

## **APPENDIX 7**

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### **Transport Comparison of Crudine Ridge Wind Farm Project with Ulan Coal Continued Operations Project**

**Samsa Consulting Pty Ltd**



# SAMSA CONSULTING

TRANSPORT PLANNING & TRAFFIC ENGINEERING

13<sup>th</sup> November 2013

Wind Prospect CWP  
45 Hunter Street  
NEWCASTLE NSW 2300

Our Ref: *CRWF v Ulan\_comparison\_18\_07\_2013*  
Direct line: 0414 971 956

Attention: Edward Mounsey

Dear Edward,

## **TRANSPORT COMPARISON OF CRUDINE RIDGE WIND FARM PROJECT WITH ULAN COAL CONTINUED OPERATIONS PROJECT**

The following is a brief report comparing the transport-related impacts associated with the Ulan Coal Continued Operations (UCCO) project with the Crudine Ridge Wind Farm (CRWF) project. Both projects are located either partly or wholly within the Mid-Western Regional Council LGA.

The comparison report aims to compare the transport impacts of both projects based on:

- traffic generation added to existing traffic volumes along the surrounding road networks;
- different types of transport during construction (light vehicles, heavy vehicles, over-size vehicles) and during operations (light vehicles, heavy vehicles);
- transport routes; and
- site access impacts.

The Crudine Ridge Wind Farm and its associated traffic and transport requirements is assessed and outlined in the Preferred Project Report: Transport Assessment (Samsa Consulting 2013). Please refer to this document for pertinent details of the Project.

### **CRUDINE RIDGE WIND FARM**

For the purposes of this comparison, worst case traffic generation to the northern site access point has been used.

### **ULAN COAL CONTINUED OPERATIONS PROJECT DETAILS**

Pertinent details of the proposed UCCO project are as follows:

- The Project seeks approval for continued operations for a further 21 years. Current hours of operation are 24 hours, 7 days per week. These operating hours are proposed to remain unchanged.
- The assessment of the existing relevant road network and intersections indicate that traffic conditions are generally good.
- Current traffic generation from Ulan Coal Mine is 952 vehicle trips per weekday and 760 vehicle trips per day (7-day average). Heavy vehicles comprise approximately 73 vehicle trips per weekday and 63 vehicle trips per day (7-day average) of total traffic.

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- Future (Year 4) peak traffic generation will more than double to 1,936 vehicle trips per weekday and 1,542 vehicle trips per day (7-day average). Heavy vehicles would comprise approximately 96 vehicle trips per weekday and 72 vehicle trips per day (7-day average) of total traffic. During the morning peak period (6 am to 7 am) on a Friday, an additional 440 vehicle trips per hour would be generated.
- Future (Year 13) peak traffic generation would reduce to current levels. From Year 14 to Year 21, peak traffic generation would be approximately 30% lower than current levels: 667 vehicle trips per weekday and 532 vehicle trips per day (7-day average).
- There will be some additional minor impacts on 18 rail level crossings between Ulan Coal Mine and Muswellbrook due to the increase in the number of trains operating between Ulan Coal Mine and Port Waratah.
- Cumulative impact assessment taking into consideration background traffic growth, Wilpinjong Coal Mine, and Moolarben Stage 1 and 2 has found that while there are substantial traffic increases, traffic operations along the relevant road network and intersections are expected to remain at a satisfactory level of service with low vehicle delays.
- Road network / intersection upgrades are proposed at Ulan Road / Cope Road, as well as various road safety upgrades along the Ulan Road and Cope Road routes.

### **TRAFFIC GENERATION COMPARISON**

#### **Ulan Mine Traffic Generation**

A comparison of traffic generation of both projects has been made over a 21-year period, which has been used to align with the 21-year life of the UCCO proposal and also takes into account the approximate 18-month construction period for CRWF with a nominal 20-year operation followed by decommissioning in Year 21.

