The Coordinator-General

The Legacy Way Project (formerly known as Northern Link Road Tunnel)

Coordinator-General's report on project changes

December 2010

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1 Introduction

1.1 Background

The Legacy Way, (LW) formerly known as the Northern Link Road Tunnel Project,[1] will involve construction of two tunnels, both under five kilometres in length, linking the Centenary Motorway at Toowong with the Inner City Bypass (ICB) at Kelvin Grove. The project also includes associated works such as two ventilation stations and outlets and a tollroad control centre (TCC).

LW was declared to be a significant project under section 26(1)(a) of the *State Development and Public Works Organisation Act 1971* (the SDPWO Act) on 2 November 2007.

Following consideration of the project's environmental impact statement (EIS) and comments made on the EIS by members of the public, stakeholders and government agencies, the Coordinator-General's report evaluating the EIS was completed on 23 April 2010. The report found that the project could proceed, subject to compliance with conditions and recommendations made by the Coordinator-General to mitigate project impacts.

The report noted that the proponent had not yet chosen its construction contractor, but that the successful tenderer would be responsible for the project's detailed design. Accordingly, any amendments to the reference design (RD) assessed during the EIS process would likely require a Coordinator-General's project change report, prepared under Part 4, Division 3A of the SDPWO Act.

On 25 October 2010, the proponent provided the Department of Infrastructure and Planning (DIP) with an application for project changes (APC) as per section 35C of the Act. The application requested the Coordinator-General assess proposed design and delivery changes.

On 30 October 2010, the Department of Infrastructure and Planning (DIP) advertised a request for submissions from the public on the project changes, with submissions invited until 19 November 2010.

On 29 November 2010 Brisbane City Council (BCC) supplied the Coordinator-General with further information on the project changes (FIAPC) in a document that responded to key issues raised in submissions.

This document, the *Coordinator-General's report on the Legacy Way project changes*, provides the Coordinator-General's decision on the project changes. The assessment has been made having regard to the SDPWO Act, the APC, the FIAPC, discussion and correspondence between the proponent and DIP, the EIS, public

[1] The project was re-named by the Lord Mayor on 10 November 2010, with a pledge to provide part of toll charges to support Legacy.

submissions and comment, input received from government agencies on the changes, and an independent review of the alignment changes undertaken by Parsons Brinckerhoff.

1.2 The proponent

The project proponent is Brisbane City Council (BCC). On 20 September 2010, BCC selected a preferred contractor for the design, construction, operation and maintenance of the project.

The contractor is Transcity Joint Venture (Transcity), which includes the Spanish infrastructure company, Acciona, Australian construction firm, BMD Constructions, and Italian tunnelling experts, Ghella.

Transcity has been contracted to deliver and operate the project as BCC's agent for a 10-year period.

2 Description of proposed changes

As part of its winning bid, Transcity proposed various changes to the project's RD related to design and delivery methods. Its rationale was to increase project efficiencies while working to reduce the cost of public-funded infrastructure.

The tendered design is substantially the same as the RD and is consistent with the original project's objectives.

Following is an overview of the key project changes proposed by Transcity in the APC. Section 4: Evaluation of environmental effects, provides an assessment of the changes.

2.1 Construction method changes

For the tunnels, the key construction method has changed. Both tunnels will now be lined with pre-cast, reinforced concrete rings installed by the two tunnel boring machines (TBM). Previously it was proposed to cast a concrete lining in place as excavation occurred.

The tunnels' underground cross passages and substation sites would remain drained. Overall, the inflow of groundwater to the changed project due to the changed construction method would be at a lower rate than estimated for the RD, reducing from an estimated four litres per second to three litres per second.

In terms of elastic settlement of the tunnels post-construction, BCC advises the changed construction method will result in either no change or possibly lower settlement than previously estimated, due to the immediate and permanent support provided by the concrete rings.

Due largely to the proposal to line the tunnels with pre-cast segments, the construction phase will increase from 45 months to 49 months, from December 2010 to December 2014. Formal commencement of construction (excluding pre-construction works) of the project is scheduled to start from February 2011.

2.2 Project changes: overview

2.2.1 Horizontal alignment

Figure 2.1 provides the proposed new alignment, which is a key project change. This would provide a straighter, more direct route between the tunnel connections to the Centenary Motorway (CM) and the Inner City Bypass (ICB). The straighter route has become possible by not having to allow for local connections at Toowong and Kelvin Grove as was the case for the original RD version of the project proposed when the EIS was released.

The overall project length, including tunnel entry and exit transition ramps, remains at approximately seven kilometres; however, the length of the tunnels is shorter. The westbound tunnel (with its entrance at the ICB, travelling west to the CM) would be shorter by about 400 metres. The eastbound lane, travelling to the ICB, would be decreased by about 20 metres. Both changes are due mostly to the straighter route and the reduction of cut and cover required at the tunnel ends given the shallower alignment.

The main alignment between the connections would differ from the RD by commencing at the western side of Mt Coot-tha Road, approximately 100 metres north of the RD alignment (see top of figure 2.1). The main alignment would pass under the Toowong Cemetery in a straighter route than the RD, then swing up to 300 metres south of the RD to connect with the ICB on the southern side of Normanby Terrace, at a location close to that proposed in the RD.

The straighter alignment will result in a reduction in the number of affected properties. Whereas the RD identified 374 properties that would need a volumetric (subsurface) easement due to the tunnels passing under properties, this has been reduced to 334.

Of these 334 properties, 269 are newly affected, including 6 Council-owned properties. Sixty-five properties that were affected by the RD continue to be impacted.

As with the RD, no surface acquisitions of private properties will be required.

2.2.2 Vertical alignment

The vertical alignment of the tunnels is proposed to be shallower for most of the route, except for the section from Cairns Terrace, Kelvin Grove Road and Normanby Terrace, in the vicinity of the ICB connection (see base of figure 2.1).

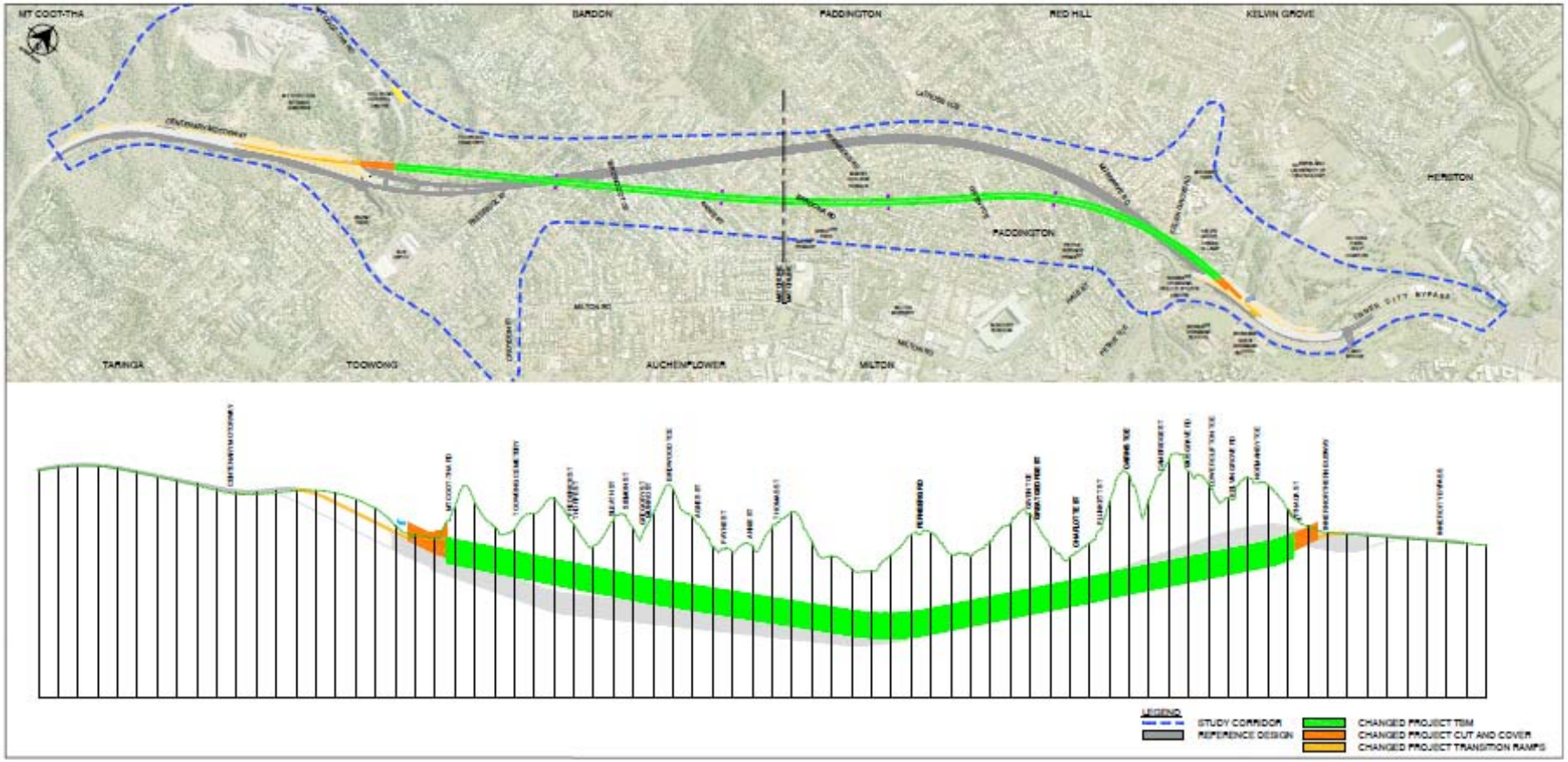

Figure 2.1 General alignment—changed project

BCC states this is due to the topography of the area of the new horizontal alignment and design changes to optimise the tunnel gradients.

The APC provides that flatter or 'easier' grades within the main tunnels in the changed project would provide for more efficient flows for all traffic, but especially for heavy commercial traffic inclined to slow on steeper grades. Consequentially, there would be improved safety and some reductions in vehicle emissions.

2.2.3 Centenary Motorway connection changes

It is now proposed that the entry and exit portals of the project tunnels be located in the centre of the motorway corridor. Realignment of the eastbound lanes of the CM to the north is also proposed.

The key benefit for the change in location of the CM (western) connections is that the construction works including the launch of the TBMs could occur offline from CM traffic thereby removing disruptions. The construction of the surface works, such as the realigned eastbound lanes of the CM could also occur offline, requiring a single traffic switch to the ultimate alignment on completion of the works.

The APC states the changed connection would avoid construction through Mount Coot-tha Road and its roundabout and will consolidate the construction area. As well as simplifying construction traffic management, the approach will provide improved grades for the associated cut and cover and transition structures to the CM.

With the realignment of the CM eastbound lanes, and the positioning of the tunnel entry and exit portals in the centre of the motorway corridor, the ventilation station, ventilation outlet and water and power utility area would move further west into the rising ground along the edge of the Brisbane Botanic Gardens Mount Coot-tha (the botanic gardens).

The above-ground ventilation outlet would be relocated approximately 43 metres north-west of the position proposed in the RD. The ventilation station would be buried to mitigate its visual impact and landscaped over, enabling it to be included in the future expansion of the botanic gardens.

Due to the changes, the worksite in the vicinity of the CM (the western worksite) will increase from approximately four hectares to six hectares in size, extending to the edge of the botanic gardens to the west of Mt Coot-tha Road. Additional site access to and from the western worksite from Mt Coot-tha Road for light vehicles is now proposed.

Due to the portal location and alignment changes, there is no longer the requirement for tunnel construction through Anzac Park or the pedestrian/cycle bridge or pathway along the CM.

The TBMs will be assembled within the western worksite on the CM boundary of the botanic gardens. Surface works will be undertaken during standard construction

hours (6.30 am to 6.30 pm, Monday to Saturday), with TBM works able to occur 24 hours a day, seven days a week.

As with the RD, a spoil conveyor belt will transport the majority of the TBM spoil to the Mount Coot-tha quarry. This operation is also proposed to be near-continuous.

2.2.4 Ancillary works

Anzac Park temporary construction workforce parking

Construction workforce parking for up to 300 cars in Anzac Park was proposed in the APC, provided by BCC in response to Coordinator-General's Report condition 18(k) (schedule 3) which prohibited workforce parking in local streets and required off-street parking to be provided. In the FIAPC document, BCC reduced the size of the construction carpark to a maximum of 200 car spaces.

Tollroad control centre

BCC proposed in the APC to locate the TCC at a site opposite the botanic gardens on Mount Coot-tha Road.

The APC provided that the TCC is a building required for the project's operations phase. It is where tunnel monitoring would occur, with the building required to be occupied by a small number of staff 24 hours per day. Maintenance of items such as ventilation fans would occur at the location, and maintenance vehicles would be stationed on site.

BCC acknowledged in the FIAPC document its decision to seek an alternative location for the TCC in light of public feedback on the suitability of the proposed site. The Coordinator-General has treated this change as withdrawn, and therefore has not assessed or made any decision in respect of this change. An alternative TCC location will now be subject to a separate change request process under Part 4, Division 3A of the SDPWO Act.

Project office and visitor's centre

The APC provided that a construction project site office and associated visitor's centre was proposed to be located on a site along Sir Samuel Griffith Drive.

BCC has since advised that for commercial reasons, the use of the proposed site is no longer possible. The preferred alternative is to use established office space with sufficient parking located close to the project works. Given no construction works will be required, this matter is no longer required to be considered in the assessment of changes.

2.2.5 Inner City Bypass connection changes

Rearrangement of the tunnel connections to the ICB is proposed to accommodate the location of the entry and exit portals of the tunnels into the centre of the ICB, which is a change to the RD. This change would require the eastbound lanes of the ICB to move to the north.

The transition ramps between the LW portals and the ICB would be together in the centre of the ICB and extend from in line with the Brisbane Girls Grammar School (BGGS) to the tunnel portals between Victoria Park Road and the Inner Northern Busway (INB) overpass (see figure 2.2).

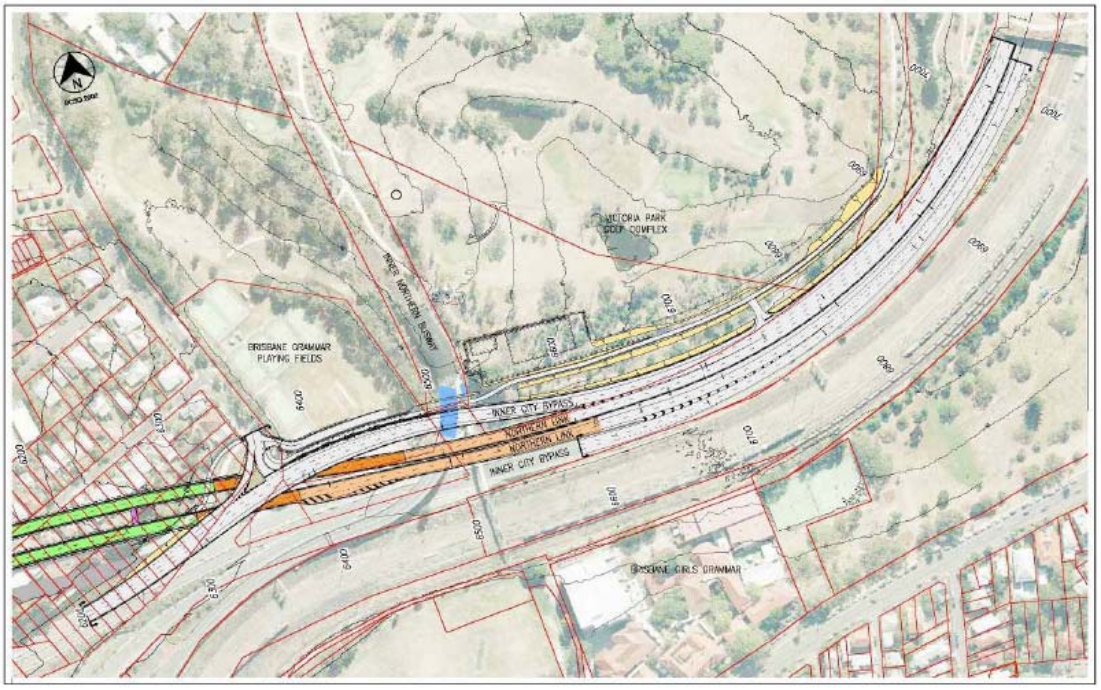

Figure 2.2 Changed project—eastern connection overview

The realignment of the eastbound ICB lanes would require a widened median and would therefore involve increasing the land required over the Brisbane Grammar School (BGS) playing fields. A new span for the INB would also need to be constructed. Construction of a temporary bridge for buses is proposed to ensure use of this section of the INB is not unduly interrupted.

BCC states the benefits for the rearranged tunnel entry and exit portals would include a reduction in disruption to ICB traffic flows during construction and more efficient connections and grades between the changed project and the ICB. It would create better sight lines for merge and diverge conditions and enable the westbound tunnel cut and cover section to be reduced by 300 metres.

The eastbound tunnel exit portal would be located 60 metres further east nearer to the INB overpass. The westbound entry portal would be located 300 metres further west, in line with Victoria Park Road.

The location of the eastern ventilation station and ventilation outlet would be unchanged. Access to the eastern ventilation station would be from the eastbound carriageway of the ICB (also unchanged).

The existing pedestrian bridge that spans the ICB in this area would need to be extended due to the realigned eastbound ICB lanes.

2.2.6 Spoil quantities and transportation

In terms of spoil to be extracted due to the excavation of the tunnels, the changed project will result in an increase of less than one per cent of spoil amounts estimated for the RD. This is due to the slightly larger tunnel size required to install the tunnel rings, with the tunnel size increasing from 12 metres to 12.4 metres, and changes to the location of the western worksite.

Total spoil for the project would now be in the order of 1 275 500 bank cubic metres[2]. Of this, 1 083 700 bank cubic metres (85 per cent) will be produced through tunnel excavation, with:

- 932 000 bank cubic metres (86 per cent) to be transported to the Mount Coot-tha Quarry via a conveyor
- 151 700 bank cubic metres (14 per cent) trucked to spoil receiver sites (being unable to fit within the quarry)

The remaining 191 800 bank cubic metres of spoil resulting from surface works consists of:

- 151 300 bank cubic metres of western connection spoil trucked to spoil receiver sites

[2] Bank cubic metres is a measure of volume representing one cubic metre of rock or material in the ground before it is excavated.

- 40 500 bank cubic metres of eastern connection spoil trucked to spoil receiver sites.

For tunnel backfill purposes, 95 000 bank cubic metres (nine per cent) of tunnel excavation spoil will be returned post-processing offsite as infill to the base of the tunnel.

As part of the project changes, BCC proposes to permanently leave in place the spoil transported to the quarry as part of the quarry's future restoration. Previously, the material was to be processed and conveyed off site. Consequently, there will be up to 83 400 fewer truckloads associated with spoil transportation entering and leaving the quarry than proposed for the RD.

3 Public notification and consultation

3.1 Public notification

Given that a number of the proposed amendments will affect people differently, the Coordinator-General required public consultation to be undertaken on the changes. On 30 October 2010, an advertisement was placed in *The Courier Mail* inviting submissions on the proposed changes. Submissions were able to be received until 19 November 2010.

Gaining an understanding of issues of interest has informed decisions within this report on the APC, and conditions have been set to manage any impacts. Following is an analysis of issues of interest that were raised in submissions.

3.2 Analysis of submissions received

Five hundred and fifty submissions were received. Table 3.1 summarises the number of submissions made.

Table 3.1 Public and agency comments on the project changes

Agency	Submissions received
Queensland Government	**7**
Queensland Police Service Department of Employment, Economic Development and Innovation Department of Community Safety Department of Transport and Main Roads Department of Environment and Resource Management Queensland Health Queensland Treasury	
Stakeholder and community groups	**8**
Brisbane Grammar School (BGS) Brisbane Girls Grammar School (BGGS) The Royal Automobile Club of Queensland (RACQ) Brisbane Central Business District Bicycle User Group (Brisbane CBD BUG) Friends of Toowong Cemetery Association Inc. The Brisbane West and Mt Coot-tha branches of the Queensland Greens Association for the Study of Peak Oil and Gas Orienteering Queensland	
Private individuals[1]	**535**
TOTAL	**550**

[1] Number of submissions received during the public consultation period, including those for whom extensions of time were granted. The figure excludes tabled petitions to the Queensland Parliament and signed petitions sent to DIP which are outlined below.

Table 3.2 provides an overview of the key issues raised in submissions from private individuals.

Table 3.2 Key issues: private individuals

Private individuals – key issues	Submissions received
Location of the toll road control centre (TCC) facility	367
Anzac Park	129[2]
Route and design of tunnel	31[3]
Other	8
TOTAL	**535**

[2] A submission received in relation to Anzac Park contained an additional 27 signatories.
[3] A submission received in relation to the route and design of LW contained an additional 15 signatories.

Key matters raised in submissions on issues of interest are discussed in further detail in section 4 of this report: Evaluation of environmental effects.

Many submissions raised matters that do not relate to the project changes, such as project viability or the project's greenhouse gas impacts. Project-wide issues were dealt with in the Coordinator-General's report on the EIS that assessed the environmental, social and economic effects of the project as a whole.

For the purposes of this Coordinator-General's assessment of the APC, only issues relevant to the changes have been evaluated in this report.

Petitions

Four petitions were received about the project changes.

Three petitions on the proposed changes were tabled to the Queensland Parliament:

- Save Ada Park (opposing the TCC), 2583 signatories, a paper petition which was tabled on 23 November 2010.
- Save Ada Park, 719 signatories, an e-petition tabled on 23 November 2010.
- Anzac Park, 591 signatories, an e-petition tabled on 25 November 2010.

A further petition was received by DIP:

- 'Stop the Northern Link project tunnel under Paddington', with 76 signatories, received by DIP on 19 November 2010.

4 Evaluation of environmental effects

This section provides an overview of the key changes, discusses input from submissions (from members of the public and advisory agencies) on the changes and contains the Coordinator-General's assessment of the changes.

Note that this evaluation should be read in conjunction with the Coordinator-General's report on the EIS for the project (April 2010), which provides detailed analysis of matters such as vibration, noise, air, water, traffic and community impacts and associated mitigation measures. The following assessment builds on the analysis already undertaken in that report.

4.1 Transport and traffic

Changes to the project will alter the construction traffic profile from that proposed in the EIS phase, with differences to amounts of heavy vehicle haulage of materials to and from worksites.

In addition, the preferred placement sites for spoil delivery have changed from Swanbank in the west to an approved landfill site at Rudd Street, Oxley and from Port of Brisbane in the east to Australia Trade Coast development land at Pinkenba.

The APC notes other suitable locations may be identified during the course of the project and would be subject to complying with Coordinator-General's report conditions 16 and 17 (schedule 3).

Table 4.1 and Table 4.2 provide an overview of the changed transportation profiles for both eastern and western work fronts.

4.1.1 Proposed change

Western worksite

For the western works in proximity to the CM:

- The RD proposal to concrete seal the tunnels would have required 23 333 truckloads of concrete and 2520 truckloads of shotcrete, being a total of 25 853 truckloads.
- The changed project's use of pre-cast concrete rings will require 8600 truckloads for ring deliveries and 2520 truckloads for grout, being a total of 11 120 truckloads.
- The RD and changed project both propose using part of the spoil for tunnel backfill. The spoil will be taken off site, treated and returned to site by truck. For the RD, 13 300 truckloads were required for this activity. For the changed project, 10 200 truckloads will be required, resulting in a reduction of 3100 truckloads.
- Due largely to the requirement for the tunnel size to be increased from 12.0 metres to 12.4 metres (to accommodate the installation of the concrete rings

lining), an additional 38 000 bank cubic metres of spoil will need to be hauled for the changed project. This will equate to an extra 2900 truckloads.

- Overall, the change will result in a reduction of almost 15 000 truckloads (30 000 truck movements) at the western worksite, or four truckloads less per hour averaged over the construction period.

Eastern worksite

For the eastern works near the ICB, the amount of spoil to be removed has increased by 1100 truckloads, or from 0.3 truckloads to an average of 0.8 truckloads per hour (around 2 truck movements per hour).

This is due largely to spoil estimates associated with the partial burial of the ventilation station, which was not accounted for in the RD.

The duration for the haulage of spoil for the eastern section has reduced from the RD's 23 months to 15 months. This reduction is predominantly due to the reduced length of cut and cover tunnelling works required on the tunnel's westbound carriageway.

Table 4.1 Overview: truck movements: western and eastern worksites

Reference Design		
Criterion	**Truckloads**	**Truckloads per hour**
Western worksite		
Spoil haulage	20 400	6
Tunnel lining (shotcrete, concrete)	25 853	6
Invert backfill material	13 300	6
Subtotal truckloads	**59 553**	**18**
Eastern spoil truckloads	**2000**	**0.3**
Total truckloads	**61 553**	
Changed project		
Criterion	**Truckloads**	**Truckloads per hour**
Western worksite		
Spoil haulage	23 300	7
Tunnel lining (rings, grouting)	11 120	3
Invert backfill material	10 200	4
Subtotal western truckloads	**44 620**	**14**
Eastern spoil truckloads	**3 100**	**0.8**
Total truckloads	**47 720**	

Table 4.2 provides the changes to the number of truckloads from the RD to the changed project.

Table 4.2 Overview: truck movement changes: western and eastern worksites

Changed project		
Criterion	**No. truckloads**	**Truckloads per hour**
Western worksite		
Spoil haulage	+2,900	+1
Tunnel lining	-14,733	-3
Invert backfill material	-3,100	-2
Subtotal western truckloads	**-14,933**	**-4**
Eastern and ICB spoil	+1,100	+0.5
Total change to truckloads	**-13,833**	

The APC states that general material deliveries and tunnel components (such as asphalt, smoke duct segments and waterproofing membranes) are largely the same as proposed in the RD.

Overall, construction works will require around 47 720 truckloads (95 440 truck movements) of materials over the duration of the project, with the changes resulting in a reduction of almost 14 000 truckloads (or 28 000 truck movements) from the number proposed in the RD.

Western worksite: vehicle access

The APC states that transportation of spoil and materials would remain unchanged from the RD, with access and egress being a left-in, left-out to and from the eastbound section of the CM.

Heavy vehicles that had made deliveries or transported spoil would exit the worksite entering the left lane of the CM, merge to the right lane in preparation for entering the Mount Coot-tha Road roundabout to make a return journey west along the CM.

The changed project proposes an additional light vehicle access from the western worksite to Mount Coot-tha Road (see Figure 4.1).

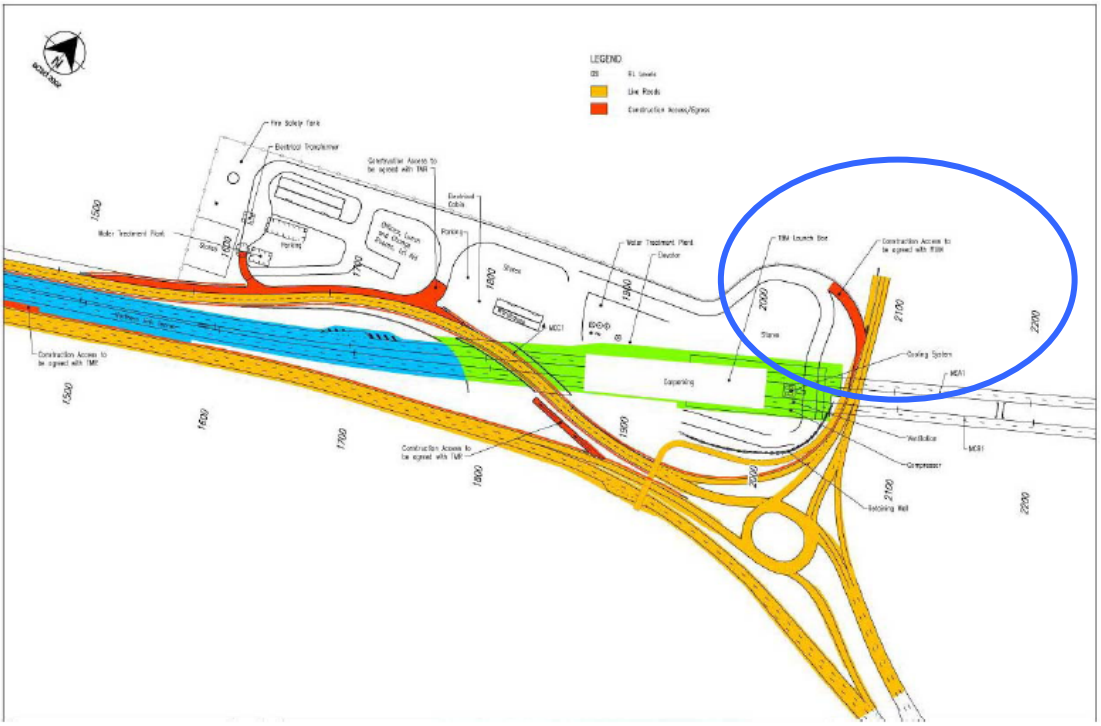

Figure 4.1 Western worksite (light vehicle access circled)

4.1.2 Agency position

The Department of Transport and Main Roads' (TMR) submission on the project changes stated:

- No heavy vehicles should exit from the western worksite directly on to the CM due to safety and efficiency (traffic congestion) considerations. It was suggested that instead, the proposed light vehicle access to Mount Coot-tha Road be upgraded, possibly with lights installed; and traffic management systems applied to minimise speed differentials for heavy vehicles traversing the Mount Coot-tha Road roundabout.
- Use of B-doubles to transport rings to site is subject to an application to TMR for approval of this use.
- As with the RD, spoil transportation routes are subject to TMR's agreement via its approval of the construction traffic management plan (CTMP).

