

In reply, please quote: 12761

11th May 2022

Energy Farms Ltd
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Attention: Steve Hawkins

TRAFFIC IMPACT ASSESSMENT – PROPOSED SOLAR PLANT **KINA ROAD ŌPUNAKE - LOTS 3 & 15 DP 682**

Introduction

The purpose of this letter is to assess the traffic effects associated with the construction and ongoing operation of a utility solar generation plant at the abovementioned address. This letter is suitable for inclusion in a resource consent application.

Proposal

Energy Farms Ltd proposes to construct a solar plant at Kina Road Ōpunake, within a development area of approximately 188.6 Ha across two titles.

Background

We have used baseline data (obtained in March 2022) from mobileroad.org for traffic flow volumes. We have not undertaken a site visit; this letter is limited to a desktop study of capacity and safety effects.

The development area is accessed from Kina Road. For our assessment, we have assumed that all containerised materials are delivered from Port Taranaki via SH45 to Ōkato, then via Old South Road, Oxford Road, Saunders Road, Wiremu Road and Kina Road to the site. We have assumed that all hardfill material for access roads and laydown areas are delivered from one of several local Quarries, via Wiremu Road and Kina Road to the site.

Error! Reference source not found. shows the current width and traffic data a long the hardfill freight route, and Table 2 shows the current width and traffic data along the container freight route.

Table 1: Road Data Along Proposed Hardfill Route

Road	RP no.	Surface	Width (m)	ADT (VPD)	% HGV	No. HGV
Wiremu Road, near Saunders Road intersection	RP0 - RP12.53	Sealed	6.6	638	10.0	64
Wiremu Road, north of Kina Road intersection	RP0 - RP12.53	Sealed	7	588	14.0	83
Wiremu Road, south of Kina Road intersection	RP11.81 - RP12.53	Sealed	7	503	10.0	51
Upper Kina Road, near Wiremu Road intersection	RP6.25 - RP9.40	Sealed	6.5	62	18.0	12
Upper Kina Road, near site entrance	RP6.25 - RP9.40	Sealed	5.7	219	10.0	22

Table 2: Road Data Along Proposed Container Route

Road	RP no.	Surface	Width (m)	ADT (VPD)	% HGV	No. HGV
SH45, south of New Plymouth	-	Sealed	8.9	7788	3.1	242
SH45, north of Ōkato	-	Sealed	8.7	3794	4.3	166
Old South Road	RP0 - RP0.23	Sealed	18	1500	4.0	60
Oxford Road	RP0 - RP3.30	Sealed	7	790	4.0	32
Saunders Road	RP0 - RP20.62	Sealed	7	828	6.0	50
Wiremu Road, near Saunders Road intersection	RP0 - RP12.53	Sealed	6.6	638	10.0	64
Wiremu Road, north of Kina Road intersection	RP0 - RP12.53	Sealed	7	588	14.0	83
Upper Kina Road, near Wiremu Road intersection	RP6.25 - RP9.40	Sealed	6.5	62	18.0	12
Upper Kina Road, near site entrance	RP6.25 - RP9.40	Sealed	5.7	219	10.0	22

Estimated Vehicle Movements

Construction Traffic

The date for construction commencement is not known. The estimated construction duration is 14 months, with three months for aggregate delivery and 11 months for container delivery.

Referencing Beca drawing, "Solar Farm Site Layout, Ōpunake" for Energy Farms Ltd, the estimated volume of imported hardfill to construct internal access roads (2825m long, 3.5m wide) and construction laydown areas (12,800m²) is 6,800m³ (assuming 300mm thick pavements), requiring approximately 850 (16m³) HGV movements. An estimated 700 containers (1400 HGV movements) of supply items will be delivered to the site.

The estimated movements have been assessed against the separate routes and including a factor of 1.5 to allow for mobilisation/demobilisation & unknowns.

For hardfill deliveries along Wiremu Road and Kina Road, the upper estimate of additional HGV movements is 1276.

For container deliveries along SH45, Old South Road, Oxford Road, Saunders Road, Wiremu Road and Kina Road the upper estimate of additional HGV movements is 2100.