As can be seen below in *Table 1* and *Figure 1*, CRWF has its maximum traffic generation during its initial 18-month construction period. During an estimated 4 months of this initial 18-month construction period, there is a peak in construction traffic generation (shown in brackets in Year 1).

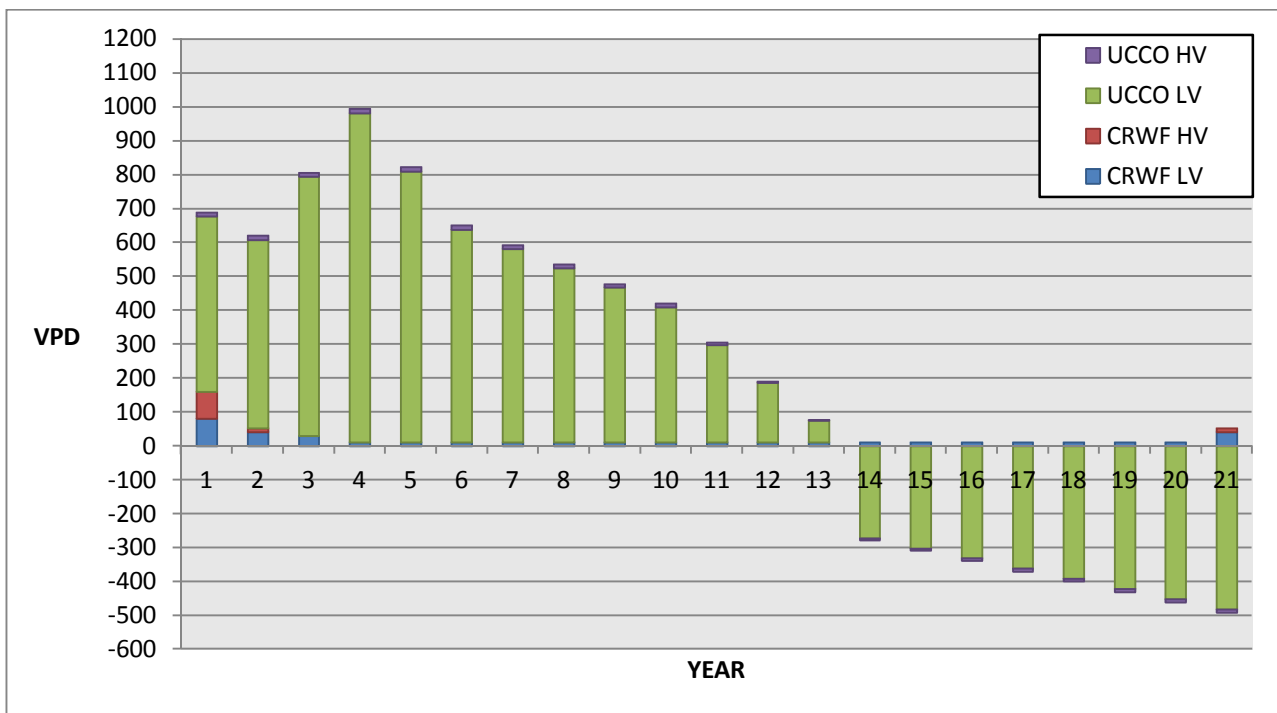
During CRWF maximum traffic generation, both light and heavy vehicle trips are less than those estimated for UCCO, with light vehicle trips significantly less (approximately 7.7% of UCCO trips for the majority of the construction period). Once CRWF becomes operational, it would generate some 30 light vehicle trips per day in the first year and 10 light vehicles trips per day thereafter, which is significantly less than UCCO light vehicle trip generation per day up until about Year 14, when additional UCCO trips reduce to below current trip generation levels for existing operations. Prior to Year 14, CRWF light vehicle trip generation per day is between 1.0% and 15.6% of UCCO light vehicle trip generation per day (depending on the comparison Year).