4.1.3 Proponent's further information

In further information provided to the Coordinator-General, BCC noted that with regard to alternative access to the western worksite being via Mount Coot-tha Road, this may incur traffic disruptions on the road and potential conflicts with pedestrian and cycle routes and botanic gardens traffic if not appropriately managed. Further investigations and design are therefore to be undertaken to ascertain if the current proposal to egress from the worksite on to the CM can be achieved.

4.1.4 Coordinator-General's conclusions

The intent of the traffic management conditions imposed in the Coordinator-General's report remain relevant in requiring the proponent to construct the project in accordance with mitigation measures that will control the size and flow of construction traffic (such as condition 14—Environmental Management and condition 16—Traffic Management (schedule 3)).

Overall, construction will require around 47 720 truckloads of materials over the duration of the project, with the project changes resulting in a reduction of almost 14 000 truckloads, or 28 000 truck movements. This approach is commended for the associated reduction in dust, noise, road use and vehicle emissions.

In addition, the shorter cut and cover works proposed for the eastern connection will result in a reduction of spoil haulage by seven months, which will reduce disturbance to the local community and road users. While spoil haulage will increase from an average of 0.3 to 0.8 loads per hour for the duration of the works (or an additional 1100 truckloads) this is a marginal increase to a relatively small number of truck movements.

While the location of sites that will receive spoil has changed from the RD, the alternatives are in the same areas and are in accordance with the Coordinator-

General's report conditions that require spoil haulage routes to rely upon arterial roads, directing traffic away from residential areas where possible.

Condition 4 of this report notes that any spoil destination must have relevant approvals to receive the spoil, and states that the Department of Environment and Resource Management (DERM) must be notified of any spoil location changes. Spoil handling and transportation must still be undertaken in accordance with the Coordinator-General's report conditions, including 17—spoil handling and placement, and condition 16—traffic management, to minimise impacts.

With regard to TMR's recommendation that no heavy vehicles should exit from the western worksite due to safety and traffic efficiency, this is subject to further negotiation between the proponent and TMR. As detailed design is progressed, further work is currently being undertaken to ascertain if this use can be undertaken safely and with minimised implications for traffic movements.

However should the proponent not be able to demonstrate to TMR's satisfaction that heavy vehicles could safely exit on to the CM from the western worksite, community consultation on the proposal to allow truck movements via Mount Coot-tha Road will need to occur. This would be undertaken within a Coordinator-General's project change assessment process. Condition 7 of this report provides this requirement.

Condition 16 (schedule 3) of the Coordinator-General's report remains in force, requiring the proponent to secure agreement with TMR on the construction traffic environmental management plan (EMP) sub-plan. This plan will include proposed spoil transportation routes and list the type of heavy vehicles that will be used to transport materials to site. The proponent will be required to demonstrate these activities present no unacceptable impacts to the road network.

4.2 Spoil delivery: conveyor to quarry

As required by the Coordinator-General's report (condition 17(b)(ii), schedule 3), the alignment of the spoil conveyor system, which will transport material to the quarry, has altered to move it further away from the botanic gardens' public areas. At 1.5 kilometres, the conveyor will be approximately 500 metres longer than proposed in the RD (see figure 4.2).

Figure 4.2 Changed project—spoil conveyor route and stockpile design

The conveyor will travel from the spoil handling shed in the western worksite and travel for 630 metres adjacent to the motorway, in an area required for future expansion of the CM. Clearing of vegetation will be necessary to install the conveyor, however as this section is a road reserve, the APC states approvals under the *Vegetation Management Act 1999* (VMA) will not be required. This vegetation would have been cleared in the future for motorway expansion.

The conveyor will then continue approximately 550 metres along the western boundary of the botanic gardens to the quarry.

Approximately two hectares of vegetation clearing will be undertaken in this section, with VMA, *Natural Assets Local Law 2003* (NALL) and *Nature Conservation Act 1992 (*NCA) permits required for the vegetation along the botanic gardens boundary. 1.3 hectares of the vegetation has been mapped under the VMA as being 'of least concern'.

Spoil delivery from the conveyor to the Mt Coot-tha Quarry would be near-continuous for approximately 13 months, from February 2012 to April 2013, as it will be associated with the TBM operations, which can be undertaken at all times. The APC states the conveyor will be able to be operated in accordance with the Coordinator-General's condition 22, which covers long-term night time noise limits.

BCC has proposed a change to the treatment of spoil conveyed to the quarry from the tunnels, providing that the spoil will be used for rehabilitating the quarry rather than being treated as a re-usable resource.

Spreading and compacting the tunnel spoil within an allocated area of the quarry, will be undertaken in accordance with existing operation times of the quarry allowed under its permit approval with DERM (i.e. from 7 am to 5 pm, Monday to Friday). Outside of these hours, spoil will be deposited from the conveyor into the pit but will only be moved during quarry operating hours, thereby reducing noise impacts on nearby residences.

The APC states if the conveyor breaks down, spoil can be held on site for 48 hours at a spoil handling shed located in the western worksite before being trucked off site. However, partial trucking would need to occur during this period to avoid disrupting the TBM operations.

4.2.2 Agency position

DERM stated that it generally supports the conveyor belt method as it would reduce the environmental footprint associated with managing the material. DERM advised that design of the structure should be undertaken to ensure compliance with acceptable noise limits.

Around 195 000 bank cubic metres of spoil will be taken from under state-owned land (mainly the Toowong Cemetery). This will require investigation with DERM to determine if payments to the State Government are required under terms of the *Forestry Act 1959*.

4.2.3 Coordinator-General's conclusions

If the conveyor system was not implemented, all tunnel spoil would need to be transported by road, equating to 450 truckloads per day (at peak production) or a total of approximately 83 400 truckloads over an approximately 14-month period. Clearly, use of the conveyor system will achieve a good environmental outcome through the reduction of traffic movements, potential noise and dust, and vehicle emissions.

It is noted the nearest residential dwelling to the Mt Coot-tha quarry (located on Sir Samuel Griffith Drive) is approximately 330 metres from the proposed spoil stockpile in the quarry. Condition 17(b) of the Coordinator-General's report requires the conveyor system to be designed, constructed and operated to comply with schedule 3 conditions, which includes requirements to minimise air and noise disturbances. An additional condition 17(i) has been imposed in this report, which requires operation of the conveyor and the placement of spoil to be in accordance with conditioned noise limits.

Should the spoil conveyor system break down and temporary hauling of spoil occur, this would be required to be undertaken in accordance with relevant Coordinator-General's report conditions for the management of noise, dust and transportation, including condition 17: spoil handling and placement.

New condition 17(h) included at appendix 1 (condition 4) notes activities within the quarry will be the responsibility of the quarry manager. Given BCC is both the project proponent and quarry operator, managing compliance with conditions to minimise disturbance to residences will be a relatively straightforward process for DERM as the environmental regulator.

In terms of spoil to be taken from under state-owned land, the proponent and DERM will need to discuss whether payments to the State Government are required under terms of the *Forestry Act 1959*.

While not a project change, this matter is addressed in the Coordinator-General's report, which notes the proponent is obliged to obtain all necessary approvals and licences from all relevant authorities as required under any Act. Similarly, the proponent will be required to secure all necessary approvals for the clearing and offsetting of listed vegetation as per state and local laws.

4.3 Centenary Motorway interface

Traffic impacts of access to and from the western worksite adjacent to the CM are discussed separately in section 4.1.1.

4.3.1 Key changes

Key changes provided in the APC include:

- entry and exit tunnel portals and transition ramps to be located in the centre of the motorway and approximately 60-100 metres further north to the RD
- realignment of the CM eastbound lanes to the north and east (CM westbound lane unchanged)
- westbound tunnel merge arrangements with the CM will be shorter than the RD by about 150 metres
- movement of the ventilation outlet by 43 metres north-west. The structure will protrude 20 metres above the land's surface, as per the RD
- burial of the ventilation station
- western worksite to increase from four hectares to six hectares, extending further along the CM to the Mount Coot-tha Road edge of the botanical gardens.

The APC states the changes will result in the following benefits:

- construction traffic management will be simplified (CM works to be undertaken offline with no traffic impacts and only one switch to the new section required, post-completion)
- removal of tunnel-related construction through the Anzac Park wetlands, the pedestrian/bicycle bridge and path, the Mt Coot-tha Road and roundabout
- burying of the ventilation station, with restoration of gardens above the station, will further reduce the project's visual impact and will enhance the botanic gardens development in accordance with intentions for its future expansion; less amenity impacts due to burying of infrastructure
- given that for the RD, the TCC was proposed to be permanently located on this site, its removal alleviates encumbrance on the botanic gardens.

The APC notes the following detriments will result due to the project changes:

- realignment of the CM eastbound lanes to the north and east will have an edge effect on the botanic gardens
- additional clearing of vegetation required—from 1.6 hectares in the RD, to 15 hectares
- larger temporary worksite area required in botanic gardens from four hectares (RD) to six hectares.

4.3.2 Community response

A private submitter writing on behalf of a bicycle group, the Brisbane CBD BUG, noted it was commendable that the CM pedestrian/cycle overpass will not be impacted by the project changes.

A question was raised in the submission about the proposed use of the cyclist/pedestrian bridge by workers to access the western worksite; with this use not supported. The submitter acknowledged that should this use occur, workers will need

to be made aware of sharing the path with other users to ensure collisions with cyclists do not occur.

4.3.3 Agency position

TMR raised the following issues:

- The proponent needs to demonstrate the project works will not impact on future projects such as the Inner Orbital[3] and future upgrade of the CM to six lanes
- any additional assets transferred to the State Government (because of the design change) would have to be to TMR's agreement.
- CM access to/from the ventilation station is to be for emergency access only. Heavy vehicles requiring access during the operations phase are to be managed via traffic closures, with relevant permits obtained from TMR.
- Continued support was provided for the proposal to extend the pedestrian and cyclist pathway along Mt Coot-tha Road to the Ada Street entrance of the botanic gardens, and safety adjustments to Dean Street and Miskin Street pedestrian/cycle crossings.

4.3.4 Proponent's position

In a response to TMR's submission provided to the Coordinator-General and TMR, BCC stated discussions will be ongoing with TMR to resolve outstanding issues in accordance with existing requirements and conditions.

4.3.5 Coordinator-General's conclusions

- It is noted that work hours remain unchanged—for surface works, hours remain as 6:30 am to 6:30 pm, Monday to Saturday, with the TBM activities and spoil conveyor belt able to operate continuously, subject to compliance with conditioned noise limits.
- The western worksite is major construction area for assembling and launching of the TBMs. It is noted and supported that noise barriers up to six metres high will be placed along the edge of the worksite, buffering noise for gardens visitors.
- Agreement has been reached with TMR that operational access from the eastern carriageway of the CM to the western ventilation station is to be limited to maintenance vehicles only. The access will be subject to agreement and conditioned TMR approval within the project's Road Network Interface Agreement. Condition 8 (Appendix 1) provides this requirement.
- In terms of the project's design ensuring adequate provision for the co-location of future road network upgrades, the Coordinator-General's report condition 26(a) and (b) (schedule 3) requires the proponent's planning to include future road

[3] Future planning has identified requirement for an 'Inner Orbital' tunnel between the Centenary Motorway and Stafford Road at the Everton Park interconnector

projects. Some amendments to the conditions have been developed in consultation with TMR which update the conditions in accordance with the changed project design, while still ensuring the project works will not impede future state road works in the area (condition 18, appendix 1). In addition, new condition 26(a)(iii) (Appendix 2) provides the project's design speed is to be in accordance with the posted speed.

- While the project changes will result in a slightly larger temporary worksite footprint with an additional two hectares required, and a permanent increase in impacts on the edge of the botanic gardens adjacent to the CM, these changes are balanced by the associated removal of disturbance to the CM, Anzac Park and the Mount Coot-tha roundabout proposed in the RD. The worksite impact will be temporary and will not impact on public areas of the gardens.
- It is noted restoration of the worksite post-construction will facilitate expansion of the botanic gardens. The APC provides commitments that restoration will expand the public access area of the gardens. The restoration will be undertaken in consultation with botanic gardens management to ensure it accords with future expansion of the gardens.
- For workers using the pedestrian/cycle path overpass to travel to and from the western worksite, the submitter who did not support this proposal acknowledged that, should the use occur, workers will need to be made aware of the need to share the path with other users to ensure safe passage for all users is maintained.
- It is found that the Coordinator-General's report condition 16(g)(iii) (schedule 3, Appendix 2), which requires the proponent to ensure the construction traffic EMP incorporates measures to ensure pedestrian and cyclist safety and movements on routes adjacent to construction worksites, is sufficient to address this issue. The EMP will include the need to ensure workers are made aware of the need to walk to and from the worksite with due care of bicycle users in the vicinity. Therefore, no additional conditions on this matter are required.
- In terms of the submitter's suggestion that cycle groups be informed of proposed changes to pathways, as per new condition 9 (Appendix 1), it is recommended that the proponent consults with bicycle groups to communicate any proposed adjustments to bicycle path networks across the project, at least one month before such works commence.
- Approval by bicycle groups of the design for cycle path works was also requested; however, it is found that the Coordinator-General's report condition 24(d) (schedule 3, Appendix 2), which states the project's detailed design must provide safe, legible and convenient connections for cyclists, is sufficient to address this matter.

4.4 ICB interface

4.4.1 Key changes

The APC provides the key changes for works in the vicinity of the ICB (eastern works) are as follows.

Eastern worksite

The APC confirms and defines the area required for the eastern worksite and TBM extraction site. The APC further confirms that all Coordinator-General's conditions for minimising impacts, including construction times and acceptable levels of dust, noise and vibration will be complied with for works undertaken at the eastern worksite.

Eastern ventilation station and outlet

The location of the eastern ventilation station and ventilation outlet is unchanged from the RD. While not addressed in the EIS, access to the eastern ventilation station from the eastbound carriageway of the ICB has been proposed as a design development.

INB impacts

The realignment of the eastbound ICB carriageway would require restructuring of the existing INB bridge that spans over the ICB.

To minimise the effect on INB operations, the APC proposes a separate, temporary INB overbridge be built that would be used during the realignment of the ICB and construction of the final extended INB structure.

While the APC proposes any switches in INB traffic between the temporary and permanent bridges would occur at night to minimise disruptions, further information provided by BCC states that weekend closures may be required to effect the works. This will be required to be in agreement with Transcity and DTMR.

Pedestrian overpass

The existing pedestrian bridge over the ICB from the BGS would be extended over the realigned ICB lanes and connected to the realigned footpath surrounding the construction areas. Connectivity with the BGS playing fields and the Victoria Park pedestrian and cycle path will be maintained. Figures 2-45 and 2-46 of the APC provide the proposed change.

Noise barriers

The proponent states that preliminary modelling indicates compliance with the Coordinator-General's conditions on acceptable noise levels can be achieved by:

- increasing existing noise barriers adjacent to Normanby Terrace residences by an additional one metre
- installing two new noise barriers:

- one up to six metres high to the west of Victoria Park Road and
- one to the east of Victoria Park Road adjacent to the BGS sports fields (north of the ICB).

Figures 6-1 and 6-2 of the FIAPC provide further information on the proposed noise barrier locations and concept designs.

4.4.2 Community response

A number of submissions were received from the public on changes to the project design for the eastern connection of the project. Areas of interest raised in submissions include:

- parking—construction workers might park in Normanby Terrace
- pedestrian access—the pedestrian bridge over ICB to grammar schools is considered inadequate
- safety—safety and security issues in relation to the bikeway along the back boundary of the southern side of Normanby Terrace
- noise and vibration impacts on residents of Normanby Terrace and Kelvin Grove
- health impacts from noise and vibration due to the eastern portal being moved closer to residents. The existing noise barriers along the ICB are considered ineffective
- economic—financial impact on home businesses due to disruption from noise and car parking; residents mindful about the perceived negative impact the eastern portal may have on property prices
- air quality—dust impacts on air quality and health as a result of the eastern portal and ventilation outlet moving closer to residents of Normanby Terrace; impact from ultrafine particles in tunnels and from ventilation stacks; ventilation station should be buried to reduce visual impact for neighbouring properties
- traffic—construction vehicle access from Victoria Park Road; QUT buses to use the busway rather than Victoria Park Road; Kelvin Grove tunnel exit should not be removed on the grounds that it places more traffic on to the ICB and other inter-joining streets with traffic doubling back to access the north-west suburbs; move tunnel entrance along the ICB towards Herston
- light spill—some houses in Normanby Terrace may require special treatment depending on location
- other—security issues relating to theft/burglary; potential for property damage as close to surface tunnel construction activities; shared bike pedestrian path; beeping noise when trucks reverse; vegetation removal; landscaping at the ICB end of Victoria Park Road to lessen the visual and noise impact of the ICB
- land use—the proposed resumption of land used by BGS as playing fields

- the significant use (both temporary and permanent) of the school's playing fields during the four-year construction phase
- impact of noise levels on teaching. BGGS states no noise level measurements have been taken to determine current noise levels so as to make decisions on future noise mitigation barriers. Reservations that appropriate barriers will not be installed for construction and operation
- BGGS expressed reservations over changes to the design of the ventilation shaft (as no figure could be found in the revised EIS)
- concerns that air and noise monitoring data would not be publicly available post-implementation to ensure the continued provision of a healthy environment for students.

4.4.3 Agency position

With regard to the INB works, TMR states:

- The proposed new busway bridge span is to have design, construction and quality assurance methodologies approved by TMR prior to construction.
- The construction plan for these works is to demonstrate works can be done safely with little risk of unplanned delays.
- The construction verification process needs to observe all TMR hold and witness points by an independent expert.
- TMR is to be able to freely access the works for any inspections, with no tolls incurred for maintenance works.
- A traffic plan incorporating measures to minimise disruptions (for example, for medical staff travelling between hospitals after hours) needs to be approved by TMR. Alternative routes with costs for additional buses may need to be provided by the project. Contingency plans for unplanned delays need to be addressed. The traffic plan should detail that closures are to coincide with low use times.
- Arrangements to undertake construction on the busway are to be agreed with Translink (TL) and TMR.

4.4.4 Proponent's position

In general terms, the APC and FIAPC provide the proponent's commitment to work with residents in the area to minimise disturbance and undertake activities in compliance with conditions as made.

In response to issues raised in submissions, the FIAPC further provides:

- The existing footpath/bikeway along the back boundary of the southern side of Normanby Terrace will be realigned around the TBM extraction site to maintain access during project works; and will be restored to its existing alignment post-construction. The bikeway will be closer to residences as a result of the change, which raised the point in submissions that security could be an issue. BCC states

noise barriers will be placed along the rear property boundary of the properties in this section, which will improve security by preventing ready access to backyards.

- In response to requests to improve the standard of the pedestrian bridge over the ICB, BCC states that while the bridge structure beyond the extension will not be altered, a concrete footpath will be provided to link in with the newly aligned footpath/bikeway.

4.4.5 Coordinator-General's conclusions

The Coordinator-General's report on the EIS paid particular attention to the project's impacts on residences in the vicinity of the eastern works, given this area is the closest to project activities. Conditions on matters such as traffic, air, noise, and vibration impacts were provided to help minimise impacts.

It is noted that the eastbound tunnel exit portal has been moved about 60 metres to the east of the location proposed for the RD, moving it slightly away from some adjacent residences in Normandy Terrace.

The westbound tunnel entry has been moved closer to residences, generally in line with the eastbound tunnel exit portal and with the western boundary of the BGS playing fields. As discussed in the APC and detailed in figures 6-1 and 6-2 of the FIAPC, barriers will be increased behind residences adjacent to the ICB to buffer noise.

Further information provided on the barriers confirmed these will incorporate visual attenuation such as clear panels to allow sight and light through. While, in part, barriers are proposed to be higher, there needs to be a balance between minimising noise while not compromising amenity.

Conditions made in the Coordinator-General's report require works such as barriers and the ventilation system to be designed to minimise visual impacts (condition 24, schedule 3). Condition 18(m)(iii) (schedule 3) requires consultation with community liaison groups (CLGs) to discuss ways of mitigating visual impact of construction areas. Submissions from residents in this area confirmed a commitment to ongoing participation via representation on the area's CLG to provide input to the project as it is progressed, and this is encouraged.

BCC states that 3D modelling of noise impacts for the new portal and transition areas will inform detailed design to ensure compliance with conditions for operational noise (condition 31, schedule 3) is maintained.

Commendably, the reduced cut and cover works will shorten spoil haulage by about seven months, lessening the amount of disturbance for residents in the vicinity of the works.

In terms of the project's requirement to acquire a section of the playing fields leased by BGS, BCC states the project change would amount to an area of less than 1000 square metres, taking the total land required to approximately 3200 square metres.

This acquisition will need to be negotiated to ensure adequate compensation is achieved. By law, the process is required to be in accordance with terms of the *Acquisition of Land Act 1967* (ALA), which provides a fair and transparent process for both parties to determine the terms of acquisition.

A claim for compensation is generally assessed and prepared by an independent valuer on behalf of the claimant, with the proponent responsible for valuation costs. Where no agreement can be reached on compensation terms, the matter can be referred by either party to the Land Court for determination.

Following ongoing discussion with BGS regarding the project's land requirements, BCC advised a Notice of Intention to Resume (NIR) pursuant to the ALA was provided to the school on 19 November 2010. The issuing of an NIR commences the compulsory acquisition process. Given this process is underway and will be undertaken in full adherence to requirements of the ALA, it is neither necessary nor appropriate to condition this matter.

It is noted compensation for the project's impacts on the school's use of the playing fields, and contemplation of alternative sporting fields being established nearby (for example, on Queensland Rail property) are the subject of negotiation by the parties.

However, the school's request for the prompt provision of detailed information on timeframes for project development and the extent of impacts is reasonable to allow the school to plan its sport-based programs to best alleviate disruption that will occur due to the project works.

Condition 6 of this report (Appendix 1) requires the proponent to provide a range of information to BGS, including a program for land use and details of the use of the land. In addition, information on the timing for works in the drainage easement which will disrupt the school's use of some of its tennis fields are to be provided. Further, wherever possible, timing of the drainage works is to be sequenced to minimise disruption to the school's use of the areas.

This information is to be provided by the proponent in early 2011, which will work to inform the school's planning for the start of the school year.

As provided in the FIAPC, a construction traffic management plan (CTMP) will be developed in consultation with BGS to ensure access arrangements for pedestrians and cyclists are addressed. This requirement is included at condition 5 (Appendix 1) of this report, which requires disruption to the cycle path be minimised and procedures be established to ensure the community's safety in proximity to construction works. It is further required that consultation with other frequent path users, such as the BGGS, on the CTMP be invited.

In terms of potential disturbance due to project activities, conditions made in the Coordinator-General's report regarding maximum noise levels, air quality parameters for emissions and dust management practices such as those made in conditions 20 (air quality) and 22 (noise and vibration) (schedule 3) remain in force for the project changes to minimise impacts from the project.

It is noted the APC provides that noise barriers will not be required to mitigate noise to the schools located on the south of the ICB as the existing noise limits the project must comply with are achievable. However, as provided in the EIS, investigation of classroom facades at BGS and BGGS will be undertaken to determine actual noise attenuation and assess the need for further mitigation if compliance with noise limits cannot be achieved.

Should the proponent be unable to comply with condition 22 (construction noise) and condition 31 (operational noise), it will need to design workable solutions to achieve acceptable noise limits.

Regarding busway works, condition 3 (schedule 2) of the Coordinator-General's report states that the proponent will need to obtain approval from TMR prior to any interference with a busway. Consultation between the parties will be undertaken to inform this approval. Within this process, the proponent will need to address the design, construction, quality assurance and traffic management requirements TMR and Translink have for the new busway span. The state agencies have confirmed no further conditioning is required to address this matter.

No issues were raised in TMR's submission regarding access to the eastern ventilation station. However, this is subject to compliance with condition 16 (g)(xii) (schedule 3) of the Coordinator-General's report, which requires a road safety audit to be undertaken on all worksite entry and exit locations in accordance with Austroads guidelines, to ensure safe passage can be afforded.

4.5 Alignment changes

4.5.1 Key changes

The APC confirms the vertical alignment of the tunnels is proposed to be shallower for most of the route, except for the section in the vicinity of the ICB connection from Cairns Terrace, Kelvin Grove Road and Normanby Terrace (see base of figure 2.1).

BCC states this is due to the topography of the area of the new horizontal alignment and design changes to optimise the tunnel gradients.

The RD alignment as presented in the EIS was further north to provide for the shortest possible ramp connections at Toowong and Kelvin Grove Road. These ramps were removed from the RD in the supplementary report on the EIS (SEIS) following feedback received in submissions on the EIS. With the ramp connections now absent, the sole objective of the tunnels is to connect the ICB to the CM.

The straighter alignment means that the horizontal alignment of the mainline tunnels then moves further south within the study corridor. The elevation of the ground surface towards the southern end of the study corridor is generally lower, being closer to the Brisbane River. Therefore the changed project alignment, for the majority of the route, has less cover between the lower existing ground surface elevation and the top (crown) of the tunnel.

The APC states the shallower depths will improve traffic flow and operation of the project, with lengths of maximum grade reduced from the RD's five per cent. The changed project provides gentler grades, with the majority being around two per cent.

Regenerated noise

In terms of construction regenerated noise[4] the RD provided 434 properties may experience noise greater than the night time (10 pm to 6 am) noise objective of 35 dBA[5], whereas for the project change, a total of 523 properties are potentially affected.

The changed project due to shallower depths therefore results in a predicted increase of 89 potentially affected properties that may experience noise levels in excess of the noise objectives.

As per the RD, properties under which tunnelling will occur may be affected by regenerated noise for approximately 7–10 days while the TBM passes underneath.

Vibration

For vibration during construction, BCC states that analysis of potential impacts for the RD used data taken from a recent tunnelling operation with similar geology in Ireland.

For the changed project, the analysis has been reconsidered in light of construction data now available from the completed Clem 7 project. Despite the shallower depths, these results indicate a predicted decrease from 245 to 84 affected properties that may exceed the 0.5 millimetre vibrations per second guide for human comfort within sleeping areas.

These 84 affected properties would be within the 523 properties anticipated to be affected by regenerated noise. BCC advises generally, the 84 properties are those that would be situated over the mainline tunnels and cross passages where the structures are close to the surface.

Geology

The changes to the vertical alignment will result in shallower depths for the majority of the tunnels' route.

For areas including the Toowong Cemetery, Frederick Street, Toowong, and Charlotte Street, Paddington, the tunnel depth from surface to the tunnel's crown will be less than 1.5 times the diameter of the tunnel, or less than 18.6 metres.

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[4] Regenerated noise is created when vibration from tunnel excavations travels through the ground and causes a building's surfaces to vibrate, creating an audible noise.
[5] dBA – measurement of decibels (dB) that uses the standard 'A' weighting filter to determine sound pressure.

The APC provides that installing concrete ring segments, to provide an instant and permanent support system, will minimise impacts of ground movement around the tunnels. This would allow for construction through a wide range of ground conditions, from extremely weathered, low-strength rock to high-strength rock to be undertaken with low risk.

The project would undertake additional geotechnical investigation works along the alignment before completing the detailed design. Works will include up to 30 boreholes being made to investigate the geology in areas where limited geotechnical information exists.

Air quality

In terms of in-tunnel air quality during the operations phase, BCC states the changes will be in accordance with air emission levels assessed during the EIS phase and as per air quality conditions applied in the Coordinator-General's report.

Groundwater

Due to the construction method changes, the APC states overall, the inflow of groundwater to the changed project tunnels would be at a lower rate than estimated for the RD, reducing from an estimated four litres per second to three litres per second.

Settlement

Once the tunnels are constructed, the APC provides that estimates for elastic settlement of the ground surface are comparable to those of the RD, with less than five millimetres settlement predicted for the majority of the new alignment.

As with the RD, there are isolated areas with the potential for settlement greater than five millimetres. However, BCC estimates the risk of this occurring will be lessened given the project changes, in particular the changed proposal to install reinforced concrete rings as the tunnel support structure.

Cultural heritage

The heritage listed property 'Baroona' is no longer affected by the route. However heritage listed properties 'Boondah' and 'Cross Terrace' are now affected by the change in alignment.

4.5.2 Community response

Specific issues raised regarding the proposed alignment changes include:

- The impacts of tunnel construction vibration and settlement on residential properties located above the alignment. Some families may be required to move house for two weeks due to noise and vibration levels. This should be at the expense of the proponent. Any property damage should be rectified at the proponent's expense. Requested that specific property noise and vibration assessments are issued to property owners.

- The depth of tunnel construction in some areas in relation to properties is too close to the surface.
- Independent valuer to assess the valuation impact for volumetric resumptions.
- The lack of geotechnical information and potential impact from groundwater is a risk.
- There could be an adverse impact on property prices and quality of life due to the tunnel passing underneath residents' property.
- The alignment may place undue development constraints upon Rosalie Village.

4.5.3 Agency position

In its submission, the Department of Community Safety (DCS) stated that in delivering the changed project, the proponent will need to implement mitigation measures that will protect people and places from hazards and risks. These measures include developing emergency management planning procedures, and consulting with DCS for advice on matters involving fire engineering and prescribed fire safety systems/installations as design is progressed.

DERM stated in its submission 'adjustments to the project route and design will result in an increase in the number of residents being potentially adversely affected by regenerated noise. Many of these are newly affected residents.

It is recommended that the Coordinator-General ensure any approval contain conditions relating to noise complaint management and mitigation, including the inclusion of clear and transparent impact based triggers for suitable mitigation measures (including timeframes for implementation) and offers of temporary relocation of impacted residents.'

