NSW GOVERNMENT | Planning

MAJOR PROJECT ASSESSMENT
Hume Highway Duplication Project
Tarcutta Bypass

Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

December 2009

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EXECUTIVE SUMMARY

The Hume Highway is and will continue to be a key interstate road passenger and freight corridor within the national transport network. The importance of this corridor is expected to continue over the next 20 years, in conjunction with the expected growth in alternative modes of transport, with approximately 5,000 to 6,000 heavy vehicles forecasted to use the Hume Highway per day by 2025.

Sections of the Hume Highway within NSW remain as single carriageway. These sections pose a significant safety risk to all road users and impact on the overall road performance efficiencies of the highway. With the continued importance of the Hume Highway, the predicted increase in passenger and heavy vehicle volumes will exacerbate current safety and performance conditions. This will have flow on effects on the ability of this road corridor to cater for expected demands associated with its role within the national transport network.

To resolve these issues, the NSW State Government has committed under the Commonwealth Government's AusLink National Land Transport Plan to upgrade the remaining 89 kilometres of single carriageway located between the Sturt Highway junction and Albury Wodonga by 2012.

As part of this program of works, the NSW Roads and Traffic Authority (RTA) proposes to bypass the town of Tarcutta, with the highway comprising dual carriageway. It is noted that this proposal has been declared as a critical infrastructure project under the *Environmental Planning and Assessment Act 1979*.

The key issues associated with the project relate to the impacts on flora and fauna, indigenous heritage, non-indigenous heritage, hydrology, noise and vibration, social and economic, and traffic and transport. These issues were reflected in the seven submissions the Department received during the exhibition period for the Environmental Assessment. Submissions were received from the Department of Environment, Climate Change and Water, Land and Property Management Authority, Department of Transport and Infrastructure, NSW Office of Water, Department of Industry and Investment, Wagga Wagga City Council and one member of the public.

Following a thorough assessment of the Environmental Assessment and Submissions Report, the Department accepts that the proposed alignment has been designed to minimise the impacts on the surrounding environment and local community, and that the extent to which these impacts can be minimised or avoided is limited by the proposed approach to the project, being the governing road design and safety specifications that must be achieved. The Department is satisfied that an appropriate balance of these conflicting factors has been achieved and that the predicted impacts have been minimised wherever possible through the proposed alignment. The Department is also satisfied that the mitigation, management and monitoring measures, as recommended in the conditions of approval and the Statement of Commitments, will ensure that these impacts are minimised further during detailed design, construction and operational phases of the projects.

The Department acknowledges that the will be some residual impacts on the surrounding environment and local community following the implementation of the recommended conditions of approval, particularly with respect to economic and noise impacts. But it has been concluded that these residual impacts are acceptable given the benefit that the total project would provide to the general public, through significant improvements to road safety, and the benefits delivered to the region and the state through improved road network capacity and performance for all motorists and the economic benefits delivered through improved road freight efficiencies.

The Department considers that the project will assist in achieving the priorities on the *NSW State Plan*. In particular, the better transport priorities are relevant as the project would improve the efficiency of the road network, maintain the road infrastructure and improve road safety.

Consequently, the Department considers the proposal is in the public interest and recommends that the Tarcutta Bypass project be approved subject to the recommended conditions of approval.

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1. BACKGROUND

1.1 The Hume Highway Upgrade Program

The NSW Roads and Traffic Authority (the Proponent) proposes to upgrade the Hume Highway in the vicinity of Tarcutta village. The Hume Highway is the main road transport link between Sydney and Melbourne and forms part of the National Highway network. The highway is the subject of a bipartisan commitment between the State and Commonwealth Governments to provide a continuous four lane carriageway from Sydney to the Victorian border by 2012. This commitment is otherwise known as the Hume Highway upgrade program (refer to Figure 2).

Key objectives of the program are to:

- improve freight efficiency;
- improve the level of service;
- improve the level of safety for local, regional and interstate traffic;
- reduce congestion and travel times between Sydney and Melbourne;
- improve regional access;
- meet the key objectives for the AusLink National Network; and
- be consistent with viable, long-term economic and social outcomes, and the obligation to current and future generations to sustain the environment.

Single carriageway sections of the Highway have been the subject of significant construction activities over the last two years with, 80 kilometres of the 108 kilometres either complete or due for completion by the end of 2009. Remaining single carriageway sections of the Highway will be limited to the towns of Tarcutta, Holbrook and Woomargama. Planning activities for these towns are well advanced.

In December 2008, the Prime Minister announced a package of Federal rail, road, education and research, and business measures to support Australia's economy during the global economic crisis by bringing forward infrastructure spending. Of the sixteen strategic road infrastructure projects announced across Australia, the Tarcutta and Woomargama Hume Highway town bypass projects were allocated funding.

1.2 Location and Surrounding Environment

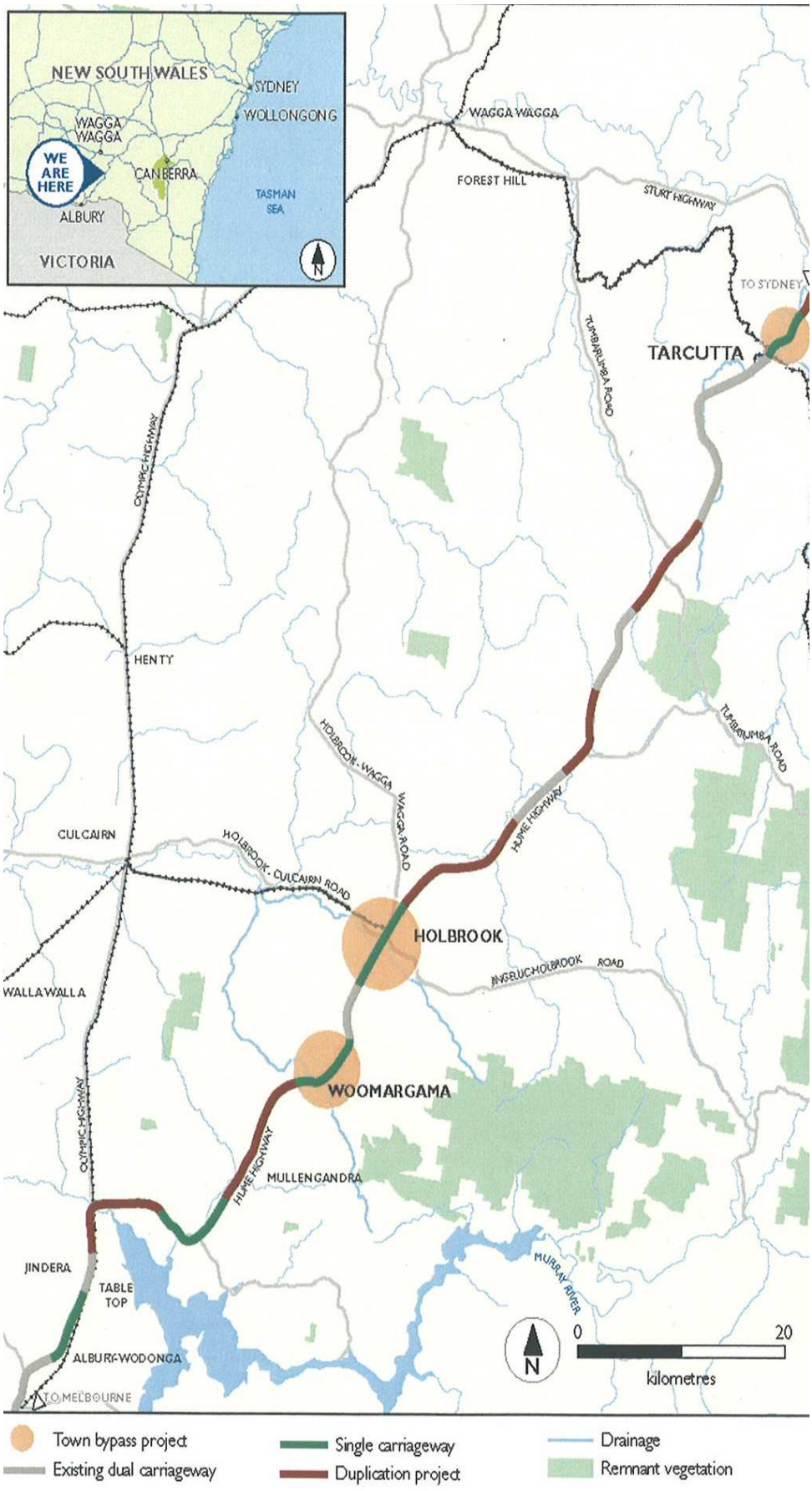
Tarcutta is a village located in the south-west of the state with a population of 245 people (ABS, 2006). Located 45 kilometres south of Gundagai and 35 kilometres south-east of Wagga Wagga, the town traditionally is considered to be the half way point between Sydney (421 kilometres) and Melbourne (460 kilometres) when using the Hume Highway.

