PART B – AEIS

21. TRAFFIC AND TRANSPORT

21.1. Transport methods and routes

21.1.1. Road network

SunWater recognises that the Project area is situated within three DTMR regions including Darling Downs, Fitzroy and South West regions of Queensland.

One submitter requested that Table 21-2 of the EIS incorporate projects under the Natural Disaster Relief and Recovery Arrangements (NDRRA) for both State and Local Authorities. Table 21-2 of the EIS has been updated as **Table 21-1** with information from the Queensland Government's *Queensland Transport and Roads Investment Program (QTRIP) 2013-14 to 2016-17*.

Table 21-1 QTRIP planned investment for local and state controlled roads in the vicinity of the Project

Road Segment	Description	Total Indicative Cost ($M)
Leichhardt Highway (Westwood – Taroom)	Rehabilitate and overlay sections 0 – 257 km	78.2
	Rehabilitate bridges and culverts, sections 0-192km	4.8
Fitzroy Developmental Road (Taroom-Bauhinia)	Rehabilitate and overlay section 1 to 76 km	4.0
Leichhardt Highway (Taroom – Miles)	Widen pavement section from 29 to 35 km and 91 to 92 km.	7.0
	Undertake routine maintenance at section 0 - 128 km	1.6
Jackson-Wandoan Road	Rehabilitate pavement at section 0 – 48 km	11.2
Roma – Taroom Road	Rehabilitate pavement at section 0 – 65 km	29.4

[1]Source: DTMR 2013

21.1.1.1. Traffic volumes

A submitter requested that traffic volume data be updated as it was not the most recent available data. The data provided in Section 21.3.2.4 of the EIS has been updated with 2011 DTMR data and is provided in **Table 21-2**.

Table 21-2 Traffic volumes for state controlled roads affected by the Project

Road Segment	AADT [vehicles per day]	Average daily commercial vehicles (CVs) [vehicles per day]
Leichhardt Highway (26A)		
1.76 km south of Fitzroy Developmental Road	600	200
Leichhardt Highway (26B)		
9 km north of Jackson-Wandoan Road	700	200
700 m south of Jackson-Wandoan Road intersection	1,100	200
50m north of Juandah Creek Bridge	700	200
Warrego Highway (18C)		
3.46 km east of Leichhardt Hwy Intersection	2,200	400
Warrego Highway (18B)		
600m west of Dalby-Cecil Plains Road	6,500	1,400
1km east of Oakey Creek	5,200	1,300
Leichhardt Highway (26A)		
400 m south of The Boulevard	800	200
Bowen Street west of Banana	2,200	400
300 m south of Fairview Rd	700	200
100 m north of Woolein Creek	700	200
11 km south of Wowan	800	200
Dawson Highway (46B)		
1 km east of Banana	1,200	300
900 m west of Burnett Highway (41E)	1,800	200
700 m west of Burnett Highway (41D)	5,600	300
Roma-Taroom Road (4397)		
0.14 km north of Wybara Road	100	40
Jackson-Wandoan Road (4302)		
9.18km South of Wandoan	200	100
Warra-Kogan Road (3403)		
13.2km South of Warrego Highway	100	10
Warrego Highway (18D)		
680m west of Leichhardt Hwy intersection	3,300	900
5.03km west of Leichhardt Hwy	1,900	600
1.26km west of Dulacca Nth Rd	1,400	500
6.99km east of Yuleba-Surat Rd	1,500	500
3.96km west of Wallumbilla South Rd	1,600	400
0.57km east of Roma Downs Rd	4,300	1,000

(*Source: DTMR Emerald and Roma district officers*)

21.1.2. Construction phase

A submitter requested clarification of the estimation of the number of articulated vehicles to be used for the delivery of materials for the pipeline. Based on the revised pipeline length (**Part C** of the AEIS), Section 21.3.8.5 of the EIS has been updated to reflect the current material delivery requirements for the pipeline component of the Project.