4.5.4 Proponent's position

The FIAPC notes in some locations, the predicted regenerated noise levels from TBM-driven tunnelling for the changed project may exceed the goals in the Coordinator-General's noise conditions, as was the case for the RD.

Measurements to improve the accuracy of the predictions and mitigation measures (e.g. temporary relocation of residents), in combination with community consultation, will be implemented to address any predicted noise level exceedences.

In terms of geology, the FIAPC notes that additional geotechnical investigations will be undertaken prior to construction, particularly in the shallower cover locations. It notes that appropriate risk mitigation measures will be implemented in the design and construction of the tunnel should these additional geotechnical investigations show unanticipated results.

In terms of concerns with development constraints for the Rosalie village, the FIAPC notes the changed project tunnel depths and location do not compromise any existing development rights.

4.5.5 Coordinator-General's conclusions

In terms of the proposed design change to use pre-cast concrete rings installed during the TBM works, the proponent states this method will provide better ground support and prevent the inflow of groundwater.

An independent technical review (IR) of the alignment changes commissioned by the Coordinator-General and undertaken by Parsons Brinckerhoff supports this method as an improvement.

Vibration and regenerated noise

The issue of vibration and noise was discussed in detail in the Coordinator-General's report on the EIS (section 4.2.2), and should be read in conjunction with this assessment. To build on this analysis in the context of the project changes, the key difference due to the shallower alignment is, when compared to the RD, the changed project alignment would increase the level of vibration at properties above and either side of the alignment.

However the APC provides that analysis of potential vibration impacts has now been updated in light of construction data since available from the completed Clem 7 project. The analysis of likely vibration levels has therefore been assessed using different data to the RD.

These results indicate that despite the shallower depths, there is a predicted decrease from 245 to 84 affected properties that may exceed the 0.5 millimetre vibrations per second guide for human comfort within sleeping areas.

The IR confirms that analysis of international data indicates vibration from the changed project will be incapable of inducing or promoting structural damage to any properties along the alignment. Despite this finding, the works will still require careful monitoring and particular attention to building precondition surveys, which will be undertaken at all properties above the alignment.

Table 14, condition 22 of the Coordinator-General's report (Schedule 3) provides a guide to vibration levels for minimal risk of cosmetic damage, with peak particle velocity of five millimetre per second for residential areas and two millimetres per second for heritage listed areas.

The potential impacts are therefore likely to be limited to short-term reduction in personal amenity.

Existing conditions in the Coordinator-General's report (tables 12 and 13, condition 22, sSchedule 3) include guides for satisfactory vibration levels for both human comfort and sensitive building contents. Vibration levels of 0.5 millimetres per second for sleeping areas during night time tunnelling are provided as a satisfactory human comfort level.

The condition notes that for sensitive building contents (such as optical microscopes) a guide of 0.5 millimetres per second is indicated as an upper bound satisfactory

vibration level, with large computer disk drives and sensitive electronic instrumentation having levels of from 1.0–5.0 millimetres per second.

For the majority of residences on the alignment, vibration is estimated to be less than 0.5 millimetres per second. It is estimated that 84 properties may be subjected to vibration varying between 0.5 millimetres per second and 1 millimetre per second.

The effect of such vibrations on properties are minimal and as would have been experienced in the RD.

The APC identifies the peak vibration from the TBM works at residential properties will be around 1 millimetre per second for the tunnel area around Charlotte Street, Paddington. For this section, the depth of the surface to the tunnel's crown would be approximately 12 metres.

For this and other sections of the alignment where there are residences above the alignment, the perceptibility of vibration from the tunnelling activities will vary according to factors such as the time of the tunnelling and the type of building.

Condition 22 in the Coordinator-General's report notes that, where predictive/actual noise modelling will be exceeded, specific mitigation and management measures must be designed and implemented in consultation with owners and occupants of potential affected premises. Condition 22 includes clear impact-based triggers for residence-based mitigation.

The project is conditioned to develop a noise and vibration EMP sub-plan that details the management measures. The measures may include temporary relocation of occupants or sensitive building contents and/or measures carried out at the premises to minimise the risk of damage.

The IR found no adjustments were required to the Coordinator-General's conditions with respect to vibration, finding that the existing conditions are considered appropriate to ensure the amenity of residents is maintained at acceptable levels. Near identical guidelines have been successfully applied to other tunnelling projects to ensure quality of life is maximised as well as ensuring the contractor applies best practice methods to minimise potential impacts.

In addition to potentially reduced amenity from vibration, vibration levels in the range of 0.5 millimetres per second to 1.0 millimetre per second may also manifest as higher than acceptable levels of regenerated noise. As per the RD, properties under which tunnelling will occur may be affected for approximately 7 to 10 days while the TBM passes underneath.

BCC states that the project changes would result in a predicted increase of 89 potentially affected properties (from 434 up to 523) which may experience regenerated noise levels of greater than the night time (10 pm to 6 am) noise objectives of 35 dBA. The 523 properties that may experience these greater noise levels would also include the 84 properties that may experience vibration at levels between 0.5-1.0 millimetres per second.

While vibration data for the changed project has been adjusted to take account of Clem 7 data, no regenerated noise data across the corridor was taken; therefore, analysis undertaken in the RD has been extended to apply to the changed project. Given the depths are shallower, the increased estimation results. As construction commences and monitoring of regenerated noise occurs, it may be found that the levels are indeed conservative and may result in a decrease from predicted to actual levels.

As per condition 22, predicted noise levels must be updated prior to construction along the corridor, to calibrate with results of actual data obtained. Advance notice to residents likely to experience greater than acceptable levels of noise would then need to be undertaken and mitigation strategies, including potential short-term relocation of residents, would need to be discussed and agreed.

As with the RD, the proponent is responsible for all reasonable costs for such mitigation measures, with residents affected by excess noise able to claim associated costs. This also applies to any additional residents who may be affected by the project's changed alignment.

Table 11 of condition 22 notes night time regenerated noise objectives of 40 dBA from 6:30 pm to 10:00 pm; and 35 dBA from 10:00 pm to 6:30 am. Where modelling predicts or demonstrates these objectives will be exceeded, the management measures detailed in the noise and vibration EMP sub-plan must be implemented. BCC has confirmed these measures, as well as temporarily relocating residents, could include operational activities being changed, for example:

- reducing tunnelling activities in sensitive locations (where noise and vibration impacts are predicted to exceed the night time sleep disturbance goals) to 6:30 am to 10 pm only)
- reducing the thrust of the TBM in sensitive locations which will reduce the vibration and hence regenerated noise impacts.

Condition 9 of the Coordinator-General's report required the establishment of an independent Community Liaison Representative (ICLR), with the nominee to be approved by the Coordinator-General. The ICLR's role shall include, but is not limited to, consulting with the proponent on consultation strategies, and being available for direct contact by the community during standard construction hours and periods of high noise impact activities. The ICLR will, to the greatest extent practicable, resolve community complaints.

The ICLR's role in working with residents, as noise impacts are better known during construction, will be key to addressing community concerns.

For the Toowong cemetery, BCC is of the view that the alignment change results in an improved alignment under the cemetery, with the tunnel traversing a section of the cemetery where fewer graves are located. The submission from the Friends of Toowong Cemetery (FOTC) noted the changed tunnel alignment creates the

maximum benefit to the Toowong Cemetery, reducing traffic in front of the cemetery's main gate.

FOTC noted that as with the RD, there are risks from construction and settlement to gravestones and burial voids that will need to be closely attended to. The FIAPC states that extensive geological investigation will be undertaken during detailed design which will inform construction measures. Should rock quality be an issue, ground improvement measures, such as micro-piling from the surface, may be undertaken. Existing monuments may be restored prior to tunnelling and propped or braced where necessary.

Condition 2 (schedule 1) of the Coordinator-General's report provides for management of works in culturally significant places, including the cemetery. A cultural heritage management plan (CHMP) must be developed prior to construction. Condition 10 (Appendix 1) of this report provides that the CHMP for the Toowong Cemetery must be developed in consultation with the FOTC.

Geology

As discussed, the changes to the vertical alignment will result in shallower depths for the majority of the tunnels' route.

For areas including the Toowong Cemetery, Frederick Street, Toowong, and Charlotte Street, Paddington, the tunnel depth from surface to the tunnel's crown will be less than 1.5 times the diameter of the tunnel, or less than 18.6 metres.

The IR notes by changing the alignment of the tunnel and generally reducing the level of cover to the tunnel crown, the alignment has been moved into more highly weathered and potentially weaker material. Such conditions can be associated with possible surface impacts such as structural damage.

The FIAPC notes that additional geotechnical investigations will be undertaken prior to construction, particularly in the shallower cover locations. Appropriate risk mitigation measures will be implemented in the design and construction of the tunnel should these additional geotechnical investigations show unanticipated results. BCC has further confirmed that in the cemetery location, this may result in a slightly deeper alignment being designed for this area should ground conditions require it.

BCC has confirmed the project has processes in place to ensure its construction methods are fit for purpose in relation to the conditions construction is to occur in. All design aspects of the project will be subject to independent third party review by the project's independent verifier (IV).

The IV is required to be experienced in construction and project management and, in particular, in verifying design documentation and construction for road and tunnel projects. The IV will be responsible for approving all aspects of the final design before each aspect is constructed, and verifying the project has been constructed in accordance with all approved designs.

In addition to the role of the IV, condition 14 (b) (appendix 2) requires nomination for the approval of the Coordinator-General of a suitably qualified and experienced independent environmental management representative (EMR) independent of the project design and construction personnel. Construction will be monitored by the EMR to ensure that the works are consistent with the Coordinator-General's conditions and all relevant legislation.

As a local government initiative, Council's own governance for matters such as project design will also be built into project processes. BCC has confirmed as proponent it will take an ongoing active interest in all aspects of the project, including review of all information provided by both the IV and EMR. BCC within the terms of its project contracts can request that the EMR undertake additional monitoring and review if Council requires it. BCC will hold ongoing discussions with the IV to ensure it is satisfied that all relevant matters have been considered and that all outcomes are compliant with legislative, contractual and Coordinator-General requirements.

To provide particular attention to shallower work fronts, condition 2 of this report (appendix 1) requires specific treatment for areas of low cover, with special area plans (SAPs) to be designed and implemented for areas of the alignment where the TBMs will be in less than 1.5 the diameter of the tunnel. For the purposes of the condition, the area has been rounded up to 19 metres.

The SAPs are to provide an action plan to specifically address construction management in these areas. Surveys and ground instrumentation are to be in place and a detailed ground monitoring regime installed and fully baselined prior to tunnelling. Mitigation measures are to be included to manage impacts in these areas.

The SAPs are to be made available for discussion by landholders and land caretakers, such as the FOTC.

In addition, results of monitoring in these areas are to be made publicly available as per existing condition 4 (Schedule 3) 'Monthly environmental monitoring reports'.

Cultural heritage

The APC notes that newly affected heritage listed properties 'Boondah' and 'Cross Terrace' are not anticipated to incur impacts in exceedence of stated conditions.

Condition 17 of this report provides that the list of state significant places affected by the project be amended.

Other matters

DCS's suggestions regarding hazard and safety are accounted for in existing conditions 25—Hazard and risk, which requires a construction EMP to be developed (Hazard and risk sub-plan) in accordance with the *Workplace and Safety Act 1995, Tunnelling code of practice 2007* and the *Fire and Rescue Act 1990* and Australian Standard (AS) AS4360:2004 Risk Management. Condition 13 of this report includes provision for the project to comply with subsequent updates of the AS beyond this edition provided for in the project documentation.

In terms of groundwater ingress, the IR found the adoption of tunnel lining using pre-cast concrete represents current best practice and is an improvement to the RD proposal. This revised approach would provide enhanced ground support and prevent the inflow of groundwater, with an overall slight reduction in groundwater resulting due to the project change. No changes to relevant conditions regarding management of groundwater are proposed.

In terms of general effects of the alignment changes, as with the RD, no surface acquisitions of private properties will be required. This is unusual for inner-city linear infrastructure and is in part a result of good project design.

A reduction in the number of volumetric resumptions under private properties will be achieved, from 374 in the RD to 334.

The IR noted the change in horizontal alignment provides minimal impact on road geometry and safety as all elements exceed TMR requirements.

The IR acknowledged the operational advantages of the shallower alignment, with the flatter grades likely to reduce the requirement for lane changes and braking due to helping to keep vehicle speeds constant, with consequential traffic flow and safety improvements. Vehicle operating efficiencies are also likely, especially for heavy commercial traffic. A slight reduction in emissions is also expected.

While it is acknowledged the shallower depths may result in additional disturbance encountered by a greater number of residents, it is found that existing conditions as enforced in the Coordinator-General's report provide clear and reasonable impact-based triggers for residence-based mitigation.

4.6 Tollroad Control Centre

The APC provided a key project change was the proposal to locate the TCC on a vacant block of state-owned land opposite the botanic gardens on the corner of Mount Coot-tha Road and Richer Street, Toowong.

Approximately 367 submissions were received which objected to the proposed location. In addition, petitions against the proposal were tabled in the Queensland State parliament with a total of 3302 signatories.

Key issues raised in submissions included:

- the suitability of the site given its zoning as reserve/parkland;
- the loss of green space;
- the building's close proximity to residences, with the closest being about 20 metres from the site's boundary; and
- the ability to manage disturbance for a building that would be staffed at all hours.

In the FIAPC, the proponent confirmed that in response to community feedback the proposed location has been retracted, with feasibility studies on the alternative locations currently underway. Therefore, this report does not assess or make any decision in respect of this change.

BCC's quick response to the community's views on this proposal is commendable, and is in line with the responsive approach taken during the EIS phase where issues with land acquisition for mid-tunnel entry points was taken into account, with the entry points removed from the project proposal prior to the Coordinator-General's assessment.

Condition 3 of this report (appendix 1) provides that the proponent must request consideration by the Coordinator-General on the revised proposed location for the TCC prior to commencement of the project's operations phase and to construction of the TCC.

The alternative TCC location will be subject to a separate change request process under Part 4, Division 3A, of the SDPWO Act. Consultation will be undertaken at that time by the Coordinator-General to ascertain community views.

4.7 Workforce parking: Anzac Park

The RD indicated the botanic gardens overflow car park on Mount Coot-tha Road would be used for temporary construction workforce parking. Areas along Sir Samuel Griffith Drive were also suggested as possible areas workers might park.

The Coordinator-General's Report condition 18(k) (Schedule 3) stated:

The construction workforce must not park in local streets. A dedicated and adequate construction workforce off-street parking area must be provided. All construction workforce vehicles must be directed to project construction workforce car parks.

To avoid construction workforce car parking in local streets, shuttle transport between construction workforce car parks distant from a construction area must be provided for the duration of the period the construction area is in use.

In response to this requirement, the APC proposed to establish a temporary workforce car park in a section of Anzac Park, Toowong, for up to 300 vehicles (see figure 4.3).

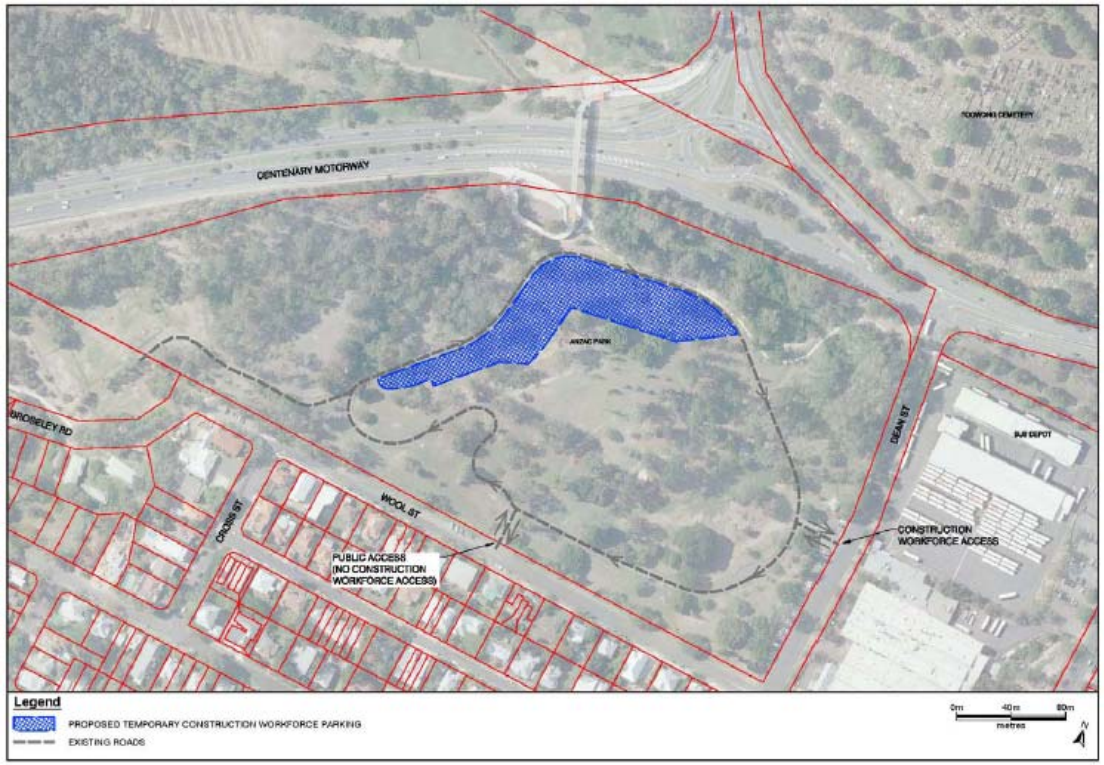

Figure 4.3 Proposed temporary workforce construction parking—Anzac Park

BCC confirmed the car park would be used by workers who would walk approximately 550 metres across the pedestrian/cyclist overpass to access the western worksite.

Anzac Park, approximately 14 hectares in size, is bordered by the CM, Dean Street, Wool Street and Broseley Road. The Toowong bus depot runs the length of the park on the Dean Street side. For Wool Street, residences overlook the park along its length.

The park is accessible to vehicles via Dean Street and Wool Street. The construction workforce parking area is proposed to be located within a section of the park's existing internal ring road.

The APC states the temporary construction workforce car park would:

- be located in the northern part of the park nearest to the CM, adjacent to the new pedestrian and cycle bridge
- be situated behind a topographic ridge which would visually separate the site from Wool Street
- have limited access for project workers to and from Dean Street (i.e. no access via Wool Street, near residences)
- be securely fenced
- be reinstated post-project completion in line with Council, stakeholder and community requirements.

4.7.2 Community response

One hundred and twenty-nine submissions were received on the construction workforce parking proposal. A petition was also tabled to Parliament, with 591 signatories. Key issues raised in submissions included:

- increased traffic from construction workers' vehicles posing an unacceptable risk to public safety, particularly children accessing play areas and amenities
- Council should undertake a risk assessment of the temporary workforce car park
- traffic and speed issues and associated risk to users of the park for recreation and exercise
- cyclist safety
- noise from construction workers
- construction workers should use public transport
- consideration should be given to alternative sites
- slope of the land not suitable for a car park
- impacts on flora and fauna, in particular loss of large mature trees
- lack of community consultation

- loss of park space for four years
- contaminated land
- impact on aesthetic and social amenity of the park
- inconsistency with planning codes and the EIS
- heritage issues—the park is a memorial to fallen soldiers from the Great War.

4.7.3 Agency position

DERM noted that should the proposal proceed, in undertaking surface works on the car park, the project must comply with the lawful requirement to ensure the general environmental duty of care (section 319 of the *Environmental Protection Act 1994*).

This requires managing activities to avoid water contamination, including installing adequate sediment and erosion control to ensure soil or stormwater run-off does not enter gutters and drains or interfere with waterways.

4.7.4 Proponent's position

In response to issues raised in submissions on the proposal, BCC suggested the following refinements:

- Decrease the size of the car park from a maximum of 300 car spaces to a maximum of 200 spaces.
- Re-seal the section of the ring road that would provide access to the workforce car park (from Dean Street) to allow dual access.
- Prevent workers from accessing the rest of the ring road, isolating the project's use of the park.
- Fence off road access from Dean Street to the parking area to improve safety, with a break in the fence to ensure pedestrian cross passage. The crossing point would be clearly marked.
- Build a new amenities block closer to the main park recreational area, since access to the amenities block at the far north-east corner of the park would be impeded by the car park road access. In addition, new barbeque (BBQ) facilities will also be provided away from the parking area.
- The public would still be able to drive around the full extent of the ring road and use the Dean Street entrance/exit.
- No retaining walls would be constructed, minimising park disturbance. Earthworks will not involve cutting in to the existing contours of the earth, but rather only grass clearing, grading and laying of an on-ground surface such as bitumen.
- Manage earthworks in accordance with requirements in the Coordinator-General's report condition 21(o)—Erosion and sediment control plan. Water quality objectives required by Coordinator-General conditions would be complied with by ensuring surface water run-off was managed to not cause environmental harm.

- No heritage trees will be removed or are in the vicinity of the proposed parking area. Significant trees will be retained and fenced around during the car park's use, with detailed design of the car park to locate car park spaces away from the protected trees.
- Conduct an arboriculture assessment in accordance with Australian Standards (AS) (AS4970:2009—Protection of Trees on Development Sites).
- Limit access for construction traffic to the side of the park away from residents.
- Manage fauna in accordance with the flora and fauna EMP, with a qualified spotter/catcher present on site during construction works as required.
- Prepare a construction traffic management plan (CTMP) as per general requirements of Coordinator-General's conditions 15 and 16
- Avoid impacting cycleway/pedestrian walk area or park amenities by fencing the parking area.

4.7.5 Coordinator-General's conclusions

It is noted that many submitters provided input on the temporary car park proposal, which has resulted in BCC suggesting a number of refinements in the FIAPC to address key issues raised in the 129[6] submissions. Clarification has been provided on how issues such as safety and sharing use of the park with the community could be achieved.

While there is merit to the proposal and the refinements proposed by BCC provide greater detail about how the proposal's impacts will be managed, further consideration of alternate locations is required in order to understand if locating parking elsewhere would reduce disturbance to the community while providing a workable solution for the project. The part of the project changes application that relates to the request to locate temporary car parking in a section of Anzac Park as provided in this change process is therefore refused.

The proponent is advised to investigate existing parking areas in the vicinity of the western works, such as the park and ride car park adjacent to the Toowong bus depot and available space in the worksite.

It is likely a combination of parking areas may be required to provide adequate parking while conforming with the requirement of condition 18(k) (Schedule 3) that the workforce is not to park on local streets.

The FIAPC states that retracting the proposal to build the TCC in a section of the existing botanic gardens overflow car park on Mount Coot-tha Road also results in BCC reverting to the RD proposal to locate a portion of workforce car parking in the overflow area. This matter was addressed within the EIS and is therefore not part of

[6] 129 individual submissions were received, which included a submission co-signed by 27 signatories. In addition, a petition was tabled to Parliament on 25 November 2010 which had 591 signatories.

the changes consideration, with the use of this area able to proceed. BCC is advised to investigate optimising use of the existing car park as a part of its parking strategy.

Similarly, as the RD noted parking areas along Sir Samuel Griffith Drive may be areas used for workforce parking, this is also excluded from this assessment of changes. This area may therefore also be useful as part of the parking solution, as may parking within the western worksite.

Regardless of where parking is located, condition 11 (appendix 1) of this report requires compliance with noise limits to minimise disturbance.

Should the proponent find that additional parking is required and that the provision of this additional parking would constitute a change to the project, a change application assessed by the Coordinator-General would need to be made[7].

Recommendation 1 of this report provides that should this scenario eventuate, further information should be provided to the Coordinator-General on the proponent's parking plan proposal. The plan should provide detail on investigation of options for location of the project's car parking for the western works in existing parking areas prior to the consideration of seeking to construct in a new area.

The parking location options should be considered individually and collectively, and assessed using criteria including community impacts, cost, suitability, opportunities and risk. Mitigation measures for risk and impacts should be considered.

Note that the Anzac Park proposal may be reconsidered in the subsequent assessment as a part of the project's parking proposal, however the proponent is advised to consider this option only after other options have been fully explored. Additionally, it is recommended that it be considered as being used in conjunction with other parking solutions not provided in the RD.

This information should be provided as part of any application under section 35C of the SDPWO Act. It would be assessed by the Coordinator-General as part of a separate change process under Part 4, Division 3A of the SDPWO Act. Consultation will be undertaken at that time to ascertain community views.

Recommendation 1 also advises the proponent to undertake community consultation on its parking strategy, regardless of if a change process under the SDPWO Act occurs.

For the eastern worksite, parking remains as provided in the RD and is therefore not assessed in this report.

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[7] Note this does not relate to parking in the western worksite, which was included in the change application.

4.8 Miscellaneous

Half yearly audit reports

Condition 5 (Appendix 2, Schedule 3) of the Coordinator-General's report requires that the proponent procure an audit of the project's compliance with the conditions of the report. The auditor is to be independent of the project and suitably qualified. Condition 14 of the report requires the appointment of an Environmental Management Representative (EMR) and allocates tasks to the EMR relating to overseeing the environmental management of the project.

The proponent has requested that the EMR be allowed to undertake the audit for Condition 5 provided that the EMR is a suitably qualified auditor.

Coordinator-General's conclusions

Provided that the EMR is suitably qualified and is willing to undertake the audit there are advantages that could accrue from having the EMR undertake it. The EMR will have a longer-term knowledge of the proponent's compliance with the conditions and should be able to offer a more comprehensive assessment of compliance. A suitably qualified auditor will take all documentation and observations to make their assessment. The EMR will do likewise and will add a degree of greater understanding of the information in the documentation.

In view of the above the proposed change is approved. The wording of condition 5(c) will be changed to add 'The Environmental Management Representative may undertake the audit provided that it complies with these requirements'.

Glossary amendments

The APC sought amendment to two definitions in the glossary of the Coordinator-General's report. These are to be amended as follows, with the text with a strikethrough to be omitted:

- 'permanent construction works'

  means all 'construction works' (see definition above) other than~~, for the main Toowong worksite defined in the supplementary report,~~ pre-construction surveying, establishment of worksite security arrangements (including signs, fences, safety barriers and temporary security personnel facilities), vegetation clearing, demolition and removal of structures and required public utility works ~~up to the boundary of the main Toowong worksite~~.

The removal of mention of the Toowong worksite will broaden the definition to apply to works across all areas of the project.

- 'surface **construction** works' means all Construction Works at or exposed to the surface, but does not include underground works **across the project's alignment or works on and above the surface within an acoustic enclosure in the work area in the vicinity of the Centenary Motorway.**

The addition of the words indicated in bold will indicate that spoil transportation from the TBM operations to the spoil handling shed within the western worksite, and then from the spoil conveyor to the Mount Coot-tha quarry, are part of the TBM activities which are able to be undertaken continuously. This is as described in the RD.

Other matters

Some minor amendments to conditions have also been made, including correct cross-referencing of condition numbers and updating design drawing numbers referenced in conditions that relate to the RD version of the project.

5 Conclusion

The LW project changes as proposed by BCC to the Coordinator-General have been addressed within this report as per the process described in Part 4, Division 3A (Changes to project) of the SDPWO Act (the change process).

Due to developments that arose during consultation on the project changes, subsequent information is to be provided by BCC on the proposed new location for the TCC; and heavy vehicle access to the western worksite should agreement with TMR on the access not be achieved. Consultation on these matters will be undertaken once more details are provided, with a decision to be made by the Coordinator-General in a further Coordinator-General's change report.

Submissions made on the proposed changes have been key to gaining an understanding of issues of interest. They have informed the making of conditions as made in appendix 1 of this report.

It is noted the alignment change impacts 269 newly affected residences. However, the new route will reduce directly affected residences from 374 to 334. As with the RD, no surface acquisitions of privately owned land will be required, however sub-surface volumetric titles will need to be acquired for all properties the tunnels pass under.

Conditions as made in the Coordinator-General's Report will seek to minimise disturbance and provide clear impact-based triggers for the implementation of mitigation measures to manage vibration, noise, dust and air quality.

Further conditions made in this change report at appendix 1 seek to build on those already applied, and to vary them where required.

In terms of the effect of the changed alignment resulting in works required in shallower areas, construction methods will be required to address these conditions, which are not unusual for tunnelling projects. Existing conditions require the project to be constructed in accordance with Australian Standards for risk management, and design will be independently verified before and after construction to ensure it is fit for purpose. As conditioned in this report, special area plans will be developed for the shallowest areas to provide particular detail for construction in low overburden areas and associated mitigation measures. These are to be shared with residents in the vicinity.

On balance, the proposed project changes are improvements to the RD, for example:

- removing permanent construction impacts of tunnelling works on Anzac Park and the Mount Coot-tha roundabout;
- by burying one of the ventilation stations to provide for future extension of public areas of the botanic gardens;

- through the introduction of design improvements such as the location of tunnel entrance and exit portals in the centre of motorways to work to improve safety; and
- the use of concrete pre-cast rings to provide immediate tunnel support, as per current industry best-practice.

The alignment change will also result in operational improvements, with easier grades within the tunnels providing for more efficient flows for traffic.

The spoil conveyor system is a strong environmental outcome and will remove the need for up to 450 truckloads per day (at peak production) or a total of up to 83 400 truckloads over a 14-month period. Use of the spoil to aid future restoration of the quarry is also supported. In addition, the changes will result in a reduction of almost 14 000 truckloads (or 28 000 truck movements) from the number proposed in the RD.

The retraction of the proposed location of the TCC by the proponent was responsive to community feedback made during the submissions phase. The retraction of the proposed western construction project site office (western site office) and associated visitor's centre on a site along Sir Samuel Griffith Drive will not proceed due to commercial reasons and dedicated office space will be contracted for this use. As this will not involve construction the matter is therefore concluded for the purposes of the change process.

