumulative effects.
- 4.37 This further analysis showed that even if one major site and up to five small / intermediate sites are all operating simultaneously, the cumulative peak only increases to 72 movements for the peak hour. This increase is only equivalent to approximately 2% of the typical peak hour volumes through the most affected intersections under assessment, and would be similar to the typical day to day variations in traffic flow on the road network.
- 4.38 Overall, the SIDRA results indicate that the cumulative effects of construction traffic with multiple construction sites operating simultaneously are expected to be minimal. Overall increases in delay are in the region of only a few seconds of increased delay at the worst affected intersections. Changes of this magnitude would not be readily detectable to most motorists using these intersections.

### **Mitigation**

- 4.39 In my opinion, the 18 construction sites assessed can be established with no more than minor traffic effects on the operation of the surrounding road and pedestrian network during the works period, provided that the following general mitigation measures are implemented at each site:

- (a) The use of the construction truck routes as detailed in the Construction Truck Route Diagram for each site where possible to generally follow arterial routes and avoid right turns.
- (b) Restricting truck sizes to that appropriate to the site and its surroundings.
- (c) Producing a detailed TMP(s) for each site.

4.40 These mitigation measures have been incorporated into the Proposed Designation Conditions, and in particular, in Proposed Designation Conditions TM.1 - TM.3.

4.41 The detail of the mitigation measures will be finalised at the time the TMP is prepared. However, in order to satisfy myself that it will be possible to successfully mitigate the effects, I have developed examples of detailed mitigation measures that could be put in place for the individual sites, which are summarised in **Attachment A**. The measures summarised in **Attachment A** are consistent with the recommendations made in the original Traffic Report and Section 92 responses. These may well be amended depending on the outcome of detailed design, but are provided as examples of the types of appropriate mitigation that may eventuate from consideration of Proposed Designation Conditions TM.1-TM.3 following detailed design of sites. Overall, I am satisfied that any potential traffic effects can be adequately mitigated and that the Proposed Designation Conditions provide for this mitigation to occur.

### **Summary of Assessment**

4.42 I have assessed the potential traffic effects associated with the Project and consider that the implementation of mitigation measures can adequately address those effects. While the specific mitigation to be implemented at each site will be determined during detailed design and once the construction methodology and programme is confirmed, I am satisfied that the Watercare's Proposed Conditions adequately provide for this to occur. I am comfortable that with Watercare's Proposed Conditions, there are no traffic, vehicular or pedestrian safety reasons associated with the proposed works required for the establishment of

the Project that would impact on the grant of the consents sought or confirmation of the proposed designations.

## 5. RESPONSE TO SUBMISSIONS

5.1 A total of 25 submissions received referred to traffic / transportation issues. I have reviewed those submissions and categorised them into either the sites of concern or the individual submitter as follows:

- (a) *Mount Albert War Memorial Reserve.* A total of 13 submissions received related to traffic issues at this site.<sup>3</sup>
- (b) *Haverstock Road.* Two submissions received related to traffic issues at this site.<sup>4</sup>
- (c) *Keith Hay Park.* Two submissions received related to traffic issues at this site.<sup>5</sup>
- (d) *Lyon Ave.* Three submissions received related to traffic issues at this site.<sup>6</sup>
- (e) *Western Springs.* One submission received related to traffic issues at this site.<sup>7</sup>
- (f) *May Road.* One submission received related to traffic issues at this site.<sup>8</sup>
- (g) Friends of Oakley Creek ("**FOOC**") whose submission relates to three sites with traffic concerns particularly relating to Walmsley Park.
- (h) Auckland Transport ("**AT**") general submission on Proposed Consent Conditions.

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<sup>3</sup> Hamish and Michelle Archer, Anne and Robin Boyd, Stephanie and Jeffrey Boyle, Bright Beginning Early Childhood Education Centre Limited, Joy Burnett, Bruce Colloff, Community Refuge Trust (CORT), Nicola Craig, Toby Cumow and Helen Hume, L France, Stuart Jones, D Jotti and J Eades, Sally Kedge and Peter Kerridge, Pip, Tony and Alexandra McAlwee, Rosy Wei, George and Jack Zhang.

<sup>4</sup> Plant & Food Research, and Institute of Environmental Science (ESR).

<sup>5</sup> Paul and Maria Puertollano, and George and Maureen Whitehead.

<sup>6</sup> Mt Albert Residents Association, St Lukes Gardens Apartments Body Corporate and St Lukes Garden Apartments Progressive Society Incorporated.

<sup>7</sup> Tawa Farms Ltd.

<sup>8</sup> Foodstuffs Ltd.

5.2 I consider each of these as follows:

**Mount Albert War Memorial Reserve (see pages 45 - 47 and 55 - 60 of the Hearing Drawing Set)**

5.3 There were a number of concerns expressed by submitters relating to traffic / transportation around the Reserve site. I address each below.

Wairere Avenue Footpaths

5.4 Concern has been expressed by a number of submitters relating to the closure of footpaths in the area and particularly on Wairere Avenue.

5.5 I can confirm that no footpaths on Wairere Avenue would need to be closed or altered in any way as a result of the proposed construction work for *both* site layout options (the Reserve site or the Car Park site). Site traffic will be travelling at reduced speeds as enforced by existing speed humps on Wairere Avenue. Further, conflict with pedestrians particularly children will be minimised by closing the northern access to the public. An alternative pedestrian access would also be provided to the remaining parts of the reserve not affected by the proposed works to retain the existing north-south pedestrian access within the reserve. As such contractors / drivers will be completely separated from pedestrians (particularly small children), and all footpaths will remain.

Parking in Mount Albert War Memorial Reserve

5.6 A number of submitters have noted the traffic parking surveys that have been undertaken by myself and other TDG staff in the area, particularly in the Mount Albert War Memorial Reserve car park. In this regard the submitters have noted that their own observations of this car park usage are generally in accordance with my own findings and surveys, being that the lower car park is only really used on major community events and that outside these times approximately 40 spare spaces are always available.

5.7 The temporary removal of 14 spaces required by the Reserve site can therefore be accommodated by the current parking supply at the reserve.