For our assessment we have assumed a cut/fill balance within the site and that spoil from earthworks activities (trenches, topsoil stripping, etc.) will be disposed on-site and therefore generate no additional traffic movements on the roading network.

The additional vehicle movements associated with supply items are negligible (less than 1%) when compared with the ADT of SH45 (3794 VPD).

Day-to-Day Plant Operation & Maintenance

Staff expected to access the site daily include:

- Cleaners and general building maintenance staff (e.g. plumbers, air conditioning technicians and general maintenance workers)
- Delivery drivers
- Grounds staff (e.g. for lawn mowing and weed eradication)
- People tending livestock or managing wildlife or vermin
- People entering high voltage substation areas such as telecommunications repairers, meter readers and ground staff.

We consider the traffic movements associated with the above activities as negligible; they are not considered further in this assessment.

Traffic Assessment

The 14-month construction period equates to 290 working days (allowing 15 days for Christmas shutdown and public holidays). Breaking down to 59 working days (20%) for hardfill delivery and 231 (80%) working days for container delivery.

During the hardfill delivery period, 1278 HGV movements gives an average of 22 daily vehicle movements or 2-3 vehicles per hour. We assumed an average of twenty additional light-vehicle movements per day during construction. Table 3 shows the relative increase in traffic volumes on the Kina Road and Wiremu Road, resulting from the proposal during the hardfill importation phase.

Table 3 Anticipated Effect on Roads Along Proposed Hardfill Import Route

Road	New HGV	HGV increase	New ADT	Increase ADT
Wiremu Road, near Saunders Road intersection	86	34.4%	680	6.6%
Wiremu Road, north of Kina Road intersection	105	26.5%	630	7.1%
Wiremu Road, south of Kina Road intersection	73	43.1%	545	8.3%
Upper Kina Road, near Wiremu Road intersection	34	183.3%	104	67.7%
Upper Kina Road, near site entrance	44	100.0%	261	19.2%

During the container delivery period, 2100 HGV movements gives an average of 10 daily vehicle movements or 1-2 vehicles per hour. We assumed an average of twenty additional light-vehicle movements per day during construction. Table 4 shows the relative increase in traffic volumes on SH45, Old South Road, Oxford Road, Saunders Road, Wiremu Road and Kina Road, resulting from the proposal during the container importation phase.

Table 4: Anticipated Effect on Roads Along Proposed Container Import Route

Road	New HGV	HGV increase	New ADT	Increase ADT
SH45, south of New Plymouth	252	4.1%	7818	0.4%
SH45, north of Ōkato	176	6.0%	3824	0.8%
Old South Road	70	16.7%	1530	2.0%
Oxford Road	42	31.3%	820	3.8%
Saunders Road	60	20.0%	858	3.6%
Wiremu Road, near Saunders Road intersection	74	15.6%	668	4.7%

Road	New HGV	HGV increase	New ADT	Increase ADT
Wiremu Road, north of Kina Road intersection	93	12.0%	618	5.1%
Upper Kina Road, near Wiremu Road intersection	22	83.3%	92	48.4%
Upper Kina Road, near site entrance	32	45.5%	249	13.7%

Kina Road has low daily traffic volumes, so the relative increase in both ADT and HGV movements are high. We expect most light-vehicle movements to occur during the AM/PM peaks. The effect of the additional HGVs may be noticeable but is characteristic for the area (due to the already high proportion of HGVs associated with rural production in the area).

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Intersection Capacity

Referencing AUSTROADS Guide to Traffic Management Part 6 figure 3.25, during peak hour (15% ADT), the Wiremu Road/Kina Road intersection has capacity for >80 VPH turning left, and >80 VPH turning right, before turning treatments are warranted.

Provided that HGV deliveries are staggered across working hours, the additional vehicle movements during construction are unlikely to exceed the thresholds for provision of turning treatments. Should the number of hourly deliveries to the site exceed the thresholds outlined above, appropriate temporary traffic management should be implemented.

Environmental

The existing road network is sealed, the additional traffic is not expected to cause any environmental nuisance.

Crash History

We assessed data from the Crash Analysis System (CAS) database, sourced in March 2022, at points of interest along the proposed route.