The main transportation activity will occur after establishment of the easement and lay down areas, and will comprise the delivery of the majority of approximately 1.7 million tonnes of material to the lay down areas. This will occur prior to the main construction teams arriving to the two pipe-laying fronts, with smaller teams operating at supporting infrastructure site, such as balancing storages and pump stations. This will reduce potential conflicts between construction and delivery vehicles, and will spread the traffic demand over time. However, delivery of bedding and other materials is dependent on weather conditions, as unsealed roads and access tracks to work sites may be inaccessible for varying periods. The delivery of bedding material is scheduled to commence early in the year, prior to the dam construction peak, which is scheduled at the latter half of the same year. **Table 21-3** provides indicative quantities for raw materials during construction of the Project.

Table 21-3 Indicative quantities of raw materials required to construct the pipeline

Material	Likely source	Quantity (total) [tonnes]	Quantity (during construction peak) [tonnes]
Bedding material	Commercial sources - Wandoan, Miles, Dalby, Chinchilla	945,000	567,000
Gravel	Spring Creek, vicinity of Cockatoo	200,000	120,000
Rock facing	Spring Creek, vicinity of Cockatoo	12,000	7,200
Road base (CBR 2-1 & 2-4)	Spring Creek, vicinity of Cockatoo	12,000	7,200
Rock fill	Spring Creek, vicinity of Cockatoo	16,000	9,600
Clay	Gurulmundi	315,000	189,000
Concrete	Commercial sources - Wandoan, Miles, Dalby, Chinchilla	31,500	18,900
Pavement	Commercial sources - Wandoan, Miles, Dalby, Chinchilla	155,400	93,200
Hardstand (lay down areas)	Commercial sources - Wandoan, Miles, Dalby, Chinchilla	17,200	10,300
	Total	**1,704,100**	**1,022,400**

Based on a standard semi-trailer 20 tonne payload, over the peak construction period, the bedding material equates to approximately 51,120 loads (163 articulated vehicles per day (vpd)) in total, and 43,100 loads (137 articulated vpd) on State Controlled Roads (SCRs). The EIS did not include pavement and hardstand tonnage in the vpd estimations. Each work site will operate eight trucks for the delivery of bedding material. With an average distance of 20 km from source to lay down areas, the number of trips per day is estimated 41 vpd for each work front.

To be conservative, pipe delivery is assumed to commence as soon as lay down areas are available. Pipes will be 13.4 m in length and 1.2 m in diameter. A total of 10,200 pipes will be used for the pipeline, equating to 5,100 loads based on two pipes, plus associated fittings and ancillary equipment, per load. Over the 21 month planned pipe laying

period and (an assumed) preceding two months of lay down availability, this equates to an average of 12 deliveries per day in total.

The spoil haulage for the 35 km (approximate) segment between Chinchilla and Warra will be via the construction easement and with occasional use of the Warrego Highway. It will be performed over a 12 month duration. For the rest of the pipeline, no significant additional traffic demand associated with waste trench material is anticipated to use the surrounding road network.

Concrete will be delivered from the dam site, Wandoan, Miles or Chinchilla to the required work front. Plant requirements during pipe laying period will total 31 items, with 11 plant items carried over from the preceding clearing and earthworks stages. Sundry deliveries (including fuel) are minor and included in the above totals.

Estimated daily vehicle trips during pipe laying to/from outside the Project site are summarised in **Table 21-4**.

Table 21-4 Estimated daily vehicle trips during pipeline construction

Generation type	Daily traffic generation, pipe laying [vpd]		
	Light vehicles	Single unit trucks/buses	Articulated vehicles
Workforce (total of 2 work camps)	40	22 (only at each roster change)	
Construction materials and plant equipment (total of all work fronts)		16	262
Service vehicles (sundry items, total of all work fronts)	16	2	

21.1.3. Road link assessment

Based on the updated AADT presented in **Table 21-2** and revised material delivery requirements presented in **Table 21-3** and **Table 21-4**, Table 21-10 of the EIS has been updated and is presented in **Table 21-5**.