- 5.8 The Car Park site would temporarily remove up to 65 parking spaces in the lower car park. As there are generally 40 spare spaces available outside peak major events periods, I consider this would only potentially cause a parking shortfall of 20-25 spaces during the typical peak periods (standard weekends). Alternative car parking is proposed to be provided within the reserve, subject to approval from Auckland Council Parks and the Albert-Eden Local Board. An example of such a layout is shown on **Plan 1c** on Page 58 of the Hearing Drawing Set. I note that on-street parking on Wairere Avenue and surrounding streets, such as Selcourt Road and Jesmond Terrace, is also available to accommodate spill over parking demand during peak periods.
- 5.9 During major events the on-site car park has been observed to be completely utilised and hence there is a potential shortfall of 65 spaces. This could however be completely compensated by the suggested alternative car parking on-site as well as possibly using the tennis court off Selcourt Road (as described in the May Section 92) which could accommodate 45 spaces. This would only need to be used on major events, which from Auckland Council records occur only on two days per year.
- 5.10 In summary, while the use of the Car Park site for construction would result in a parking shortfall during peak periods, I am comfortable that this can be adequately mitigated through the provision of alternate car parking within the reserve, along with the available on-street parking and temporary major event parking.

#### Construction activity within the Reserve

- 5.11 Concern has been expressed that construction vehicles may affect cyclists and pedestrians in the car park and reserve.
- 5.12 As the construction site (including its access all the way to Wairere Avenue) would be completely fenced and closed to the public, construction vehicles would be completely separated from other users of the reserve or car park. For *both* the Reserve site and the Car Park site, I recommended that the north access be closed entirely to public for the duration of the works and be used as a construction site access only. This is proposed by Watercare as shown on pages 39 and 50 of the Hearing Drawing Set.

#### Trucks accessing the site from Asquith Avenue

- 5.13 A number of submitters (including Bright Beginnings Early Childhood Education Centre) expressed concern regarding trucks using the northern end of Wairere Avenue (the Asquith Avenue end).
- 5.14 No trucks are proposed to use the northern end of Wairere Avenue. All trucks would enter and exit the site via the driveway from Wairere Avenue and travel to and from New North Road which is more appropriate for accommodating larger trucks for *both* site options.

#### Increase in vehicle numbers

- 5.15 Concern has been expressed by one submitter (Laural France) regarding disruption caused by an increase in traffic truck volumes on Wairere Avenue.
- 5.16 This submitter lives at 13 Wairere Avenue (as shown on **Plan 1d** on page 55 of the Hearing Drawing Set) which is north of the proposed truck access to the site via the driveway to the Mount Albert War Memorial Reserve car park. No additional vehicles would be travelling past 13 Wairere Avenue as a result of the construction activity as they would be required to use the truck route referred to above for *both* site options.
- 5.17 Between the site entrance and New North Road, the increase in vehicles (both cars and trucks) would be between 7 and 9 vehicle movements per hour, depending on the construction stage, for *both* site options. I consider this level of increase to be low and well within the capacity of the surrounding roads.

#### Trucks avoiding times when children walk to and from school

- 5.18 Concern has been expressed regarding pedestrian safety on Wairere Avenue with an increased number of trucks accessing Wairere Avenue and the Reserve. This is because Wairere Avenue carries a lot of foot traffic, children in particular. Nearby childhood centres and Mount Albert Grammar School ("**MAGS**") have also been identified on **Plan 1d** on page 55 of the Hearing Drawing Set.

- 5.19 The proposed truck routes have been developed to ensure that arterial routes are used as much as possible. The trucks would use the southern end of Wairere Avenue to gain access from the site to the arterial network for *both* site options. The number of trucks expected is low (five movements per hour) and all pedestrian access points, routes, and footpaths would be retained. As outlined in the AEE, traffic movements would be managed during peak school times. All truck drivers would be made aware of school children in the area, both before and after school and, as usual, would be required to obey all traffic regulations. The proposed barrier / noise wall around the site will be designed so that the sight distance at the proposed site access will not be compromised. When the TMP is prepared for the detailed works, it is possible this may include an on-site spotter to be stationed at the driveway during school peak periods. Therefore, no particular restrictions relating to truck movements are warranted in this location.

#### **Haverstock Road (Plan 8 on page 79 of the Hearing Drawing Set)**

- 5.20 Both of the submissions relating to the site at Haverstock Road raise the same issues but are from two different parties, being Plant and Food Research and Institute of Environmental Science and Research. My response to the concerns raised is as follows.

#### Provision of specific access information and potential constraints

- 5.21 Both submissions expressed concerns regarding the lack of detailed vehicle access information and potential constraints to be implemented as part of the works.
- 5.22 Initially there were three potential access points (see section 4.4.5 of the Traffic Report). These included 96/98 Haverstock Road, the end of Camden Road and the end of Hampstead Road (using the submitters' access). Since this assessment (and noted in section 1.4 of Attachment 6: Traffic of the December Section 92), the Hampstead Road option has been removed leaving Haverstock Road and Camden Road. While Haverstock Road is the preferred access of the two remaining options, flexibility is still required at this time so both options have been retained. Neither option would cause any adverse effects on the current accesses of the two research institutes.

### Cumulative effects

- 5.23 The submitters are concerned that there would be cumulative effects of activities due to the works, including parking demands and truck movements.
- 5.24 The potential for cumulative effects was also raised by Council staff and as a result the December Section 92 contained information on the cumulative effects of a number of sites operating at the same time. The conclusion reached, following the additional analysis undertaken and as described earlier in this evidence, was that the cumulative effects of the sites operating at the same time were forecast as being minor and would be imperceptible to the average motorist.

### Additional mitigation

- 5.25 These submitters also suggested additional mitigation such as a TMP, including defined access, controls and limitations be proposed, as well as a CMP including days and hours of operation, worker numbers and onsite management.
- 5.26 I agree with these suggestions. Watercare is proposing to develop a CTMP for each site prior to construction. This is explained in sections 6 and 7 of the Traffic Report, and Proposed Designation Condition TM.1 requires that a detailed TMP(s) be prepared prior to construction. Condition TM.2 sets out in detail the requirements to be included in that plan or plans. In my opinion, the Proposed Designation Conditions provide the relief sought by these submitters.