Refinements to the Anzac Park temporary construction car park proposal as made by BCC in response to submissions provided improved solutions to address matters such as safety and co-use of the park with the community. However, further investigation of other site options for location of workforce parking will work to ascertain the best location for this project requirement.

Therefore, this report refuses the Anzac Park proposal as provided within this current project change process.

An application or applications for the revised car parking proposal and the revised TCC location are to be made under section 35C of the SDPWO Act if they involve a change to the project. They will be assessed by the Coordinator-General within a separate change process (or processes) subject to Part 4, Division 3A of the SDPWO Act.

As provided in condition 16 of this report, the project must be carried out generally in accordance with the Environmental Impact Statement (September 2008) (EIS) for the project, the EIS Supplementary Report for the project (June 2009) (Supplementary Report) and the application for the project changes including further information provided during the change report process, and as varied by the Coordinator-General's Report on the Project Changes (December 2010). To be clear, this excludes the Anzac Park temporary car parking proposal and the proposed location of the TCC which, to be considered again, would be subject to a separate change process or processes.

Conditions as made in this report are made pursuant to section 35I(2) of the SDPWO Act. Under section 35K of the SDPWO Act, the Coordinator-General's report for the EIS for the project and the Coordinator-General's change report both have effect for the project. However, if the reports conflict, the Coordinator-General's change report prevails to the extent of the inconsistency.

Appendix 1 provides the new conditions as made by this change report. Appendix 2 provides the existing Coordinator-General's conditions, with amendments to existing conditions and new conditions as applied herein.

A copy of this report will be given to the proponent, under section 35J of the SDPWO Act.

I would like to thank all members of the community, stakeholders and government agencies who made comment and provided advice on the changes.

A copy of this report will be provided to advisory agencies and will be made publicly available, pursuant to s35(5)(b) on the DIP's website at:
http://www.dip.qld.gov.au/legacyway

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Graeme Newton
Coordinator-General
Director-General
Date: December 2010

Appendix 1: Conditions and recommendation

SCHEDULE 1: New conditions and recommendation: Legacy Way (formerly Northern Link Road Tunnel) project changes (December 2010)

Recommendation 1: Temporary construction car parking

(This becomes new recommendation 35 in part 4, Schedule 3 of appendix 2)

(a) It is recommended that the proponent investigate, in the making of a parking plan, a range of options to satisfy the project's construction workforce parking requirements for the western works.

(b) Should the plan propose options that require a change to the project, for example, construction on a new site not currently used for parking, consideration by the Coordinator-General of the project's workforce parking plan for the western works is required through the making of an application under section 35C of the *State Development and Public Works Organisation Act 1971.*

(c) The plan should demonstrate that a range of options have been explored in detail prior to the making of any application. The parking location options should be considered individually and collectively, and assessed using criteria including community impacts, cost, suitability, opportunities and risk. Mitigation measures for risk and impacts should also be considered.

(d) Regardless of if an application is made as per above, it is recommended that the proponent undertake consultation with the community on its parking plan.

Condition 1: intentionally left blank

Condition 2: special area plan: low cover tunnelling works

(This becomes new condition 36 in part 4, schedule 3 of Appendix 2)

(a) Special area plans (SAPs) are to be designed and implemented for tunnel boring machine (TBM) activities in areas of low overburden where a distance of less than 19m from the tunnel crown to the ground surface is to be encountered.

(b) The SAPs are to detail management measures for construction in these areas. Measures are to include, but not be limited to, surveys and ground instrumentation and a detailed ground monitoring regime installed and fully baselined prior to tunnelling works commencing in the vicinity.

(c) Mitigation measures are to be included in the SAPs to manage impacts in these areas.

(d) The SAPs are to be made available for discussion to landholders in these areas and land caretakers, such as the Friends of Toowong Cemetery.

(e) Results of monitoring in these areas are to be made available as per original condition 4 (schedule 3) 'Monthly environmental monitoring reports'.

Condition 3: tollroad control centre (TCC)

(This becomes new condition 41 in part 4, schedule 3 of Appendix 2)

Prior to commencement of the operations phase, the proponent is to request consideration by the Coordinator-General on the revised proposed location for the TCC through the making of an application under section 35C of the *State Development and Public Works Organisation Act 1971.*

Condition 4: spoil conveyor belt

(The following replaces condition 17, part 2, schedule 3, Appendix 2. Highlighted text indicates new inclusions.)

Condition 17: spoil handling and placement

(a) Construction spoil from construction must be for:

(i) surface works and cut-and-cover works, handled and removed in a manner to mitigate noise and dust impacts on nearby properties, consistent with the objectives and limits established in Schedule 3 of these conditions

(ii) tunnel construction works, handled and removed from within an acoustically-lined and ventilated workshed, to mitigate noise, air quality, night lighting and over-shadowing impacts on nearby properties, consistent with the environmental objectives and performance criteria established in the Draft D&C EMP in Appendix D of the supplementary report to the EIS and these conditions.

(b) Spoil handling facilities, including the external conveyor system, and stockpiling and storage facilities, must be designed, constructed and operated to comply with the schedule 3 conditions and satisfy the following requirements:

(i) the facilities must be safe and secure, such that unauthorised access to any part of it is not available, directional night lighting is provided to all access points and hazard areas, and facility operations are capable of remote surveillance by worksite staff

(ii) the conveyor must not impede existing access to public areas within the Mt Coot-tha Botanic Gardens. Conveyor facilities established elsewhere must not impede existing access to public facilities, recreation areas and open space, or if access would be constrained as a consequence of the facilities, only with the prior agreement of the BCC

(iii) access to the conveyor system for maintenance purposes must be provided within the conveyor corridor and as close as practicable to the conveyor system

(iv) the facilities must be situated, designed and constructed to present the minimum visual and landscape impact as far as practicable, having regard to topography, vegetation, scale, character of construction and construction materials, location relative to sensitive land uses, and the likely duration of its use

(v) construction of spoil handling facilities including the conveyor system must avoid where practicable, or minimise and mitigate the potential invasion or colonisation of areas disturbed by construction activities by introduced plant and animal pests such as, but not limited to, fire ants, birds and weeds.

(c) Upon completion of the spoil handling and transport task, the spoil handling facilities must be decommissioned as soon as practicable and rehabilitated to a condition suitable for use for the preferred purposes under the area's designation in Brisbane City Plan 2000 (City Plan). Such rehabilitation must include:

(i) remediation of any land contaminated by either the construction or use of the facilities

(ii) rehabilitating the worksite including the conveyor corridor to an approximation of the pre-existing ground form, providing such rehabilitation works would not cause negative changes in surface drainage patterns or flood levels

(iii) landscaping works generally consistent with a landscape master plan to be prepared and provided to the Coordinator-General in consultation with the BCC at least 30 days prior to decommissioning works commencing

(iv) reinstatement of any impacted pedestrian and cycle paths to their former location.

(d) Spoil placement within the quarry, being the distribution, spreading and compaction of conveyor spoil from the project works, is to be controlled in accordance with the existing quarry development permit. These activities are only to be undertaken between 7am and 5pm, Monday to Friday, and not on public holidays.

(e) All placement of spoil at spoil placement areas must comply with the performance criteria of the filling and excavation code in City Plan 2000 or similar applicable local authority plan.

(f) Spoil placement areas must be rehabilitated as quickly as reasonable and practicable to manage and mitigate the potential adverse environmental impacts of dust, soil erosion and sedimentation.

(g) Spoil placement must be managed to minimise adverse environmental impacts on waterways, and sensitive places.

(h) The conveyor belt for delivery of spoil into the Mt Coot-tha Quarry and spoil deposition into the Mt Coot-tha Quarry must be managed and operated in accordance with project documentation. Activities within the quarry will be the responsibility of the quarry manager.

(i) Operation of the spoil conveyor and discharge of the spoil from the conveyor into the quarry must meet the performance criteria for noise in table 10, Condition 22 and air quality in Condition 20 of the Coordinator-General's Report, for residential properties in the vicinity.

(j) For spoil other than what is deposited in the Mt Coot-tha Quarry, spoil placement areas must have appropriate approvals for the receipt and handling of the spoil material and changes to location of spoil placement areas are to be notified to the administering authorities.

Condition 5: Brisbane Grammar School—construction traffic management plan

(The following becomes new condition 37, part 4, schedule 3, appendix 2.)

(a) A construction traffic management plan (CTMP) is to be developed in consultation with BGS to address access arrangements in the vicinity of project works.

(b) Procedures are to be included in the CTMP which ensure the community's safety in proximity to construction works.

(c) The CTMP is to detail that disruption to use of the pedestrian and bicycle path over the Inner City Bypass (ICB) is to be minimised.

(d) Consultation on the CTMP with other frequent path users, such as the Brisbane Girls Grammar School and the community in the immediate vicinity of the path, is to be invited.

(e) The CTMP is to be established at least one month prior to commencement of site establishment in the vicinity of the ICB, with a copy provided to BGS and the Coordinator-General. The document will be updated as required for different stages of activity.

Condition 6: Brisbane Grammar School—schedule of project works

(The following becomes new condition 38, part 4, schedule 3, appendix 2.)

The proponent is required to provide the following information to BGS within 15 business days after commencement of the project contract, or by 4 February 2011:

(a) a program which indicates temporary and permanent land resumptions of land used by the school

(b) details of the contractor's use of the land during the construction phase (both permanent and temporary use) including:

(i) proposed construction worksites

(ii) changes to spoil management and associated truck movements and

(iii) workforce car parking on the school's land

(c) details of the access to and potential impacts upon the school's use of the remaining part of the playing fields during the construction phase

(d) details of work to be carried out within the drainage easement, the timing of the works, and any long-term constraints on use of the surface; and

(e) details of work to be carried out within the drainage easement, the timing of the works, and any long-term constraints on use of the surface. The timing of the works are to be sequenced to minimise disruption to the school's use of the areas, wherever possible.

Condition 7: western worksite

(The following becomes new condition 39, part 4, schedule 3, appendix 2.)

(a) Agreement between DTMR and the proponent on vehicle construction access and egress arrangements for the western worksite is to be achieved prior to site establishment.

(b) Should DTMR require egress for all vehicles to connect to Mount Coot-tha Road rather than the Centenary Motorway, the proponent is to request consideration of the matter by the Coordinator-General through the making of an application as per section 35C of the *State Development and Public Works Organisation Act 1971.*

Condition 8: western ventilation station

(The following is inserted as condition 30 (c)(viii) (part 3, schedule 3, appendix 2)

Access from the east-bound carriageway of the Centenary Motorway to the project's western ventilation station is limited to maintenance vehicles only. It will be subject to agreement and conditioned TMR approval for specific types of maintenance vehicles, and times of access, within the project's Road Network Interface Agreement. The gates to the station are to be locked at all other times.

Condition 9: bicycle infrastructure—consultation

(The following becomes new condition 40, part 4, schedule 3, appendix 2.)

Consultation with local bicycle groups and the wider community is to be undertaken to communicate any proposed adjustments to bicycle path networks across the project, at least one month prior to these works commencing. A timeline of developments is to be provided.

Condition 10: cultural heritage

(The following becomes new condition 42, part 4, schedule 3, appendix 2.)

The cultural heritage management plan (CHMP) for the Toowong Cemetery as required in condition 2 (schedule 1) of the Coordinator-General's Report is to be developed in consultation with the Friends of Toowong Cemetery.

Condition 11: Noise

Add to condition 22(h), part 2, schedule 3, appendix 2 the following highlighted text:

(a) Any night-time noise sources from designated temporary construction workforce car parking must be managed in such a way to achieve the limits set out in Table 10.

Table 10: Night time noise limit

Noise type	Time of day	$LA_{10,(adj)\ (10mins)}$ (measured at a sensitive place)[1]	$LA_{1(adj)(10mins)}$ (measured at a sensitive place)[1]
• Steady construction noise • noise from designated temporary construction workforce car parking	6.30 pm – 6.30 am	Background + 3dB(A)	Background + 5dB(A)

[1] Measured in accordance with the most recent edition of the *Queensland Government's Noise Measurement Manual.*

Condition 12: environmental management representative

The wording of condition 5(c), part 1, schedule 3, appendix 2, will be changed to add the following sentence [included here as bolded text]:

(a) The auditor must be a suitably qualified person with not less than five years experience in environmental auditing or who is otherwise acceptable to the Coordinator-General in consideration of the principles in AS 19011. **The Environmental Management Representative may undertake the audit provided that it complies with these requirements.**

Condition 13: hazard and risk

The wording of condition 25(a), part 3, schedule 3, appendix 2, will be changed to add the following sentence [included here as bolded text]:

The project must be constructed in accordance with the Construction EMP, the Construction Hazard and Risk (CHR) EMP Sub-Plan and:

(i) Australian Standard AS4360:2004 Risk Management **(or a later version cited in project documentation)**

(ii) *Workplace and Safety Act 1995—Tunnelling Code of Practice 2007*

(iii) Fire and Rescue Act 1990.

Condition 14: condition citation

For condition 18(c)(ii), part 2, schedule 3, appendix 2, the words 'condition 21' are to be replaced with the words 'condition 22'.

Condition 15: schedule 8 deletion

Schedule 8 of Coordinator-General's report (April 2010) is now deleted as a superseded design drawing.

Condition 16: general conditions

Amend condition 1(a), part 1, schedule 3, appendix 2 to include that indicated below as bolded text:

(a) The project must be carried out generally in accordance with the Environmental Impact Statement (September 2008) (EIS) for the project, the EIS Supplementary Report for the project (June 2009) (Supplementary Report), **and the application for the project changes including further information provided during the change report process, and as varied by the Coordinator-General's Report on the Project Changes (December 2010).**

Condition 17: development on a state heritage place

Condition 2(b), schedule 1, Appendix 2, is to be modified:

(a) To remove (iii) 'Baroona' at 90 Howard Street Paddington; and

(b) To add (iii) 'Boondah at 50 Howard Street, Auchenflower; and

(c) (viii) 'Cross Terrace' at 50 Cairns Street, Paddington.

Condition 18: amendments to condition 26: Centenary Motorway interface

The following replaces conditions 26(a)(i)-(iv).

26(a)(i) the project's stage 1 design is to accommodate for the future widening of the centenary motorway to six lanes. The proponent will limit the three lane future widening to the existing outer concrete barrier of the west-bound carriageway past the tunnel transition structure. 'Past' means as per the eastbound carriageway from chainage 900 to approximately 1900, as indicated in the proponent's Application for Project Changes (October 2010) Fig 2-17: Changed Project Alignment: Centenary Motorway Connection, page 52.

26(a)(ii) the construction zone for the outer third lanes of the future centenary motorway widening shall be maximised to ensure all project-impacted infrastructure (including gantries, lighting poles, conduits, cabling, pits, manholes, drainage systems etc) are in the ultimate position such that TMR does not incur future additional costs for the motorway upgrade works – for example for matters such as infrastructure relocations; upgrading of drainage systems; etc.

26(a)(iii) the project's design speed for east-bound traffic for the tunnel's entry point is to be 90 kilometres per hour. For the west-bound tunnel exit point, the design speed it to be maximised within the established limits of the concept design to maintain the existing 90 kilometre per hour posted speed.

26(b)(iv) is now deleted.

SCHEDULE 2: Glossary amendments

These amendments will be made to schedule 6—Glossary of Terms, appendix 2.

- ‘permanent construction works’ means all 'construction works' (see definition above) other than, pre-construction surveying, establishment of worksite security arrangements (including signs, fences, safety barriers and temporary security personnel facilities), vegetation clearing, demolition and removal of structures and required public utility works.
- ‘surface construction works’ means all construction works at or exposed to the surface, but does not include underground works across the project’s alignment or works on and above the surface within an acoustic enclosure in the work site in the vicinity of the Centenary Motorway.

Appendix 2: Complete list of conditions, December 2010

TABLE OF CONTENTS

Additions to appendix 2 as made by the Coordinator-General's change report (December 2010) are indicated in highlighted text. Note some text in conditions may have been deleted but for ease of reading, these are generally not indicated.

SCHEDULE 1: Stated conditions for *Sustainable Planning Act 2009* (SPA)[1] approvals

(1) Material change of use of premises if all or part of the land is on the Environmental Management Register or Contaminated Land Register

(a) An appropriately qualified person must undertake investigations in locations where earthworks may potentially encounter contaminated soils (i.e. land that is listed on the Environmental Management Register (EMR) or identified areas from a site history and observations analysis). The Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland 1998 must be adhered to in these investigations. Any land identified as having contaminated soil must be notified to the DERM.

(b) Contaminated soil can only be removed from land listed on the EMR or Contaminated Land Register (CLR) in accordance with a disposal permit under the *Environmental Protection Act 1994*.

(c) A Site Management Plan for contaminated land on the tunnel alignment must be prepared where that land is not being removed from the EMR or CLR prior to any disturbance of the soil on that land, in accordance with:

(i) National Environmental Protection (Assessment of Site Contamination) Measure 1999 (NEPM) /National Environment Protection Council (NEPC)

(ii) the *Environmental Protection Act 1994*.

(d) If spills occur during the transportation of contaminated soil, the area affected will be remediated and the relevant authorities advised.

(2) Development on a state heritage place

(a) Condition surveys must be conducted of each place on the Queensland Heritage Register ('place of State significance'), to the extent the place is the subject of development, prior to any construction works commencing which may impact on the cultural heritage values of that place. The condition surveys must include detailed structural inspections prior to construction, including all timber framing, stonework, brickwork, and the integrity of sealing of all timber in the stone/brickwork.

(b) Prior to any construction works commencing which may impact on the cultural heritage values of a place of State significance, prepare specific Cultural Heritage Management Plans for each place, to the extent impacted, including:

(i) Mount Coot-tha Forest

(ii) Toowong Cemetery

(iii) Boondah, 50 Howard Street, Auchenflower

(iv) St Brigid's Church, Musgrave Road, Red Hill

(v) Ithaca Embankments, Nos 3 and 4, Musgrave Road, Red Hill

(vi) Gona Barracks

(vii) Victoria Park, Herston

(viii) Cross Terrace, 50 Cairns Street, Paddington.

(c) The cultural heritage management plans (CHMPs) required in (b) must include the following elements:

(i) vibration goals and their monitoring and recommended actions should those goals be exceeded

(ii) the effects of potential settlement and associated monitoring and management

(iii) archival recording of all elements of cultural heritage significance that will be removed, demolished, or exposed to a significant risk of damage

(iv) archival recording of cultural heritage values to be undertaken with the advice of an appropriately qualified heritage consultant

(v) monitoring of compliance with the measures outlined in the CHMP

(vi) immediate reporting of any damage caused as a result of the project to the chief executive administering the *Queensland Heritage Act 1992*, including details of the damage, how it occurred and proposed measures to reinstate, rectify or remediate the damage

(vii) consultation with the DERM in an effective and timely manner, particularly where the potential exists for the construction works to impact on a place of State significance.

(d) The draft CHMPs must be provided to DERM for review and comment, and the comments taken into account in finalising the plans, prior to any construction works on, under or over the place of State significance

(3) Development on a local heritage place

(a) Condition surveys must be conducted of each place on the City Plan 2000 Heritage Register (''Local Heritage place'), to the extent the place is the subject of development, prior to any construction works commencing which may impact on the cultural heritage values of that place. The condition surveys must include detailed structural inspections prior to construction, including all timber framing, stonework, brickwork, and the integrity of sealing of all timber in the stone/brickwork.

(b) Prior to any works commencing which may impact on the cultural heritage values of a local heritage place, prepare specific Cultural Heritage Management Plans (CHMPs) for each place, to the extent impacted, including Anzac Park.

(c) The CHMPs required in (a) must include the following elements:

(i) vibration goals and their monitoring and recommended actions should those goals be exceeded

(ii) the effects of potential settlement and associated monitoring and management

(iii) archival recording of all elements of cultural heritage significance that will be removed, demolished, or exposed to a significant risk of damage

(iv) archival recording of cultural heritage values to be undertaken with the advice of an appropriately qualified heritage consultant

(v) monitoring of compliance with the measures outlined in the CHMP

(vi) consultation with Brisbane City Council (BCC) in an effective and timely manner, particularly where the potential exists for the construction works to impact on a place of local significance.

(4) Making a material change of use for ERA 51—road tunnel ventilation stack operation

(a) Prior to the commencement of operation of the environmentally relevant activity (ERA), prepare and implement an operational air quality environmental management plan to mitigate and manage the potential impacts on air quality arising from the operation of the tunnel ventilation system.

(b) The ventilation system must be designed so that it does not prevent the possible future installation of filtration equipment to remove small particles and possibly oxides of nitrogen from vitiated air before it is released to the ambient environment during tunnel operation.

(c) The western ventilation outlet for the project is to be situated adjacent to the Centenary Motorway at the location indicated in the EIS[8], and must be at least 20 metres in height above natural ground level in that location, or no less than RL 67metres, whichever is the higher.

(d) The eastern ventilation outlet for the project is to be situated adjacent to the Inner City Bypass (ICB) at the location indicated in the EIS[9]. The height of the ventilation outlet must be at least 15 metres above ground level in that location, or no less than RL 58metres, whichever is the higher.

(e) The ventilation system must be designed so that the system is capable of meeting PIARC criteria for in-tunnel air quality described in Table 1 and capable of meeting the goals for ambient air quality set out in Table 4.

[8] Location of western ventilation outlet indicated in Figure 2-6 of the Application for Project Change (October 2010).
[9] Location of eastern ventilation outlet indicated in the EIS, Figure 4-13.

Table 1: In-tunnel air quality criteria

Parameter	Criteria
Carbon monoxide (CO)	70 ppm generally 90 ppm in peak traffic congestion
Nitrogen dioxide (NO_2)	1 ppm (average)
Visibility coefficient (K)	0.005 m^{-1} for free flowing traffic (greater than 50km/hr) 0.007 m^{-1} otherwise

Notes:
[1] Monitoring and measuring protocols for each criteria as set out in the PIARC guidelines, as current December 2009.
[2] Peak traffic congestion occurs when traffic flows are less than 10 km/h
[3] Visibility coefficient (K-value) may fluctuate with peak Conditions.

(f) For in-tunnel air quality, the criteria set out in Table 1 must be achieved.

(g) To manage in-tunnel air quality effectively, a system must be implemented for the on-going, continuous monitoring linked to a system of traffic management to maintain appropriate traffic flows and consequent emission levels within nominated air quality standards in
Table 1.

(h) Monitoring results for in-tunnel air quality must be reported as set out in Table 5. Monitoring must be undertaken in accordance with accredited procedures, and the results must be publicly available.

(i) In circumstances where the in-tunnel air quality criteria is exceeded, the reporting must also describe the corrective actions taken to avoid a recurrence and to minimise the impact on ambient air quality.

(j) To minimise and manage the risk of exceeding the goals for ambient air quality, on-going continuous monitoring of the air flow within each of the ventilation outlets must be conducted for the project. Monitoring must be undertaken in accordance with accredited procedures. The results of monitoring of the air flow within each of the ventilation outlets must be made publicly available in the event of exceeding in-tunnel air quality criteria or in the event of exceeding ambient air quality goals. The results must be available within 24 hours of such an exceedance.

(k) The ventilation system must be managed so that air quality within each ventilation stack does not exceed the criteria set out in Table 2.

Table 2: Criteria for air quality within each ventilation outlet

Pollutant	Criteria	Unit	Measuring Period
Carbon monoxide (CO)	70	ppm	1 hour
Nitrogen dioxide (NO_2)	2.0	mg/m^3	1 hour
Particulate matter less than 10 μg (PM_{10})	1.0	mg/m^3	1 hour

(l) On-going monitoring of ambient air quality must be conducted at two monitoring stations for each ventilation outlet. The monitoring stations must be located generally within the vicinity of the sites described in Table 3.

Table 3: Monitoring sites—ambient air quality

Ventilation outlet	Monitoring locations	Location description
Western	Anzac Park	In the vicinity of Wool Street and Cross Street
	Mt Coot-tha Botanic Gardens	In the vicinity of the main car park situated to the south of the main entrance off Mount Coot-tha Road
Eastern	Spring Hill	In the vicinity of the secondary grammar schools
	Kelvin Grove	Within an area bounded by Kelvin Grove Road, Musk Avenue, Victoria Park Road and the ICB

(m) The parameters for ambient air quality must be monitored consistent with the air quality parameters set out in Table 4.

Table 4: Ambient air quality parameters

Pollutant	Goal[3]	Unit	Measuring Period
Carbon monoxide (CO)	11	mg/m^3	8 hour maximum[1]
Nitrogen dioxide (NO_2)	62	$\mu g/m^3$	annual mean
	250	$\mu g/m^3$	1 hour maximum[1]
Particulate matter less than 10 μg (PM_{10})	50	$\mu g/m^3$	24 hour maximum[2]
Particulate matter less than 2.5 μm ($PM_{2.5}$)	25	$\mu g/m^3$	24 hour maximum
	8	$\mu g/m^3$	annual mean

Notes:
[1] Maximum allowable exceedence—one day per year.
[2] Maximum allowable exceedence—five days per year not including exceeding ambient goals due to external events (e.g. dust storms, fires, major construction works) as recorded at more than one monitoring station operated by DERM.
The goals are in accordance with the Environmental Protection (Air) Policy 2008—Schedule 1 – Air Quality Objectives.

(n) Results from monitoring in accordance with accredited procedures, must be reported by the proponent to the Chief Executive of DERM in accordance with Table 5 and must be publicly available.

- **Table 5: Reporting of air quality monitoring**

Time Scale	Air Quality Parameter	Reporting Requirements
Real-time reporting	In-tunnel	Unvalidated data updated on an hourly basis and available on-line via a project website.
Daily reporting	External ambient[1] air	Unvalidated hourly data reported daily on-line via a project website.
Exceedence/Incident reporting	Air within each ventilation outlet	Unvalidated hourly data corresponding with the period during which an exceedence of either the in-tunnel criteria or ambient air quality goals, or

		both of these incidents occurred must be made available on a project website within 24 hours of such an incident. Validated hourly data corresponding with the period during which an exceedence of either the in-tunnel criteria or ambient air quality goals, or both of these incidents occurred must be reported to DERM and made available on a project website within seven days of such an incident.
Monthly reporting	In-tunnel, ambient and ventilation outlet	Monthly summaries and trend information must be presented on the project website and provided to DERM within seven days of the end of each month.

Note: 1 – Recorded in the locations described in Table 3.

(o) In circumstances where monitoring identifies an exceedence of the ambient air quality goals, the reporting must also set out the performance of the tunnel ventilation system at the time and provide conclusions with regards to the level of contribution by the tunnel ventilation system, if any, to the exceedence of the ambient air quality goals.

(p) The location and reporting of monitoring of ambient air quality relating to tunnel operations should be reviewed by the proponent after five years of operations. Should a proposal be made to vary ambient air quality monitoring or reporting, a report assessing the issue and providing substantiated reasons for the proposal is to be provided to the Chief Executive, DERM for approval.

(q) Noise attributable to the ventilation system must comply with the noise limits in Table 6: Ventilation system noise limits.

Table 6: Ventilation system noise limits

Time of day	LA $_{eq(adj)(15mins)}$ (measured at a sensitive place)[1]	Noise limit $LA_{10,(adj)\ (15mins)}$ (measured at a sensitive place)[1]
6.30 am – 6.30 pm	Background + 5dB(A)	Background + 5dB(A)
6.30 pm – 6.30 am	Background + 5dB(A)	Background + 3dB(A)

[1] Measured in accordance with the most recent edition of the *Queensland Government's Noise Measurement Manual.*

SCHEDULE 2: Recommended conditions for other approvals

(1) Aboriginal cultural heritage

The proponent must develop and have approved under the Aboriginal Cultural Heritage Act 2003, a Cultural Heritage Management Plan (CHMP) prior to any excavation, construction or other activity that may cause harm to Aboriginal cultural heritage.

(2) Connection to a state controlled road

Approval must be obtained from the chief executive of the Department of Transport and Main Roads (TMR) under the Transport Infrastructure Act 1994 for carrying out works for connections to any state controlled road.

(3) Interference with a railway or busway

(a) Approval must be obtained from the busway manager TMR or railway manager (Queensland Rail) prior to any interference with a busway or railway under the *Transport Infrastructure Act 1994*

(b) If any project works are likely to interfere with the operation of busway or railway services, consultation must be undertaken with the busway manager or railway manager to identify and implement actions which will minimise disruption to busway or railway operations.

(4) Road closures

Any road closures required must follow the procedure set out in the relevant legislation.

(5) Explosives

Any use, storage and transport of explosives required for the project must be approved in accordance with the *Explosives Act 1999*.

SCHEDULE 3: Imposed conditions

These conditions are **imposed** by the Coordinator-General on the project under section 54B of the *State Development and Public Works Organisation Act 1971.*

These conditions do not relieve the proponent of the obligation to obtain all other approvals and licences from all relevant authorities required under any other Act.

In accordance with section 54B(3) of the *State Development and Public Works Organisation Act 1971*, the Coordinator-General has **nominated** entities to have jurisdiction for a number of conditions in this schedule. Schedule 4 describes which entity has jurisdiction for the conditions and the entities that should be consulted by the proponent in regards to each condition ('Consultative bodies').

In accordance with section 54D of the *State Development and Public Works Organisation Act 1971*, these conditions apply to anyone who undertakes the project, including, for example the proponent and an agent, contractor, subcontractor or licensee of the proponent and public utility providers undertaking public utility works.

To simplify presentation, this Schedule 3 is divided into three parts in accordance with the different phases of the project:

- **Part 1: General conditions** (which applies to both the design and construction phase and operation and maintenance phase (unless otherwise specified)
- **Part 2: Design and construction phase** (which applies to all activities from commencement of concept design, to construction and then to commissioning, including site preparation, demolition, material deliveries, construction activities and decommissioning and rehabilitation of worksites)
- **Part 3: Operation and maintenance phase** (which applies to the project from the time the tunnel is capable of accepting traffic).