Table 21-5 Estimated levels of service for affected roads

Road Segment	Background traffic, 2016			Background traffic plus estimated Project construction traffic			Proportion of Project traffic to future AADT
	2016[1] AADT [vpd]	Commercial vehicle (CV) [vpd]	LOS[2]	2016[1] AADT [vpd]	CV [vpd]	LOS[2]	[Percentage]
Leichhardt Highway (26A)							
1.76 km south of Fitzroy Developmental Road	780	290	A	830	320	A	6.5%
Leichhardt Highway (26B)							
North of Jackson-Wandoan Road intersection	960	310	A	1,030	344	A	7.2%
South of Jackson-Wandoan Road intersection	1,540	300	A	1,660	377	A	7.0%
7.5km south of Downfall Creek Rd	910	310	A	1,020	377	A	10.5%
Warrego Highway (18C)							

Road Segment	Background traffic, 2016			Background traffic plus estimated Project construction traffic			Proportion of Project traffic to future AADT
	2016[1] AADT	Commercial vehicle (CV)	LOS[2]	2016[1] AADT	CV	LOS[2]	[Percentage]
3.46 km east of Leichhardt Hwy Intersection	2,960	570	A	3,040	613	A	2.7%
Warrego Highway (18B)							
Dalby–Road 325 intersection	8,810	1,870	C	8,980	2,002	C	1.9%
Road 325 intersection–chainage 27.0 km	7,000	1,770	B	7,090	1,822	B	1.3%
Leichhardt Highway (26A)							
400 m south of The Boulevard	1,050	300	A	1,150	395	A	8.7%
Bowen Street west of Banana	3,010	610	A	3,110	706	A	3.2%
300 m south of Fairview Rd	950	250	A	960	250	A	0.5%
100 m north of Woolein Creek	1,020	250	A	1,030	250	A	0.5%
11 km south of Wowan	1,110	300	A	1,160	343	A	4.1%
Dawson Highway (46B)							
1 km east of Banana	1,670	380	A	1,680	380	A	0.3%
900 m west of Burnett Highway (41E)	2,390	200	A	2,440	243	A	2.0%
700 m west of Burnett Highway (41D)	7,610	430	B	7,640	457	B	0.4%
Roma-Taroom Road (4397)							
0.14 km north of Wybara Road	180	50	A	190	50	A	2.6%
Jackson-Wandoan Road (4302)							
9.18 km South of Wandoan	270	80	A	340	144	A	20.3%
Warra-Kogan Road (3403)							
Estimated, south of Warrego Highway	70	0	A	80	0	A	6.3%
Warrego Highway (18D)							
Miles side of Leichhardt Hwy intersection	4,520	1,210	A	4,560	1,210	A	0.9%
4.07 km west of Leichhardt Hwy	2,520	750	A	2,560	750	A	1.6%
1.26 km west of Dulacca Nth Rd	1,960	620	A	1,990	620	A	1.5%
13.01 km East of Yuleba-Surat Rd	2,060	670	A	2,080	670	A	1.0%
1.72 km West of Wallumbilla South Rd	2,170	550	A	2,180	550	A	0.5%
0.23 km East of Roma Downs Rd	5,840	1,360	B	5,910	1,424	B	1.2%

[1] Background growth based on historical growth rates

[2] Level of Service: A – excellent; B – good; C – satisfactory; D – tolerable; E – congested; F – very congested

21.2. Project impacts and mitigation measures

21.2.1. Project impacts

A submitter requested confirmation that the pipeline easement will not enter SCR reserves. Since publication of the EIS the pipeline has been refined (**Part C** of the AEIS). Subsequently, changes to alignment have occurred and the pipeline now avoids entering SCR reserves and instead occurs within private property adjacent to SCRs. The pipeline will be required to cross SCR at specific locations to avoid remnant vegetation, flood prone areas and better service potential customers. The refined alignment will cross the Warrego Highway approximately 500 m south of Hastings Road. This crossing point is preferred to the point discussed in the EIS because it avoids remnant vegetation in and near the road reserve and also avoids conflicting with the Chinchilla Kogan Road intersection. The decision to move the pipeline to the western side of the Warrego Highway as suggested by respondents reduces future requirements to bore underneath the highway for lateral connections as the majority of potential customers are located to the south. The decision also minimises potential impacts of the pipeline on stream flows and existing bridge structures of the rail or road networks as it moves to downstream of the infrastructure. Such potential will be specifically investigated during detailed design and mitigation applied if necessary, though the likelihood is regarded as remote.