### **Keith Hay Park (Plan 14 on page 108 of the Hearing Drawing Set)**

- 5.27 Two issues have been identified by the two submitters concerned with this site.

### Heavy vehicle access

- 5.28 Mr and Mrs Puertollano's submission expresses concern regarding traffic access for the Earth Movers and Dump Trucks.
- 5.29 This is a secondary construction site that I have classified as an intermediate sized site from a traffic perspective. The truck volumes are only expected to increase by up to five movements per hour.

These low additional volumes are well within the capacity of the surrounding roads and minimal effects on the surrounding road network are expected as a result.

- 5.30 Further, the site access would be of sufficient width to accommodate the expected truck size and the site access would be separated from adjacent properties by the retention of the existing 5m wide planted buffer.

No access to the site from Gregory Place.

- 5.31 One submitter (George & Maureen Whitehead) suggested that there should be no access to the site from Gregory Place due to it being too narrow.

- 5.32 I completely agree with this submitter with regard to construction traffic and accordingly access to the main construction site in Keith Hay Park is proposed entirely off Arundel Street. Only access to the micro-tunnelling works between the manholes shown on Plan 14a, page 109 of the Hearing Drawing Set would be via Rainford Street.

- 5.33 I do, however, consider that maintenance vehicles could and should be able to access the permanent site during normal operations (ie when construction finishes) via Gregory Place. These vehicles would be infrequent (approximately one per month) and normally be small size vehicles (maintenance may require larger vehicles as necessary).

**Lyon Avenue (Plan 6 on page 68 of the Hearing Drawing Set)**

- 5.34 The three submissions relating to the Lyon Avenue site are from the St Lukes Gardens Apartments Body Corporate and St Lukes Gardens Apartments Progressive Society Incorporated, (together "**St Lukes Gardens Apartments**"), and Mt Albert Residents Association ("**MARA**"). The traffic issues raised in these submissions and my response to each are detailed below.

### Heavy traffic movements

- 5.35 The St Lukes Gardens Apartments submitters would like a traffic effects survey undertaken at their intersection, particularly given the St Lukes Mall expansion is likely to be undertaken at around the same time as the Project.
- 5.36 The surveyed traffic movements at the St Lukes Road / Morningside Drive / Morning Star Place intersection are set out in detail in Table 21, Section 4.3.3 of the Traffic Report. The assessment presented in the Traffic Report illustrates that the expected traffic generation of the proposed works is estimated to be up to four passenger cars and five heavy vehicles per hour. This equates to one additional vehicle entering or exiting Morning Star Place every seven minutes. TDG has previously undertaken traffic assessments and associated traffic modelling on behalf of Westfield St Lukes to assess the effects of the St Lukes Mall expansion and thus is well aware of this intersection. I consider that the impacts of the traffic movements caused by the proposed works at the Lyon Avenue site on the St Lukes Road / Morning Star Place intersection, with or without the Westfield St Lukes Mall expansion, would be minimal.
- 5.37 The submitters also have concerns with the suitability of Morning Star Place for heavy truck movements given it has varying roadway widths. The issues of trucks passing each other, traffic queues and restrictions on residential traffic are specifically identified by the submitters.
- 5.38 The number of heavy vehicles expected to travel on Morning Star Place is approximately five single unit trucks per hour (for the largest vehicle expected). The probability of two trucks accessing Morning Star Place at one time and/or causing traffic queuing as a result is therefore low. The largest design vehicle to access the site is expected to be a single unit truck which is no bigger than the rubbish collection trucks that are already serving the St Lukes Gardens Apartments. In addition, Plan 6a on page 69 of the Hearing Drawing Set shows two single unit trucks able to pass each other throughout the entire length of Morning Star Place. As noted by the submitter the minimum width of the road is 6.9m. This is more than adequate to accommodate two simultaneous dump trucks as they are typically 2.5m wide.

### Visitor parking spaces

- 5.39 The 22 visitor parking spaces on the current spillway cap need to be removed during construction. The potential loss of these parking spaces during the construction of the Project is anticipated and provided for in the St Lukes Gardens Apartments resource consent for the site. Watercare is consequently able to remove these visitor parking spaces during construction and is not required to provide replacement of these spaces until construction has finished and the site is reinstated.

### Access

- 5.40 One submitter (MARA) has stated that access should be from Lyon Avenue or across the creek from MAGS.
- 5.41 Since receiving these submissions I have investigated a total of seven alternative access options identified by Watercare's Principal Engineering Advisors. A plan showing these access locations is included as **Attachment B**. The access options are as follows:
- Option One – Morning Star Place
  - Option Two – Lyon Avenue
  - Option Three – 2 Wagener Place
  - Option Four – 1 & 2 Wagener Place
  - Option Five – Retail Parking Area at 1 Wagener Place
  - Option Six – Fergusson Reserve and MAGS playing fields from Fergusson Ave or Haverstock Rd
  - Option Seven – Alberton Avenue via 'Gate 1' and MAGS playing fields
- 5.42 A summary of my findings in relation to the traffic impact of each of these options is discussed as follows. I have also included my assessment for the seven access options in **Attachment B** of my evidence.

- 5.43 Option 1: Morning Star Place has an excellent linkage to the major road network via a signalised intersection. Morning Star Place also has good provision for pedestrian and vehicular safety as separate footpaths and a two-lane two-way road is available. The original drawing indicated an intention to extend the designation over privately owned car parking spaces. I have since reviewed the site access and can confirm that no private car parking spaces associated with the apartment units need to be affected by the works. The designation boundary has been amended so that these private car parking spaces are not affected. This revised drawing was provided to the Council on 22 May 2013 (page 62 of the Hearing Drawing Set). I consider that Morning Star Place is a viable option from a traffic engineering point of view. The access enables excellent access onto the road network by means of a signalised intersection and is considered satisfactory with respect to traffic safety.
- 5.44 Option 2: Lyon Avenue has a poor connection to the major road network. Although pedestrian numbers would be low, footpaths are not provided on the private lane used to access properties at the southern end of the road. The level of safety for vehicles would be acceptable if convex mirrors are provided. The current configuration only allows one-way movements at a time thus two-way access would require traffic management. Should a two-lane two-way access be provided via Lyon Avenue, all angled parking spaces on the southern end of the road would need to be removed. This would cause significant impacts on the affected residents.
- 5.45 Option 3: 2 Wagener Place is a potential option including use of the car park at the rear of the property which is currently established on Crown-owned land. This option is more viable as a single lane access due to the presence of the angled car parks along the access. If a two-lane two-way access is to be provided then the parking would all need to be relocated.
- 5.46 Option 4: 1 & 2 Wagener Place would only be an acceptable option from a traffic engineering point of view provided substantial works are undertaken to form a single lane access road only through the rear of 1 Wagener Place to the construction site. This access would be suitable at most, for entry or exit only for construction vehicles, to be

implemented in combination with another access option such as Option 1.