The following part applies due to the making of new conditions and a recommendation made in the Coordinator-General's report on the project changes in December 2010:

- **Part 4: New conditions and recommendation**

Note however that some conditions in each part could also have some relevance to the other parts.

Part 1: General conditions

(1) General conditions

(a) The project must be carried out generally in accordance with the environmental impact statement (September 2008) (EIS) for the project, and the EIS Supplementary Report for the project (June 2009) (Supplementary Report) **and the application for the project changes including further information provided during the change report process, and as varied by the Coordinator-General's Report on the project changes (December 2010).**

(b) The proponent must notify the Coordinator-General and all nominated entities in writing of the commencement of the design and construction phase and the commencement of the operation and maintenance phase at least four weeks prior to the relevant commencement date.

(c) The proponent must notify the Coordinator-General and all nominated entities in writing of the commencement of the 'permanent construction works' at least one week prior to the relevant commencement date.

(2) Offsetting greenhouse gas emissions

(a) The proponent must produce a greenhouse offset plan that, at a minimum, provides an offset for the greenhouse gas emissions generated from the construction and operation of the project. The plan must be submitted to the Coordinator-General for approval at least one month prior to commencement of permanent construction works. It must detail the:

(i) greenhouse gas emissions of the construction and operation of the project, supported by detailed greenhouse gas emission calculations. Emissions from vehicles using the project are not included in the operation emission calculations.

(ii) greenhouse gas emissions to be offset associated with the proportion of the project's operational electrical energy requirements not purchased from 'Green Power' sourced from a renewable energy source accredited by the National GreenPower Accreditation Program that meets the criteria of the Australian Government's Renewable Energy Target.

(iii) proposed off-sets, which may include contributions to Ecofund Queensland or another accredited offsets program acceptable to the Coordinator-General, and the methodologies for calculating the offsets.

(iv) proposed actions and associated timeframes to achieve the offsets. The plan must also include an ongoing reporting regime relating to progress against subsequently approved timeframes, which must include acquiring the construction emissions offsets within three months of the project's opening to traffic and the operation emissions offset within three months of a calendar year for the previous year's emissions, and

(v) a review process for the plan that is triggered upon the implementation of any other legally binding carbon emission reduction requirements that applies to the project. The purpose of the review process would be to ensure that 'double counting' of greenhouse gas emissions and off-sets under the plan and any legally binding carbon emission reduction requirements does not occur.

(b) The proponent must implement the measures within the greenhouse offset plan following the Coordinator-General's approval of the plan.

(3) Reporting of releases or events

(a) The proponent must notify the Coordinator-General and the relevant nominated entity as soon as practicable after becoming aware of any release or event that occurs otherwise than in accordance with these conditions, or any event where environmental harm (as defined by the *Environmental Protection Act 1994*) is caused or threatened.

(b) Within 14 days following any notification in accordance with Condition 3(a), written advice detailing the following information must be provided to the Coordinator-General and relevant nominated entity:

(i) name of the operator of the activity and the persons responsible for the activity

(ii) name and telephone number of a designated contact person

(iii) location of the release/event

(iv) date and time of the release/event

(v) time the operator became aware of the release/event

(vi) suspected cause of the release/event

(vii) a description of the resulting effects of the release/event

(viii) results of any sampling or monitoring performed in relation to the release/event

(ix) actions taken to mitigate any environmental harm (including environmental nuisance) caused by the release/event

(x) proposed actions to prevent a recurrence of the release/event, responsibility and timing for implementation.

(4) Monthly environmental monitoring reports—construction only

(a) The proponent is to prepare an environmental report on a monthly basis for the design and construction phase. The report is to include, but is not limited to:

(i) monitoring data undertaken for the period and an interpretation of the results in respect of conditions in Schedule 3 and the EMP and EMP sub-plan requirements

(ii) satisfaction of environmental objectives and performance criteria and other EMP requirements

(iii) any incidents of non-compliance, including details of the incident, resulting effects, corrective actions, revised construction practices to prevent a recurrence, responsibility and timing

(iv) reporting of complaints, including number of complaints, description of issue, responses and corrective actions.

(b) The monthly environmental report is to be made available on the project website within two weeks of the end of the month to which the report relates.

(5) Half yearly audit reports

(a) The proponent must procure the following:

(i) Audits to be undertaken on a six monthly basis during the audit period by an independent and suitably qualified expert (auditor), engaged by and at the expense of the proponent, to determine whether the proponent has complied with each of the conditions in Appendix 1, Schedule 3 of the Coordinator-General's Report for the project in all construction areas.

(ii) Submission by the proponent to the Coordinator-General of the auditor(s)' written report of the audit (Audit Report) together with an audit certification statement (Audit Certification Statement), not later than 42 days after the end of the relevant six month period.

(b) The audit period will:

(i) commence on the commencement of construction of the project

(ii) end once all Schedule 3 Part 2 conditions have been complied with to the satisfaction of the Coordinator–General and a final audit report together with an audit certification statement has been submitted by the proponent confirming that all conditions in this schedule have been satisfactorily complied with for a period two years after commencement of the operation phase of the project.

(c) The auditor must be a suitably qualified person with not less than five years experience in environmental auditing or who is otherwise acceptable to the Coordinator-General in consideration of the principles in AS 19011. The Environmental Management Representative may undertake the audit provided that it complies with these requirements.

(d) The proponent must promptly provide the auditor(s) with all such information and site access as may be reasonably required to enable the auditor(s) to undertake the audit and prepare the audit report.

(e) The audit report must include:

(i) details of the project, including the name and location of the project, members of the audit team (including brief details of each member's qualifications and years of experience), and employees of the proponent interviewed for the audit

(ii) a summary of what conditions were activated during the reporting period

(iii) a summary of any non-compliances identified during the current audit period with conditions at the front end of the report, with reference to where further information can be found in the body of the report

(iv) a summary of any non-compliances that were identified during the previous audit period, with details of site remediation activities, corrective actions taken or to be taken and revised practices implemented or to be implemented (as relevant)

(v) a compliance evaluation table detailing the relevant condition in Schedule 3 of the report, whether compliance with this condition was achieved and how compliance was evaluated (for example the lists of documents, site inspection or employee interview relied upon by the auditor to evaluate the condition)

(vi) a site plan showing the project activities (for example work areas, road infrastructure and any significant features such as waterways etc)

(vii) a list of the evidence used to support the findings of the audit. The list should detail the title, date and holder of any documents reviewed, the date and locations of any site inspections conducted and the name and position details of any person interviewed for the purpose of conducting an audit (the Coordinator-General may request copies of documents used as evidence at a later date)

(viii) any further attachments which the auditor(s) consider are relevant to the audit report.

(f) The audit report must otherwise be in such form as may be required by the Coordinator-General and notified to the proponent.

(g) A suggested format for the audit report can be found at the Department of Infrastructure and Planning's website www.dip.qld.gov.au, but this is not a prescribed form.

(h) The audit report must be accompanied by an audit certification statement which is to be completed and signed by the auditor(s). The audit certification statement must be attached to the audit report and include:

(i) name of project, proponent and details of Coordinator-General's report(s) or approval to which the audit relates

(ii) date, place, methods and evidence used to assess compliance

(iii) summary of any non-compliances identified

(iv) auditor's name, position, company and contact details, auditor's qualifications and/or experience; and declaration whereby the auditor:

A. certifies the conditions contained in Schedule 3 of Appendix 1 of this Coordinator-General's report have been satisfactorily complied with, subject to any qualifications which the auditor has outlined in the audit certification statement

B. certifies that to the best of the auditor's knowledge, all information provided in the audit report is true, correct and complete

C. certifies that the auditor, and to the best of the auditor's knowledge, all members of the audit team are independent from the proponent to the extent that the outcome of the audit will not be influenced by any relationship with the proponent or potential benefits to the auditor or members of the audit team

D. acknowledges that it is an offence under section 157(O) of the SDPWO Act, to give the Coordinator-General a document containing information that the auditor knows is false or misleading in any material particular.

(i) A suggested format for the audit certification statement is available online from www.dip.qld.gov.au, but this is not a prescribed form.

(j) The proponent must promptly provide (and must ensure that the auditor(s) also promptly provide at the cost of the proponent) the Coordinator-General with such further information and/or site access as may be required by the Coordinator-General in respect of any audit report or concerning compliance with the conditions in Appendix 1, Schedule 3 of this Coordinator-General's report.

Part 2: Design and construction phase

(6) Communication and consultation

(a) Prior to the commencement of construction works, and then at three-monthly intervals, the proponent shall advertise in relevant local newspapers, the nature of construction works proposed for the forthcoming three months, the areas in which these works are proposed to occur, the hours of operation and a contact telephone number.

(b) The proponent shall undertake early and on-going engagement with owners and occupants of sensitive places adjacent to or predicted to be impacted by the proposed construction works (including spoil haulage), and works associated with impact mitigation measures. The consultation shall include the provisions of clear information about the scale, timing, duration, location, intensity and potential effects of construction works and, where required by these conditions, the mitigation measures available to the owner or occupant.

(c) The proponent shall ensure that the local community, businesses and public transport operators are kept informed (by appropriate means such as: local newsletters, leaflets, newspaper advertisements, community notice boards and the project internet site, to be established in accordance with condition 6(d), of the progress of the project, including any traffic disruptions and controls, construction of temporary detours and work required outside the 'Standard Construction Hours', including noisy works, not less than 48 hours prior to such works being undertaken.

(d) The proponent shall establish a project internet site at least three months prior to the commencement of construction works and maintain the internet site until at least 12 months after commencement of operation of the project or as long as required for updating operational air quality and traffic monitoring results. The internet site shall, as a minimum, contain monthly work progress and consultation activities updates, including but not limited to:

(i) a description of relevant approval authorities and their areas of responsibility

(ii) a list of environmental management reports that are publicly available and the executive summaries of those reports

(iii) minutes from Community Liaison Group (CLG) meetings (refer Condition 7)

(iv) bi-monthly newsletters consistent with Condition 6(c)

(v) 24 hour toll-free complaints contact telephone number, established in accordance with Condition 8(a)(iii)

(vi) reporting of complaint management details, including nature of complaints and how the complaint was addressed, and analysis of complaints over time

(vii) a means of lodging complaints over the internet, including the method for elevating the complaint if the complainant is unsatisfied with the initial response

(viii) a means of asking questions or providing feedback.

(e) Work progress, construction activities and planned work schedule must be provided and updated more frequently in accordance with this condition, where significant changes in noise impacts are expected.

(7) Community Liaison Group

(a) The proponent shall establish appropriate representative CLGs to the satisfaction of the Coordinator-General and in accordance with the community communication strategy required under Condition 8.

(b) The proponent shall:

(i) ensure a CLG is established for each locality in which surface construction works are to be undertaken (i.e. a CLG for the construction area at the Centenary Motorway at Toowong and a CLG for the construction area at the ICB at Herston)

(ii) appoint as the Chair of each CLG the relevant independent community liaison representative (ICLR) defined by Schedule 3 Condition 9(a) of this Coordinator-General's report

(iii) ensure that each CLG comprise at least two representatives of the proponent (including the Environmental Management Representative), at least one representative of the lead construction contractor, at least four community representatives (including the Chair) and one local business representative

(iv) ensure that the first meeting of each CLG is held prior to commencement of construction in the relevant area and that this first meeting consider the interrelationship of this CLG with any existing community liaison or consultative groups of adjoining or interrelated developments

(v) provide to the CLG regular information on the progress of work on the project and monitoring results

(vi) promptly provide to the CLG such other information as the Chair may reasonably request concerning the environmental performance of the project

(vii) allow the CLGs to make comment/s about the:

A. construction progress and implementation

B. environmental management plan and sub plans

C. compliance with the conditions of this Coordinator-General's report, and

D. other matters relevant to the construction and operation of the project.

(viii) ensure the CLGs have access to reasonable and sufficient information for such purposes

(ix) invite representatives from relevant government agencies or other individuals to attend meetings as reasonably required by the Chair

(x) provide access for site inspections by the CLG at times that are mutually acceptable to the proponent and the CLG members

(xi) consider the recommendations and comments of the CLGs and provide a response to the CLGs

(xii) take minutes for each meeting and seek the agreement of the CLG members to those minutes within 14 days of that meeting

(xiii) make CLG minutes available for public inspection on the project website and at the project display centre within seven days of their endorsement by the Chair

(xiv) provide meeting facilities and bear all costs associated with the establishment and ongoing function of the CLGs

(xv) when circumstances require, meet all reasonable costs to engage independent consultants to interpret relevant technical information and tasks of a similar nature as agreed by the relevant CLG

(xvi) at least six months prior to the commencement of operation of the project, expand the CLG to include a representative of the NLRT operator

(xvii) decommission each CLG 12 months after the project's opening to traffic.

(c) In the circumstance of any unresolved disagreement between CLG members about the operation of a CLG or the responsibilities of its members, including the proponent, the Coordinator-General's decision shall be final.

(8) Community communication strategy

(a) The proponent shall prepare a community communication strategy for the construction period, to be initiated prior to the commencement of construction. The strategy shall set out the community consultation procedures for the project, which shall comply with the obligations under these conditions, other approvals, licences and permits. It will also include:

(i) identification of stakeholders likely to be affected by the project, including identification of sensitive places, businesses and other sensitive land uses

(ii) procedures for the establishment and functioning of the CLGs for each locality in which surface works are to be undertaken (e.g. construction areas near the Centenary Motorway at Toowong and the ICB at Kelvin Grove / Herston) in accordance with Condition 7

(iii) establishment of procedures and mechanisms through which the community stakeholders can discuss or provide feedback to the proponent or environmental management representative in relation to the environmental management and construction and operation of the project, including a 24 hour—7 day serviced toll-free hotline and email service

(iv) procedures and mechanisms through which the proponent can respond to any enquiries or feedback from the community stakeholders in relation to the environment management and construction of the project

(v) procedures and mechanisms to be implemented to respond to any matters not resolved by the proponent response under Condition 8(a)(iv) on the matters relating to environmental management and the project construction

(vi) procedures for informing the local community of planned investigation and construction activities including regular newsletters, scheduled information sessions or open days

(vii) a complaints process as specified in Condition 15(f)(ix)

(viii) where required, special procedures to respond to complaints, issues or incidents, such as face-to-face meetings and on-going communications with affected parties and a documented process for issues resolution

(ix) procedures for informing affected road network users of planned traffic arrangements including temporary traffic switches

(x) the provision of training for all employees and sub-contractors on the requirements of the community communication strategy.

(b) The proponent must prepare and implement a detailed community notification strategy to provide information to road users, including motorists, pedestrians and cyclists, on the timing of the implementation of project elements.

(9) Independent community liaison representative (ICLR)

(a) The proponent shall nominate a person(s) experienced in mediating disputes, to be approved by the Coordinator-General, to serve as the ICLR(s). The role of the ICLR(s) shall include but not be limited to:

(i) chair CLG meetings (refer to Condition 7)

(ii) communicate with the proponent with regard to community consultation strategies

(iii) contact the Environmental Management Representative immediately if, in the opinion of the ICLR, an unacceptable noise or other impact is being generated with reference to these conditions

(iv) being available for direct contact by the community during the hours of 9.00 am to
4.00 pm Monday to Friday and by arrangement during periods of high noise impact activities as outlined in the Construction Noise and Vibration Management Sub Plan (Condition 21)

(v) to the greatest extent practicable, resolve community complaints not resolved by the proponent's complaints process.

(b) the proponent shall bear the cost of employment of the ICLR.

(10) Display Centres

(a) At least one display centre shall be established and maintained at least until opening of the project to traffic. The ICLR shall be based at a display centres at agreed times outlined in the community communication strategy. The display centre(s) shall be open between 10.00 am and 6.00 pm on week days when surface construction work is undertaken and between 10.00 am and 1.00 pm on Saturdays when surface construction work is undertaken. Up-to-date photographs, diagrams, engineering drawings, technical reports, samples and other suitable material shall be provided at each display centre, covering at least:

(i) noise and retaining wall locations, details and finishes

(ii) landscape concept, cross section treatments, perspective views and details

(iii) buildings

(iv) bridges

(v) tunnels

(vi) overall architectural and landscape design theme(s)

(vii) ventilation technology and ventilation stack design

(viii) temporary works affecting businesses, residences, pedestrians and public transport users.

(b) A dedicated PC internet access point to the project internet site shall be provided at each display centre. A phone line shall be provided from one display centre to the centre where the ICLR(s) are based if more than one display centre is established.

(c) At least one display centre shall be staffed, unless alternative public display activities outlined in the community involvement plan are programmed and publicised. Any proposals to not staff the display centre(s) must be agreed by the ICLR(s).

(11) Building works

(a) Toll road control buildings associated with the project must be designed sympathetically to the surrounding environment. Temporary buildings associated with the project must be designed and sited to reduce impacts on adjoining properties where practicable.

(b) Project buildings must be designed and constructed so that shadowing and light spill onto adjacent premises is minimised and consistent with the relevant Australian Standards.

(12) Pedestrian/cycle connectivity

(a) The existing connectivity and functionality of the Centenary Motorway Bikeway and Centenary Motorway Cycle and Pedestrian Bridge at Toowong will be maintained during the construction period. Where occasional closure to the Centenary Motorway Cycle and Pedestrian Bridge is required for modification of the structure to span the new road works or other safety issues, an alternative route must be provided and such closures will not exceed 50 days in total for the duration of the construction works of the project and the proponent is to schedule the works to minimise disruption to cyclists where possible. No single closure is to be greater than 30 calendar days.

(b) A pedestrian/cycle path consistent with the existing pedestrian/cycle infrastructure must be constructed from the Centenary Motorway pedestrian/cycle overpass adjacent to the Mount Coot-tha roundabout to the main entrance of the Mount Coot-tha Botanic Gardens prior to commencement of operations.

(13) Requirement for equitable access statement

At least two months prior to the commencement of permanent construction, the proponent must submit an Equitable Access Statement (EAS) to the Department of Communities (Disability Services Queensland) for comment. The purpose of the EAS is to ensure that the needs of people with a disability or who may experience access problems are taken into account during the design of the project, including in respect to signage, tactile ground surface indicators, doors and doorways and egress lighting systems. The Department of Communities comments must be taken into account in finalising the EAS. The proponent must finalise the EAS within six months of commencement of construction and must implement the finalised EAS.

Note: The Department of Communities shall provide a response to the EAS within 30 days of receipt of all reasonable and relevant information from the proponent assuming receipt of adequate and sufficient information. If comments are not provided by the Department of Communities within the one month period the Department is deemed to have no comments.

(14) Environmental management

(a) The proponent shall appoint construction and/or operation head contractors that have an environmental management system prepared in accordance with the AS/NZS ISO 14000 series or BS7750-1994 and/or have a proven environmental management performance record.

(b) At least two months prior to commencement of construction the proponent shall nominate for the approval of the Coordinator-General a suitably qualified and experienced Environmental Management Representative(s) independent of the project design and construction personnel. The proponent shall employ the environmental management representative(s) for the duration of construction, or as otherwise agreed by the Coordinator-General. The representative(s) shall:

(i) be the principal point of advice in relation to all questions and complaints concerning the environmental performance of the project

(ii) certify that the Design and Construction EMP (D&C EMP) and the Operation and Maintenance EMP (O&M EMP) and associated EMP sub-plans meet the requirements of these conditions

(iii) monitor and audit the implementation of all EMPs, EMP sub-plans and monitoring programs and advise the proponent with respect to the achievement of all project environmental outcomes

(iv) reviewing and approving the project induction and training program related to environmental matters for all persons involved in construction activities and monitoring implementation

(v) periodically monitoring the proponent's environmental activities to evaluate the implementation, effectiveness and level of compliance of construction activities with the Design and Construction EMP (D&C EMP), and associated plans and procedures, including carrying out site inspections at least fortnightly at all active sites

(vi) have responsibility for considering and advising the proponent on matters specified in these conditions and all other licences and approval related to the environmental performance and impacts of the project

(vii) notwithstanding the preference that the proponent implement the actions outlined in the D&C EMP to prevent environmental impacts, be given the authority and independence to advise reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts, and in the event of non-compliance with any condition of Schedule 3, to advise the proponent and DERM that relevant actions be taken or ceased to achieve compliance with the condition

(viii) shall be available for contact during all time construction activities are occurring at the worksites and be present on site during any 'high noise impact' construction activities as defined in the relevant EMP Sub-Plan.

(15) Environmental management plan (EMP)

(a) A D&C EMP, including EMP sub-plans, must be prepared and implemented to properly and effectively manage the environmental impacts arising from the project. The D&C EMP must include but is not limited to:

(i) being developed generally in accordance with the draft EMP in Appendix D of the Supplementary Report

(ii) incorporating all of the conditions for design and construction in Schedule 3 of this Coordinator-General's report

(iii) identifying elements of the D&C EMP requiring ongoing action in the operational phase of the project

(iv) demonstrating how the elements in (i) to (iii) above have been included in the D&C EMP.

(b) The D&C EMP and EMP sub-plans must be developed and implemented in stages to address each relevant component of design and construction. It must provide for progressive assessment of predicted impacts and design of mitigation measures prior to the relevant stages of construction works.

(c) The D&C EMP, including EMP sub-plans, must be made publicly available.

(d) At least five business days prior to the commencement of construction works, the D&C EMP and EMP sub-plans shall be provided to the Coordinator-General, following consultation with the relevant nominated entities with jurisdiction and consultative bodies (identified in Schedule 4) and their comments taken into account in finalising the plans. The D&C EMP and EMP sub-plans shall be certified by the Environmental Management Representative as being in accordance with these conditions and all undertakings made in the EIS and supplementary report prior to seeking comments from the relevant nominated entities and consultative bodies.

Note: The relevant nominated entities and consultative bodies shall provide an integrated and coordinated response through the nominated entity with jurisdiction to the D&C EMP within one month of the certified D&C EMP and EMP sub-plans being provided to the nominated entity and consultative bodies. If comments are not provided by the nominated entities and through them, the consultative bodies, within the one month period, the entity/body is deemed to have no comments.

(e) The D&C EMP and EMP sub-plans must be based on predictive studies and assessments of construction impacts which have regard to the scale, intensity, location and duration of construction works and infrastructure. Properties which would be adversely affected must be identified.

(f) The D&C EMP must accord generally with the following framework:

(i) **environmental objectives and performance criteria**—the D&C EMP and EMP sub-plans must adopt and incorporate the environmental objectives and performance criteria set out in Draft D&C EMP in Appendix D of the Supplementary Report to the EIS updated where necessary to incorporate these conditions.

(ii) **EMP Sub-Plans**—the D&C EMP is to incorporate the following sub-plans as required by these conditions to address in detail specific environmental impacts of the construction works:

A. construction traffic

B. construction traffic vehicles

C. geology and soils

D. hydrogeology and groundwater quality

E. surface water quality

F. air quality

G. noise and vibration

H. flora and fauna

I. cultural heritage

J. social environment

K. hazard and risk

L. waste management

M. urban design and landscape.

(iii) EMP sub-plans must include measures designed to comply with relevant industry standards for environmental management, including those set out in schedule 7 to these conditions.

(iv) **Design of mitigation measures**—mitigation measures must be designed in response to the predicted impacts, with detailed design measures to address localised impacts where necessary.

(v) Mitigation measures must be directed to achieving the environmental objectives and performance criteria set out in the Draft D&C EMP in Appendix D of the supplementary report to the EIS, the statutory requirements, and must be consistent with these conditions. They may include the mitigation measures contained in the draft D&C EMP in Appendix D of the supplementary report to the EIS or may include other measures, provided those other measures achieve the environmental objectives and performance criteria, the statutory requirements and these conditions.

(vi) **Monitoring**—the D&C EMP must contain a program and procedures for on-going monitoring to identify the effectiveness of the mitigation measures, having regard for the environmental requirements established in the D&C EMP. Monitoring must include a range of activities such as but not limited to scientifically-conducted measurements of specified parameters, visual inspections, recordings of events, and communications with affected property owners and occupants. Monitoring results must be reported in the form required by the D&C EMP.

(vii) **Consultation**—consultation procedures must include the community engagement measures described in Conditions 6-10 of Schedule 3 of this Coordinator-General's report as a minimum, and meet the following requirements:

A. consultation with owners and occupants of properties in the corridor of construction influence identified through predictive modelling, as well as the wider community, must be conducted for the duration of the construction period

B. consultation must commence well in advance of the commencement of works, and in some circumstances, should commence with the design of mitigation measures

C. consultation with owners and occupants of affected properties must be conducted with confidentiality where requested by the owners or occupiers of premises and at a level of detail sufficient to address specific construction impacts and mitigation requirements.

(viii) **Review, response and modify**—there must be a regular review of the D&C EMP and EMP sub-plans. A process for review of mitigation measures must be outlined in the D&C EMP. The review process must provide for further or alternate mitigation measures to be implemented as soon as practical in response to monitoring results where non-compliance is identified and the outcomes of community consultation.

(ix) **Complaints**—as an extension of the consultation process, there must be a formal process for receiving and dealing quickly and effectively with complaints about construction issues. This process must be established before the commencement of construction works and should adopt a consultative and negotiated basis rather than an adversarial basis. The complaints procedure must be easy to use, with information about its implementation provided on the project website and through the visitors' information service. As a minimum, the complaints process must include the following elements:

A. a protocol establishing the responsibility for receiving and addressing complaints, and the means of notifying the community of this protocol (e.g. publication of a complaints telephone service, website advice, and address for notices and other correspondence) prior to commencement of construction

B. establishment of a 24 hour, 7 day a week serviced toll-free telephone line. The aim of the hotline is to enable any member of the general public to reach a person who can arrange appropriate response/corrective action to complaints within two hours during all times construction works occur

C. identification of the complainant, the identity of the person who received the complaint, the manner in which the complaint was made, the time and date on which the complaint was made, and the matter to which the complaint relates

D. a process wherein, upon receipt of a complaint, an investigation commences forthwith into the cause of the complaint and any actions reasonably required to address the complaint. At least a verbal response on the action(s) to be taken is provided to the complainant within two hours during all times construction works occur (unless the complainant agrees otherwise) and a detailed written response within seven calendar days of the receipt of the complaint. Information on all complaints received and response times shall be made available to the environmental management representative daily and on request to the Coordinator-General and relevant nominated entities

E. a database for tracking complaints, issues, the subject of complaints, responses and corrective actions taken. A means of reporting each complaint, such as a complaints register, must include identification of the entity responsible for addressing the complaint, the time and date on which the complaint was addressed and closed out, a brief summary of any action taken to address the complaint, and a notation as to the satisfaction or dissatisfaction of the complainant with the outcome

F. monthly reporting of complaints as part of an overall performance and compliance report posted on the project website.

(x) **Non-conformance**—a process for dealing with circumstances where goals or limits are exceeded during construction activities must be established prior to the commencement of construction works. This process must establish a mechanism for reporting, taking corrective action where required, and indicating responsibilities and timing for such action

(xi) **Reporting**—a mechanism for reporting on compliance must be established in the D&C EMP consistent with the reporting requirements of Conditions 3, 4 and 5.

(16) Traffic management

(a) Construct the project in accordance with the D&C EMP, the Construction Traffic EMP Sub-Plan and the Construction Traffic Vehicle EMP Sub-Plan.

(b) Prior to commencement of any site works or construction, a Construction Traffic EMP Sub-Plan must be prepared to implement measures that avoid, where practicable, or minimise and mitigate, the noise, dust, traffic congestion or other traffic problems or any road safety impact arising from construction traffic during the construction phase. Such measures must achieve the environmental objectives and performance criteria set out in table D-9 of the Draft D&C EMP, section D.6 of the supplementary report and must address the city-wide and local implications of surface construction works for traffic flows, public transport, pedestrian and cyclist safety, property access and parking. Construction traffic management measures may include the mitigation measures for traffic and transport described in table D-9 of the Draft D&C EMP, section D.6 of the supplementary report or other measures in accordance with these conditions.

(c) In the preparation of the Construction Traffic EMP Sub-Plan, the proponent is to consult with the BCC, TMR and any other relevant local government authority where its roads may be affected by construction traffic (e.g. Ipswich Regional Council for contaminated materials haulage to Swanbank) in order to confirm and effectively manage the impacts of construction traffic

(d) The Construction Traffic EMP Sub-Plan is to be submitted for approval by BCC, TMR and any other relevant local government authority to the extent where its roads may be affected

(e) No site works that impacts on the road network shall commence until approval of the Construction Traffic EMP Sub-Plan is provided by BCC and TMR

(f) Prior to submission the Construction Traffic EMP Sub-Plan shall be certified by a person registered by the Board of Professional Engineers of Queensland

(g) The Construction Traffic EMP Sub-Plan must detail, but not be limited to:

  (i) the number and class of construction traffic vehicles by day, hour, road name and carriageway direction

  (ii) changes in levels of service, including safety, security and efficiency, for all traffic, including buses, cyclists, pedestrians and motorised vehicles

  (iii) measures to maintain safe and functional access to community facilities, and to ensure pedestrian and cyclist safety and movements on routes adjacent to construction worksites

  (iv) measures to be taken to minimise lane closures, detours and other changes to levels of service. Specifically, the Construction Traffic EMP Sub-Plan is to detail how any interruption to access or closures of the Centenary Bikeway and the Toowong cycle/pedestrian bridge over the motorway are to be minimised

  (v) staff workplace travel plan to encourage the use of car pooling, public transport and active transport

  (vi) measures to prevent the parking of construction traffic on streets near to work sites

  (vii) traffic signage, including variable message signs (VMS), to be used

  (viii) communication mechanisms for advising of changes in travel time, including detours, changes in lane widths or locations and posted speed limit changes

  (ix) measures, including additional controls required, for avoiding disruption during peak traffic flow periods and public holidays

(x) measures, including additional controls required, for avoiding disruption of scheduled events, and to coordinate with scheduled construction and maintenance works on other projects

(xi) measures for co-ordinating the works with typical operations on State-controlled roads such as road improvements, road resurfacing, installing linemarking and street lighting maintenance

(xii) entry and exit locations to worksites, including a road safety audit for each and all worksite entry and exit locations utilising the Austroads guidelines laid out in Guide to Road Safety, Part 6: Road Safety Audit

(xiii) the management of incidents (traffic, construction or other) on and around the project works

(xiv) the monitoring and action process for ensuring that traffic congestion and traffic queue lengths are not substantially worse than those conditions prevailing in the two months prior to the commencement of works (where that period is not affected by more than two weeks of school holidays).