Instances in which the pipeline must cross SCR, the Project will seek approval and/or permits under the *Transport Infrastructure Act 1994*. The appropriate controls will be implemented in consultation with TMR as appropriate prior to the commencement of these works.

21.2.1.1. Road impact assessment

Submitters, including local councils raised several issues regarding the Road Impact Assessment (RIA). The following information and commitments should be considered in addition to the information presented in Section 21.4 of the EIS. Updates to key data contained as part of the preliminary RIA have been provided in **Section 21.1**.

One submitter requested provision of a preliminary RIA as part of the SEIS. The intention of Chapter 21 of the EIS (a preliminary RIA) was detailed in Section 21.1.2. The EIS was deemed to address stages 1 – 3 of the RIA process. Impacts associated with the Project were detailed with relevant mitigations identified. A revised RIA will be developed in accordance with the DTMR *Guidelines for Assessment of Road Impacts of Development* (GARID) during detailed design and will be submitted to DTMR for review and approval.

The nominated transport strategy and routes will be reviewed with the construction and haulage contractors once they are appointed. The RIA with the associated Road Use Management Plan (RUMP), TMPs as well as Road Corridor Permits (RCPs) for any pipe-related works within or crossing an SCR will be developed in consultation with DTMR and local councils then submitted to DTMR for review and approval prior to the commencement of Project construction.

Specific mitigation measures and strategies as discussed in Table 21-13 of the EIS will be refined during detailed Project design, when additional and more certain trip generation and traffic volume information will be available. The detailed RIA and TMPs will then include:

- final details of pipe haulage including lay down locations including access points to SCRs and Haulage program including frequency and duration of haulage and routes;
- final details of road crossing and proposed mitigation treatments to minimise impacts;

- final details of construction of the pipeline and potential impacts, if any, on road infrastructure. As discussed in **Section 2.2.5** (Part B of the AEIS), SunWater intends that the pipeline be buried for the entire route;
- likely generated equivalent standard axles (ESAs) and road segments where five per cent of baseline ESAs will be exceeded;
- calculations of impacts using Width for Volume (Road Planning and Design Manual Chapter 7), to consider if the current SCRs have sufficient width for their activity;
- road incident assessment (crash data analysis) for at least the last five years where data is available;
- detailed Pavement Impact Assessment (PIA) in accordance with the DTMR Guidelines for assessment of Road Impacts of Development, considering impacts on timing of pavement rehabilitation and maintenance;
- SIDRA analysis of all relevant SCR intersections;
- development impacts on school bus routes/existing bus set down areas; and
- proposed mitigation strategies including:
    - proposed treatments for affected intersections;
    - contributions (based on the Fitzroy methodology for rehabilitation and maintenance or other applicable local method should one exist); and
    - measures proposed during the various phases of the Project in relation to school bus routes and set down areas.

Requirements for mitigating impacts from the Project within or in proximity of a road reserve and a railway corridor are discussed in Sections 21.4.1 and 21.4.2 of the EIS. The specifics of design and construction requirements will be determined in detailed design, in consultation with DTMR.

21.2.1.2. Construction camps

A submitter requested further information on access roads to construction camps. As discussed in Section 21.3.8.2 of the EIS, the location of the construction camps will be determined through consultation with Council and agencies as appropriate at detailed Project design. SunWater will liaise with DTMR and Council and consideration will be given to the road standard and access requirements. The final locations will be taken into account during development of the detailed RIA and TMP.