- 5.47 Option 5: 1 Wagener Place is not considered to be a viable option in terms of traffic as major disturbance would be caused to the public. This option would have poor provision for pedestrian protection with significant pedestrian volumes in this area, as well as high probability of conflict between construction traffic and retail cars parking / manoeuvring into car parks.
- 5.48 Options 3, 4 and 5 would be accessed via Wagener Place which has excellent connection to the road network via the St Lukes Road / Wagener Place signalised intersection. However, both Options 3 and 4 have little provision for pedestrian safety and could only provide a single lane access. In addition, the service road adjacent to JB Hi-Fi for Option 4 would require that the entrance be redesigned and reconstructed. These options require a small loss of parking (around 2 spaces).
- 5.49 Options 6 and 7 through MAGS are both viable options to access the site from a traffic engineering perspective. Careful traffic management would however be required such as to provide signage and fencing between the site traffic and school students / park users to avoid potential conflicts. Truck movements would also be restricted to outside school peak periods for Option 7.
- 5.50 Option 6: Haverstock Road / Fergusson Avenue provides good network accessibility.
- 5.51 Access from Alberton Avenue (Option 7) would require a longer truck route and would also be restricted to left turns only. Pedestrian volumes would be high through MAGS but construction access via this route is considered acceptable provided that fencing and/or signage is installed to separate pedestrians from the access. Both options through the MAGS would result in no loss of parking.
- 5.52 Overall, there are a number of alternative access options available for the Lyon Avenue site. From a *traffic engineering* perspective I consider that the best option is the selected Option 1 (Morning Star Place access) in terms of network connectivity, pedestrian safety and vehicle

capacity. Option 3 via 2 Wagener Place and Options 6 and 7 (the two MAGS options) could be made viable (from a traffic engineering perspective) with the provision of mitigation to address the issues outlined above. There are, of course, other factors which need to be considered when selecting the best option. I understand that other witnesses are addressing the alternatives from their perspectives, and that Ms Petersen has included a summary of the overall assessment of options.

#### Access for emergency services

- 5.53 The submitters have also requested that an audit be undertaken by emergency services in relation to access, presumably to ensure emergency services would continue to be able to access the site.
- 5.54 An adequate width near the proposed site access at Morning Star Place would be maintained such that access for emergency vehicles to the adjacent St Lukes Gardens Apartments would not be compromised. **Plan 6a** on page 69 of the Hearing Drawing Set shows the vehicle tracking of a single unit dump truck passing another single unit truck along the entire length of Morning Star Place. Emergency vehicles are also up to 2.5m wide, and thus can also be accommodated.

#### Traffic light phasing and effects on St Lukes Road and Morningside Drive Intersection

- 5.55 The submitters have also raised concerns with the traffic light phasing and potential effects on the St Lukes Road / Morningside Drive / Morning Star Place intersection.
- 5.56 With approximately nine vehicle movements generated by the site per hour during peak construction periods, the worst case scenario would be to assume all nine vehicles would be exiting the site within the hour and accessing the St Lukes Road / Morningside Drive / Morning Star Place intersection (refer to **Plan 6a** on page 69 of the Hearing Drawing Set). This is equivalent to one additional vehicle exiting Morning Star Place every seven minutes. I have measured the cycle time for this intersection at between 100 - 130 seconds. This suggests that one site vehicle would be added to the intersection every third or fourth phasing

cycle. This would have a minimal effect on the traffic light phasing and the overall effect on the function of the intersection, and on the capacity of the St Lukes Road / Morningside Drive / Morning Star Place intersection, would be negligible. I note however that the cycle time for exiting Morning Star Place is very small (2 – 3 seconds) and the operation of this leg could be greatly improved (although I consider not necessary for the Project) by adding a couple of seconds to this phase, especially in the morning peak period. I consider this will be achievable in the future given the expected reduction in volume along St Lukes Road associated with the Waterview Connection.

- 5.57 With the nearby shopping centre generating little traffic in the morning peak period and the reduction in traffic at this intersection associated with the Waterview Connection (at least 13%), this small change in phase timing will have minimal effect on the operation of the signals.
- 5.58 As noted in the December Section 92, the Waterview Connection project would be completed by the time construction of the Central Interceptor Project begins. Traffic modelling undertaken by BECA for the New Zealand Transport Agency predicts that volumes on St Lukes Road would reduce by at least 13% once the Waterview Connection is in place.
- 5.59 Also noted by the submitters, the St Lukes Shopping Centre is proposed to be expanded by the time the Project construction takes place.
- 5.60 As such, I have undertaken a further SIDRA analysis of the St Lukes Road / Morningside Drive / Morning Star Place signalised intersection that includes the reduction in traffic volumes on St Lukes Road as a result of the Waterview Connection, and incorporates the predicted traffic volumes resulted from the St Lukes Shopping Centre expansion as well as minor upgrades to this intersection as part of the expansion from the supporting documentation of Plan Change 8.<sup>9</sup> This is the base scenario modelled.
- 5.61 The results confirm that the performance of the intersection would essentially remain unchanged with the Project construction traffic added to the base scenario. In particular, the average delays at the

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Statement of Evidence of Mr Harries for proposed Plan Change 8 dated 15 June 2010.

intersection as a whole increase by around 2 seconds while average delays to vehicles on Morning Star Place increase by only 0.2 seconds.