(h) The Construction Traffic EMP Sub-Plan and the Construction Traffic Vehicle EMP Sub-Plan must be subject to periodic review, update and continuous improvement to address construction program requirements, construction sequencing or identified shortcoming with any pre-existing Construction Traffic EMP Sub-Plan.

(i) Where changes to the methodologies or mechanisms described in the Construction Traffic EMP Sub-Plan are proposed, a revised Construction Traffic EMP Sub-Plan shall be submitted for approval by BCC and TMR and any other relevant local government prior to these changes being implemented.

(j) The Construction Traffic EMP Sub-Plan is to identify routes to be used by construction traffic vehicles for haulage of construction materials and any construction spoil produced as part of the project, including:

(i) the nominated haulage routes should as far as is reasonable and practicable, rely upon arterial roads and minimise the use of minor roads

(ii) a construction traffic vehicle includes any vehicle carrying materials to and from the Brisbane City Council Mount Coot-tha Quarry where those materials have arisen from the Northern Link worksite or are intended for delivery to the Northern Link worksite

(iii) notwithstanding any other restrictions already in place through other legislation and in addition to other requirements included in table D-9 of the Draft D&C EMP, section D.6 of the EIS supplementary report (June 2009), the nominated haulage routes included in the Construction Traffic EMP Sub-Plan are to generally restrict construction traffic vehicle movements with an objective of:

A. no construction traffic vehicles equal to or greater than Austroads Class 3 (two-axle truck) on Frederick Street at any time

B. no construction traffic vehicles equal to or greater than Austroads Class 3 between 8pm and 6am the next morning, or equal to or greater than Austroads Class 5 (four-axle truck) at any time, on Moggill Road (west of Centenary Motorway)

C. no more than six trips (past any one point in one direction) per hour of construction traffic vehicles equal to or greater than Austroads Class 4 (three-axle truck) permitted between 8pm and 6am the next morning on Mt Coot-tha Road and Centenary Motorway

D. no construction traffic vehicles equal to or greater than Austroads Class 3 permitted between 8pm and 6am the next morning on all other State-controlled roads which are not motorways.

(iv) the requirements included at 16(j)(iii) may be reviewed by TMR if a submission is made to TMR for approval, and construction traffic vehicles can be shown to be modified or designed to be operating as very low noise vehicles (tyres, motor, trailers and stack). Supporting noise test information would be required as part of such a submission.

(k) Prior to commencement of any site works or construction, a Construction Traffic Vehicle EMP Sub-Plan must be prepared to implement measures that manage the operation of the construction fleet. Such measures must achieve the environmental objectives and performance criteria set out in table D-9 of the Draft D&C EMP, section D.6 of the EIS Supplementary Report (June 2009) Construction traffic vehicle management measures may include the mitigation measures for traffic and transport described in table D-9 of the Draft D&C EMP, section D.6 of the EIS supplementary report (June 2009) or other measures in accordance with these conditions.

(i) Construction traffic vehicle includes any registered vehicle capable of conveying a load greater than two tonnes, or having a total or combined length greater than six metres that is delivering plant, materials or equipment to or from any Northern Link worksite. This classification includes mobile plant and machinery capable of moving under its own power, but does not include construction workforce vehicles.

(ii) On request, all construction traffic vehicle licence plate numbers must be supplied to TMR.

(iii) All construction traffic vehicles shall comply with, and be tested and maintained in accordance with, *Vehicle Standard (Australian Design Rule 28/01—External Noise of Motor Vehicles) 2006*.

(l) The Construction Traffic Vehicle EMP Sub-Plan should include as a minimum the following:

(i) the proposed method of haulage vehicle fleet management to:

A. avoid, or minimise and mitigate, disruption to local traffic movements generally and particularly during peak traffic periods including school drop-off and pick-up times

B. avoid haulage vehicles queuing in proximity to residential premises, schools or health care facilities

C. avoid generation of dust in the worksites and beyond the worksites from the deposition of material on roads from vehicle wheels

D. minimise and mitigate potential impacts from vehicle emissions upon adjoining premises and sensitive places situated nearby construction worksites

E. avoid excessive noise from haulage vehicle operations within and at the immediate entries and exits of the worksites

F. any other measures necessary to minimise and mitigate the adverse environmental and community impacts of construction traffic vehicle operations.

(ii) Specific measures for the construction traffic vehicle fleet to:

A. only include spoil haulage vehicles and equipment, with consistent payloads and bin sizes

B. minimise the emissions of both noise and exhaust emissions, complying with ADR28/01

C. avoid haulage during peak traffic periods where reasonable and practicable, including peak traffic periods associated with major events, including at RNA Showgrounds, Mt Coot-tha Botanic Gardens or Suncorp Stadium.

(iii) In addition to any measures included in table D-9 of the Draft D&C EMP, section D.6 of the EIS supplementary report (June 2009) specific measures to be fitted to construction traffic vehicles to facilitate:

A. real time management of trucks and traffic conditions to avoid traffic congestion, particularly in peak times, and real time scheduling to avoid queuing and the use of local roads

B. investigation of complaints and to assist with management of spoil haulage fleet performance.

(iv) Construction traffic vehicle fleet systems shall address:

A. safety, including accident & incident reporting and a Hazard Register, Risk Analysis and Safe Operating Procedures

B. routine and preventative vehicle maintenance

C. OH&S Tri Safe Audit (Qld Government self insurance audit) to assess the suitability of operators.

(17) Spoil handling and placement

(a) Construction spoil from construction must be for:

(i) surface works and cut-and-cover works, handled and removed in a manner to mitigate noise and dust impacts on nearby properties, consistent with the objectives and limits established in Schedule 3 of these conditions

(ii) tunnel construction works, handled and removed from within an acoustically-lined and ventilated workshed, to mitigate noise, air quality, night lighting and over-shadowing impacts on nearby properties, consistent with the environmental objectives and performance criteria established in the Draft D&C EMP in Appendix D of the supplementary report to the EIS and these conditions.

(b) Spoil handling facilities, including the external conveyor system, and stockpiling and storage facilities, must be designed, constructed and operated to comply with the Schedule 3 Conditions and satisfy the following requirements:

(i) the facilities must be safe and secure, such that unauthorised access to any part of it is not available, directional night lighting is provided to all access points and hazard areas, and facility operations are capable of remote surveillance by worksite staff

(ii) the conveyor must not impede existing access to public areas within the Mt Coot-tha Botanic Gardens. Conveyor facilities established elsewhere must not impede existing access to public facilities, recreation areas and open space, or if access would be constrained as a consequence of the facilities, only with the prior agreement of the BCC

(iii) access to the conveyor system for maintenance purposes must be provided within the conveyor corridor and as close as practicable to the conveyor system

(iv) the facilities must be situated, designed and constructed to present the minimum visual and landscape impact as far as practicable, having regard to topography, vegetation, scale, character of construction and construction materials, location relative to sensitive land uses, and the likely duration of its use

(v) construction of spoil handling facilities including the conveyor system must avoid where practicable, or minimise and mitigate the potential invasion or colonisation of areas disturbed by construction activities by introduced plant and animal pests such as, but not limited to, fire ants, birds and weeds.

(c) Upon completion of the spoil handling and transport task, the spoil handling facilities must be decommissioned as soon as practicable and rehabilitated to a condition suitable for use for the preferred purposes under the area's designation in Brisbane City Plan 2000 (City Plan). Such rehabilitation must include:

(i) remediation of any land contaminated by either the construction or use of the facilities

(ii) rehabilitating the worksite including the conveyor corridor to an approximation of the pre-existing ground form, providing such rehabilitation works would not cause negative changes in surface drainage patterns or flood levels

(iii) landscaping works generally consistent with a landscape master plan to be prepared and provided to the Coordinator-General in consultation with the BCC at least 30 days prior to decommissioning works commencing

(iv) reinstatement of any impacted pedestrian and cycle paths to their former location.

(d) Spoil placement within the quarry, being the distribution, spreading and compaction of conveyor spoil from the project works, is to be controlled in accordance with the existing quarry development permit. These activities are only to be undertaken between 7am and 5pm, Monday to Friday, and not on public holidays.

(e) All placement of spoil at spoil placement areas must comply with the performance criteria of the filling and excavation code in City Plan 2000 or similar applicable local authority plan.

(f) Spoil placement areas must be rehabilitated as quickly as reasonable and practicable to manage and mitigate the potential adverse environmental impacts of dust, soil erosion and sedimentation.

(g) Spoil placement must be managed to minimise adverse environmental impacts on waterways, and sensitive places.

(h) The conveyor belt for delivery of spoil into the Mt Coot-tha Quarry and spoil deposition into the Mt Coot-tha Quarry must be managed and operated in accordance with project documentation. Activities within the quarry will be the responsibility of the quarry manager.

(i) Operation of the spoil conveyor and discharge of the spoil from the conveyor into the quarry must meet the performance criteria for noise in table 10, Condition 22 and air quality in Condition 20 of the Coordinator-General's Report, for residential properties in the vicinity.

(j) For spoil other than that what is deposited in the Mt Coot-tha Quarry, spoil placement areas must have appropriate approvals for the receipt and handling of the spoil material and changes to location of spoil placement areas are to be notified to the administering authorities.

(18) General construction

(a) The project must be constructed in accordance with the D&C EMP including EMP sub-plans.

(b) Surface construction works shall be restricted to the hours of 6.30 am to 6.30 pm (Monday to Saturday) ('Standard Construction Hours') and at no time on Sundays and public holidays.

(c) Notwithstanding Condition 18(b), above, the following construction works are permitted to be undertaken outside of standard construction hours, subject to conditions:

(i) the delivery of oversized plant or structures that police or other authorities determine require transport along public roads to be outside of the standard construction hours and for which there is no feasible alternative

(ii) operation of the conveyor to transport spoil from the tunnel boring machine into the Mt Coot-tha quarry, provided the relevant noise limits in table 10, Condition 22 can be met

(iii) emergency work to avoid the loss of lives or property, or to prevent environmental harm

(iv) construction works for which relevant authorities (for example road management authorities) require that particular works at particular locations can only be undertaken outside of the standard construction hours and for which there is no feasible alternative

(v) loading and haulage of spoil may be undertaken at any time between 6.30am Mondays to 6:30pm Saturdays provided the relevant noise limits in Condition 22 can be met in relation to loading and haulage in construction areas. There must be no haulage of construction spoil on Sundays or public holidays

(vi) any other construction works approved by the Coordinator General.

(d) Details of any works to be conducted in accordance with Condition 18(c), other than 18(c)(iii) including copies of any associated approvals, must be submitted to the Coordinator-General and nominated entity for the noise and vibration condition at least five business days prior to the relevant construction works being undertaken.

(e) Construction areas must be designed and constructed to achieve compliance with these conditions and the environmental objectives and performance criteria for the management and mitigation of construction impacts set out in the draft D&C EMP in Appendix D of the supplementary report to the EIS.

(f) Specific measures which must be taken to manage and mitigate construction impacts include:

  (i) night lighting, including security lighting, must be designed, installed and positioned to minimise light spill onto residential premises or other sensitive receptors and comply with the relevant Australian Standard

  (ii) access points for pedestrian and vehicular traffic must be situated according to the Transport, Access, Parking and Servicing Planning Scheme Policy in City Plan 2000

  (iii) achieving compliance with the requirements of the Hazard and Risk Assessment Planning Scheme Policy in City Plan 2000

  (iv) the tracking of sediment by construction vehicles from construction areas to public roads and the receiving environment must be avoided by the installation of measures within the worksite (e.g. shakedown pads, 'rumblegrids', wheel washes or other similar methods).

(g) Any water supply or other infrastructure services required to support construction works must be designed and constructed to achieve the environmental objectives and performance criteria set out in the Draft D&C EMP in Appendix D of the supplementary report to the EIS, and including but not limited to flood management.

(h) Construction works must be managed to minimise adverse environmental impacts on waterways and sensitive places.

(i) Where it is identified that property damage has occurred to premises as a consequence of the construction works, such damage must be repaired as soon as practicable at no cost to the property owners. Such repairs must be undertaken in consultation with the property owners and occupants and must return the premises at least to the condition existing prior to commencement of construction works

(j) Construction areas must be rehabilitated as quickly as reasonable and practicable to manage and mitigate potential impacts such as dust, diminished water quality, soil erosion and sedimentation.

(k) The construction workforce must not park in local streets. A dedicated and adequate construction workforce off-street parking area must be provided. All construction workforce vehicles must be directed to project construction workforce car parks. To avoid construction workforce car parking in local streets, shuttle transport between construction workforce car parks distant from a construction area must be provided for the duration of the period the construction area is in use.

(l) Construction workforce car parks must be rehabilitated as quickly as is reasonable and practicable to a standard suitable for future use of a purpose preferred in this location under the area designation in City Plan 2000.

(m) The visual amenity of the construction areas must be maintained. Measures to be undertaken include, but are not limited to:

  (i) incorporating acoustic screening and landscaping around the construction areas using mature trees and shrubs where possible

  (ii) daily inspections of the acoustic barrier and other visible surfaces for graffiti which is to be removed within 24 hours

  (iii) consultation with the CLGs to discuss additional solutions to mitigating the visual impact of the construction areas

  (iv) design and siting of construction buildings and facilities to minimise overshadowing of private properties between 9.00 am and 3.00 pm on 21 June.

(n) The proponent shall ensure that access to all properties is maintained during construction and following opening of the project to traffic, unless a solution acceptable to the property owner/occupant is reached and documented in the form of a signed agreement. The proponent shall ensure that any access affected by the project is reinstated to an equivalent standard or that adequate compensation is negotiated with the relevant landowner(s).

(o) Following completion of permanent construction works the construction areas must be rehabilitated as quickly as reasonable and practicable. The plan for rehabilitation must be developed in consultation with the relevant CLG. Planting and landscaping shall give priority to the use of native species endemic to the Brisbane area and the *City Plan 2000: Planting Species Planning Scheme Policy* and shall include the use of mature trees, where appropriate. There must be provision for ongoing maintenance (including any necessary remedial action) to ensure the survival of vegetation planted at the site for a period of at least 12 months from the date of practical completion of each area.

(19) Flora and fauna

(a) The project must be constructed in accordance with the D&C EMP (Design and Construction), including the Flora and Fauna EMP Sub-Plan.

(b) Clearing shall only occur to the extent that is necessary for the construction phase and operational phase of the project.

(c) Any clearing or activities associated with clearing within the subject properties must not adversely impact on vegetation outside the project site.

(d) Procedures to minimise the potential for impacting flora and fauna must be included in the Flora and Fauna EMP Sub-Plan and be implemented on the site. Procedures are to include, but are not limited to:

(i) engagement of an experienced fauna catcher/spotter to undertake checks for fauna prior to native vegetation removal

(ii) checking site works such as trenches and culverts each morning and after periods of inactivity for any fauna trapped or likely to be harmed by construction works

(iii) identifying and marking vegetation to be retained to minimise loss of habitat

(iv) identifying fauna, including habitat areas and avoidance, management, and mitigation requirements

(v) undertaking a health assessment of significant trees in the vicinity of the project prior to commencement of construction and adopt a program to ensure minimum impacts of the project and rapid recovery

(vi) measures to ensure there is no damage to vegetation that occurs during the construction of the project (beyond site clearing) e.g. during the transport of oversize materials to the site.

(20) Air quality

(a) All construction works occurring at the construction areas must be carried out in a manner that will prevent and/or minimise the emission of dust and particulate matter to the atmosphere from these sites.

(b) Emissions of dust and particulate matter from construction works must not cause dust deposition of 120 milligrams per square metre per day, averaged over one month, when monitored in accordance with the most recent version of *Australian Standard AS3580.10.1 Methods for sampling and analysis of ambient air – Determination of particulate matter – Deposited matter – Gravimetric method*.

(c) Emissions of dust and particulate matter from construction works must not cause ambient air quality to exceed any of the following limits at a sensitive place:

(i) a concentration of particulate matter with an aerodynamic diameter of less than 10 micrometres (PM_{10}) suspended in the atmosphere of 50µg/m^3 (micrograms per cubic metre) over a 24 hour averaging time, when monitored in accordance with the most recent version of *Australian Standard AS3580.9.6 Determination of suspended particulate matter – PM_{10} high volume sampler with size-selective inlet – Gravimetric method*

(ii) a 24 hour average concentration of total suspended particulate matter of
80 µg/m^3 when monitored in accordance with the most recent version of AS/NZS 3580.9.3:2003 *Determination of suspended particulate matter—Total suspended particulate matter (TSP)—High volume sampler gravimetric method*.

(d) The results of the continuous monitoring data must be made available to the nominated entity administering this condition and the Coordinator-General on request.

(e) The release of noxious or offensive odours, or any other noxious or offensive airborne contaminants resulting from the activities to which these Conditions relate, must not cause a nuisance at any sensitive receptor.

(f) Prior to commencement of construction works an Air Quality EMP Sub-Plan, acceptable to the nominated entity administering this condition, must be developed and implemented and include, but not limited to the following:

(i) a background dust and particulate matter air quality monitoring program to determine air quality levels at sensitive places likely to be impacted by the project

(ii) identification of potential sources of dust and particulate matter emissions from works associated with the project

(iii) an assessment of the potential impact that these dust emissions will have on sensitive places, including predicted dust deposition rates, total suspended particulate and PM_{10} concentrations

(iv) reasonable and practicable measures which will be implemented to avoid, mitigate and manage the generation of dust and particulate matter at construction areas to ensure compliance with these conditions

(v) an air quality monitoring program, including a real time component using a tapered element oscillating microbalance analyser (TEOM) air quality monitoring device or similar, to manage dust issues and assess compliance with these conditions. The program should include establishing trigger levels with regard to the limits in these conditions and procedures to be implemented when trigger levels are exceeded (for example, by developing procedures to be implemented in response to a TSP trigger of 180 ug/m^3 one hour average). Monitoring equipment must be placed in locations representative of the most likely adversely affected sensitive place taking into account the nature and location of construction works and wind directions.

(vi) a program to train staff involved in carrying out dust generating activities, in dust management practices.

(g) Reasonable and practicable dust mitigation measures that may be incorporated into the Air Quality EMP Sub-Plan are provided below:

(i) stockpiles:

A. orienting stockpiles of sand, gravel or other materials in a direction that reduces exposed surfaces to prevailing winds where possible

B. watering product stockpiles to maintain a moisture content that minimises dust generation where possible

C. use of dust-suppressants

D. storage of materials in bunkers

E. establishing a cover crop/grasses on topsoil stockpiles.

(ii) haul roads and transport of aggregates and sand:

A. watering unsealed haul roads regularly

B. use of shakedown pads and road sweeping of sealed haul roads

C. use of dust suppressants

D. ensuring that trucks transporting fine materials are covered or that the load is wet down prior to transport

E. clearing spillages from side rails, tail gates and draw bars of vehicles prior to and after movement of materials.

(iii) crushing, screening and concrete batching plant and equipment:

A. employing water sprays as required to ensure that the moisture content of the material being processed is suitable to minimise dust during crushing and material handling

B. assessing wind direction prior to undertaking work that is likely to generate large quantities of dust and postponing works if wind is blowing towards a sensitive place

C. locating stationary dust generating activities (including concrete batching/rock crushing) as far as practical from sensitive places

D. ensuring that any dust collection systems including filters fitted to plant and equipment are maintained and cleaned as required to ensure their effective operation

E. use of windshields or barriers.

(iv) trafficable areas:

A. keeping surfaces clean

B. sealing with bitumen or other suitable material

C. using water sprays

D. installing an effective truck body and wheel wash facility

E. using dust suppressants and wind breaks.

(v) blasting and rock drilling:

A. dust collectors must be used as necessary to minimise the release of wind blown dust to the atmosphere while rock drilling is carried out

B. dust deposits must not smother or damage vegetation

C. blasting must be restricted when strong winds are blowing in the direction of sensitive places

D. dry and fine material within the blasted area should be wetted down to suppress dust evolution.

(h) Dust and particulate matter management measures should focus on 'source control' e.g. by stockpile management, wheel washes in addition to 'end of pipe' solutions such as house cleaning.

(i) Monitoring undertaken for the purposes of meeting the requirements of these conditions must be undertaken in accordance with the methods prescribed in the latest edition of the *Air Quality Sampling Manual* (Queensland Government 1997).

(j) Underground works must be ventilated, and ventilated air must be treated for the removal of dust prior to its release to the ambient environment.

(k) Dust filters for the tunnel construction ventilation system must be installed, operated and maintained to achieve the air quality objective for the environmental values for health and well-being set out in the *Environmental Protection (Air) Policy 2008*.

(21) Groundwater and surface water

(a) The project must be designed and constructed in accordance with the D&C EMP including the Groundwater and Surface Water EMP sub-plans. These sub-plans must be implemented prior to the release of any water off-site.

(b) Predictive modelling, based on background monitoring, must be carried out for areas where construction works are likely to intercept groundwater or cause the movement of groundwater.

(c) Where predictive modelling predicts that construction works are likely to intercept groundwater or cause the movement of groundwater, or where construction works intercept groundwater, specific mitigation and management measures must be designed and implemented to achieve the environmental objectives and performance criteria in the D&C EMP.

(d) Where there is an identified potential risk of groundwater movement (including drawdown) as a result of the project impacting on any property all reasonable and practicable measures must be taken to avoid, or mitigate and manage the impacts. These measures must be developed in consultation with owners and occupants of potentially-affected property prior to the commencement of construction works that have the potential to impact on the property.

(e) Where it is identified that property damage has occurred to premises as a consequence of the construction works affecting groundwater levels, such damage must be repaired as soon as practicable at no cost to the property owners. Such repairs must be undertaken in consultation with the property owners and occupants and must return the premises at least to the condition existing prior to commencement of construction works.

(f) A specific, targeted monitoring program must be adopted to monitor groundwater flows during construction works, and for a period of five years after commencing operations, including, in locations where predictive modelling suggests there is a potential for groundwater draw-down. The predictive modelling must specifically consider the potential for inflow to occur from the Brisbane River.

(g) Stormwater must not be released from the construction areas to receiving waters in exceedence of the stormwater quality values in Table 7 as measured at the release point.

Table 7: Stormwater quality release measures

Water Quality Parameter	Value
pH	6.5-8.5
Turbidity	<20 NTUs
Oils and Grease	no visual films or odour
Debris	no visible debris
Suspended Solids (combined wet and dry flows)	50 mg/L

Suspended Solids (wet weather flow)	90%ile < 100mg/L

(h) Groundwater must not be released from construction areas to receiving waters in exceedence of the groundwater quality values in Table 8 as measured at the release point.

Table 8: Groundwater quality release measures

Water Quality Parameter	Value
Physico-Chemical	
pH	6.5-8.5
Dissolved Oxygen	80-100% saturation
Total phosphorus	0.06 mg/L
Total nitrogen	0.45 mg/L
Chlorophyll-a	0.01 mg/L
Turbidity	<20 NTL
Suspended Solids (combined wet and dry flows)	50 mg/L
Suspended Solids (wet weather flow)	90%ile < 100mg/L
Toxicants	
Total dissolved iron	0.0005 if Secchi >1m NR < 1 m
Total arsenic	0.05 mg/L
Total cadmium	0.002 mg/L
Total chromium	0.05 mg/L
Total copper	0.005 mg/L
Total nickel	0.015 mg/L
Total lead	0.005 mg/L
Total zinc	0.05 mg/L
Oils and Grease	no visual films or odour
Polycyclic aromatic hydrocarbon (PAH)	0.003 mg/L
Total chlorine	0.02 mg/L

(i) A construction water quality monitoring program must be established utilising the following guidelines:

(i) Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000

(ii) Queensland Water Quality Guidelines 2009

(iii) Monitoring and Sampling Manual 2009 Environmental Protection (Water) Policy 2009 (Queensland Government)..

(j) Water quality objectives for the receiving waters must be established to protect environmental values in the vicinity of off-site discharges of stormwater and construction waste water in accordance with the *Environmental Protection Regulation 2008* and the *Environmental Protection (Water) Policy 2009*

(k) Construction water quality (stormwater and groundwater) must be monitored at the release point at least weekly in the event of a release to determine whether the water quality release measures specified in Tables 7 and 8 are being achieved.

(l) All determinations of the quality of contaminants released must be:

(i) made in accordance with the methods prescribed in the *Monitoring and Sampling Manual 2009 Environmental Protection (Water) Policy 2009* (Queensland Government)

(ii) carried out on samples that are representative of the discharge.

(m) Where water quality monitoring indicates an exceedance of the water quality release limits:

(i) corrective actions and mitigation measures, including ceasing the release, must be implemented immediately to avoid further exceedances of the limits

(ii) an incident report must be prepared within two days of the receipt of determinations that indicate the exceedance, together with a statement describing the corrective actions and mitigations measures implemented to ensure no further exceedance occurs. Such an incident report must be posted on the project website as soon as the report is prepared

(iii) the exceedance must be reported in the next Monthly Environmental Monitoring Report required by Condition 4, Schedule 3 of these conditions, together with a statement describing the effectiveness of the corrective actions and mitigation measures implemented.

(n) Groundwater and surface water quality monitoring must be reported within the monthly environmental monitoring report. Reporting of an event that results in an uncontrolled release of contaminants to the environment must be reported immediately, in accordance with Schedule 3, Condition 3 of these conditions. Reporting on water quality monitoring of any releases from construction areas will include immediately following a rainfall event exceeding a two-year Average Recurrence Interval (ARI).

(o) An Erosion and Sediment Control Plan (ESCP) which has been certified by a Certified Professional in Sediment and Erosion Control (or similar qualification) as complying with these conditions and best practice, must be developed as part of the Surface Water EMP Sub-Plan and implemented for construction works on construction areas. The ESCP must:

(i) focus on source control options such as minimising site disturbance and optimising site layout to minimise the generation of sediment

(ii) set clear performance criteria for sediment basin design, construction, operation and maintenance

(iii) detail the timing of installation of all measures to ensure that they are installed and commissioned prior to the commencement of activities which may cause sediment to leave construction areas

(iv) where sediment ponds are not able to be utilised, demonstrate that the mix of measures proposed at any one time will achieve performance commensurate with that of sediment basins

(v) include a monitoring plan to demonstrate compliance with performance criteria and compliance with these conditions.

(p) Erosion control and sediment control structures must be maintained at all times, including during site clearing, construction and rehabilitation works, and be repaired or replaced as required after each rainfall event.

(q) All sedimentation ponds must be designed by a suitably qualified and experienced engineer to achieve the objectives of the ESCP.

(r) The Surface Water EMP Sub-Plan must include, but is not limited to the following:

(i) prevention of stormwater and stormwater runoff from contacting contaminants and disturbed areas

(ii) measures to minimise runoff from disturbed areas

(iii) measures to ensure separation of clean and contaminated storm waters (including the diversion of clear and uncontaminated stormwater away from any sedimentation ponds)

(iv) treatment measures used to treat sediment laden stormwater, including performance indicators to achieve compliance with release limits specified in these conditions

(v) a management process which prioritises options for re-use over releases to the environment. Where available and of appropriate chemical and biological quality for its proposed purpose, the proponent should use stormwater, groundwater, recycled water or other water sources in preference to potable water for construction including concrete mixing and dust control

(vi) assessment of the receiving water quality and environmental values. Where it is proposed to discharge to the stormwater system, this assessment relates to the discharge point of the stormwater system

(vii) assessment of the impacts of the volume and the quality of the discharge on the receiving water

(viii) measures to mitigate the impacts of the discharge and protect the environmental values of the receiving environment

(ix) proposed receiving environment and discharge quality monitoring program, including set monitoring points that must be identified for each release point

(x) measures for corrective action and continuous improvement

(xi) measures for periodic reporting and implementation of corrective action and continuous improvement measures.

(s) The Groundwater EMP Sub-Plan must include, but is not limited to the following:

(i) quality of groundwater being intercepted

(ii) options to reduce the volume of groundwater to be treated and released

(iii) volume of groundwater to be treated and released

(iv) groundwater treatment process

(v) treatment measures used to treat groundwater, including performance indicators to achieve compliance with release limits specified in theses conditions

(vi) a management process which prioritises options for re-use over releases to the environment

(vii) assessment of the receiving water quality and environmental values. Where it is proposed to discharge to the stormwater system, this assessment relates to the discharge point of the stormwater system

(viii) assessment of the impacts of the volume and the quality of the discharge on the receiving water

(ix) measures to mitigate the impacts of the discharge and protect the environmental values of the receiving environment

(x) proposed receiving environment and discharge quality monitoring program, including set monitoring points that must be identified for each release point

(xi) measures for corrective action and continuous improvement

(xii) measures for periodic reporting and implementation of continuous improvement measures.

(t) The proponent must implement and comply with provisions of the ESCP, and the Surface Water and Groundwater EMP Sub-Plans.