With respect to heavy vehicle trips, CRWF generates a similar number of trips per day for the majority of the construction period (12 heavy vehicle trips per day compared to 11 or 12 heavy vehicle trips per day in Years 1 and 2), with an increase during the relatively brief 4 months of the construction period when peak traffic generation occurs. At these times there would potentially be up to 80 heavy vehicle trips per day. Of the total heavy vehicle trips during the construction period, 10 are over-dimension vehicles.

**Table 1: Additional Daily Traffic Generation By Year**

YEAR	CRWF (vpd)		UCCO (weekday average)		UCCO (7-day average)	
	LV	HV	LV	HV	LV	HV
1	40 (80)*	12 (80)*	518	11	697	8
2	40	12	556	12	442	8
3	30	0	764	12	608	8
4	10	0	972	12	774	8
5	10	0	800	12	637	8
6	10	0	628	12	500	8
7	10	0	571	11	455	7
8	10	0	514	11	409	7
9	10	0	457	10	364	6
10	10	0	400	10	318	6
11	10	0	288	8	228	4
12	10	0	176	5	138	3
13	10	0	64	2	48	2
14	10	0	-272	-6	-218	-2
15	10	0	-302	-7	-239	-2
16	10	0	-332	-7	-260	-3
17	10	0	-362	-8	-281	-3
18	10	0	-392	-8	-302	-4
19	10	0	-422	-9	-323	-4
20	10	0	-452	-9	-344	-5
21	40	12	-482	-10	-366	-6

\* Peak traffic generation in brackets during approximately 4 months of the 18-month construction period (assumed to be in Year 1)



**Figure 1: Additional Daily Traffic Generation Comparison By Year**

As a comparison of total project traffic generation (including current Ulan Mine operations), daily traffic volumes for both projects has been made over the same 21-year period as above.

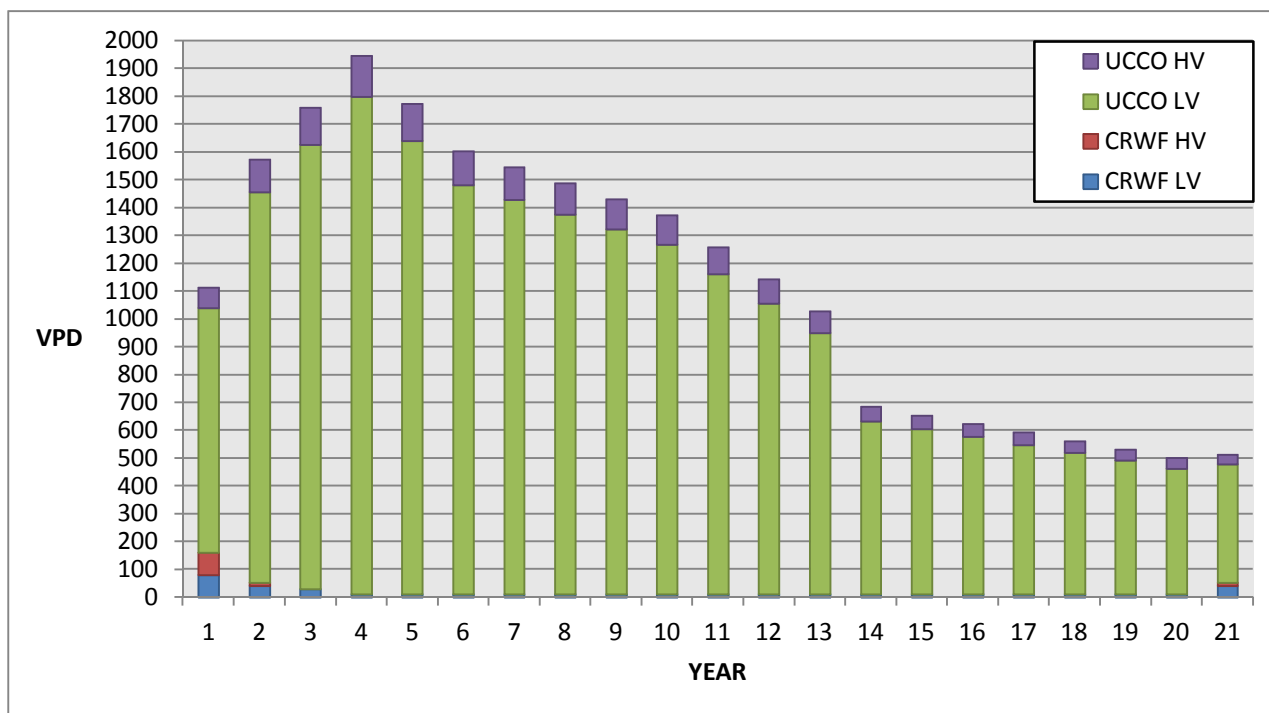
As can be seen below in *Table 2* and *Figure 2*, during CRWF maximum heavy vehicle traffic generation (during approximately four months) is slightly higher than that of UCCO. Light vehicle trips during the same period are significantly less than at UCCO (less than 4.6% of UCCO trips for the majority of the construction period). Once CRWF becomes operational, it would generate some 30 light vehicle trips per day in the first year and 10 light vehicles trips per day thereafter, which is between 1.9% and 2.2% of UCCO light vehicle trip generation per day (depending on the comparison Year).