#### Full reinstatement

- 5.62 The submitters are also concerned about damage to Morning Star Place and would like the road fully reinstated following the completion of construction.
- 5.63 I understand Watercare would remedy any damage that is caused to the road infrastructure on Morning Star Place by site vehicles during construction.

#### Rubbish collection

- 5.64 The submitters are also concerned about rubbish collection and would like to ensure that it is not affected.
- 5.65 The rubbish collection systems along Morning Star Place would be accommodated and their operation would be maintained during the proposed works. No construction vehicles are intended to park on Morning Star Place and the road is wide enough to accommodate two trucks passing each other (**Plan 6a** on page 69 of the Hearing Drawing Set).

#### Carparking loss

- 5.66 The submitters are concerned regarding the temporary loss of the visitor car parks.
- 5.67 Visitor car parks associated with the St Lukes Gardens Apartments are constructed over the Watercare spillway. I understand that the temporary removal of those car parks is specifically provided for in the resource consent associated with the St Lukes Gardens Apartments and would not result in any non-compliance issues with existing resource consents. I also understand that the car parks would be reinstated by Watercare, in accordance with the development deed between the parties, once works are completed. Finally, the proposed designation boundary has been amended so that none of the privately owned and allocated car parks are now affected by the designation.

**Western Springs (pages 34 - 37 of the Hearing Drawing Set)**

- 5.68 The only submitter in relation to this site (Tawa Farms Ltd) owns the land occupied by the Caltex service station on Great North Road adjacent to a secondary site associated with the Western Springs site. The traffic issue raised in this submission relates to the access to this secondary site and its effects on the Caltex service station.
- 5.69 This site is very small and can only cater for single unit trucks. In the December Section 92 Figure 2a was produced and shows a truck entering and exiting the site in a forwards direction to and from the site (refer to Plan 2a(v2) on page 35 of the Hearing Drawing Set). As such, while the access to the site is adjacent to the Caltex service station, the impact would be negligible given that vehicle volumes would be low (up to nine per hour), and that all vehicles would enter and exit the site in a forwards direction and would only undertake left turns (due to the presence of a solid central island).

**May Road (pages 98 - 101 of the Hearing Drawing Set)**

- 5.70 The submission relating to May Road is from Foodstuffs (Auckland) Ltd. Most of the properties on Roma Road (where the site access is located) are occupied by the head office and distribution operation of Foodstuffs, and as such, Roma Road is an important link for the company's operations.
- 5.71 Since the Foodstuffs' submission was received a number of discussions have been held with Foodstuffs or their representatives to clarify their concerns and provide additional information where necessary. I understand that the Section 92 responses to the Council have addressed some of their concerns relating to cumulative effects and effects on surrounding intersections and provided general clarification of certain traffic related matters. The one outstanding traffic related matter is related to the performance and operation of the construction access itself onto Roma Road, and consideration of the availability of one-way access using Roma Road and May Road (instead of Roma Road alone for two-way traffic).

- 5.72 The site driveway from Roma Road is proposed to be around 7.5m in width to accommodate the truck and standard vehicle trackings as part of the May Section 92. The driveway and the vehicle trackings are shown on Plan 12 on page 98 of the Hearing Drawing Set.
- 5.73 Two-way operation of light vehicles along Roma Road would be easily achievable. However, two-way operation for trucks would not be possible at the driveway entrance (but would be along the access-way itself). Of note, the majority of users (including all vehicle and truck drivers of the Project construction site as well as Foodstuffs) would be entirely familiar with the site as it is likely that the same workers both at the Project and the Foodstuffs site would access the site on a regular basis. The proposed signals / driveway operation for two-way operation are intended to work as follows:
- (a) Generally signals would be on red for all exiting vehicles, thus giving priority to vehicles entering from Roma Road.
  - (b) When a vehicle exits the site they would come up to the signals, stop and trigger the green exit aspect. At the same time the "truck coming" warning sign would be illuminated for traffic on Roma Road.
  - (c) The exiting vehicle then leaves the site and gives way to vehicles on Roma Road as per a standard driveway.
    - (i) The reason for the "truck coming" sign is that when a truck exits another truck cannot enter at the same time. Thus there is the possibility that when the truck is exiting another truck could be coming along Roma Road wanting to enter the site which needs to be managed. This should however be put into the overall context of truck movements at the site. There would generally be only six truck movements per hour (three in, three out) during shaft excavation, and nine movements per hour during tunnelling. As such, the chance of meeting another truck in this location would be relatively low. However it is recognised that it may occur and for this reason a management system has been proposed.

- (ii) When the "truck coming" sign is illuminated, entering truck drivers on Roma Road would be advised to slow and pull over and/or stop in the area where the on-street parking has been removed and wait for the truck to exit the driveway before turning in (ie it is simply a warning device). If another general vehicle on Roma Road is behind them they would simply go past the stationary / parked truck so there would be no hold up of through traffic.

- 5.74 A manual controller would only likely be present when larger / one-off deliveries occur, with the remainder of time generally being truck and trailer units.
- 5.75 With the mitigation measures discussed above, I consider that the proposed two-way site access off Roma Road will function satisfactorily from a traffic engineering perspective.
- 5.76 Regardless of the above (and as explained by Ms Petersen), Watercare has been working with the owner of the May Road property to acquire the requisite property interests for this major construction site. I understand that has now been obtained and that, in particular, Watercare has bought the area it needs for permanent works and leased a larger area it needs during construction. In particular Watercare now has a license enabling access directly to May Road in addition to its legal access to Roma Road.
- 5.77 This license would enable one-way construction circulation utilising both Roma Road (likely entry) and May Road (likely left turn exit) and avoid the need for the traffic management measures I have described above relating to the site entrance (as the driveways would be required to be one-way only).
- 5.78 This revised alternative has been developed by Watercare in an effort to address Foodstuffs' concerns. I have no traffic / transportation issues with this alternative recently put forward and it would work very well from a construction perspective.