Points of interest were:

- SH45/Old South Road/Carthew Street intersection
- Old South Road/Oxford Street/Cumming Street intersection
- Wiremu Road/Kina Road intersection
- Kina Road site access.

SH45, Oxford Road, Saunders Road, Wiremu Road and Kina Road to the site have open-road speed limits. Within the Ōkato township, SH45, Old South Road and Oxford Roads have a speed limit of 50km/h.

There have been six crashes recorded here (one minor and five non-injury) at the SH45, Old South Road and Carthew Street intersection between 2000 and 2015. The crash types and severity are included in Table 5.

Table 5: SH45, Old South Road and Carthew Street Intersection Crash Types and Severity

Crash Type	Severity	Number of Crashes
Truck and car	Non-Injury Crash	1
Single truck	Non-Injury Crash	1
Two cars	Minor Crash	1
Single car	Non-Injury Crash	3

The Old South Road, Oxford Street and Cumming Street cross-intersection is in a 50km/h speed limit zone. Sight distances exceed 200m each way. There have been three crashes recorded here (one serious, one minor and one non-injury) between 2003 and 2008. The crash types and severity are included in Table 6.

Table 6: Old South Road, Oxford Street and Cumming Street Intersection Crash Types and Severity

Crash Type	Severity	Number of Crashes
Car and pedestrian	Minor Crash	1
Two cars	Serious Crash	1
Single car	Non-Injury Crash	1

Sight distance at the Wiremu Road/Kina Road intersection is >400m to the north; the sight distance to the south is restricted to 140m by a horizontal curve. The horizontal curve has a recommended speed of 65km/hr; a design speed of 80km/hr is adopted. From AUSTROADS Guide to Road Design Pt 3 (geometric design), the stopping sight distance for an 80km/hr design speed on a 10% downgrade is 130m. There have been three crashes recorded here (one serious, one minor and one non-injury) between 2000 and 2003. The crash types and severity are included in Table 7. The crashes are from loss of control (i.e. individual vehicles) and are not related to the intersection sight distance.

Table 7: Wiremu Road & Kina Road Intersection Crash Types and Severity

Crash Type	Severity	Number of Crashes
Single car	Non-Injury Crash	1
Single car	Minor Crash	1
Single motorcycle	Serious Crash	1

At the Kina Road site entrances, sight distances exceed 400m in each direction. There has been one minor single car crash recorded within 600m of the entrance in 2017.

Site Access

The proposed construction access points to the sites are on Kina Road. The vehicle crossing locations are more than 20m from intersections and there is adequate visibility in each direction. As all requirements of the South Taranaki District Plan are met there are no constraints to construct an appropriate vehicle crossing.

The construction access vehicle crossings will be asphalted to the boundary and constructed to the standard specified in the South Taranaki District Council District Plan Appendix 5; for a vehicle crossing with more than 30 equivalent car trips per day. It is anticipated that the two laydown areas within the site will be metalled, to minimise potential for tracking of mud onto Kina Road, in accordance with good practice.

Recommendations

We recommend the following to minimise any potential adverse effects.

- Schedule HGV deliveries to arrive outside of peak traffic times (i.e. between 10am & 4pm) and spread across the day to minimise adverse effects on safety.
- Provide signage along Kina Road, between the site access point and the Wiremu Road intersection, and along Wiremu Road near the Kina Road intersection and before the blind corner south of the intersection; to notify road users of increased HGV movements during the construction period.
- Construct two vehicle crossings (for >30 car equivalent daily car trips) in general accordance with South Taranaki District Council District Plan Appendix 5, to access the site.

Conclusions

The effect of the additional traffic on SH45 is negligible.

Provided our recommendations are implemented, we assess that the construction and operation of the solar plant will not adversely affect the safety or efficiency of the adjacent roading network.

Limitation

This letter has been prepared solely for the benefit of our client Energy Farms Ltd and the South Taranaki District Council in relation to the resource consent application for which this letter has been prepared. The comments in it are limited to the purpose stated in this letter. No liability is accepted by Hawthorn Geddes engineers & architects ltd in respect of its use by any other person, and any other person who relies upon any matter contained in this letter does so entirely at their own risk.

Yours faithfully,



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