Tarcutta's mid highway location has resulted in the town developing a supporting role for the trucking industry by being either a change over point or rest stop for heavy vehicles travelling between the two capital cities. Infrastructure such as layover areas and interchange facilities reinforce this role. The connection of the trucking industry with Tarcutta is enshrined in the Australian Truck Drivers memorial (dedicated to heavy vehicle drivers killed on the roads) being located in the town.

Topography in the area can be generally classified as undulating to hilly, typical of this region. Tarcutta Creek and Keajura Creek are the two main watercourses in the immediate area. Additionally, a number of unnamed watercourses feed both creeks from the surrounding hillside. Endemic vegetation has been extensively cleared to facilitate agricultural development with remnant vegetation restricted to roadside reserves, riparian corridors and land (such as rocky hilltops) of limited suitability for farming. These areas however, have been extensively modified through grazing resulting in the loss of understory vegetation.

Land use within the project area can generally be categorised as rural with grazing a predominant feature. Urban development in the town is located both west and east of the existing highway with some rural residential development on the fringe. The existing Hume Highway forms the main street for the town and is currently signposted at 50km/h. The town cemetery sits on the western fringe of the village and abuts the new highway alignment.

Figure 1 - Hume Highway Upgrade Program



2. PROPOSED DEVELOPMENT

2.1 Project Description

The project involves the construction and operation of approximately seven and a half kilometres of four-lane dual carriageway to the west of Tarcutta as depicted in Figure 2 . The new alignment will commence to the north of the town tying in with the soon to be completed dual carriageway between the Sturt Highway and Tarcutta. The southern tie in for the bypass will be south of Humula Road. A distance of one kilometre will separate the existing and proposed road alignment. Table 1 provides an overview of the key features associated with the project.

Capital investment value for the project is $235 million, and requires a workforce of 250 personnel. The project is unlikely to be staged and estimated to take approximately two years to complete. Key objectives for the Tarcutta bypass are:

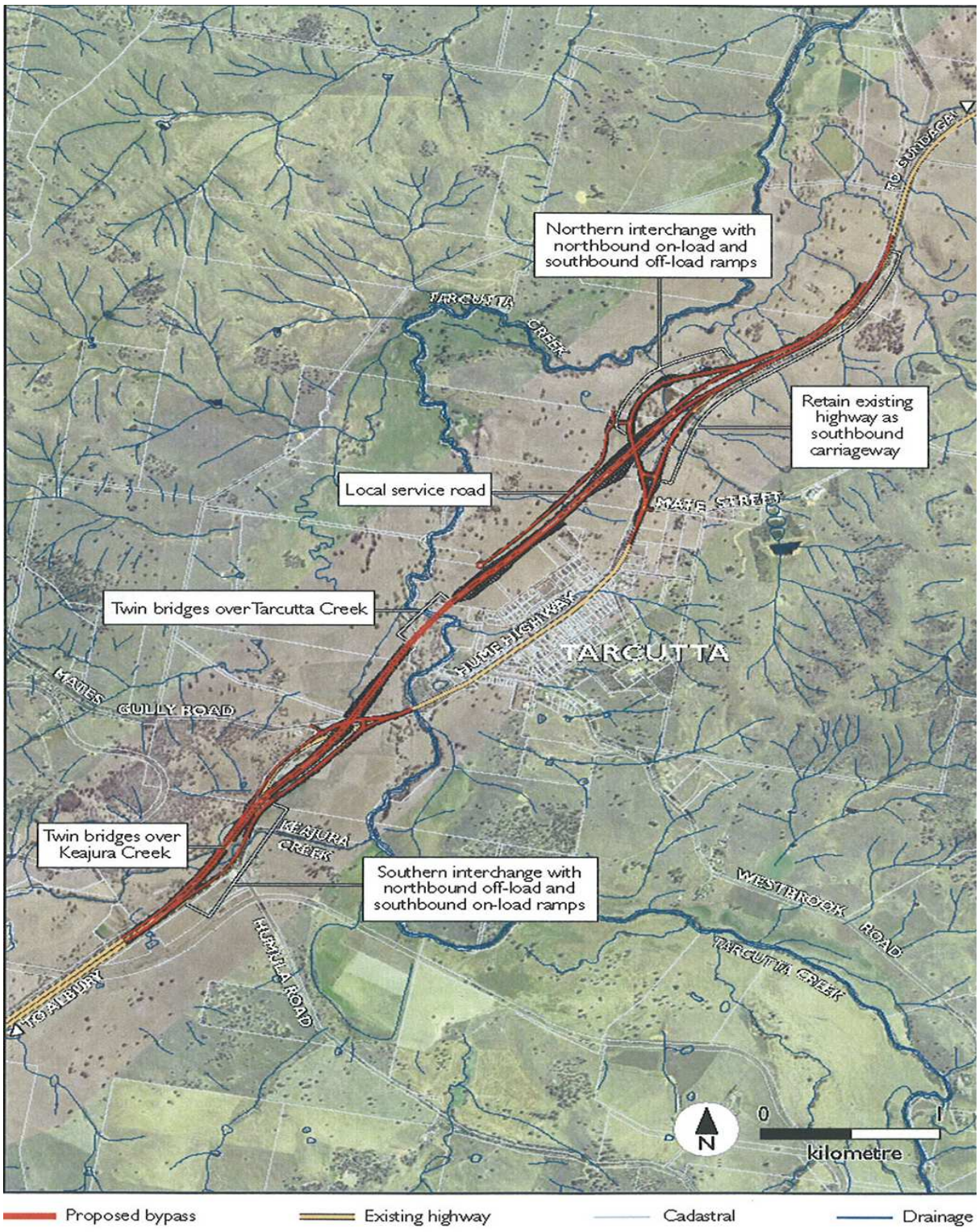
- improvement in safety and travel efficiency;
- minimal adverse impacts on the environmental values of the area;
- achieving the urban design objectives adopted for the project;
- facilitates free flowing, direct links in and out of Tarcutta village;
- retaining Tarcutta as a 'trucking town';
- establishes local road access arrangements that provide safe and easy access;
- establishes access to private properties that would be isolated, and to land parcels severed as a result of the project; and
- minimising property impacts.

Table 1 - Key Components of the Project

Component	Description
Road footprint	The alignment will be a dual carriageway configuration 90m wide comprising increasing to 300m at each interchange. Each lane will be 3.5m wide with a 3m shoulder. Medians will be depressed and landscaped with a width up to 12m. Median width will be reduced in areas of high cost and/or environmental constraints. The bypass has been designed to minimise grade changes and for B-double movements with a design speed of 110km/h.
Earthworks	To construct the bypass a number of cut and fill activities will be required. Preliminary estimates have identified that 660,000 m^3 of spoil will be generated with 750,000 m^3 required for the project. Any shortfall will be sourced from quarries in the region. A temporary haul road and creek crossing(s) will also be constructed alongside the alignment for the duration of works.
Northern Interchange	A half diamond interchange comprising of a northern onload and a southern offload ramp will be constructed north of Mate Street. A two lane bridge will cross the new highway at a 35 degree angle and be 90m in length. The interchange will be lit and signposted in line with RTA policies.
Southern Interchange	A half diamond interchange comprising of a southern onload and a northern offload ramp is proposed. The bridge structure will be 90m in length and cross the new highway north of Mates Gully Road. The interchange will be lit and signposted in accordance with RTA policies.
Tarcutta Creek Bridges	Two new 500m multi span bridges catering for dual carriageway traffic will be constructed. Deck height will vary between four and eight meters from existing ground level and sit on embankments three to four metres high.
Keajura Creek Bridges	Two new multi span bridges each designed for dual carriageway conditions are proposed. Each structure will be 80m in length and provide three metres of vertical clearance. The existing Keajura Creek bridge will either be rehabilitated or replaced and used for local access.
Culvert crossings	New culverts will be constructed at existing watercourse crossings and depressions to minimise impact on existing flow paths. Rock mattress and scour protection will be employed to minimise erosion at locations where velocities are predicted to be high. Channels and catch drains may also be constructed to direct flows from a culvert to an existing natural watercourse.
Property acquisition	Approximately 80 hectares will be required to accommodate the project This will require land and property infrastructure adjustments to 7 private properties, two parcels of crown land and part of a travelling stock route.
Property access and infrastructure	The Proponent has identified that private property access will be maintained during construction and operation. The existing highway will be retained where possible for two-way traffic movement. A new property access road west of the highway will be constructed between the northern interchange and Tarcutta Creek. A new two lane access road east of the new highway will be constructed between Humula and Mates Gully Roads for property and highway access. This access road will also function as the travelling stock route. Utilities and services relocated as part of the project will be undertaken in consultation with the relevant providers.
Temporary and ancillary works	The 'main' site compound will be located adjacent to the northern interchange and contain staff offices, amenities, materials, concrete batch plant and major equipment. Satellite compounds will also be used at key locations and provide nominal amenities (i.e. toilets) and storage for plant and materials. The existing pre-cast yard at the

	northern tie-in of the project will also be used.