### Friends of Oakley Creek

- 5.79 This submission relates to the possible effects on the Oakley Creek as a result of three construction sites at: May Road, Walmsley Park and Keith Hay Park. In particular, the submitter has concerns regarding the effects of the proposed bridge structure across Oakley Creek at the Walmsley Park site. The submitter requests further investigation of the possibility to move the existing pedestrian crossing on Sandringham Road Extension to enable site access to be located so to avoid the construction of the bridge.
- 5.80 As part of the May Section 92, I have carried out an assessment of possible locations to relocate the pedestrian crossing in order to allow the construction access to be located south of Oakley Creek. Three options were considered and discounted as follows:
- Option 1: retain the existing pedestrian crossing location;
  - Option 2: shift the crossing to the north of Gifford Avenue; or
  - Option 3: shift the crossing south of its existing location.
- 5.81 These options are shown on **Attachment C**.
- 5.82 The analysis showed that the pedestrian crossing would need to be moved if the access was on the south side of Oakley Creek (hence why the crossing on the north side of the creek was chosen as the preferred option). As such, retaining the crossing at its existing location with an access to the south of the creek is not considered a viable option.
- 5.83 Shifting the crossing to the north of Gifford Avenue would create issues relating to pedestrian desire lines, and require pedestrians to cross Gifford Avenue using the pedestrian crossing. As such I would not recommend this option.
- 5.84 Shifting the crossing south of the existing location (ideally 30m south) would provide an acceptable pedestrian crossing location, however would likely shift the crossing to a position that is too close to the O'Donnell Avenue intersection. The next available position south of the existing crossing would be some 150m away which would cause issues

regarding existing pedestrian desire lines that have developed with the use of the existing crossing especially relating to Walmsley Park.

- 5.85 Overall, I consider that moving the pedestrian crossing is difficult due to the presence of other vehicular crossings, roads and bus stops. However if required, moving the crossing would not be impossible. My preference is for the crossing to remain in its existing location. If it needs to be moved, the best alternative is to move it 30m south.

### **Auckland Transport**

- 5.86 Auckland Transport's submission seeks a number of amendments which are largely on the strategic / planning level rather than traffic / transport related issues. As such, with the exception of an issue relating to access for AT and utility providers within the road reserve, I do not consider there are any specific traffic related issues with AT to be addressed.

- 5.87 There are a total of six proposed construction sites that include parts of the road reserve within their designation. AT wishes to see conditions to ensure AT and utility providers that need to do work in these areas of the Transport Corridor are not unduly or unnecessarily restricted.

- 5.88 I agree that AT and other utility providers should not be unduly or unnecessarily restricted from the road reserves that will be part of the construction sites. Proposed Designation Conditions W.1 and W.2 have been included to both ensure AT and other network utility operators do not need written consent under section 176 of the RMA for routine access, inspection and maintenance of existing assets, and to reflect AT's request to refer to the National Code of Practice for Utility Operator Access to Transport Corridors (which was an area of clarification for AT). Therefore in my opinion, AT's transportation concerns are fully addressed by Watercare's Proposed Conditions.

## **6. RESPONSE TO COUNCIL PRE-HEARING REPORT**

- 6.1 I have reviewed both the Council Pre-hearing Report as well as the FLOW report entitled "Main Project Works – comment on Submissions and outstanding issues" (June 2013), both dated June 2013.

### Further Evidence

- 6.2 On page 247 of the Council Pre-hearing Report there is one traffic related matter where further evidence is requested at the hearing.
- 6.3 This relates to the Walmsley Park site, and in particular, FOOC's submission. The FLOW report has responded to this submission by suggesting that one alternative solution to moving the pedestrian crossing on Sandringham Road Extension would be to signalise the intersection of Sandringham Road Extension / Gilford Avenue (and include signalised pedestrian crossings). As discussed above, the pedestrian crossing is not proposed to be moved at present and would only be required to be moved if the location of the entranceway into the proposed construction site was moved to the south side of Oakley Creek (this is sought by a number of submitters). The Council Pre-hearing Report has then asked if this signalisation is "feasible":<sup>10</sup>

Whether the suggestion of signalising the intersection of Sandringham Road Extension/Gilford Avenue and inclusion of signal controlled pedestrian crossings on each approach is feasible...

- 6.4 In terms of physical feasibility, a signalised intersection could be constructed in this location generally within the existing kerblines. However, I have undertaken initial SIDRA modelling of this intersection which has shown that signalising the intersection would add around 55 seconds additional delay to northbound through vehicles on Sandringham Road Extension in the morning peak (due to vehicles stopping on Sandringham Road Extension for the traffic signals).
- 6.5 In my opinion this is an unreasonable effect to users of Sandringham Road. Accordingly, to increase capacity and reduce delay to an acceptable level, the road would need to be widened to accommodate additional through traffic lanes which would be outside either Watercare or AT designations. As such, I do not consider signalising the Sandringham Road Extension / Gilford Avenue intersection to be a feasible option for the Project and remain of the view that the currently proposed access is appropriate and that the pedestrian crossing should not be moved.

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Council Pre-hearing Report at page 247.

### Consent Conditions - Mitigation Measures

- 6.6 Throughout both the FLOW report and the Council Pre-hearing Report are a number of new suggested conditions relating to traffic. These conditions in the main are very detailed and generally relate to the example mitigation measures I have developed for each site (as detailed in **Attachment A**).
- 6.7 As I have noted previously in my evidence, the mitigation measures set out in **Attachment A** are only examples of detailed mitigation measures that could be put in place for the individual sites, under **current** traffic conditions. As such, these may well (and will likely) be amended depending on the outcome of detailed design, and the performance of the roading network at the time of lodgement of Outline Plan of Works "**OPW**".
- 6.8 The mitigation measures are provided as examples of the types of appropriate mitigation that may eventuate from implementation of Proposed Designation Conditions TM.1, TM.2 and TM.3 following detailed design of sites.
- 6.9 In general I have no issue with the intent of any of the conditions as they typically reflect the example mitigation measures which I have already developed and included in **Attachment A**. I do however consider them to be both overly detailed and unnecessarily restrictive to be imposed as conditions on the designation at this point in time.
- 6.10 In terms of detail, a number of the conditions relate to limiting construction traffic at specific intersections, banning of movements, or referencing certain procedures (eg Corridor Access requests ("**CAR**")). These detailed conditions and measures simply may not be relevant in the future when the OPW for each site is lodged and works proceed. A number of things can, and will, change to both the road network (eg signalisation of intersections) or to the process involved (eg CAR requests). As such, these detailed conditions could be completely redundant or unnecessary or impossible to comply with, once specific detail is known and the OPWs are lodged (which is likely to be a considerable number of years away). While these kinds of conditions may be appropriate for a resource consent application, they are not

considered appropriate in the context of designations where a further OPW process is required.