(u) Notwithstanding limits specified in Conditions 20(h) and (i), any release to waters must not contain any contaminants in sufficient concentration to result in environmental harm.

(v) Any spillage of wastes, contaminants or other materials must be cleaned up as quickly as practicable. Such spillage must not be cleaned up by hosing, sweeping or otherwise releasing such wastes, contaminants or material to any external storm water drainage system, roadside gutter or waters.

(w) All un-washed empty chemical, oil and fuel drums must be stored on a concrete hardstand area and so as to not contaminate stormwater.

(x) Washing, degreasing, servicing, cleaning or other maintenance of vehicles, plant, or other equipment must not occur in any area where resulting contaminants will or may be released to any storm water drain, land or waters.

(y) Regulated wastes, chemicals (including paints and solvents), fuels (and other hydrocarbons), cement and concrete must be stored and handled so as to prevent the release or likelihood of release of contaminants, particularly to stormwater drains and pits.

(22) Noise and vibration

(a) The proponent must develop and submit a Noise and Vibration EMP Sub-Plan acceptable to the nominated entity at least one month prior to the commencement of any construction activities which:

(i) contains clear criteria for the assessment of compliance with the conditions of this approval

(ii) is based on the necessary noise modelling for decision making in respect of achieving compliance with these conditions. As construction proceeds, results from such predictive modelling must be compared with noise monitoring results on a weekly basis and where the actual measured noise levels vary by more than 2dB(A) from the predicted noise levels, the model must be re-calibrated to ensure the model accurately predicts the impacts

(iii) identifies works which will generate a 'high noise impact'[10] at sensitive places

(iv) identifies all reasonable and practical measures which will be implemented to minimise the effects of high noise impacts works

(v) identifies all plant and equipment to be used on site and details noise abatement measures which will be implemented to reduce the noise generated by the operation of each item of plant and equipment

(vi) identifies all reasonable and practical measures which will be implemented to achieve the noise objectives listed in Table 9: Acoustic quality objectives

(vii) identifies all reasonable and practical measures which will be implemented to minimise the noise generated by activities undertaken in accordance with Schedule 3, Condition18(c)

[10] 'High Noise Impact' for the purpose of this condition is defined in the Glossary

(viii) implements a hierarchy of mitigation focusing on source control (e.g. selection of quieter plant and equipment, implementation of quieter construction techniques), appropriate planning (e.g. site layout/location of noisy equipment, staging of construction works, delivery times), site mitigation (e.g. temporary screening) before considering residence based mitigation measures

(ix) identifies management measures which will be implemented when the night time regenerated noise objectives listed in Table 11 are exceeded

(x) clearly indicates the timing of implementation of mitigation measures

(xi) includes a monitoring component which details verification, ongoing routine and reactive monitoring requirements and use of specific equipment to conduct attended and unattended measurements as necessary to identify and measure the source in question

(xii) identifies the sensitive places including those who for various reasons will be affected by daytime works (e.g. elderly, housebound, shift workers) and makes clear provision for the protection of these people's amenity whilst construction activities continue

(xiii) includes clear impact-based triggers for offering of residence based mitigation and/or temporary relocation

(xiv) where noise modelling predicts that noise objectives will be exceeded, requires negotiations with affected residents to commence prior to commencement of works

(xv) sets timeframes within which negotiations must be completed and any agreed actions undertaken.

(b) The Noise and Vibration EMP Sub-Plan must be assessed by an independent acoustic specialist as meeting the requirements of Condition 22(a). Written proof of this assessment must be forwarded to the nominated entity and Coordinator-General with a copy of the EMP Sub-Plan.

(c) The proponent must implement the Noise and Vibration EMP Sub-Plan.

(d) All reasonable and practical mitigation measures, as detailed in the Noise and Vibration EMP Sub-Plan, must be in place to minimise the impacts of construction works undertaken outside of the standard construction hours in accordance with Condition 18(c) prior to the commencement of those works.

(e) All reasonable and practical measures, as detailed in the Noise and Vibration EMP Sub-Plan, must be implemented in an endeavour to meet the objectives identified in Table 9: Acoustic Quality Objectives for all construction works undertaken during standard construction hours. These measures must be in place prior to the commencement of construction works.

Table 9: Acoustic quality objectives

Sensitive Place	Time of day	Acoustic quality objectives (measured at the receptor) dB(A)[2]		
		$LA_{eq,adj,1hr}$	$LA_{10,adj,1hr}$	$LA_{1,adj,1hr}$
Dwelling (for outdoors)	Standard Construction Hours[1]	50	55	65
Dwelling (for indoors)	Standard Construction Hours	35	40	45
Library and educational institution (including a school, college and university) (for indoors)	When open for business or when classes are being offered	35		
Childcare centre or kindergarten (for indoors)	When open for business, other than when the children usually sleep	35		
Childcare centre or kindergarten (for indoors)	When the children usually sleep	30		
School or playground (for outdoors)	When the children usually play outside	55		
Hospital, surgery or other medical institution (for indoors)	Visiting hours	35		
Hospital, surgery or other medical institution (for indoors)	Anytime, other than visiting hours	30		
Commercial and retail activity (for indoors)	When the activity is open for business	45		
Park or garden that is open to the public (whether or not on payment of an amount) for use other than for sport or organised entertainment	Anytime	The level of noise that preserves the amenity of the existing park or garden		

Notes:
[1] Standard construction hours for the purposes of these conditions, are defined in condition 18(b), as 6.30 am to 6.30 pm Monday to Saturday, and at no time on Sundays or public holidays
[2] All measurements are to be undertaken in accordance with the most recent edition of the *Noise Measurement Manual* (Queensland Government).

(f) Any surface work generating high noise impact, as detailed in the Noise and Vibration EMP Sub-Plan, may only be undertaken in continuous blocks within the same noise catchment for periods not exceeding three hours with a minimum respite from those works of not less than one hour between each block.

Note: For the purposes of this condition 'continuous' includes any period during which there is less than a one hour respite between ceasing and recommencing any of the work the subject of this condition.

(g) All mobile plant and equipment must be fitted with either less tonal 'broadband', 'quacker' or similar type reversing alarms or other warning devices (such as flashing lights) except where other measures such as spotters are engaged to effectively warn people who may be at risk of injury from movement of reversing mobile plant

(h) Long term night time noise sources, including the conveyor and temporary ventilation shafts, must be designed, constructed and managed in such a way as to comply with limits in Table 10. Any night-time noise sources from designated temporary construction workforce car parking must be managed in such a way to achieve the limits set out in Table 10.

Table 10: Night time noise limit

Noise type	Time of day	$LA_{10,(adj)\ (10mins)}$ (measured at a sensitive place)[1]	$LA_{1(adj)(10mins)}$ (measured at a sensitive place)[1]
• Steady construction noise • noise from designated temporary construction workforce car parking	6.30 pm – 6.30 am	Background + 3dB(A)	Background + 5dB(A)

[1] Measured in accordance with the most recent edition of the *Queensland Government's Noise Measurement Manual.*

(i) Where modelling predicts or monitoring demonstrates that underground works exceed the objectives identified in Table 11 in the most affected habitable rooms of a sensitive place, then the management measures identified in the Noise and Vibration EMP Sub-Plan must be implemented.

Table 11: Night time regenerated noise objectives

Time	Objectives – $LA_{eq\ (adj)\ (15\ min)}$ [1]
6.30 pm to 10.00 pm	40 dB(A)
10.00 pm to 6.30 am	35 dB(A)

[1] Measured in accordance with the most recent edition of the *Queensland Government's Noise Measurement Manual.*

(j) Predictive modelling for vibration from construction works must be undertaken progressively and prior to the commencement of construction works along the corridor of construction influence. As construction proceeds, results from such predictive modelling must be compared with vibration monitoring results to determine the potential for construction works to impact on human comfort, to cause cosmetic damage to buildings, or to impact on the functioning of the vibration-sensitive contents of buildings and the model recalibrated. Where there is a significant difference between the actual measured vibration levels and the predicted vibration levels the model must be re-calibrated to ensure the model accurately predicts the impacts.

(k) Where the predictive modelling predicts that vibration goals for human comfort set out in Table 12, the contents of sensitive buildings set out in

Table 13 and cosmetic damage to buildings set out in Table 14 are likely to be exceeded by construction works, then specific mitigation and management measures must be designed and implemented, prior to the commencement of construction works that are predicted to exceed the guide values, to achieve the environmental objectives and performance criteria in the D&C EMP in consultation with owners and occupants of potentially affected premises. Mitigation and management measures may include temporary relocation of occupants or sensitive building contents and/or measures carried out at the premises to minimise the risk of damage.

Table 12: Guide for satisfactory vibration levels—human comfort

Area	Vibration Levels
Within sleeping areas during continuous night-time tunnelling[11] works	0.5mm/sec peak particle velocity based on a 'low probability of reaction' (ref AS2670.2:1990)

[11] Continuous tunnelling works include operations of tunnel boring machines and roadheaders.

Table 13: Guide for satisfactory vibration levels—sensitive building contents

Sensitive Building Contents	Vibration Levels
Precision balances	0.5—2.0mm/s
Some optical microscopes	0.5mm/s
Large computer disk drives and sensitive electronic instrumentation	1.0—5.0mm/s

Table 14: Guide to vibration levels for minimal risk of cosmetic damage

Vibration Type	Peak Particle Velocity (mm/s)		
	Heritage Listed	Residential	Sensitive Commercial
Transient Vibration[1] (e.g. blasting)	2	10	10
Continuous Vibration[2] (e.g. TBM, roadheading)	2	5	5

[1] Measured in the ground directly adjacent the building of concern.
[2] Measured on the building foundations.

(l) On-going, continuous vibration monitoring must be conducted in the corridor of construction influence. Monitoring must be undertaken in accordance with accredited procedures and must be readily and publicly available. In circumstances where the guide values are not met, the reporting must describe the corrective actions taken to mitigate and manage the impacts. Monitoring results must be reported in accordance with the monthly reporting requirements of Condition 4 of Schedule 3 of this Coordinator-General's report.

(m) Building condition surveys must be conducted, progressively, of properties identified in the predictive modelling as potentially being affected by cosmetic damage as a result of construction works.

(n) Where a building condition survey indicates that cosmetic damage or more severe damage has occurred to premises as a consequence of the construction works, such damage must be repaired as soon as practicable at no cost to the property owners. Such repairs must be undertaken in consultation with the property owners and occupants and must return the premises at least to the condition existing prior to commencement of the relevant construction works.

(o) Transient airblast overpressure must not exceed 130 dB (lin) at a sensitive receptor. Notwithstanding this requirement, all reasonable and practicable measures to prevent or minimise the impacts of blasting must be taken, including, but not limited to:

(i) coverage of the blast pattern with appropriate overburden material and/or matting to minimise the generation of overpressure

(ii) designing the blast to minimise impacts, including maximising the stemming length and minimising the amount of explosive used to the extent practicable and considering weather conditions.

(p) Blasting may only occur during the hours of 7.30 am to 4.30 pm Monday to Saturday, and not on Sundays or Public Holidays.

(q) Prior to each blasting event, at least 24 hours notice must be provided to persons that may be adversely affected.

(23) Waste

(a) The project must be constructed in accordance with the D&C EMP, including the Construction Waste EMP Sub-Plan.

(b) In circumstances where waste material is released to the environment, the incident must be reported immediately to the relevant authorities and such corrective or remedial action as required to render the area safe and to avoid environmental harm must be taken forthwith.

(c) All regulated waste must be transported by a licensed operator under the *Environmental Protection Act 1994* and disposed of at a facility licensed to accept such waste.

(24) Urban design and landscape

(a) The project must be constructed in accordance with the D&C EMP, including the Urban Design and Landscape EMP Sub-Plan.

(b) The Urban Design and Landscape EMP Sub-Plan generally must achieve the environmental objectives and performance criteria, and generally must be consistent with the Draft Outline EMP (D&C) presented in the EIS. The sub-plan must ensure the project is constructed in a manner that minimises the visual impact of infrastructure and hard landscaping elements, including portals, overhead structures, fencing, signage, new bus shelters, etc.

(c) The project detailed design must incorporate measures established in *Crime Prevention Through Environmental Design (CPTED) Guidelines for Queensland Part A: Essential features for safer places. 2007*.

(d) The project detailed design must provide safe, legible and convenient connections for pedestrians, cyclists and public transport users to and from all residential areas adjacent to the project.

(e) The City West Strategy, and particularly the potential for a future land bridge across the ICB and railway lines in the vicinity of Victoria Park Road, must be actively considered by the proponent during design of the project to ensure the opportunity to construct this bridge in the future is not compromised by the project.

(f) Project lighting shall be designed constructed and operated to comply with
AS 4282-1997: Control of the Obtrusive Effects of Outdoor Lighting.

(25) Hazard and risk

(a) The project must be constructed in accordance with the Construction EMP, the Construction Hazard and Risk (CHR) EMP Sub-Plan and:

(i) Australian Standard AS4360:2004 Risk Management (or a later version cited in project documentation)

(ii) *Workplace and Safety Act 1995—Tunnelling Code of Practice 2007*

(iii) *Fire and Rescue Act 1990.*

(b) The CHR EMP Sub-Plan must be prepared and implemented with regard to the potential risks associated with tunnel construction including risk minimisation and incident management, inundation, flood inundation via the portals, tunnel collapse, fire and chemical hazard, and traffic hazards associated with construction traffic.

(c) The CHR EMP Sub-Plan must be prepared in consultation with the relevant emergency services organisations and must ensure site accessibility for emergency services vehicles to the road network and construction areas, maintenance of essential urban services (water, power), transport and the use and storage of dangerous goods in construction areas, and communications during incidents.

(d) It may also include the measures for managing construction hazard and risk set out in the Draft D&C EMP in Appendix D of the supplementary report.

(e) At least two months prior to the commencement of permanent construction works, the CHR EMP Sub-Plan shall be submitted to the Department of Community Safety (DCS) for consultation on elements related to emergency services access to project construction sites and associated procedures and subsequent advice to the Coordinator-General for the Coordinator-General's approval of the sub-plan.

(f) Every month, the proponent and lead construction contractor must conduct routine onsite safety inspections and CHR EMP Sub-Plan updates with DCS personnel.

(g) The proponent and lead construction contractor must conduct a simulated emergency response exercise on at least one occasion within 12 months of the commencement of construction works in conjunction with the DCS.

(26) Connection of the project to the Centenary Motorway

(a) The connection and 'tie in' of the project to the Centenary Motorway is to be designed, constructed and operated to ensure that the operation of the project does not limit the ability for possible widening of the Centenary Motorway.

(i) the project's stage 1 design is to accommodate for the future widening of the centenary motorway to six lanes. The proponent will limit the three lane future widening to the existing outer concrete barrier of the west-bound carriageway past the tunnel transition structure. 'Past' means as per the eastbound carriageway from chainage 900 to approximately 1900, as indicated in the proponent's Application for Project Changes (October 2010) Fig 2-17: Changed Project Alignment: Centenary Motorway Connection, page 52.

(ii) the construction zone for the outer third lanes of the future centenary motorway widening shall be maximised to ensure all project-impacted infrastructure (including gantries, lighting poles, conduits, cabling, pits, manholes, drainage systems etc) are in the ultimate position such that TMR does not incur future additional costs for the motorway upgrade works – for example for matters such as infrastructure relocations; upgrading of drainage systems; etc.

(iii) the project's design speed for east-bound traffic for the tunnel's entry point is to be 90 kilometres per hour. For the west-bound tunnel exit point, the design speed it to be maximised within the established limits of the concept design to maintain the existing 90 kilometre per hour posted speed.

(b) Future planning for Brisbane has identified a new 'Inner Orbital' tunnel between the Centenary Motorway and Stafford Road at Everton Park as a transport network improvement option. The connection and 'tie in' of the project to the Centenary Motorway is to be designed and constructed to ensure that:

(i) operation of the project shall not compromise the ability for a future connection of Centenary Motorway with an 'Inner Orbital' tunnel

(ii) operation of the project should not compromise the ability for future operation of the 'Inner Orbital' tunnel and the Centenary Motorway as a continuous motorway route (that is, maintaining the speed environment) with traffic flow priority on Centenary Motorway directed to the continuous route

(iii) the Northern Link connection excavation works are not to be below the existing motorway surface levels west of a line drawn between the two points (E46987.038, N157425.253) and (E47071.605, N157283.886)

(iv) deleted.

(27) Impact on the Moggill Road Interchange of the Centenary Motorway

(a) The construction and operation of the project must be conducted in accordance with the Traffic Impact Management EMP Sub-Plan

(b) The purpose of the Traffic Impact Management EMP Sub-Plan is to mitigate and manage the traffic impacts from project operations on the surrounding road network identified in this section and section 26 and the immediate pedestrian impacts at the connections of the project to State Controlled roads.

(c) The Traffic Impact Management EMP Sub-Plan is to be submitted to TMR for approval within 180 days of commencement of construction of the project.

Note: If TMR approval or comment on the Traffic Impact Management EMP Sub-Plan is not provided to the proponent within a one month period of its submission, assuming receipt of adequate and sufficient information, then that EMP Sub-Plan is deemed to be approved.

(d) The Moggill Road Interchange of the Centenary Motorway is to be designed and upgraded to mitigate traffic and pedestrian impacts resulting from operation of the project. The proponent is to bear all reasonable costs of the upgrading directly associated with mitigating the traffic and pedestrian impacts resulting from the operation of the project. The forecast traffic scenario used in the design, as well as the design details associated with capital works required for the mitigation, shall be to the satisfaction of TMR and shall be developed collaboratively between BCC and TMR through an Interface Agreement that defines the process for finalising the proponent's obligations. The mitigations are to be designed to ensure the following:

(i) The level of service for the Moggill Road interchange intersections for the year of opening shall be no lower than level of service forecast by TMR for the following traffic movements at the time of the Project opening:

A. eastbound and westbound through traffic on Moggill Road

B. southbound off-ramp traffic movements onto Moggill Road from the Centenary Motorway

C. right turn traffic from Moggill Road onto the Centenary Motorway northbound on-ramp.

(ii) To address the prospect of off-ramp traffic queuing beside the motorway traffic, the stand-up lanes on the southbound off-ramp shall accommodate the forecast traffic scenario for year of opening traffic queues, such that the 95% queue length will not extend onto motorway lanes immediately adjacent to the through lanes of the motorway.

(iii) Traffic queuing from any turning slots on Moggill Road for the year of opening under the forecast traffic scenario shall not extend to interfere with the through lanes of Moggill Road.

(iv) In mitigating the impacts, all motorway ramp elements are to be compliant with TMR's Road Planning and Design Manual for a 100km/h motorway design speed.

(v) Any widening or extension of the northbound on-ramp merge necessary to comply with TMR's Road Planning and Design Manual shall be to the west of the existing motorway without affecting the existing median width or narrowing motorway lane or shoulder widths.

Part 3: Operation phase

(28) Community engagement

(a) There must be a mechanism for receiving and dealing with community concerns and complaints about the operational aspects of the project, including achievement of the environmental objectives for the project. This mechanism should:

(i) be similar to that established for the construction phase

(ii) provide a mechanism to resolve operational impacts where the environmental performance criteria have not been met

(iii) provide for prompt responses to complaints made, with information, corrective action where required, and reporting back to the complainant and proponent

(iv) be incorporated within the wider environmental reporting framework for the project.

(29) Environmental management

(a) A comprehensive Operation and Maintenance (O&M) EMP must be prepared and implemented. The project must be operated in accordance with the O&M EMP, including O&M EMP sub-plans. The O&M EMP must:

(i) be developed generally in accordance with the Draft Operation EMP in Appendix D of the supplementary report

(ii) incorporate all of the conditions for operation contained in Appendix 1 and any other approvals that are relevant to the environmental management of the operation of the project

(iii) incorporate the elements of the D&C EMP that have ongoing requirements for the operation phase of the project

(iv) demonstrate how the elements in (i) to (iii) above have been included in the O&M EMP.

(b) The O&M EMP must be provided to the Coordinator-General at least ten business days prior to commencement of operation of the project[12] following consultation with the relevant nominated entities and consultative bodies and their comments taken into account in finalising the plans. The O&M EMP and EMP sub-plans shall be certified by the Environmental Management Representative as being in accordance with these conditions and all undertakings made in the EIS and supplementary report prior to seeking comments from the relevant nominated entities and consultative bodies.

(c) At least 60 business days prior to the commencement of operation, the certified O&M EMP and EMP sub-plans shall be provided to the relevant nominated entities.

Note: The relevant nominated entities and consultative bodies shall provide an integrated and coordinated response through the nominated entity with jurisdiction to the O&M EMP and EMP sub-plans within one month of the certified O&M EMP and EMP sub-plans being provided to the nominated entity and consultative bodies. If comments are not provided by the nominated entities and consultative bodies within the one month period the entity/body is deemed to have no comments.

(d) The O&M EMP must accord generally with the following framework:

(i) **environmental objectives and performance criteria—**must be incorporated as set out in the Draft Operation EMP in Appendix D of the supplementary report

(ii) **EMP sub-plans —**must identify, address and resolve specific environmental impacts predicted or occurring during the operational aspects of the project. EMP sub-plans must include measures designed to comply with the relevant industry standards for environmental management, including those set out in section 19.6.4 of the EIS and Schedule 6 of these conditions

[12] Operations commence with the opening of the tolled road to traffic.

(iii) **design of mitigation measures—**mitigation measures must be designed in response to the predicted impacts. Mitigation measures may include a wide range of measures such as, but not limited to, changes in operation procedures and practices, and design interventions to buffer places from predicted or actual operation impacts. Such measures must be effective and must achieve the environmental objectives and performance criteria set out in the Draft Operation EMP in Appendix D of the supplementary report, the statutory requirements and must be consistent with these conditions. They may include the mitigation measures contained in the Draft Operation EMP in Appendix D of the supplementary report, or may include other measures, provided those other measures achieve the environmental objectives and performance criteria, any relevant statutory requirements and these conditions

(iv) **monitoring—**on-going monitoring for operational impacts must be undertaken for some aspects of the project, including air quality (in-tunnel, in-stack and ambient air), noise from ventilation plant and other plant and equipment, road traffic noise (limited period), surface water quality, and such other operational aspects as necessary to assess performance relative to the environmental objectives set out in the Draft Operation EMP in Appendix D of the supplementary report or these conditions. The form of monitoring must be appropriate to the impact and must adopt the parameters established in the O&M EMP

(v) **review, response and modifications—**there must be a regular review of the O&M EMP. A process for review of mitigation measures must be outlined in the O&M EMP and must occur at a minimum of annually for the first five years of operation, starting within three months of opening, and at least biennially thereafter, unless on-going impacts occur warranting a more frequent review process

(vi) the review process must provide for further or alternate mitigation measures to be implemented as soon as practical in response to monitoring results where non-compliance with these conditions is identified. The review process must also address recurring concerns raised during community consultation or raised through the complaints mechanism

(vii) **complaints—**there must be a formal process for receiving and dealing with concerns about the operation of the project in relation to the environmental objectives. This process must be substantially the same as that established during the construction phase, except for such enhancements as required to address operational impacts and community concerns.

(viii) **non-conformance—**a process for dealing with circumstances where thresholds are exceeded during operation must be established prior to the commencement of operations. This process must establish a mechanism for reporting, taking corrective action where required and indicating responsibilities and timing for such action

(ix) **reporting—**a mechanism for reporting on compliance must be established in the Construction EMP consistent with the reporting requirements of conditions 3, 4 and 5.

(30) Traffic management

(a) The operations of the project must be conducted in accordance with the O&M EMP and the O&M Traffic EMP Sub-Plan.

(b) At least one year prior to the expected opening of the NLRT to general traffic, the proponent must prepare and submit to BCC and TMR for review and approval, an O&M Traffic EMP Sub-Plan. For clarity, the required date of submission will not be determined by the expected tunnel opening at the time of works commencement, but by any revised works programs (which may either bring forward or delay expected opening) as the project progresses.

(i) In the preparation of the O&M Traffic EMP Sub-Plan, BCC, and TMR are to be consulted in order to confirm and effectively manage the traffic impacts of operation of the Project.

(ii) The O&M Traffic EMP Sub-Plan is to be submitted for approval by BCC, and TMR prior to its implementation.

Note: BCC and TMR shall provide a response to the O&M Traffic EMP Sub-Plan within one month of receipt of all relevant information from the proponent, assuming receipt of adequate and sufficient information. If no response is provided by BCC and TMR within the one month period the O&M Traffic EMP Sub-Plan is deemed to be approved.

(c) The O&M Traffic EMP Sub-Plan should include, but not be limited to:

(i) detailed traffic management layout diagrams and supporting text for operations expected to involve lane or road closures on the NLRT Project or involve lane or road closures on Frederick Street, Mount Coot-tha Road, the Centenary Motorway or the ICB

(ii) measures to manage in-tunnel air quality where an incident in the tunnel system or adjacent road network requires traffic to cease flowing or slow below design speeds for the ventilation system

(iii) measures to manage traffic flows into and out of the tunnel system, having regard for conditions in tunnel and on the surface road network

(iv) measures to enable emergency services and other relevant entities to attend to incidents in the tunnel system

(v) measures to execute evacuations if necessary

(vi) measures to undertake maintenance requirements and other tunnel operational activities

(vii) measures to assist with safe and efficient transport network operations, through consultation with key stakeholders.

(viii) Access from the east-bound carriageway of the Centenary Motorway to the project's western ventilation station is limited to maintenance vehicles only. It will be subject to agreement and conditioned TMR approval for specific types of maintenance vehicles, and times of access, within the project's Road Network Interface Agreement. The gates to the station are to be locked at all other times.

(31) Noise

(a) The operation of the project must be conducted in accordance with the O&M EMP and the Operation Noise EMP Sub-Plan.

(b) Prior to the commencement of operations, an Operation Noise EMP Sub-Plan must be prepared and implemented to mitigate and manage the potential for noise from project operations. The Operation Noise EMP Sub-Plan should detail, but not be limited to, measures to mitigate and manage road traffic noise in specified locations identified in predictive modelling and including the following:

A Mount Coot-tha Road/ Centenary Motorway intersection

B Centenary Motorway at the NLRT merge and diverge locations

C ICB at the NLRT merge and diverge locations.

(c) The project must be designed and built to achieve the following airborne traffic noise criteria at the commencement of operations:

(i) State controlled roads—the project is required to comply with the TMR *Road Traffic Noise Management: Code of Practice*, which mandates a traffic noise criterion of 68 dBA $L_{A10(18hour)}$ where there are noise-sensitive places. Airborne traffic noise attenuation measures adjacent to State-controlled roads are only applicable to sections of road where new permanent works are occurring, for example, the tunnel merge and diverge lanes on the Centenary Motorway.

(ii) For all other public roads—63 dBA $L_{A10(18hour)}$ except where this level is already exceeded at sensitive places. In that case, the 'status quo' noise levels should be maintained (i.e. in Y2026 without the project) or specific measures to address localised impacts be implemented in consultation with potentially affected property owners and occupants.

(d) The Operation Noise EMP Sub-Plan should include the following measures to ensure monitoring and reporting is conducted to manage operational noise effectively be:

(i) in compliance with the TMR Road Traffic Noise Management: Code of Practice in respect to State-controlled roads

(ii) monitored in accordance with accredited procedures and must be publicly available

(iii) in circumstances where operation noise goals are not met, the reporting must also describe the corrective actions to avoid a recurrence and to minimise the impacts of traffic noise.

(32) Ground water and surface water

(a) Ground water and surface water must not be released from the project to receiving waters in exceedence of the water quality measures in Table 16 as measured at the release point.

Table 16: Operational water quality release measures

Water Quality Parameter	Value
Physico-Chemical	
pH	6.5-8.5
Dissolved Oxygen	80-100% saturation
Total phosphorus	0.06 mg/L
Total nitrogen	0.45 mg/L
Chlorophyll-a	0.01 mg/L
Turbidity	<20 NTL
Suspended Solids (combined wet and dry flows)	50 mg/L
Suspended Solids (wet weather flow)	90%ile < 100mg/L
Toxicants	
Total dissolved iron	0.0005 if Secchi >1m NR < 1 m
Total arsenic	0.05 mg/L
Total cadmium	0.002 mg/L
Total chromium	0.05 mg/L
Total copper	0.005 mg/L
Total nickel	0.015 mg/L
Total lead	0.005 mg/L

Total zinc	0.05 mg/L
Oils and Grease	no visual films or odour
Polycyclic aromatic hydrocarbon (PAH)	0.003 mg/L
Total chlorine	0.02 mg/L

All determinations of the quality of ground water and surface water released must be:

(i) made in accordance with the methods prescribed in the latest edition of *Monitoring and Sampling Manual 2009 Environmental Protection (Water) Policy 2009* (Queensland Government)

(ii) carried out on samples that are representative of the discharge.

(b) Where water quality monitoring indicates an exceedence of the water quality release measures:

(i) corrective actions and mitigation measures must be implemented immediately to avoid further exceedences

(ii) an incident report must be prepared within two days of the exceedence, together with a statement describing the corrective actions and mitigations measures implemented to ensure no further exceedence occurs. Such incident report must be provided to the nominated entity and posted on the project website as soon as the report is prepared.

(c) Measures must be initiated in the instance of an emergency or hazardous situation, to collect wastewater for subsequent removal and disposal to an authorised release point.

(d) Where there is an identified potential risk of groundwater movement (including drawdown) as a result of the project impacting on any property all reasonable and practicable measures must be taken to avoid, or mitigate and manage the impacts. These measures must be developed in consultation with owners and occupants of potentially-affected property prior to the commencement of works that have the potential to impact on the property.