Figure 2 – Proposed Upgrade Alignment (RTA, 2009)



2.2 Project Need and Context

Traffic volumes along the Hume Highway have increased in the order of four percent annually over the last ten years. Growth has occurred in a linear pattern and the Proponent has identified that it is attributable to delivery of dual carriageway along the corridor and the corresponding improvement in travelling conditions. This trend is likely to continue with the delivery of an additional 80 kilometres of dual carriageway in 2009.

Presently, in excess of 2000 vehicles use the highway at this location with 45% per cent being heavy vehicles. Truck volumes are highest at midnight with 30% of these vehicles utilising the town's heavy vehicle rest facilities. Between 75 and 80% of all heavy and light vehicles in both directions were found not to stop in Tarcutta during the day.

Crash rates on this section of highway are considered to be typical of two lane rural roads in NSW, with 12 accidents between 2002 and 2006. No fatalities were recorded. Heavy vehicles were represented in a third of accidents. Accidents themselves were either caused by vehicles running off the road (on curves or straights) or "rear enders". The design of the project is likely to result in a lower rate of accidents, through the realignment of the highway and removal of single carriageway which would remove the likelihood of rear end accidents in particular. Further, dual carriageway conditions provide safer overtaking opportunities and remove the risk of high speed head on, or side on collisions. Crash rates on undivided sections of the Hume Highway were found to be 15% higher than divided sections and more severe.

The project is consistent with the *NSW State Plan* Priorities S7 (safer roads) and Priority P2 (Maintain and Invest in Infrastructure). Further, the project has been identified in the *NSW State Infrastructure Strategy* (2008-2018).

Additionally, the RTA has modelled freight demand for both road and rail along the Sydney-Melbourne corridor as part of the Hume Highway Strategic Planning study. The study concluded that, irrespective of the continued rail investment and associated travel time improvements, it would only marginally slow the rate of road traffic increase along the highway. An upgrade to the highway would therefore still be required.

Should the project not proceed, Tarcutta will remain as one of three sections of the entire Highway not duplicated. This will result in Tarcutta forming a choke point in the efficient movement of goods between Sydney and Melbourne as traffic will be forced to a single carriageway and halving of speeds (from 100 kilometres/hour to 50 kilometres/hour in town). Consequently, the change in driving conditions coupled with the predicted growth in traffic volumes will increase the risk of accidents on this section of road. Further, predicted volumes would contribute to a long term decrease in the level of service for the highway at Tarcutta, ultimately resulting in an unsatisfactory level of service during peak traffic periods such as school holidays and long weekends in 2022.

Notwithstanding, residents in Tarcutta would continue to be exposed to amenity and connectivity impacts associated with highway traffic travelling through the town.

3. STATUTORY CONTEXT

3.1 Major Project

On 20 December 2007, the then Minister for Planning declared the Tarcutta bypass (as well as the Woomargama and Holbrook bypasses) to be projects to which Part 3A of the *Environmental Planning and Assessment Act 1979* applies.

3.2 Critical Infrastructure Project

On 4 March 2009, the then Minister for Planning declared the Tarcutta bypass (as well as the Woomargama and Holbrook bypasses) to be critical infrastructure projects under Part 3A of the *Environmental Planning and Assessment Act 1979*.

3.3 Relevant Environmental Planning Instruments

There are no State Environmental Planning Policies that substantially govern the carrying out of the project.

3.4 Minister's Approval Power

In accordance with section 75H (3) of the *Environmental Planning and Assessment Act 1979*, the Environmental Assessment was placed on public exhibition from 2 September 2009 until 6 October 2009. Advertisements notifying of the exhibition of the Environmental Assessment were placed in the Sydney Morning Herald, Daily Telegraph and Wagga Daily Advertiser. In addition, the Proponent notified residents of Tarcutta of the exhibition via a community brochure and held a staffed display to answer any enquiries from the community.

The Environmental Assessment was made publicly available on the Department's website, the Department's head office Wagga Wagga City Council. Additional copies were also made available at Tarcutta Post Office, Halfway Café (Tarcutta) and the Nature Conservation Council.

The Department considers that is has met all applicable legal obligations so that the Minister can make a determination in relation to the project. It is also noted that the Environmental Assessment submitted in support of the subject application addressed the Director-General's requirements issued for the project application.

4. CONSULTATION AND ISSUES RAISED

The Department received seven submissions during the exhibition of the Environmental Assessment. One submission was received from the general public and the remainder were from Government agencies.

The key issues raised in the submission received from the member of the public include:

- the historical significance of the Old Tarcutta Inn has been overlooked;
- an increase in road traffic noise which will exceed the recommended limits;
- increased flood height limits;
- loss of critical and endangered flora and fauna, including species not identified by environmental studies; and
- disruption and loss of rural lifestyle, including the decrease of property value due to the property having highways on both the eastern and western side.

Issues raised in submissions from Government agencies are summarised below.

Table 2 - Overview of Government Agency Submissions

Agency	Concerns
Department of Environment, Climate Change and Water	• Area of clearing. • Effectiveness and long term sustainability of crossing points. • Amendments to the Statement of Commitments. • Monitoring and surveying of flora and fauna. • Aboriginal heritage management. • Construction noise. • Hours of construction. • Operational noise. • Hydrology. • Quarrying.
Land and Property Management Authority	• Land acquisition. • Loss of habitat. • Access to reserves. • Sediment and dust control.
Department of Transport and Infrastructure	• No objection.
NSW Office of Water	• No objection, subject to conditions.
Department of Industry and Investment	• Management of works at individual waterway sites. • Riparian vegetation. • River snagging. • Fish passage. • Water quality. • Monitoring.
Wagga Wagga City Council	• Loss of native vegetation. • Biodiversity offsets. • Fragmentation of habitat. • Pedestrian access. • Stock route. • Severed agricultural land. • Economic impacts

4.1 Submissions Report

On review of the issues identified in submissions, the Department required the Proponent to prepare a Submissions Report to address each of the issues raised in those submissions. As part of this process, the Proponent made comment in relation to the issues identified. Following consideration of the submissions, and additional refinement of the project design, the Proponent proposed three (3) amendments to the project as follows:

- a reduction in the skew of the northern interchange bridge;
- a westward shift in the bypass alignment by up to approximately 80 metres for approximately 2.5 kilometres between chainages 43500 and 46000; and
- amendments to the southern interchange

It is considered that these amendments are acceptable and do not significantly change the nature and scope of the original proposal nor will they result in additional adverse impacts, subject to condition. As such, a Preferred Project Report was not required for the project.

The Department consulted with key regulatory agencies, with respect to the Submissions Report. Generally agencies were satisfied with responses to submissions and the revised Statement of Commitments.

5. ASSESSMENT OF ENVIRONMENTAL IMPACTS

After consideration of the Environmental Assessment, submissions, Submissions Report and the Government agency response to the Submissions Report, the Department has identified the following key environmental issues associated with the proposal:

- Ecological impacts;
- Aboriginal heritage impacts;
- Non-Aboriginal heritage impacts;
- Impacts on hydrology;
- Noise and vibration impacts;
- Social and economic impacts; and
- Traffic and transport impacts.

All other issues are considered to be minor and have been adequately addressed as part of the Statement of Commitments.

5.1 Ecological Impacts

Issues

The construction of the project would result in the clearance of 16 hectares of native vegetation. This clearing would comprise the following:

- seven hectares of Box-Gum Woodland (an endangered ecological community (EEC) under the *Threatened Species Conservation Act 1995*), five hectares of which fits the definition of the critically endangered ecological community under the *Environment Protection and Biodiversity Conservation Act 1999*.
- five hectares of Inland Grey Box Woodland, an endangered ecological community under the *Threatened Species Conservation Act 1995*, and subject to a preliminary listing as an endangered ecological community under the *Environment Protection and Biodiversity Conservation Act 1999*.

Habitat fragmentation has been identified as an issue relevant to the project. Habitat fragmentation can result in significant adverse impacts upon fauna, with specific impacts including:

- barrier effects: where particular species are either unable or unwilling to move between suitable areas of fragmented habitat;
- genetic isolation: where individuals from a population within one fragment are unable to interbreed with individuals from populations in adjoining fragments; and
- edge effects: where a zone of changed environmental conditions (i.e. altered light levels, wind speed and/or temperature) occurs along the edges of habitat fragments.

Once operational, the project would be hazardous to fauna attempting to cross the highway. Particularly vulnerable species include the Squirrel Glider, Swift Parrot and woodland bird species such as the Grey-crowned Babbler.

A number of weed species have been observed in the area of the project. The construction of the project would have the potential to disperse weeds into areas of remnant vegetation where weed species do not currently occur. Weed dispersal would potentially occur due to earthworks, movement of soil, and attachment of seed (and other propagules) to vehicles and machinery.