With respect to heavy vehicle trips, CRWF generates less traffic than UCCO during most of the construction period (12 heavy vehicle trips per day compared to 73 heavy vehicle trips per day in Year 1). However, during the approximate 4 months of the construction period when peak traffic generation occurs, there would be slightly more traffic with 100 heavy vehicle trips per day. Of the total heavy vehicle trips estimated for the construction period, 10 are over-dimension vehicles. During post-construction periods, traffic impacts, both light and heavy, are negligible.

**Table 2: Daily Traffic Volumes By Year**

YEAR	CRWF (vpd)		UCCO (weekday average)		UCCO (7-day average)	
	LV	HV	LV	HV	LV	HV
1	40 (80)*	12 (80)*	879	73	697	63
2	40	12	1,403	117	1,101	109
3	30	0	1,596	133	1,252	124
4	10	0	1,788	148	1,403	139
5	10	0	1,629	135	1,278	127
6	10	0	1,470	122	1,153	115
7	10	0	1,417	118	1,112	111
8	10	0	1,364	113	1,070	106
9	10	0	1,311	109	1,028	102
10	10	0	1,258	104	986	98
11	10	0	1,152	96	903	90
12	10	0	1,046	87	820	82
13	10	0	940	78	737	73
14	10	0	622	52	491	49
15	10	0	594	49	483	47
16	10	0	566	46	475	45
17	10	0	538	44	467	42
18	10	0	510	41	459	40
19	10	0	481	39	451	38
20	10	0	453	37	443	36
21	40	12	425	35	435	33

\* Peak traffic generation in brackets during approximately 4 months of the 18-month construction period (assumed to be in Year 1)



**Figure 2: Daily Traffic Volume Comparison By Year**

Cumulative Mine Projects Traffic Generation

In addition to the project specific comparison made above, a comparison has been made between the cumulative traffic of all mines operating off Ulan Road against the CRWF project traffic generation along its transport route.

Other mines that are operating (or will be operational in the future) and generating traffic along Ulan Road include Wilpinjong Coal (approved and currently operating), Moolarben Coal Stage 1 (approved and to become operational in 2013) and Moolarben Coal Stage 2 (not yet approved but assumed to become operational in 2013).

It is noted that because the Wilpinjong Coal project is currently operating, its traffic generation is included as part of existing background traffic. Therefore, the cumulative traffic increases result from UCCO and Moolarben Coal Stages 1 and 2.