6.11 In terms of the necessity of such conditions, in my experience, section 176A of the Resource Management Act 1991 relating to OPWs is sufficient in dealing with detailed mitigation of designations. In particular, subsection 3 (d) and (f) of section 176A specifically address vehicular access, circulation and the provision of parking, as well as any other matters to avoid, remedy, or mitigate adverse effects on the environment.

6.12 Over the last seven years I have been extensively involved in the production of traffic reports supporting OPWs for ONTRACK / Kiwirail's double tracking through Newmarket and the western line, as well as the Auckland electrification process. In terms of traffic effects, these projects were very similar to the Central Interceptor Project as they both involved the majority of the works within the designation (outside road reserve), but required assessment of vehicular access points and resulting heavy vehicle construction effects. This rail designation has little in the way of conditions relating to traffic, but rather, relied on the OPW process and section 176A of the RMA to ensure specific traffic effects were adequately avoided, remedied or mitigated. Within the OPW process I have personally prepared numerous traffic reports, including mitigation measures. For example this has included:

- Restricted movements in / out of a site (eg no right turns).
- Provided additional traffic lanes (eg right turn bays).
- Removed parking and assessed the effect of this removal.
- Provided exact truck routes.
- Assessed each individual access and if required, provided mitigation (eg manual control of driveways).
- Reviewed pedestrian safety and provided mitigation (eg additional footpath width).
- Provided additional pedestrian crossings.
- Banning heavy vehicle movements at intersections (eg right turns).

- Restricted hours of operation of heavy vehicles (eg commuter peak periods in congested areas).
- Provided for truck cleaning areas.
- Detailed traffic management signage.
- Provided for material storage and contractors parking.

6.13 These are essentially the same types of measures that are proposed in the Council and FLOW's conditions and as such, in my experience, it is unnecessary and inappropriate to include this level of detail as designation conditions.<sup>11</sup> Rather, what is important is for the Proposed Conditions to provide the general framework to reassess and avoid, remedy or mitigate the effects once exact details are known about the works and exact details are known about the time when they will be occurring.

6.14 Further, I note that under 176A(4) of the RMA, the territorial authority may request the requiring authority to make changes to the OPW document once lodged. My experience with the Kiwirail projects is that the territorial authority frequently does request changes which are generally accepted and/or discussed and negotiated with the requiring authority. However, if the requiring authority refuses the territorial authority's request, the territorial authority may then appeal to the Environment Court.

6.15 For the reasons explained above, I do not support the approach taken in the FLOW report, nor that taken in the Council Pre-Hearing Report. It is both overly detailed and unnecessarily restrictive to impose conditions like this on the designation at this point in time. That level of detail is more appropriately suited to the OPW stage.

#### **Consent Conditions - Other Matters**

6.16 There are a number of other conditions proposed in the Council Pre-hearing Report (from the FLOW report). The following responds to those other conditions which I consider should be deleted, retained or amended.

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<sup>11</sup>

I have provided further comment on each specific suggestion in **Attachment D**.

*Proposed Condition TM.2*

- 6.17 The Council Pre-hearing Report proposes an amendment to proposed condition TM.2(f) as follows:

TM.2 The TMP(s) shall describe the measures that will be taken to avoid, remedy or mitigate the traffic effects associated with construction of the Project or Project stage. In particular, the TMP(s) shall describe:

...

(f) Any proposed monitoring to measure the impact of the works on traffic and the impact of the traffic management measures. If safety or operational issues are evident, means to address this will be implemented and could include restricting truck access during peak commuter periods (7am to 9am and 4pm to 6pm weekdays).

- 6.18 While I agree that if safety issues are evident they should be mitigated, having a detail that specifies only one measure and restricts it to current commuter peak period hours, may not be appropriate in 5 years time when the OPW may be lodged. As such I consider the wording should be changed as follows:

Any proposed monitoring to measure the impact of the works on traffic and the impact of the traffic management measures. If safety or operational issues are evident, measures to be implemented to address these issues.

*Proposed Condition TM.4:*

- 6.19 In regards to (a) "Vehicular access" and (b) "contractors parking", I consider these items are already adequately covered in regards to OPW applications as discussed above. These items would be covered in any OPW application for all sites, not just the ones listed in the Proposed Condition. Subsections (a) and (b) are not considered appropriate or necessary and have been deleted in Watercare's Proposed Conditions.
- 6.20 In regards to (c) Western Springs I agree with the overall sentiment regarding the Great North Road / Bullock Track intersection, however the conditions are based on the intersection that currently exists. In 5 years time when the OPW may be lodged, the traffic environment, and indeed the form of this intersection, is likely to be different. This intersection may indeed be signalled or upgraded in another way by

this time which would make the proposed condition inapplicable and unnecessary. As such I consider that this matter is adequately addressed in conditions TM.2 (a), (c) and (h) as proposed to be amended by Watercare and TM.4(c) is not required.

- 6.21 Condition (g)(ii) relates only to Pump Station 23. I would expect that any damage directly caused by construction vehicles would be reinstated / remedied not only for this site but at any site. Accordingly I would suggest a new condition as follows:

TM.3A Any damage in the road corridor directly caused by heavy vehicles entering or exiting construction sites within the designated land shall be repaired as soon as practicable or within an alternative timeframe to be agreed with Auckland Transport.