There will be cumulative impacts as a result of the Hume Highway duplication projects. The cumulative impacts would include a greater extent of clearing of native vegetation and habitats, including threatened ecological communities, as well as further fragmentation of habitats, including habitat for threatened flora and fauna. It is estimated that a total of approximately 125 hectares of native vegetation has been or would be cleared for the five current duplication projects and the three town bypass projects on the Hume Highway. The current project would contribute 14 percent of this clearing. The total extent includes an estimated 93 hectares of endangered ecological community, of which the Tarcutta bypass project contributes 12 hectares. The loss of 93 hectares of endangered ecological communities is considered significant.

The project will require the construction of waterways crossings, which may modify the natural hydrology of the watercourses, resulting in excessive flow velocities, modified water depths, and increased water turbulence. Other impacts may occur, such as decreased light levels and blocked debris, which would restrict fish passage.

It is noted that both Tarcutta and Keajura creeks from part of the Lower Murray River endangered ecological community. The project would include waterway crossings and minor creek realignment within these areas, which would contribute to the disturbance of the creeks. It is noted that the waterways within the project area are currently affected by riparian vegetation clearance, erosion and sedimentation, alteration to flows and bank instability due to stock access and vegetation removal.

In order to mitigate potential impacts from the project on ecology, the Proponent has identified measures that would be implemented, including:

- checking hollow-bearing trees for fauna;
- collection of native seeds;
- using endemic species for landscaping;
- implementing strategic revegetation works in the corridor to increase fauna habitat linkages;
- undertaking ongoing management of weeds;
- clearly demarcating limits of clearing;
- developing fauna crossings;
- maintaining fish passages; and
- developing a biodiversity offset package.

Submissions

The DECCW considers that the loss of 16 hectares of native vegetation is a significant reduction in available habitat for threatened species in the vicinity of the project. It is opined that this reduction will negatively impact on connectivity and may result in vegetation cover falling below critical threshold values. In addition, the DECCW considers that the project has the potential to restrict the movement of wildlife across and along the highway. The DECCW recommends that a comprehensive biodiversity offset package be implemented.

The Land and Management Authority raised concerns with the loss of habitat values as a result of land acquisition and the potential spread of weeds.

The Department of Industry and Investment seeks to ensure that fish passages are maintained.

Wagga Wagga City Council raises concerns that the exact location of vegetation losses is not provided, lack of detail concerning biodiversity offsets (including concerns that offsets may be provided outside of the Tarcutta area), and the fragmentation of habitats.

Consideration

Terrestrial Flora and Fauna Impacts

The Department recognises that the project corridor is confined given other constraints associated with the project, such as heritage and land acquisition impacts. The Department considers that the Proponent has reasonably endeavoured to avoid or minimise the extent of disturbance to the Endangered Ecological Communities, fauna habitat and the key habitat corridors.

Notwithstanding the minimisation of the clearing requirements, the project would still have an adverse impact on the Endangered Ecological Communities and threatened fauna species in the region. These impacts will arise out of habitat destruction or disturbance in addition to increased fragmentation, barrier effects and increased rates of road strike.

Given this adverse impact, and the limitations associated with mitigating this impact within the project corridor, the Department supports the proposed combination of corridor-specific mitigation measures, such as the use of endemic species for revegetation and fauna crossings, and the implementation of regional biodiversity offset measures. The Department is satisfied that this approach would ensure that localised impacts are minimised

wherever possible, and that cumulative and longer-term impacts on the Endangered Ecological Communities and the relevant threatened fauna species are appropriately addressed.

Whilst the Department considers that the mitigation measures proposed by the Proponent are generally good practice, the Department recommends a number of conditions which aim to ensure that impacts are kept at an absolute minimum. These conditions include requirements such as the following:

- details of fauna underpasses and aerial crossings to be undertaken with advice from a qualified ecologist;
- installation of nest boxes and relocated hollows;
- application of a biodiversity offset strategy;
- implementation of effective weed control;
- implementation of a Flora and Fauna Monitoring Program; and
- preparation of a Construction Flora and Fauna Management Plan

The then Minister, as a condition of the concept plan approval granted to the previous five Hume Highway duplication projects, required a Biodiversity Offsets Strategy to offset the cumulative and longer-term impacts on the Box-Gum Woodland community and the regional populations for the relevant threatened fauna species as a result of those projects. As the Strategy was developed in consultation with DECCW (including the Office of Water) and approved by the Department, it is considered appropriate to adopt the Strategy with revisions to be made to include biodiversity offsets required for this (and other) Hume Highway bypass projects. In determining the suite of biodiversity measures for the bypasses (Woomargama, Tarcutta and Holbrook), the Department has recommended a condition of approval requiring the Proponent to develop a Biodiversity Offset Package, based on the revised Strategy, to be prepared, in consultation with the DECCW and the Department of the Environment, Water, Heritage and the Acts, and submitted for the approval of the Director-General prior to construction of the project.

Whilst the Package will ensure that the delivery of regional offsets would address the contributions that the project would have towards the cumulative impacts of the Hume Highway upgrade program, the Department considers that localised impacts will also need to be addressed through the implementation of management and mitigation measures. The Proponent has proposed to implement corridor-specific measures during the pre-construction and construction periods, such as habitat clearing procedures to minimise the disturbance of fauna. The Department supports the proposed measures to minimise and avoid biodiversity impacts resulting from the project. Nonetheless, to ensure due consideration is given to the biodiversity impact during the construction stage, the Department has recommended conditions of approval requiring a Construction Flora and Fauna Environmental Management Plan and a Threatened Species Monitoring Program, which will monitor mitigation measures during the construction phase to ensure the biodiversity outcomes are achieved and modified if necessary. Further, a condition is recommended to ensure the implementation of effective weed control in all revegetated areas which may have potential value as wildlife habitats.

In conclusion, the Department is satisfied that the species-specific mitigation and offset measures, in conjunction with a management, monitoring and review regime for both corridor specific and regional offset measures would ensure that the local and regional impacts of the project are appropriately mitigated and that the desired ecological outcomes are achieved. Consequently, the terrestrial ecological impacts are considered to be acceptable.

Aquatic Flora and Fauna Impacts

The Department notes that there may be impacts on the river system (including Tarcutta Creek and Keajura Creek), which may lead to impacts upon aquatic fauna. At the forefront of such concerns is the removal and/or damage of riparian vegetation, which acts as a stabilising mechanism for river systems. Once riparian vegetation is adversely affected, other flow on impacts, such as turbidity, may arise affecting the aquatic ecosystem as a whole. However, given that the key impacts upon the aquatic ecosystem will occur as a result of the proposed crossings or works in proximity to watercourses, the Department is satisfied that any potential impacts to aquatic ecology could be effectively minimised through the implementation of construction management controls and appropriate design of all new or modified crossings.

In order to ensure that project construction is undertaken in a manner which would minimise adverse impacts upon the aquatic ecology of the area, the Department recommends a number of conditions which include the following:

- the rehabilitation of riparian areas in consultation with the DII;
- watercourses affected by the proposal are to be rehabilitated to emulate a natural stream system; and
- watercourse crossings and culverts to be designed and constructed in a manner to ensure effective fish passage requirements are provided.

The Department is satisfied that the above recommendations would ensure that any impact is appropriately mitigated and managed during all phases of the project ensuring that impacts are contained to acceptable levels.

5.2 Aboriginal Heritage Impacts

Issues

The archaeological surface surveys undertaken by the Proponent for the project indicated that the largest concentration of artefacts occurs along creek lines. Most archaeology in the area is located along the protected creek margins due to successive flooding events having removed the majority of artefacts in unprotected areas.

To determine the impact of the project on aboriginal heritage of the Tarcutta area, the Proponent undertook archaeological surveys and excavation and consulted with local knowledge holders to determine items of significance and cultural places. A total of 17 archaeological sites and six cultural places were identified. Of these, it is expected that 12 sites and two cultural places will be impacted by the proposal. These are summarised in Table 3 below. In all cases, the Proponent has highlighted that the project would only partially impact on these items and sites.

Table 3 - Aboriginal Heritage Items and Site Impacted by the Project

Site	Site Type	Description	Significance
Place 1	Cultural	Withheld*	High
Place 5	Cultural	Withheld*	High
T8	Artefact scatter	On a hilltop on the western side of the Hume Highway	Moderate to high
T9/TA14	Artefact scatter	On the western side of the Hume Highway overlooking Tarcutta Creek.	Low to Moderate
T10	Artefact scatter	Representative of Aboriginal occupation areas along the elevated margins of the floodplain.	Moderate to high
T11	Artefact scatter	Has been impacted by erosion and vehicles	Low
T12/TA15	Artefact scatter	Has been impacted by colluvial movements and only a thin and disturbed cultural layer remains.	Moderate
T15	Artefact scatter	A large collection of quartz artefacts. Erosion has impacted the edges around the steeper slopes, but the majority of the site appears to in be good condition with little subsurface disturbance.	High
T16	Artefact scatter	A disturbed cluster. The ground has been impacted by flood evens and the subsurface appears to consist mostly homogenised alluvium	Low
T17	Artefact scatter	Located along the Keajura Creek, with the west bank being disturbed and the east bank in relatively good description.	Moderate to high
T18	Artefact scatter	Has high archaeological research potential in its association with Keajura Creek.	Moderate to high
T19	Artefact scatter	Has moderate archaeological research potential in its association with Keajura Creek	Moderate
T20/TA16 T-PAD-4	Artefact scatter (previously recorded PAD)	The site has been impacted and only disturbed pockets of artefacts remain on the moderately sloping site.	Moderate
T21/TA17 T-PAD-5	Artefact scatter (previously recorded PAD)	Small number of artefacts.	Moderate

*Details of the cultural places have been withheld due to cultural sensitivity and the wishes of the knowledge holders.