(e) Where it is identified that property damage has occurred to premises as a consequence of the project, such damage must be repaired as soon as practicable at no cost to the property owners. Such repairs must be undertaken in consultation with the property owners and occupants and must return the premises at least to the condition existing prior to commencement of construction works.

(f) A specific, targeted monitoring program must be adopted to monitor groundwater flows during the first twenty years of the operation of the project including, but not limited to, in locations where predictive modelling suggests there is a potential for groundwater draw-down.

(g) Reporting of the results of groundwater monitoring must be made available on the project's website and be updated not less frequently than monthly.

(33) Hazard and risk

(a) At least six months prior to the opening of the project, the proponent shall prepare an Emergency Response Plan, in consultation with the Department of Community Safety (DCS) and the Queensland Police Service and submit it to the Coordinator-General. The plan shall include, but not necessarily be limited to:

(i) protocols and procedures to be followed during emergency situations associated with the operation of the project including vehicle collisions, fires and explosions including taking into account the needs of people with a disability or who may experience access problems in emergency situations

(ii) details of traffic management measures to be implemented during emergencies, where appropriate, to minimise the potential for escalation of the emergency

(iii) management and infrastructure measures to address the potential environmental impacts of an emergency situation, including measures for containment of contaminated fire fighting water, fuel spills and gaseous combustion products

(iv) a training and testing program to ensure that all operational staff are familiar with the plan and coordination with the DCS and the Queensland Police Service is regularly exercised

(v) a simulated emergency response exercise in accordance with the approved Emergency Response Plan, including the proponent, DCS, and the Queensland Police Service (QPS) shall be undertaken on at least one occasion at least one month prior to the opening of the project to traffic.

Note: DCS and the Queensland Police Service shall participate in the emergency response exercise at a time agreed with the proponent after being provided with at least one month notification of the exercise. If no participants are provided by DCS and/or QPS for the simulated emergency response exercise after receiving the specified advice, the condition is deemed to have been satisfied

(b) The proponent shall undertake an annual Hazard Review of the project and hazardous incidents that have occurred during the preceding twelve-month period for the first five years of operation.

(i) The first review shall be undertaken no later than three months after the opening of the project to traffic. A report outlining the results of the hazard review, and any proposed additional safety measures to be implemented in response to the findings of the review, shall be submitted to the DCS within one month of completion of the review.

(ii) The proponent shall meet the DCS's requirements in relation to the findings of the review, within such time as may be agreed by the DCS. The DCS may direct the proponent to undertake further hazard review following any major incident in the tunnel.

(c) The proponent shall develop a Fire and Smoke Management Plan to address fire and life safety in the tunnel. The plan shall outline fire protection systems and other tunnel equipment, systems, and operational protocols required for fire and smoke management. In developing the plan, the proponent shall undertake a detailed fire engineering study in accordance with the *Australian Building Codes Board, Fire Safety Engineering Guidelines*, the Project Deed and in consultation with the DCS.

(i) Detailed design of the tunnel shall incorporate the design and operational measures developed in the fire engineering study and in accordance with the Project Deed to minimise the potential for and affect of fire in the tunnel.

(ii) The plan shall be developed in consultation with the Coordinator-General and the DCS. The final design of the tunnel in relation to the fire and life safety features shall be verified against the fire engineering study and Project Deed in consultation with the DCS by a suitably qualified independent person/organisation.

(d) Prior to the opening of the project to traffic, a full audit of the fire and life safety system as defined by the fire engineering study developed in Condition 33 (c) shall be undertaken by an independent person(s)/organisation. The objective of the audit shall be to ensure that all design and operational measures outlined in the fire engineering study and Project Deed have been installed and are operational and achieves the required design criteria. The results of the safety audit shall be submitted to the DCS and the Coordinator-General prior to opening of the project to traffic. The proponent shall comply with any requirements resulting from the DCS's review of the audit.

(e) Fire simulation and hot smoke testing shall be undertaken as part of the simulated emergency response exercise to be staged prior to opening of the project to traffic as required in Condition 33 (a)(v).

(f) A detailed maintenance-testing program outlining the methods of testing the fire and life safety systems and schedule for implementation shall be developed to the satisfaction of the Queensland Fire and Rescue Service prior to opening of the project to traffic.

(g) Maintenance testing of fire and life safety systems must be undertaken at least annually or any other interval as required by the design engineer and the Queensland Fire and Rescue Service. Results of maintenance testing shall be made available to the Queensland Fire and Rescue Service for review and the proponent shall comply with any additional requirements to ensure the reliability of the fire and life safety systems.

(34) Waste

(a) The project must be conducted in accordance with the O&M EMP and the Operation Waste EMP Sub-Plan.

(b) Prior to the commencement of operations, an Operation Waste EMP Sub-Plan must be prepared and implemented. This Sub-Plan must:

(i) reflect the principles of 'reduce, re-use, recycle'

(ii) identify the type, source and estimated quantities of waste

(iii) identify the procedures and responsibilities for dealing with an incident in which waste material with the potential for causing environmental harm, is released to the environment.

(c) In circumstances that such waste material is released to the environment causing an environmental incident, the incident must immediately be reported to the relevant authorities. Corrective or remedial action to render the area safe and to avoid environmental harm must be taken forthwith.

(d) All regulated waste must be transported by a licensed operator and disposed of at a facility licensed to accept such waste.

Part 4: New conditions and recommendation, provided in the Coordinator-General's Report on Project Changes for the Legacy Way Project (December 2010)

(35) Recommendation: Temporary construction car parking

(a) It is recommended that the proponent investigate, in the making of a parking plan, a range of options to satisfy the project's construction workforce parking requirements for the western works.

(b) Should the plan propose options that require a change to the project, for example, construction on a new site not currently used for parking, consideration by the Coordinator-General of the project's workforce parking plan for the western works is required through the making of an application under section 35C of the *State Development and Public Works Organisation Act 1971.*

(c) The plan should demonstrate that a range of options have been explored in detail prior to the making of any application. The parking location options should be considered individually and collectively, and assessed using criteria including community impacts, cost, suitability, opportunities and risk. Mitigation measures for risk and impacts should also be considered.

(d) Regardless of if an application is made as per above, it is recommended that the proponent undertake consultation with the community on its parking plan.

(36) Special area plan: low cover tunnelling works

(a) Special area plans (SAPs) are to be designed and implemented for tunnel boring machine (TBM) activities in areas of low overburden where a distance of less than 19m from the tunnel crown to the ground surface is to be encountered.

(b) The SAPs are to detail management measures for construction in these areas. Measures are to include, but not be limited to, surveys and ground instrumentation and a detailed ground monitoring regime installed and fully baselined prior to tunnelling works commencing in the vicinity.

(c) Mitigation measures are to be included in the SAPs to manage impacts in these areas.

(d) The SAPs are to be made available for discussion to landholders in these areas and land caretakers, such as the Friends of Toowong Cemetery.

(e) Results of monitoring in these areas are to be made available as per original condition 4 (schedule 3) 'Monthly environmental monitoring reports'.

(37) Brisbane Grammar School: construction traffic management plan

(a) A construction traffic management plan (CTMP) is to be developed in consultation with BGS to address access arrangements in the vicinity of project works.

(b) Procedures are to be included in the CTMP which ensure the community's safety in proximity to construction works.

(c) The CTMP is to detail that disruption to use of the pedestrian and bicycle path over the Inner City Bypass (ICB) is to be minimised.

(d) Consultation on the CTMP with other frequent path users, such as the Brisbane Girls Grammar School and the community in the immediate vicinity of the path, is to be invited.

(e) The CTMP is to be established at least one month prior to commencement of site establishment in the vicinity of the ICB, with a copy provided to BGS and the Coordinator-General. The document will be updated as required for different stages of activity.

(38) Brisbane Grammar School: schedule of project works

The proponent is required to provide the following information to BGS within 15 business days after commencement of the project contract, or by 4 February 2011:

(a) a program which indicates temporary and permanent land resumptions of land used by the school

(b) details of the contractor's use of the land during the construction phase (both permanent and temporary use) including:

(i) proposed construction worksites

(ii) changes to spoil management and associated truck movements and

(iii) workforce car parking on the school's land

(c) details of the access to and potential impacts upon the school's use of the remaining part of the playing fields during the construction phase

(d) details of work to be carried out within the drainage easement, the timing of the works, and any long-term constraints on use of the surface; and

(e) details of work to be carried out within the drainage easement, the timing of the works, and any long-term constraints on use of the surface. The timing of the works are to be sequenced to minimise disruption to the school's use of the areas, wherever possible.

(39) Western worksite

(a) Agreement between DTMR and the proponent on vehicle construction access and egress arrangements for the western worksite is to be achieved prior to site establishment.

(b) Should DTMR require egress for all vehicles to connect to Mount Coot-tha Road rather than the Centenary Motorway, the proponent is to request consideration of the matter by the Coordinator-General through the making of an application as per section 35C of the *State Development and Public Works Organisation Act 1971.*

(40) Bicycle infrastructure: consultation

Consultation with local bicycle groups and the wider community is to be undertaken to communicate any proposed adjustments to bicycle path networks across the project, at least one month prior to these works commencing. A timeline of developments is to be provided.

(41) Tollroad Control Centre (TCC)

Prior to commencement of the operations phase, the proponent is to request consideration by the Coordinator-General on the revised proposed location for the TCC through the making of an application under section 35C of the *State Development and Public Works Organisation Act 1971.*

(42) Cultural Heritage

The cultural heritage management plan (CHMP) for the Toowong Cemetery as required in Condition 2 (schedule 1) of the Coordinator-General's Report is to be developed in consultation with the Friends of Toowong Cemetery.

SCHEDULE 4: JURISDICTION FOR CONDITIONS

Condition number	Condition short title	Entity with Jurisdiction	Consultative Bodies
Schedule 1: Stated Conditions for *Integrated Planning Act 1997* Approvals			
Condition 1	Material change of use of premises if all or part of the land is on the Environmental Management Register or Contaminated Land Register	Department of Environment and Resource Management (DERM)	N/A
Condition 2	Development on a State heritage place	DERM	N/A
Condition 3	Development on a local heritage place	Brisbane City Council (BCC)	N/A
Condition 4	ERA 51-Road Tunnel Ventilation	DERM	N/A
Schedule 2: Recommended Conditions for Other Approvals			
Condition 1	Aboriginal Cultural Heritage	DERM	N/A
Condition 2	Connection to a State controlled road	Department of Transport and Main Roads (TMR)	BCC
Condition 3	Interference with a railway or busway	TMR	BCC (for busways)
Condition 4	Road Closures	TMR (for state controlled roads) BCC (for local roads)	
Condition 5	Explosives	Explosives Inspectorate unit the Department of Employment Economic Development and Innovation	BCC

Schedule 3: Imposed Conditions—Part 1: General Conditions			
Condition 1	General Conditions	Coordinator-General	BCC, DERM, TMR
Condition 2	Offsetting Greenhouse Gas Emissions	Coordinator-General	DERM
Condition 3	Incident Reporting	Coordinator-General	DERM, TMR, DCS, BCC
Condition 4	Monthly Environmental Monitoring Reports (Construction only)	Coordinator-General	DERM, TMR, DCS, BCC
Condition 5	Half Yearly Audit Reports	Coordinator-General	DERM, TMR, DCS, BCC
Schedule 3: Imposed Conditions—Part 2: Design and Construction Phase			
Condition 6	Communication and Consultation	Coordinator-General	DERM, CLGs, BCC
Condition 7	Community Liaison Groups (CLGs)	Coordinator-General	DERM, CLGs, BCC
Condition 8	Community Communication Strategy	Coordinator-General	DERM, CLGs, BCC
Condition 9	Independent Community Liaison Representatives	Coordinator-General	DERM, CLGs, BCC
Condition 10	Display Centres	Coordinator-General	BCC
Condition 11	Building works	BCC	
Condition 12	Pedestrian / Cycle Connectivity	TMR	BCC
Condition 13	Requirements for Equitable Access Statement	Department of Communities (DSQ)	DCS, Queensland Police Service.
Condition 14	Environmental Management	Coordinator-General	DERM, DCS, TMR, Department of Health, BCC

Condition 15	Environmental management plan (EMP)	Coordinator-General	DERM, DCS, TMR, Department of Health, BCC
Condition 16	Traffic Management	TMR (for State-controlled roads) BCC (for Local Roads)	DCS
Condition 17	Spoil Handling and Placement	Coordinator-General	BCC (where a development permit under City Plan 2000 is required), Other local authorities where a development approval is required from the local authority DERM
Condition 18	General Construction	Coordinator-General	DERM, TMR, BCC, Energex
Condition 19	Flora and Fauna	DERM	BCC
Condition 20	Air Quality	DERM	Department of Health
Condition 21	Groundwater and Surface Water	DERM	
Condition 22	Noise and Vibration	DERM	
Condition 23	Waste	DERM	BCC
Condition 24	Urban Design and Landscape	Department of Infrastructure and Planning	BCC
Condition 25	Hazard and Risk	DCS	DERM, BCC, TMR
Condition 26	Centenary Motorway Connection	TMR	BCC
Condition 27	Moggill Rd Interchange	TMR	BCC
Schedule 3: Imposed Conditions—Part 3: Operation Phase			
Condition 28	Community Engagement	Coordinator-General	DERM, CLGs, BCC
Condition 29	Environmental Management	Coordinator-General	DERM, TMR, DCS, Department of Health, BCC
Condition 30	Traffic Management	TMR (for State Controlled Roads) BCC (for Local Roads)	DCS
Condition 31	Noise	TMR	

Condition 32	Groundwater and Surface Water	DERM	
Condition 33	Hazard and Risk	DCS	Department of Communities, Queensland Police Service, DERM, BCC
Condition 34	Waste	DERM	BCC
Schedule 4: Imposed Conditions—Part 4: New Conditions (from Coordinator-General's change report: December 2010)			
Condition 36	Special area plan: low cover tunnelling works	Coordinator-General	
Condition 37	Brisbane Grammar School: construction traffic management plan	Coordinator-General	
Condition 38	Brisbane Grammar School: schedule of works	Coordinator-General	
Condition 39	Western worksite	Coordinator-General	BCC, TMR
Condition 40	Bicycle infrastructure: consultation	Coordinator-General	
Condition 41	Tollroad Control Centre	Coordinator-General	
Condition 42	Cultural Heritage	DERM	

SCHEDULE 5: COORDINATOR-GENERAL'S OTHER RECOMMENDATIONS

(1) Requirement to use renewable energy sources

I recommend that from commencement of the project's opening to traffic until 31 December 2019 the proponent should purchase at least 10% of all the project's operational electrical energy requirements from accredited renewable energy ('Green Power') sources. From 1 January 2020, the proponent should purchase at least 20% of all the project's operational electrical energy requirements from accredited renewable energy ('Green Power') sources.

(2) TMR/BCC assessing road closure permits

I recommend to TMR and BCC, as the road authorities responsible for assessing and issuing road closure permits, that in assessing requests for night time road closures for the project that the authorities give due consideration to the likely impact of such works on nearby residents with respect to the frequency, intensity, duration and impact of the works in considering the issue of the permits and any conditions that may be attached.

(3) Bus priority planning

I recommend that BCC work with TMR in developing and implementing a public transport plan that is consistent with WBTNI planning outcomes and includes interim and longer term bus priority treatments for the Moggill Road, Milton Road (western end) and Coronation Drive corridor.

(4) Future cycle use of the Centenary Motorway east of the Moggill Road Interchange

I recommend that, should the proponent commit to a contract for the construction of the NLRT project, then TMR should immediately undertake a reassessment of the on-going use of the Centenary Motorway by sports and group cyclists to be completed at least two months prior to the commencement of construction of the project. Should that assessment identify significant safety concerns, then TMR should promptly advise Bicycle Queensland and the general public that bicycle access to the Centenary Motorway east of the Moggill Road interchange will be prohibited.

(5) Provision of contractor incentives to encourage fulfilment of objectives of conditions

I recommend that the proponent provide support and incentives to its design, construction, operation and maintenance contractor(s) to encourage them to perform all of their obligations in a way that is consistent with the objective of the conditions in this report to minimise the potential environmental effects of the project.

(6) Mitigation of project impacts on the Moggill Road Interchange of the Centenary Motorway

I recommend to TMR and BCC that, if the Interface Agreement in Condition 27(d) of Schedule 3 is not finalised within 120 days of commencement of construction, then mediation of that Agreement should be promptly sought.

SCHEDULE 6: GLOSSARY OF TERMS

'APC' means application for project changes.

'background' for noise levels means background noise level measured in accordance with the Queensland Government's *Noise Measurement Manual.*

'BCC' means the Brisbane City Council, the Proponent of the Project.

'CHMP' means cultural heritage management plan.

'CHR EMP sub-plan' means Construction Hazard and Risk EMP sub-plan.

'City Plan' means Brisbane City Plan 2000.

'CLG' means the Community Liaison Group as defined by Schedule 3, Condition 7 of this Coordinator-General's Report.

'CLR' means Contaminated Land Register as defied by the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland 1998.*

'CM' means Centenary Motorway.

'CO_2-e' is the abbreviation of 'carbon dioxide equivalent' and is the internationally recognised measure that allows for the comparison of different greenhouse gases in terms of their global warming potential.

'Construction Areas' means the construction worksites, construction car parks, and any areas licensed for construction or on which Construction Works are carried out, including without limitation, the tunnel worksites and any spoil conveyor.

'Construction Works' means all works necessary for the construction of the Project, including demolition of existing buildings and structures, site preparation, Public Utility Works, tunnelling works and associated road works.

'CPTED' means Crime Prevention through Environmental Design.

'D&C EMP' means an environmental management plan or plans, including any sub-plans, for the design and construction phase of the Project.

'DCS' means Department of Community Safety.

'DERM' means the Department of Environment and Resource Management.

'DIP' means the Department of Infrastructure and Planning.

'DOC' means Department of Communities.

'DSQ' means Disability Services Queensland in DOC.

'TMR' means the Department of Transport and Main Roads.

'EAS' means Equitable Access Statement which aims to ensure that the needs of people with a disability or who may experience access problems are taken into account during the design of the project.

'EIS' means the *Environmental Impact Statement for the Northern Link Project (September 2008)*.

'EMP' means an environmental management plan.

'EMR' means Environmental Management Register as defied by the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland 1998.*

'EPP (Air)' means the *Queensland's Environmental Protection (Air) Policy 2008*.

'ERA' means environmentally relevant activity under the *Environmental Protection Act 1994*.

'**ESCP**' means Erosion and Sediment Control Plan.

'FIAPC' means further information on the application for project changes.

'GHG' means greenhouse gas.

'Green Power' means electricity sourced from a renewable energy source accredited by National GreenPower Accreditation Program that meets the criteria of the Australian Government's Renewable Energy Target.

'High Noise Impact' for this report means works which generate noise greater than the background noise level without the Project plus 20dB(A) (adjusted), at a Sensitive Place when measured in accordance with the most recent edition of the *Noise Measurement Manual* (Queensland Government).

'ICB' means Inner City Bypass. The ICB at Kelvin Grove is the location for the connection of the tunnel to the surface road network at the eastern end of the project.

'ICLR' means Independent Community Liaison Representative defined by Schedule 3, Condition 9(a) of this Coordinator General's Report.

'INB' means Inner Northern Busway.

'IR' means independent technical review.

'LoS' is 'level of service'. LoS is an index of the operational performance of traffic on a given traffic lane, carriageway or road when accommodating various traffic volumes under different combinations of operating conditions. The meaning provided (for Urban and Suburban Arterials) in Figure 5.12 of the *Road Planning and Design Manual (Queensland Department of Main Roads, 2004)* applies in this report, and may be summarised as:

LoS A – average travel speed ≥ 90% of free flow speed

LoS B – average travel speed approximately 70% of free flow speed

LoS C – average travel speed approximately 50% of free flow speed

LoS D – average travel speed approximately 40% of free flow speed

LoS E – average travel speed approximately 33% of free flow speed

LoS F – average travel speed ≤ 25% of free flow speed

'NEPC' means National Environmental Protection Council.

'NEPM' means National Environment Protection Measures made under the *National Environment Protection Council Act 1994* (Cth).

'NIAPSP' means the Noise Impact Assessment Planning Scheme Policy under Brisbane City Plan 2000.

'NLRT' means the Northern Link Road Tunnel Project between the Centenary Motorway at Toowong and the Inner City Bypass at Herston, which is the subject of this Coordinator-General's Report (see also 'Project').

'NO_2' means nitrogen dioxide.

'NO_x' means oxides of nitrogen, which includes NO_2.

'O&M EMP' means an environmental management plan or plans, including any sub-plans, for the operation and maintenance phase of the Project.

'permanent construction works' means all 'construction works' (see definition above) other than, pre-construction surveying, establishment of worksite security arrangements (including signs, fences, safety barriers and temporary security personnel facilities), vegetation clearing, demolition and removal of structures and required public utility works. (Definition updated December 2010.)

'PIARC' means Permanent International Association of Road Congress (also known as the World Road Association).

'$PM_{2.5}$' means particulate matter with equivalent aerodynamic diameter less than 2.5μm.

'PM_{10}' means particulate matter with equivalent aerodynamic diameter less than 10μm.

'project' means the Northern Link Road Tunnel (NLRT) project, as described in the *Environmental Impact Statement (September 2008)* for the project and the *Environmental Impact Statement Supplementary Report for the Project (June 2009)*.

'proponent' means the entity responsible for the procurement of the Project, the BCC, which has indicated its intention to seek a contractor to design, construct, maintain and operate the NLRT Project.

'Public Utility Works' means

(a) the replacement, modification or relocation of public utilities required as a consequence of the Project; and

(b) the construction of new utility infrastructure required for the Project.

'RD' means Reference Design.

'SDPWO Act' means the *State Development and Public Works Organisation Act 1971*.

'Sensitive Place' means any of the following places:

(a) a dwelling;

(b) a library, child-care centre, kindergarten, school, college, university or other educational institution;

(c) a hospital, surgery or other medical institution; or

(d) a commercial premises relying on calibrated equipment or computers sensitive to vibration greater than the guide values set out in Table 13 of Schedule 3 of these Conditions.

'SEQIPP' means Southeast Queensland Infrastructure Plan and Program 2009 and its successors, published by DIP.

'SIDRA' is the computer software intersection model that is used throughout Australia and New Zealand to quantify the efficiency of an isolated intersection. The acronym stands for Signalised Intersection Design and Research Aid.

'SPA' means *Sustainable Planning Act 2009*, which replaced the *Integrated Planning Act 1997* (IPA) as the principal statutory instrument in the Queensland Integrated Development and Assessment System (IDAS) on 18 December 2009.

'Spoil' means any earth or other like material removed from the Project works.

'Spoil Placement Areas' means areas for the long-term placement of spoil. For clarification, the term does not include the Mt Coot-tha Quarry.

'Standard Construction Hours' means 6:30 am to 6:30 pm Monday to Saturday and at no time on Sundays and public holidays.

'Status-quo noise levels' means noise levels anticipated in the design year, Y2026, without the Project.

'Surface Construction Works' means all Construction Works at or exposed to the surface, but does not include underground works across the project's alignment or works on and above the surface within an acoustic enclosure in the work area in the vicinity of the Centenary Motorway. (Definition updated December 2010.)

'supplementary report' means the *Northern Link Environmental Impact Statement Supplementary Report (June 2009)* prepared by the proponent.

'Underground Works' means all Construction Works that occur beneath the natural surface of the earth and within an enclosed space.

'TEOM' means tapered element oscillating microbalance analyser.

'TBM' means Tunnel Boring Machine.

'TL' means Translink.

'TSP' means Total Suspended Particles.

'waters' includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), any underground water and any part-thereof.

'WBTNI' means Western Brisbane Transport Network Investigation conducted by TMR.

SCHEDULE 7: STANDARDS AND GUIDELINES FOR ENVIRONMENTAL MANAGEMENT

Unless described or specified otherwise in these conditions, the standards and guidelines for environmental management set out in the table below, must be adopted and implemented in the construction and operation of the project.

Air Quality	AS 3580: 2003 Methods of Sampling and Analysis of Ambient Air
	Air Quality Sampling Manual (Queensland Government 1997).
	AS/NZS 3580.9.3:2003 *Determination of suspended particulate matter—Total suspended particulate matter (TSP)—High volume sampler gravimetric method*
	AS3580.9.6 *Determination of suspended particulate matter – PM_{10} high volume sampler with size-selective inlet – Gravimetric method*
	Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW—DRAFT February 2005 (NSW EPA)
	Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW—August 2001 (NSW EPA)
	Queensland *Environmental Protection (Air) Policy 2008*
	Queensland *Environmental Protection Regulation 2008*
Lighting	AS 4282-1997: Control of the obtrusive effects of outdoor lighting.
Blasting & Use of Explosives	*Australian Dangerous Goods Code, 7th Edition*, which is to be used as a code of practice.
	Explosives Regulation 2003
	Australian Explosives Code 3
	AS2187 – Explosive storage, transport and Use 1998
Dangerous Goods	AS 1216 : 1995 Classification, labels for Dangerous Goods
	AS 1678 : 2003 Emergency Procedure Guides – Transport
	AS 1940 : 2004 Storage and Handling of Flammable and Combustible Liquids
	AS 2508.2.007 : 2001 Safe Storage and Handling Information Cards for liquefied Petroleum Gas
	AS 2809 : 1999 Road Tank Vehicles for Dangerous Goods
	AS 3780 – 1994 The Storage and Handling of Corrosive Substances
	AS 2931 : 1999 Selection and Use of Emergency Procedure Guides for Transport of Dangerous Goods.
Flora & Fauna	DPI&F Fish Habitat Guideline FHG 002—'Restoration of Fish Habitats, Guidelines for Marine Areas (1998)'

	AS 4970: Protection of Trees on Development Sites
Noise & Vibration	Noise measurement manual : for use in testing for compliance with the Environmental Protection Act 1994, Third edition, 2000
	AS 1055.1 : 1997 Acoustics—Description and Management of Environmental Noise : General procedures
	AS 1055.2 : 1997 Acoustics—Description and Management of Environmental Noise : application of specific situations
	AS 1259.2 : 1990 Acoustics—Measurement of airborne noise emitted by earth-moving machinery and agricultural tractors—Stationary test Condition Part 1: determination of compliance with limits for exterior noise
	AS/NZS 2107:2000 Acoustics—Recommended design sound levels and reverberation times for building interiors
	AS 2187 : 1993 Explosives – Storage Transport and Use : use of explosives
	AS 2107 Acoustics—Recommended noise levels and reverberation times for building interiors
	AS 2436 : 1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites
	AS 2659.1 Guide to the Use of Sound Measuring Equipment
	AS 2659 Sound Level Meters
	AS 2670.1:2001 Evaluation of human exposure to whole-body vibration Part 1: General Requirements
	AS 2670.2:1990 Evaluation of human exposure to whole-body vibration Part 2: Continuous and shock-induced vibration in buildings (1 to 80 Hz)
	AS 2702 : 1984 Acoustics – Methods for Measurement of Road Traffic Noise.
	Australian Design Rule 28/01
	National Road Transport Commission—Stationary Exhaust Noise Test Procedures for In-Service Motor Vehicles
	British Standard 7385: Part 1—1990 Evaluation and Measurement for Vibration in Buildings—Guide for measurement of vibrations and evaluation of their effects on buildings
	Environmental Protection (Noise) Policy 2008
	Environmental Protection Regulation 2008
	Queensland Main Roads—Road Traffic Noise Management: Code of Practice 2000
	Queensland Main Roads Standard Specification MRS11.15 Noise Barriers, December 1999
	Queensland Main Roads Standard Specification 11.51 Environmental Management, December 1999
	BCC—Noise Impact Assessment Planning Scheme Policy

	Calculation of Road Traffic Noise (CORTN88) United Kingdom Department of Transport
	Interim Guidelines and Technical Notes for Road Traffic Noise Amelioration (DMR 1992)
	Environmental Guideline 'Noise from Construction, Maintenance & Demolition Sites' (EPA 1989)
Risk	AS 4360 : 2004 Risk Management
Soils & Erosion Management	National Environmental Protection (Assessment of Site Contamination) Measure 1999 (NEPM) NHMRC/NEPC
	Queensland Government Chemical Laboratory – Guidelines for Soil Sampling
	Queensland Acid Sulfate Soils Investigation Team (QASSIT) 'Sampling and Analysis Procedure for Lowland Acid Sulfate Soils (ASS) in Queensland' dated 1 October 1997.
	State Planning Policy 2/02: Planning and managing development involving Acid Sulfate Soils
	State Planning Policy 2/02 Guideline: Acid Sulfate Soils
	'Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland' (Department of Environment 1998)
	Soil Erosion and Sediment Control, Engineers Guidelines for Queensland Construction Sites, 1996
Waste Management	AS 1216 Classification, Hazard identification and Information Systems for Dangerous Goods
	AS 1678 Emergency Procedure Guides—Transport
	AS 1940 Storage, and Handling of Flammable and Combustible Liquids
	AS 3780 The Storage and Handling of Corrosive Substances
	AS 2809 Road Tank Vehicles for Dangerous Goods
	AS 2931 Selection and Use of Emergency Procedure Guides for Transport of Dangerous Goods
	AS 2187 Explosives—Storage, Transport and Use
Water Quality Management	Monitoring and Sampling Manual 2009 *Environmental Protection (Water) Policy 2009* (Queensland Government)
	Standard Methods of the Examination of Water and Wastewater – American Public Health Association (APHA)/Australian Waste Water Association (AWWA)
	AS 2031 : 2001 Selection of Containers and Preservation of Water Samples for Microbiological Analysis
	Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 (ANZECC 2000)
	Queensland Water Quality Guidelines 2009, and associated Updates, Queensland Government

SCHEDULE 8: (DELETED)

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