21.2.1.3. Material delivery

One submitter suggested that all pipes be delivered via rail to alleviate impacts on Dalby and Chinchilla road users. Another submitter requested that the option of transport of pipes by rail from Brisbane be investigated and reported on in the AEIS. Potential impacts to the township of Dalby (and all other road sections) have diminished owing to the truncation of the refined pipeline near Warra and the separate completion of the Woleebee to Glebe pipeline (refer to **Part C** of the AEIS). Table C2 (in Part C of the AEIS) shows the reduction in the number of lengths of pipe as being equivalent to over 45% of the original specification (18750 lengths reduced to 10198). Section 21.3.1 of the EIS stated there is some potential for use of the existing western railway system during the Project construction phase, and will be subject to negotiation with Queensland Rail. However, for the majority, locations at which pipes may be constructed will not occur near a railway. Pipes will initially need to be transported by truck to a designated railway station and loaded onto a train. Following transport via rail, the pipes will then be offloaded from the train at a stockpile prior to loading onto

a truck again and transported to a location along the easement. Total movements of trucks to transport pipeline componentry, and subsequent impacts under this option would therefore increase. Further analysis of the suitability of rail for delivery of construction material will be undertaken during the detailed design phase.

21.2.1.4. Emergency access

A submitter stated that roads must meet standards for access by emergency vehicles, in particular to mitigate bush fire risk. Roads constructed as part of the Project will meet relevant standards and will accommodate emergency vehicles.

21.2.2. Mitigation measures

Several submissions raised concerns about the cumulative impacts on the road network of multiple large projects in the region. These submissions suggested that the proponent should consider these cumulative impacts when proposing mitigation measures. Specifically, submitters suggested a range of mitigation measures that would address the cumulative impacts including, the need for a bypass at the township of Taroom, road upgrades and maintenance, rest areas and passing opportunities and upgrade the corner of Leichhardt Highway and Cromwell Street intersection.

With relation to traffic movements, construction of this Project will form a short term impact (no greater than 36 months) as part of a cumulative impact to the road network. Given the potential collective road impacts associated with long-term resource projects also identified for the region, consideration of contributions and/or mitigations for council for this Project need to be determined comparatively. As stated in Table 21-13 of the EIS, SunWater will participate in regional cumulative impact management group workshops relevant to this Project. With regard to intersection upgrades, a SIDRA analysis and treatment of affected intersections are committed to in **Section 21.2.1.1** above.

Table 21-13 of the EIS also discussed the methodology for mitigating impacts to road pavement damage potentially resulting from construction activities. A PIA is committed to in **Section 21.2.1.1** above.

Section 21.4 of the EIS described the potential impacts and mitigation measures of the Project including cumulative impacts from other projects in the region. As discussed in Section 21.5 of the EIS, through the implementation of the measures described in Table 21-13 it is considered that the majority of traffic impacts can be feasibly managed. One measure recently employed in large scale projects in the region is the use of in-vehicle monitoring systems. The possible use of such technology will be assessed in development of the TMP's and associated plans.

A submitter raised concern regarding the impacts associated with increased trucks on the roads in the Project area during construction. This was discussed in Table 21-13 with mitigation to be developed as part of RUMP and TMPs through liaison with DTMR, local councils and QPS.

21.2.2.1. Consultation

Several submissions requested that consultation be undertaken with relevant stakeholders. As discussed in Section 21.4 and 21.5 of the EIS, consultation with relevant authorities is a key component of the suite of mitigation measures proposed. SunWater is committed to ongoing consultation and communication with key stakeholders, including local and state agencies, landholders, local communities, businesses and emergency service providers. The following consultation associated with traffic and transport is proposed as part of the Project:

- RUMPs, TMPs will be developed in consultation with DTMR, local councils and QPS;

- appropriate controls, where constructing the pipeline within or in the vicinity of a road corridor, will be implemented in consultation with DTMR and/or the local councils as appropriate prior to the commencement of these works;
- mitigation measures for school travel, such as new/revised bus routes, will be developed in consultation with the affected stakeholders (DTMR, Taroom, Theodore , Wandoan, Guluguba, Miles and Chinchilla State Schools) at detailed Project design; and
- ongoing consultation with local stakeholders will be maintained as part of the Project consultation program.