It is noted that the route selection for the project was partly determined based on minimising impacts to indigenous heritage, which has effectively mitigated a number of issue which may have arisen. Further, the proposed reconfiguration of the southern interchange, particularly the relocation of the northbound exit ramp alignment, would reduce the impact on artefact scatter T15.

In addition to the design methods to minimise impacts, the Proponent has committed to a number of measures to reduce the impacts, such as managing Aboriginal heritage items in consultation with the DECCW and Aboriginal stakeholders, fencing significant sites, undertaking salvaging prior to construction, providing training to staff, ongoing consultation with Aboriginal stakeholders, and immediately stopping works in the event that any skeletal remains are discovered.

Submissions

The DECCW did not object to the project on indigenous heritage grounds, but provided a number of recommendations and comments including the preparation of an Aboriginal Heritage Management Plan and the submission of salvaging reports to the DECCW.

Consideration

The Department acknowledges the importance of the heritage items and cultural sites that would be impacted by the proposed project, particularly the cultural significance of these items and sites to the local Aboriginal community. The Department considers that priority should be given to the protection of these items and sites. It is also recognised that the extent to which impacts can be avoided or minimised is limited by road design requirements and other key project corridor considerations or constraints that equally influence the final alignment, such as biodiversity issues.

The Department is satisfied that the Proponent has adequately, through the proposed road design, minimised the number and extent of the potential impacts on Aboriginal heritage items and sites and that there is opportunity through the construction stage to further minimise these impacts. It is conceded that the removal of the items and/or destruction of these sites would have a permanent impact on cultural heritage in the region. However, it is considered that benefits will be derived through the recommended salvage and investigations in conserving these items and furthering knowledge of Aboriginal heritage and landscapes in the region. Further, in the larger context, the impacts upon Aboriginal heritage are relatively minor when considering the significant benefits that the project will deliver.

Notwithstanding the commitments made by the Proponent to minimise potential indigenous heritage impacts, the Department has recommended a number of conditions of approval, including the following requirements:

- preparation of a Construction Heritage Management Plan, which requires consultation with the DECCW and Aboriginal stakeholders and aims to ensure that construction based activities are undertaken in a manner which minimises Aboriginal heritage impacts;
- fencing of all archaeological and cultural sites within the construction site that are not to be impacted by the project;
- avoidance, to the greatest extent practicable, of potentially affected sites and cultural places, with salvaging to be undertaken where avoidance is not possible; and
- in the event that unanticipated Aboriginal heritage is discovered, work is to cease to allow an archaeologist to make an assessment of the finds in consultation with the DECCW.

Consequently, the Department is satisfied that appropriate design and management measures have been taken and/or will be implemented during construction and final design to ensure Aboriginal heritage across the corridor is appropriately protected and the impacts minimised wherever possible. The Department is also satisfied that sufficient weight has been given to Aboriginal heritage during the design of the proposed alignment with the impacts minimised wherever possible, and that the recommended salvage and excavation of items and sites directly impacted by the project would provide mitigation towards the permanent loss of these items within the cultural landscape.

5.3 Non-Aboriginal Heritage Impacts

Issues

The Tarcutta region began to undergo development upon the establishment of pastoral runs of numerous squatters. In 1836 the first properties of 'Umbutee' and 'Toonga' were established. From the 1860s the large pastoral runs were subdivided into smaller blocks and taken up by the selectors, which resulted in the establishment of mixed farming. Tarcutta town was gazetted in 1890 and supported by a couple of general stores, a bakery, a hotel, and postal and telegraphic services. Pastoral expansion in the 1830s created an arterial route from Sydney as far as lower Tarcutta, known as the Great Southern Road. By 1836, the main overland route from Sydney to Melbourne began its existence as the Port Phillip Road. In 1928 the road was renamed the Hume Highway.

The heritage assessment identified five sites/items of heritage significance within the study area, which are summarised below.

Table 4 – Non-Aboriginal Heritage Items in the Project Area

Site ID	Item	Heritage Listing	Significance
TH11	Tarcutta House Well	Not listed	Local
TH12	Tarcutta House	National Trust of Australia (NSW) Wagga Wagga Local Environmental Plan (exterior only) Wagga Wagga Rural Development Control Plan (exterior only)	Local
TH13	Ruin of an old farmhouse	Not listed	Local
TH14	Tarcutta General Cemetery	Not listed	Local
TH15	Hambledon Homestead Complex (including site TH15a historic brick well)	Register of the National Estate National Trust of Australia (NSW) State Heritage Register – this includes a curtilage of approximately 44 hectares. Wagga Wagga Local Environmental Plan Wagga Wagga Rural Development Control Plan	State

With regard to the impacts upon items TH11 to TH14, it is highlighted that these are located outside of the construction site boundary and therefore no direct impacts are expected. However, it is noted that indirect impacts such as potential loss of visual landscape and modification to landscape setting may occur.

The heritage assessment notes that items TH15 and TH15a would be subject to direct impacts, with the project impacting on a portion of the surrounding paddocks within the curtilage of the Hambledon Homestead Complex. It is considered that this impact would permanently alter the heritage curtilage of the Hambledon Homestead Complex. In addition, the project may impact on the historic brick well (and associated windmill). If impacted, it is likely that the well would be partially dismantled and the windmill would be removed.

It is noted that since the original heritage assessment was undertaken, the proposed road alignment has been modified in order to reduce impacts upon the Hambledon Homestead Complex. The realignment of the Humula Link Road would include a westward shift of the project within the curtilage of Hambledon Homestead Complex. This design change would avoid the direct impact to the brick well (and associated windmill) and reduce the impact to the heritage curtilage of the Hambledon Homestead Complex.

Submissions

One public submission was received which raised concern that the heritage value of the Old Tarcutta Inn had been overlooked.

Consideration

The Department acknowledges the heritage significance of the Hambledon Homestead Complex. During the assessment process, the Department raised concerns with the Proponent over the heritage impacts that may occur to the Hambledon Homestead Complex and reiterated that such impacts were considered unacceptable.

As a result, the Proponent modified the alignment of the project corridor in order to minimise impacts upon the Complex and to ensure that the historic brick well and associated windmill would be retained. The Department is satisfied with this response, however to ensure that adverse heritage impacts are fully minimised and mitigated, the Department recommends conditions of approval requiring the Proponent to prepare a detailed Conservation Management Plan for the Complex and prohibiting the Proponent from removing or disturbing the historic brick well and associated windmill.

With regard to the submission received from the owners of the Old Tarcutta Inn, the Department recognises that the Inn was located outside of the assessment area for the project as is beyond the limits of potential impact. Further, it is not listed on any statutory registry, although it is recognised by the National Trust of Australia. It is further noted that the modified alignment of the project corridor will move the project a further 80 metres to the west away from the Inn. Notwithstanding, the Department considers that items of significance may be indirectly impacted as a result of changes to the surrounding environment, including landscaping. As such, the Department considers that it is reasonable for the Proponent to consider the Inn in landscaping and urban design for the project. In this regard, the Department has recommended a condition of approval requiring the Proponent to ensure that landscape works do not detract from the heritage significance of indirectly or directly affected heritage items.

The Department is generally satisfied that the risks of impacts to non-indigenous heritage items are negligible. However, to ensure that impacts are minimised to furthest extent possible, a number of conditions of approval are recommended, which require the following:

- using a specialist heritage consultant to oversee works which may impact upon items of heritage significance;
- use of heritage inductions for all construction contractors, subcontractors and personnel;
- protection (such as fencing or webbing) of heritage items not directly impacted by the project;
- photographic and archival recording of directly and indirectly impacted heritage items; and
- ceasing works in the event that substantial intact archaeological deposits and/or state significant relics are discovered.

The Department is satisfied that potential impacts to non-Indigenous heritage will be successfully mitigated as a result of the amended project alignment and subject to the recommended conditions of approval.

5.4 Impacts on Hydrology

Issues

The Project is located in the Tarcutta Creek catchment, which has two main tributaries: Keajura Creek and Umbango Creek. The Tarcutta Creek catchment is part of the Murrumbidgee catchment area. It is noted that Tarcutta creek has a history of flooding with a number of significant flooding events being recorded over the past century.