Ulan Road accommodates the majority of traffic generated by the mine projects. Cumulative traffic generation from UCCO and Moolarben Coal Stage 1 along Ulan Road is as follows:

North of Cope Road – approximately 1,387 additional vehicle trips per day

South of Cope Road – approximately 1,123 additional vehicle trips per day

This cumulative traffic generation increases along Ulan Road with the addition of Moolarben Coal Stage 2 as follows:

North of Cope Road – approximately 1,631 additional vehicle trips per day

South of Cope Road – approximately 1,319 additional vehicle trips per day

The above traffic generation from all mines (including UCCO, Moolarben Stages 1 and 2) operating off Ulan Road result in total two-way weekday traffic volumes (with percentage increases from current volumes) as follows:

Ulan Road, north of Cope Road – approximately 3,408 vehicles per day (91.8% increase)

Ulan Road, south of Cope Road – approximately 2,590 vehicles per day (96.4% increase)

## **TRAFFIC IMPACTS**

The road routes proposed to be used for both projects are a combination of major roads (highways and main roads) and minor roads. CRWF proposes to use Golden Highway and Castlereagh Highway via the Mudgee Urban Area to access Aarons Pass Road to its northern site access point. An alternative route for over-length vehicles through the Mudgee urban area is also proposed (Samsa Consulting 2013).

The main transport routes proposed for UCCO are Ulan-Cassilis Road (major route), Ulan-Wollar Road and Cope Road (minor road network) with a number of additional dedicated mine access roads. The assessments found that there is abundant spare capacity along both proposed transport route road networks.

Both project assessments proposed a Construction Traffic Management Plan (CTMP) to control and manage traffic during the construction stages. This is particularly important for CRWF due to its over-dimensional vehicle movements, which were also to be controlled by the RMS permit system and the use of licensed and experienced transport contractors with experience in transporting wind farm component loads. As part of the CRWF CTMP, temporary traffic management measures such as rolling road closures are proposed due to the narrow carriageways along the minor road network to be used.

The significant volumes of traffic generated over a long life span by UCCO also make a CTMP important for that project.

The major traffic impacts associated with CRWF are temporary, with a construction period of approximately 18 months. The traffic impacts for UCCO are longer-term, over the life of the project (21 years).

Both project assessments concluded that the road networks would maintain satisfactory levels of service after the addition of project traffic generation and in the case of the UCCO assessment, even for cumulative traffic generation from mines operating off Ulan Road. For UCCO, the provision of a channelised right-turn treatment from Ulan Road into Cope Road was considered necessary more from a road safety viewpoint rather than any intersection performance issue. Additionally, some road formation improvements along both Ulan-Cassilis Road and Cope Road were proposed for UCCO.

CRWF proposed significant upgrade works along Aarons Pass Road to facilitate the transport of heavy vehicles, especially over-dimensional vehicles, between Castlereagh Highway and the northern site access point. This includes widening and levelling at sharper curve alignments, strengthening of culverts, removal and/or pruning of roadside vegetation / tree foliage and provision of passing bays along the route. Some minor upgrade works were also proposed along the Castlereagh Highway route within the Gulgong and Mudgee Urban Areas. These include making some signage removable, some temporary parking restrictions at some corners and traffic control during transportation.

## **SUMMARY**

The assessments for both projects indicated generally similar transport impacts, particularly with respect to impacts on road layout and road conditions requiring road upgrade works. CRWF proposed greater road network upgrades due to the condition of Aarons Pass Road that is to be used as a transport route.

While both project assessments concluded that the road networks would maintain satisfactory levels of service after the addition of project traffic generation, the proposed traffic volumes generated by UCCO are significantly higher than those generated by CRWF. Moreover, the higher UCCO traffic generation would occur over a long project life span (21 years) compared to the temporary peak heavy vehicle traffic generation for CRWF (a total 18-month construction period).



If you have any queries with respect to the above project comparison assessment, please do not hesitate to contact the undersigned.

Yours faithfully,

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