- 6.22 In regards to Mount Albert War Memorial Reserve - Car Park site (p), I agree there should be an additional condition relating to the car parking at the Mount Albert War memorial site. However I consider this condition as currently proposed to be too specific and detailed, as in 5 years time the situation at this site may have changed (eg there are more or less major events). In particular, the major events listed may be completely irrelevant and the number of carparking spaces affected may change through detailed design, making the condition meaningless and unworkable. Rather, I would prefer general conditions TM.3B and TM.3C noting that the carparking needs to be assessed and any effects identified mitigated within the OPW process as follows:

Public carparking at Mt Albert War Memorial Reserve Car Park Site

TM.3B In the event that construction activities reduce the number of carparks available to users of the Mt Albert War Memorial Reserve, the Requiring Authority shall, in consultation with Auckland Council Parks, Sports and Recreation and the Albert-Eden Local Board, identify suitable alternative carparking and shall construct as its cost alternative carparks sufficient to address the parking lost during construction activities.

TM.3C The Requiring Authority shall provide a plan of the layout of any alternative carparking and associated works established in condition TM.3A above to the Council as part of the OPW for the Mt Albert War Memorial Reserve site. The plan must demonstrate that the proposed carparking layout complies with relevant Council standards, and provides sufficient carparking to address parking lost during construction activities within the Reserve.

*Proposed Condition W.3*

- 6.23 A new condition, W.3, has been proposed to be added by the Council Pre-hearing Report relating to CARs. CARs are required for any work in the AT road reserve. As such, while I have no issue with the condition itself, I consider it to be pointless and entirely unnecessary as a CAR process is an independent requirement regardless of the conditions of the designation. Furthermore, in 5 years time, a CAR may not be the correct terminology and a CAR may not exist (I note that the CAR process has just recently changed and could easily change again within the next 5 years). As such, the condition as written will be meaningless and impossible to comply with. Therefore, it is my opinion that the standard requirement to provide a CAR (or similar in the future), regardless of the designation, is sufficient to protect AT and works within the road reserve. This condition, and the associated advice notes, is not accepted.

*Proposed Condition CH.3*

- 6.24 A new condition CH.3 has been proposed by the Council Pre-hearing Report in relation to sites in close proximity to schools and colleges being limited in terms of truck movements between 8:15-9:15am and 2:45-3:15pm. In my experience with heavy truck movements near schools the key issue is to ensure complex manoeuvres (especially reversing) are not undertaken in areas open to public (rather on-site in restricted areas) and that driveways into construction areas are assessed in terms of pedestrian safety. Once again, these issues cannot be completely assessed until exact details around the operation / driveway design are completed which will occur at the OPW stage.

- 6.25 While restricting movements can in some circumstances be the most appropriate solution, it is not always appropriate and there are, in my experience, other safe ways of protecting school children from trucks at site driveways other than simply placing a blanket ban on truck movements at school times (as the proposed condition suggests). For example, having an on-site driveway spotter in place at school times can also be highly effective in ensuring pedestrian safety.
- 6.26 As such, while I consider the issue regarding school children safety at the sites listed is worthy of a specific condition it would be my preference to once again have the assessment occur at the time of OPW when specific details are known about both the detailed operation / timing and indeed the number of school children present. Therefore, I would recommend an additional item under proposed condition TM.2 which draws attention to an assessment of child safety at / around education facilities (not just the sites listed) and provides measures in the OPW to avoid remedy or mitigate any effects as follows:
- (f) Measures to manage any potential effects on children at / around education facilities.
- 6.27 As such, Condition CH.3 as currently drafted, and the addition to CH.1 (referring to CH.3), are not accepted.

*Proposed Condition CH.4*

- 6.28 This condition relates to vehicles on Wairere Avenue being restricted to only travelling left out of the proposed site towards New North Road. I consider that issues such as truck routes are best covered in the OPW application, and while appropriate at the moment, may not be the case in 5 years time.<sup>12</sup> This condition is therefore not accepted.

*Proposed Condition CH.5*

- 6.29 This proposed condition relates to heavy vehicles being restricted during major events at the Mount Albert War Memorial Reserve. Once again, while I have no issue with the intent / purpose of this condition, I consider that issues such as restriction in days of operation, in my

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<sup>12</sup> In addition, it is considered that this condition as proposed is inappropriately located under "Construction Hours Conditions" rather than "Traffic Management Conditions". However, as the proposed condition is not accepted this does not appear to matter.

experience, are covered in the OPW application. While appropriate at the moment, this may not be the case in 5 years time. However this site (together with the Western Springs site) are unique in that they do have major events. As such, I consider it may be appropriate to include an additional item in proposed condition TM.2 relating to managing effects near large scale events as follows:

- (g) Measures to manage any potential construction traffic related effects on pedestrians and/or traffic associated with large-scale events in parks and reserves.

### **Lyon Avenue Site**

6.30 As discussed in my evidence above, various access options into the proposed Lyon Avenue site have been assessed in detail. Overall, from a *traffic engineering* perspective I consider that the best option is the selected Option 1 (Morning Star Place) in terms of network connectivity, pedestrian safety and vehicle capacity.

6.31 The Council Pre-hearing Report concludes as follows in relation to this site:<sup>13</sup>

The author supports the use of Morning Star Place as temporary access to the Lyon Avenue site due to potential impacts on the operation of Mt Albert Grammar School sports field. The AEE notes that the construction works at Lyon Avenue are expected to have a less than minor effect on the operation of the surrounding road and pedestrian network during the works period, subject to proposed mitigation measures.

6.32 I agree with this conclusion.

### **Council Pre-hearing Report Summary**

6.33 Overall, I am satisfied that any potential traffic effects can be adequately mitigated through the OPW process and support Watercare's Proposed Designation Conditions attached to the evidence of Ms Petersen.

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<sup>13</sup>

Council Pre-hearing Report at page 197.

## **7. CONCLUSIONS**

- 7.1 Any potential traffic effects associated with the Project can be effectively managed through mitigation and Watercare's Proposed Conditions and the OPW process provide for this to occur.
- 7.2 There is nothing in the Council Pre-hearing Report, or in any of the submissions, that would lead me to change my views and conclusions expressed in the Traffic Report which was attached to the AEE or the further Section 92 information provided to the Council and other parties.
- 7.3 For all of the reasons outlined in this evidence, and in my Traffic Reports and Section 92 response, I support the Notices of Requirement and Resource Consents sought by Watercare relating to the Central Interceptor Project and confirm Watercare's Proposed Conditions are appropriate.

**Leo Hills**  
**Traffic Design Group Ltd**

**12 July 2013**