During construction, the Proponent has predicted that there may be impacts upon local catchments, flooding and hydrology and water supply:

- local catchment impacts – there is potential for local drainage lines to be temporarily blocked or diverted. This may result in localised flooding upstream and downstream, although expected to be temporary and minor.
- flooding and hydrology – earthworks and construction of pavement and bridge structures across Tarcutta Creek and Keajura floodplain have the potential to affect flood behaviour and change flow distribution, through the blockage of usual flow paths.
- water supply impacts – it is noted that the construction of the project would require the use of approximately 200 megalitres over the two year construction period. Water extraction would likely be limited to water captured on site or existing farm dams and would therefore be unlikely to have an overall impact on surface water supplies and surrounding users.

The primary concerns in relation to surface water and the operation of the project relate to flooding and hydrology impacts. Hydraulic modelling indicates that the project would alter the distribution of flow within the Tarcutta Creek floodplain both upstream and downstream of the proposed crossing. The project would reduce floodplain

storage where it encroaches into the existing floodplain. Floodwaters would also be prevented from reaching some storage areas, specifically areas south of the existing highway and in the left overbank immediately downstream of the project. The embankment would block the conveyance of flows except where bridges or openings are constructed. Changes in flow distribution may lead to increased flood levels (afflux) and changes in flood inundation extent and velocity.

In relation to groundwater impacts, the majority of bores in the locality are licensed to supply domestic and stock requirements. Three boreholes are licensed for town water supplies for Tarcutta and two boreholes are licensed for commercial/industrial purposes. No bores close to Tarcutta village are licensed for irrigation, however there are groundwater irrigators within the greater Tarcutta Creek catchment.

A number of short term construction based impacts are expected as a result of the project. These impacts would include:

- aquifer/ground compaction, which may result in impediment or prevention of the natural groundwater flow to the north-west. Flow on effects may result in waterlogging and ponding to the immediate east of the construction site, lowering of the water table to the west and north-west, and a potential increase in the incidence of dryland salinity;
- groundwater ingress; and
- potential impacts on surrounding groundwater users through the use of groundwater supplies for construction of the project.

The operational impacts of the project on groundwater are similar to the construction based impacts, except that the operational impacts have the potential to lead to permanent changes. To summarise, the operational impacts expected are aquifer/ground compaction, dryland salinity and waterlogging.

The Proponent has identified a number of mitigation measures to limit the hydrology impacts both through the construction and operation phases of the project. These measures including the following:

- further flood modelling during detailed design;
- utilising design features to minimise flood impacts;
- implementing water efficient work practices;
- developing strategies to manage groundwater issues associated with surrounding land uses;
- undertaking groundwater monitoring;
- decommissioning and relocating boreholes, if required;
- managing change in peak flood level through detailed design;
- implementing appropriate scour protection measures; and
- Installing appropriate subsurface drainage infrastructure.

Submissions

The DECCW noted that minor increases in flood levels and velocities are expected and therefore adequate erosion protection must be provided.

The public submission received raised concern with the flooding impacts to residential properties.

Consideration

The Department considers that the impacts of flood behaviour and stream hydrology are manageable through appropriate construction methods and that the project structures would not have any significant adverse impacts or significantly worsen current conditions if the drainage structures and water crossings are appropriately designed. In this respect, the Department notes and supports the Proponent's commitment to ensure all hydraulic structures are designed to maintain or improve drainage flows and hydrology. Whilst the Department is generally satisfied with regard to flooding impacts, it is recommended that conditions of approval be included which require the Proponent to ensure that the detailed design of the proposal does not significantly increase flooding characteristics and that mitigation of flooding impacts is addressed as a source design response.

In relation to the public submissions received, the Department notes that a revised flood impact assessment, which was undertaken as a result of design changes to the Tarcutta Creek bridge, predicts that the flood impacts

upon the Old Tarcutta Inn would be negligible. The Department accepts this data. In this regard, the Department notes and supports the Proponent's commitment to undertake ongoing consultation with affected landowners during the pre-construction and construction phases of the project to resolve issues, including flooding impacts.

Notwithstanding the above comments, the Department is of the view that there are impacts evident which could potentially be further mitigated. It is considered that the impacts of compaction could be further investigated and possibly mitigated. As such, the Department recommends a condition of approval requiring the Proponent to undertake a geotechnical investigation in consultation with the NOW, to assess the risk of aquifer compaction from road construction through areas of shallow groundwater and to provide suitable mitigation measures where appropriate. In addition, the Department has recommended condition of approval requiring the design of the project maintains to the greatest extent practicable, existing water course hydrology, including existing flow distribution, water quality, and flooding behaviour, and a condition requiring that erosion and sediment control measures be implemented prior to any works commencing. It is considered that these measures will ensure that increases in flooding characteristics are minimised to the greatest extent practicable.

The Department is satisfied that the Proponent's commitments and the recommended conditions of approval would ensure that changes to hydrology along the proposed corridor are appropriately minimised.

5.5 Noise and Vibration Impacts

Issues

Construction Noise and Vibration

The Proponent undertook a construction noise impact assessment in accordance with the Environmental Noise Control Manual (EPA, 1994). The assessment was undertaken based on three zones:

- Zone 1 located to the northwest of the project alignment;
- Zone 2 located in between the existing Hume Highway and the proposed new alignment; and
- Zone 3 located to the southeast of the existing Hume Highway.

Noise levels at isolated receivers in Zone 1 are predicted to vary between compliance and exceedance in the order of 27 dB(A). The sleep disturbance criterion at these receivers is predicted to be exceeded at night in the order of 19 dB(A).

At receivers in Zone 2, noise levels are predicted to vary between compliance and exceedance of 19dB(A). The sleep disturbance criterion at these receivers is predicted to vary between compliance and exceedance at night in the order of 13 dB(A).

Noise levels in Zone 3 are predicted to vary between compliance and exceedance in the order of 27 dB(A). The sleep disturbance criterion at these receivers is predicted to vary between compliance and exceedance at night in the order of 19dB(A).

Saw cutting and paving activities are expected to result in non-compliances of up to 20dB(A) in Zone 1, 10dB(A) in Zone 2 and 20dB(A) in Zone 3 during day time. At night time, it is predicted that Zone 1 will experience exceedances of up to 27dB(A), Zone 2 up to 19dB(A) and Zone 3 up to 27dB(A).

It is further predicted that the concrete batch plant noise levels may exceed construction noise goals at five receivers by up to 3 dB(A). In addition, the pre-cast yard will impact upon two receivers, with exceedances of up to 12dB(A) and 4dB(A) respectively.

In relation to construction vibration impacts, the closest residential receiver is 77 metres away. This building is currently unoccupied. Vibration levels are predicted to be below one millimetre per second in all frequencies and no exceedance of the damage criterion is predicted. All other residential receivers are located more than 100 metres form construction activities and no vibration impacts are expected. Further, it is noted that the closest edge of the construction site boundary is located approximately 30 metres from the Tarcutta General Cemetery. Vibration levels are expected to be less than 3 millimetres per second and therefore are unlikely to damage any headstones in the cemetery.

In order to mitigate potential construction noise and vibration impacts, the Proponent has committed to a range of mitigation and management measures, including:

- use of best practice measures to minimise construction noise and vibration;
- monitoring to determine effectiveness of mitigation measures;
- a notification and negotiation procedure where noise impacts from evening and night construction activities are above criteria; and
- a procedure for responding to complaints.

Operational Noise

The assessment of operational noise was undertaken by the Proponent using the criteria for road traffic noise as it is set out in the *Environmental Criteria for Road and Traffic Noise* (ECRTN) (EPA 1999). The ECRTN classifies various road developments depending on the type of road and nature of development. The project is considered a 'new freeway or arterial road corridor' except for approximately one kilometre at the northern end of the project, where it is considered a 'redevelopment of existing freeway/arterial road'.

The noise assessment notes that most residential receivers currently receive noise from the existing Hume Highway that exceeds the ECRTN thresholds for new roads. It is predicted that if the project were not built, then by 2022 noise levels would exceed the ECRTN thresholds at more than half of the residential receivers. It is further predicted that if the project is built, then most residential receivers are likely to experience a reduction in noise levels as traffic moves from the existing highway to the new project.

The operational noise assessment notes that a total of 11 receivers within Zone 2 would experience an exceedance of the ECRTN noise threshold (by up to 8 dB(A)) as a result of the Tarcutta bypass project in combination with existing traffic noise. The table below identifies the noise levels at the receivers, with the ECRTN criterion being 50dB(A) and exceedances bolded:

Receiver	Existing Highway 2012 (no project)	Combined Project and existing highway 2012	Project 2022	Combined project and existing highway 2022
50	49.5	49	**55.5**	**56**
51	**60**	**56**	**53**	**58**
63	45.5	47	**50.5**	**51**
64	44.5	49.5	**53.5**	**54**
65	46	47	**51**	**52**
66	**50.5**	48	**51**	**53**
67	**56**	**52**	50	**55**
68	43.5	**51.5**	**55**	**55.5**
69	**58**	**54**	**51.5**	**57**
70	**52.5**	**50.5**	**52**	**53**
71	**54**	**50.5**	**50.5**	**54**

Taking into consideration the noise the receivers would be subject to from the existing Hume Highway, it can be deduced that in 2022:

- three receivers would experience decreased noise levels as a result of the Tarcutta bypass project (compared with no project);
- one receiver would experience the same noise level from the project as it would if there was no Tarcutta bypass project; and
- seven receivers would experience increased noise levels as a result of the Tarcutta bypass project.

In addition to the receivers within Zone 2, there are eight isolated receivers that would experience noise exceedances of between 1dB(A) and 10dB(A).

The Proponent has committed to mitigating operational noise impacts through the development and implementation of all reasonable and feasible mitigation measures to meet the noise criteria applicable to the project in consultation with sensitive receivers. In addition, the Proponent has committed to measuring

operational noise along the project between six months and one year after opening, and implementing further reasonable and feasible mitigation measures in instances where noise levels exceed predicted levels.

Submissions

One public submission raised concern with the construction noise and vibration impacts and the operational noise.

DECCW notes the correct noise criteria to be used and raised objection with granting approval to a variation of standard construction hours.

Consideration

Construction Noise

It is important to contextualise the predicted construction noise impacts associated with the project with reference to the nature and duration of construction-related activities. In the first instance, while the Proponent has predicted significant exceedances of construction noise objectives, these exceedances represent worst-case, 'maximum impacts'. In reality, and on average, construction noise impacts would not be experienced continuously at these levels. Further, it is also important to note that construction activities are transient and temporary in nature. No single receiver would experience maximum construction noise impacts for the duration of the construction period, and would unlikely experience elevated noise impacts for the entire period either. While there may be short duration high intensity noise events occurring during construction, such events would not be an on-going issue for receivers beyond the conclusion of the construction period. The principal focus for construction noise is therefore one of management – to ensure an appropriate balance between timely completion of construction works (to limit the total duration of impacts to receivers) and the intensity of construction activities (to limit the magnitude of impacts to receivers).

The Department is satisfied that construction noise impacts can be appropriately managed through the implementation of mitigation measures which the Proponent has committed to and recommended conditions of approval. The Department accepts that it would be difficult for the Proponent to satisfy the relevant criterion during certain construction activities. The Department considers it important, and has recommended as a condition of approval that the Proponent be required to prepare and implement a Construction Noise and Vibration Management Plan, which would detail how construction and vibration impacts would be minimised and managed. Examples of potential noise management measures include the timing of certain types of construction processes, the maintenance of machinery, ongoing consultation with affected receivers and constructively responding to noise complaints.

The Proponent seeks approval for extended construction hours beyond the standard construction hours typically applied for infrastructure and other projects. In particular, the Proponent seeks to extend construction hours on weekdays to 6:00 am to 7:00 pm (compared with standard hours of 7:00 am to 6:00 pm) and on Saturdays to 7:00 am to 4:00 pm (compared with standard hours of 8:00 am to 1:00 pm). While the Department appreciates the need for flexibility in construction hours to provide a balance between timely completion of the project and protection of local acoustic amenity, it does not consider that the Proponent has provided sufficient justification and analysis to support a blanket extension of the construction hours. Key to this justification and analysis is a reasoned scheduling of noise-generating activities to minimise noise impacts beyond standard construction hours, including consideration of issues such as respite and intensity of works. The Department suggests that the Proponent would be able to develop this information prior to the commencement of construction and considers, therefore, that a more appropriate regulatory approach in this circumstance is to permit the Proponent to seek exemptions from the standard construction hours on a case-by-case basis for clearly defined activities and mitigation approaches. This approach is reflected in the recommended conditions of approval. It is noted that the DECCW also supports extension of hours based on a justified need for certain activities, rather than a blanket extension of construction hours.

Despite the Department generally being satisfied with the assessment and mitigation measures provided by the Proponent, it is considered prudent to prescribe conditions of approval requiring the Proponent to undertake construction activities in a manner which mitigates noise impacts to sensitive receivers as far as practicable. These conditions include:

- restrictions to blasting hours and limits;
- consultation with affected educational institutions in relation to noise generating construction works within the vicinity;
- restriction on blasting limits; and
- preparation of a Construction Noise and Vibration Management Plan, which would detail how construction and vibration impacts would be minimised and managed.

Construction Vibration

The Department is satisfied that the potential vibration impacts are minimal and can be appropriately managed through the Construction Noise and Vibration Management Plan. The conditions of approval provide for criteria relating to airblast overpressure and peak particle velocity, ensuring that vibration impacts will be minimised.

The Department is satisfied that the distance of residential receivers to the construction vibration will ensure that vibration impacts will be negligible and therefore raises no objections in this regard.

Operational Noise

The Department acknowledges that the receivers along the proposed corridor alignment are experiencing and will continue to experience levels of traffic noise that exceed the recommended ECRTN noise thresholds. These residences along the proposed alignment would be exposed to elevated noise levels with or without the proposed project.

The Department notes that many residents will experience a decrease in road traffic noise levels as the project will aid in removing a significant portion of traffic from the existing Hume Highway, which runs through the centre of the town, and will place it to the west of the main township. The Department accepts that the project would provide free-flowing traffic conditions, and therefore, would be unlikely to result in noise from the use of compression breaks. Additionally, noise from compression braking on the existing highway would be reduced due to the lower volume of heavy vehicles entering Tarcutta.

Of the receivers that would experience traffic noise in excess of ECRTN thresholds, the Proponent has indicated that only seven of these would experience future road traffic noise (2022) in excess of current noise (2012) levels. All other receivers with future noise above ECRTN thresholds would experience a decrease or no change in road traffic noise as a result of the project, relative to the existing situation. In the cases where road traffic noise would increase, two receivers are expected to experience a minimal increase (up to 2 dB(A)), three would experience a moderate increase (5.5 dB(A)-6.5 dB(A)) and two would experience an elevated increase (9 dB(A)-12 dB(A)).

The Department considers that there are a number of reasonable and feasible mitigation measures available to the Proponent in order to address these predicted elevated noise levels. Such measures include at-source options such as low noise pavements and roadside noise barriers, and at-receiver options such as architectural treatments. Further work will need to be undertaken by the Proponent at the detailed design and implementation stages of the project to select appropriate mitigation measures for each particular circumstance. However, the Department is satisfied that not only are viable options available for dealing with predicted road traffic noise, but the Proponent is committed to providing reasonable and feasible measures for the protection of local acoustic amenity. The Department considers it appropriate, therefore, to recommend conditions of approval requiring the Proponent to submit to the Department, for the approval of the Director-General, a review of the operational noise mitigation measures for the project within six months of the commencement of construction. The consideration of such mitigation measures would include (but not be limited to) low noise pavements, roadside noise barriers and architectural treatments. In addition, the Department recommends a condition of approval requiring noise auditing to be undertaken within one year of the commencement of operation. The noise auditing program would include a noise monitoring program to assess compliance with the predicted noise levels and any additional noise mitigation measures that may be required.

Subject to the commitments undertaken by the Proponent and the recommended conditions of the approval, the Department is satisfied that the project will be constructed and operated in a manner which minimises noise and vibration impacts.

5.6 Social and Economic Implications

Issues

The village of Tarcutta is located in a rural environment, with the existing Hume Highway acting as the main street of Tarcutta. In 2006, the total population of Tarcutta was 245 people. Properties within the Tarcutta village are currently affected by traffic noise from the existing highway, while rural properties directly affected by the project are predominately removed from these impacts.

The businesses that occur within Tarcutta are all located on the existing Hume Highway and generally serve the needs of highway travellers. There are eight businesses which are seen as predominately serving highway traffic and include:

- Tarcutta Half-way Motor Inn;
- Tarcutta Textiles;
- Tarcutta RSL Club;
- Farmhouse Industries;
- Tarcutta Horse and Jockey Hotel;
- Mobil Petrol Station;
- Tarcutta Auto Repairs; and
- Half-way Café and Takeaway.

Business surveys undertaken suggest that six of these businesses rely on passing trade for more than 80 percent of their business. Additionally, the project will directly affect seven rural properties that partake in agribusiness activities.

The project will require the acquisition of approximately 80 hectares of agricultural land of seven properties, 12 hectares of Crown land and 4 hectares of travelling stock route. The project would also reduce the amount of land in the town common. This acquisition will lead to connectivity and severance issues, particularly on the western side of the project. It is noted that a local service road would be provided to maintain a connection to Tarcutta for these properties.

During the construction of the project, it is expected that local business will experience an increase in business as a result of an increase of up to 250 workers. The most significant socio-economic impact of the project is likely to be the operational impacts to business. A reduction in business is expected compared with the previously identified business as traffic wishing to access these businesses would have to leave the Hume Highway and enter Tarcutta via the northern or southern interchanges. A survey undertaken by the Proponent indicates that at least 50 percent of those who currently stop in Tarcutta would no longer stop once the project is opened.

The project is expected to result in a gross annual turnover loss of between $4.7 million and $7.4 million to local business. This may lead to a loss of up to 80 jobs, which represents a significant number taking into consideration the local population.

In addition to the businesses located along the existing Hume Highway, the project will also impact upon seven local agribusinesses. The seven affected properties range in size from approximately 35 hectares to 1600 hectares. The proportion of land lost to acquisition would vary from less than one percent up to approximately 15 percent. The loss of this land may reduce production and therefore profitability, whilst severance of land can reduce efficiency of management leading to reduced productivity and profitability.

Submissions

The Land and Property Management Authority raised concern with the available access to Crown reserves. Wagga Wagga City Council raised concern with the economic impacts as a result of the severed agricultural land and upon the local business located along the existing Hume Highway.

Consideration

The Department identifies and acknowledges that the project will have an impact on the local economy once it is operational. The project will divert traffic away from the town and therefore lead to a reduction in stopover traffic

and business. This is an unavoidable impact associated with most road bypass projects, which is ultimately offset by other benefits and needs, such as improved safety and reduced traffic congestion.

The local business impacts in Tarcutta are expected to be noticeable, and can be partly attributed to the relatively small population of Tarcutta and the lack of self-reliance on local business. As has been demonstrated by the Proponent, Tarcutta has a particularly high dependence upon passing traffic. The Department agrees that it is not possible to avoid these impacts, however, the expected economic impacts should be mitigated as much as practicable. The Proponent has committed to working with the local council to develop and implement a signage strategy to remind passing traffic of the presence of Tarcutta and its local businesses. This would assist, to some degree, in mitigating the expected reduction in 'spontaneous' traffic stops in the town. There would, however, remain some residual level of traffic prepared to exit the highway bypass and enter the town for a service stop, noting that there is little opportunity to do so along the highway outside of the town. The Department notes that the construction period is for two years, within which it is expected that local business will prosper from increased trade, and will allow affected businesses to plan for the future by considering relocation or other changes as deemed appropriate by the business owners.

With respect to the severance and acquisition of agricultural land, the Department considers that there will be significant impacts but also notes that the affected people will be duly compensated for the loss of any land. Furthermore, the Department accepts that no prime agricultural land would be impacted by the project, with the impacted land consisting of land suitable for cropping and grazing. This would limit the impacts and therefore have minimal impact on the viability, profitability and sustainability of agribusiness in the region.

The Department notes that the project has the potential to isolate certain properties from the village of Tarcutta and to general access requirements which may be needed to provide continued use of properties for their intended function. In order to ensure that these impacts are not extensive, including the following requirements:

- ensuring that access is maintained to provide continued use of the surrounding properties existing functions;
- the Proponent is to design and construct the project in a manner that mitigates indirect and direct impacts to property and property infrastructure, including fencing, landscaping, walls, dams, bores and the like; and
- the Proponent is to identify utilities and services potentially affected by construction to determine requirements for diversion, protection and/or support.

The Department is satisfied that the socio-economic impacts will be mitigated as far as practicable. Whilst it is acknowledged that some economic impacts are likely as a result of this project, on balance, the benefits to the wider community are significant and therefore the Department considers that the socio-economic impacts of the project are acceptable.

5.7 Traffic and Transport Impacts

Issues

It is expected that the construction of the project would result in a number of impacts upon traffic and access. However, the Proponent notes that the construction work would be undertaken to minimise conflicts between construction works and the local and regional road network. For instance, construction of the northern and southern interchanges would enable traffic to be switched between the existing highway and the project to facilitate the continual flow of traffic through and around Tarcutta. Further, temporary road works will be required to connect the existing road network to the construction works.

The construction of the project will result in increased traffic movements as a result of staff vehicles and deliveries. It is expected that the number of vehicles will vary based on construction requirements, but it is predicted that construction activities will generate approximately 240 light vehicle and 200 heavy vehicle trips per day on public roads. This represents an increase of approximately eight percent of daily weekday traffic on the road network around Tarcutta.

In addition, the construction phase of the project will likely result in access limitations. Temporary changes may be required for local roads in and around Tarcutta, including Mates Gully and Humula roads. The Proponent notes that these changes would be finalised during the detailed design of the project.

It is noted that a travelling stock route runs along the Hume Highway between Mates Gully Road and Humula Road. The Proponent has committed to ensuring the movement of stock will be maintained during construction.

Generally, it is predicted that the bypass will provide for beneficial traffic impacts once operational by reducing travel time and congestion within Tarcutta. In traffic modelling studies undertaken for the project, the results indicate that if the project did not proceed the existing Hume Highway would likely slip into an unacceptable range for Level of Service during the highest traffic times of the year (such as long weekend and school holidays). However, if the project were to proceed, the traffic would be divided between two roads and would therefore alleviate traffic congestion.

The project will also result in increased safety. It is anticipated that the project would have a lower crash rate as it is dual carriage, therefore providing adequate overtaking opportunities and limiting potential for head on collisions. It is further predicted that the reduction of traffic on the existing Hume Highway may also reduce the likelihood of crashes at intersections as there should be larger gaps in traffic.

The Proponent has committed to provide a number of mitigation measures, for both construction and operation, and include the following:

- Incorporating traffic control measures for construction vehicle movements;
- Accessible information for traffic arrangements;
- Maintaining operation of local road access; and
- Maintaining travelling stock routes.

Submissions

Wagga Wagga City Council notes that it is important to ensure that opportunities remain for pedestrian movements on all local roads. Council also requests that final arrangements for the travelling stock route be approved prior to the commencement of works to ensure the continued function of the route.

Consideration

In relation to construction traffic impacts, the Department notes that there will generally be traffic disruption to some degree for any major infrastructure project. The Department accepts that the increase in traffic during the construction of the project will not be significant and therefore it is unlikely to have significant adverse impacts. Notwithstanding, the Department notes that construction of this magnitude does have the potential to result in adverse access impacts, unless adequately managed. As such, the Department recommends a condition of approval requiring the Proponent to ensure that access to all properties is maintained during construction and operation and that any access physically affected by the Proponent is to be reinstated to at least an equivalent standard.

With regard to the operational traffic impacts of the project, the Department is satisfied that the project will result in beneficial impacts by reducing congestion and generally decreasing travel times, which is consistent with the objectives of the project. The only remaining concern is ensuring that the travelling stock route is maintained. As such, the Department recommends a condition of approval requiring the Proponent to ensure that the travelling stock route and stock holding yard between Mates Gully Road and Humula Road is maintain both during construction and operation of the project, with arrangements to be further developed during the detailed design of the project in consultation with the affected stakeholders.

The Department is satisfied that the construction traffic impacts of the project will be adequately mitigated and that the operation of the project will result in positive impacts upon the traffic flow for the Tarcutta region.

6. CONCLUSIONS AND RECOMMENDATIONS

Following a detailed assessment of the Environmental Assessment, Submissions Report and the submissions received during the exhibition period for the project, the Department is satisfied that the project is justified and its impacts are acceptable. Any remaining impacts can be appropriately mitigated or managed to acceptable levels. It is therefore recommended that the project be approved subject to the recommended conditions of approval.

It is noted that that there will be flora and fauna impacts, including the clearance of significant remnants of endangered ecological communities. However, the Department accepts that this impact is unavoidable and the extent of the impact has been minimised as much as reasonably possible through the proposed project alignments. The Department is confident that the corridor specific measures and the biodiversity offset package will ensure that the predicted impacts are appropriately minimised to acceptable levels, and that the required ongoing monitoring shall ensure that the ecological objectives of the corridor specific and wider offset measures are achieved.

Traffic noise impacts on the local community are already significant. The project will alleviate some of this operational noise by taking traffic away from the town centre and diverting it to the west, although it is acknowledged that there a number of receiver that would receive an increase in noise as a result of the project. Notwithstanding, the Department considers that the noise impacts have been minimised wherever possible through the proposed road design and that the recommended conditions of approval, which require the Proponent to consider the implementation of reasonable and feasible mitigation measures, traffic noise impacts on residences will be further reduced.

The recommended conditions of approval for the project also provide for the mitigation and management of other key impacts associated with the project during the detailed design, construction and operational phases of the project, such as heritage and hydrology. The Department believes that these requirements shall provide for the implementation of best management practices during all phases of the project, and shall ensure that the construction and operation impacts of the project on the surrounding environment are managed to acceptable levels and that the amenity of local residents and rail commuters is protected.

Consequently, the Department considers that the proposal is in the public interest and recommends that the Minister for Planning approve the Tarcutta Bypass project, subject to the recommended conditions of approval.

Chris Wilson
Executive Director
Major DA Assessments

Sam Haddad
Director-General

APPENDIX A – RECOMMENDED CONDITIONS OF APPROVAL

APPENDIX B – STATEMENT OF COMMITMENTS

Note: copy in attached CD.

APPENDIX C – RESPONSE TO SUBMISSIONS

Note: copy in attached CD.

APPENDIX D – ENVIRONMENTAL ASSESSMENT

Note: copy in attached CD.