21 May 2020

Nicole Brewer
A/Director Resource and Energy Assets
Department of Planning, Industry and Environment
Locked Bag 5022
PARRAMATTA NSW 2124

Dear Nicole,

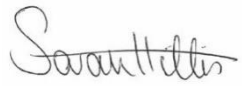
Re: 17-323 Jindera Solar Farm Revised Construction Noise Impact Assessment (SSD-9549)

This revised Construction Noise Impact Assessment (CNIA) accompanies the Amendment Report for the Jindera Solar Farm ('the proposal'). It details the amendments to the State Significant Development Application # 9549. Amendments to the design of the solar farm layout have been proposed and were included in the Amendment report to reduce overall noise impacts, particularly for those residences along Glenellen Road to the north of the development site. Significantly the amendments included an increased buffer between the south side of Glenellen Road and the solar farm infrastructure. This has the effect of moving construction activity further away from residences on Glenellen Road.

A revised CNIA has been completed to reassess the likely construction noise impacts of the updated proposed layout on adjacent residences within 2km of the development site. This is in line with Section 6.6.3 of the Environmental Impact Assessment (EIS). The original CNIA and revised CNIA for residences that could potentially experience construction noise impacts is provided below.

Reductions in predicted construction noise management levels (NML) can be seen for all residences along Glenellen Road as a result of increasing distance between solar farm infrastructure construction operations and the residences. It is however important to note that the construction noise predictions were calculated based on noise attenuation with distance from source. They do not take into account any obstacles between the source, weather conditions or other proposed mitigation measures which can influence the level of noise perceived. The assessment also assumes all plant will be operating at the same location simultaneously. Simultaneous operation is unlikely and as a result the noise predictions are conservative. Noise levels from works at the receivers are likely to be less than that predicted.

Yours sincerely,



Sarah Hillis
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Construction Noise Impact Assessment

Noise management levels

Construction noise management levels (NMLs) at all residential receptors have been calculated for the project (Table 1), and have been used in the assessment both prior to and post layout amendments. The NMLs are as originally detailed within Section 6.6.3 of the EIS. These NMLs are used to manage impacts associated with noise sensitive receivers adjacent to the proposal. The NMLs for the project have been calculated based on the minimum applicable rural background level (RBL) and NSW Interim Construction Noise Guideline (ICNG) (DECC 2009) criteria.

Table 1 Construction noise management levels

Location	Time of day	RBL dB (A) L_{A90}	NML dB (A) $L_{A90\ (15min)}$
All Residences	Day	35	45 (RBL + 10dB (A))
	Evening	30	35 (RBL + 5dB (A))
	Night	30	35 (RBL + 5dB (A))

Construction noise sources

Construction noise impacts would likely be from the operation of construction equipment. Several key activities on the site that are likely to produce the most noise include:

- Earth works for the construction of access roads, compounds and hard stands.
- Pile driving for solar panel frames and trenching for the installation of cabling.
- The delivery and movement of materials on site.

The proposed activities above use readily available construction equipment. As such, noise levels associated with that equipment (Table 2) and activity is well understood and able to be modelled. The construction activities selected above provide a worst-case scenario for noise generated from the site. It is common for the road work and compound construction activities to precede the construction of solar panel frames and cabling.

The activities above rarely occur in the same location at the same time due to safety and logistics. As such, predictive modelling of the noise impacts during construction examines two scenarios, deemed to have the highest noise impact; a) that all of the plant listed in Table 2 would be operating simultaneously at their closest point to any given receiver and b) in the same location. Simultaneous operation is unlikely and as a result the noise predictions are conservative. Noise levels from works experienced at the receivers are likely to be less than those predicted and would only apply for very short periods of time.

As with the NMLs above, the revised CNIA has used the same construction noise parameters as those used in Section 6.6.3 of the EIS.

Table 2 Construction equipment sound power levels.

Scenario 1		Scenario 2	
Road work / compound construction equipment	**Sound power level ((dB)A)) at 7m**	**Panel framing and cabling equipment**	**Sound power level ((dB)A)) at 7m**
Water Cart	83	**Delivery Truck**	83
Front End Loader	66	**Mobile Crane**	88
Light vehicles (e.g. 4WD)	78	**Pile drilling rig**	87
Grader	85	**Backhoe**	85
Vibratory Roller	84	**Power Generator**	75
Delivery Truck	83	**Concrete Truck**	84

The sound power levels for the equipment presented in the above table are sourced from the Australian Standard 2436 – 2010 ‘Guide to Noise Control on Construction, Demolition and Maintenance Sites’; the

Interim Construction Noise Guidelines (ICNG), information from past projects and information held in the NGH database.

Using construction equipment sound power levels and the former Roads and Maritime construction noise calculator, noise levels have been calculated for all involved, uninvolved an unoccupied residences. The construction noise predictions were calculated based on noise attenuation with distance from source. They do not take into account any obstacles between the source or weather conditions which can influence the level of noise perceived.

Construction noise assessment

Section 6.6.3 of the EIS details a construction noise assessment for the proposal *prior* to any layout amendment for the two scenarios. Below (Tables 4 and 5) details the predicted noise levels and impact description from the EIS against the layout *post* amendments. The post amendment layout showing the location of relevant receivers and infrastructure is shown in Appendix A.

The following key describes the Predicted Noise Level (dB(A)) and impact description:

Table 3 Predicted noise level and impact key

Predicted Noise Level dB (A)	Description
Green = no exceedance	Clearly audible = < 10 dB (A) above NML Moderately intrusive = 10 – 20 dB (A) above NML Highly intrusive = > 20 dB (A) above NML
Yellow = Minor exceedance	
Orange = Substantial exceedance	
Red = highly noise affected	

Scenario 1 – Road and compound construction

A detailed noise assessment of road work and compound construction for all sensitive receivers located within 2 km of the proposal was completed as part of the EIS (Section 6.6.3). That assessment found that construction noise levels at 52 of the total 64 modelled receivers were unlikely to exceed the NMLs.

The layout amendments have since provided a larger distance buffer between the residences along Glenellen Road and the construction works, reducing the predicted noise levels for residences. Refer to Table 4 below. Where the buffer from receivers and infrastructure has increased, distance has been highlighted grey for easy reference.

The Revised CNIA summarised in Table 4 below shows no change to the number of receivers that are likely to exceed the NML. However; as a result of the amended layout, impacts to Receiver 19 has dropped from moderately intrusive to clearly audible, and Receivers 20, 21, 17, 18, 19, 16 (on Glenellen Road) and 9 (on Ortlipp Road) will experience on average a predicted noise level reduced by 3 dB(A).

Table 4 Predicted noise levels for Scenario 1 prior and post development amendments.

Receiver	Prior to amendment			Post amendment		
	Distance (m) from development infrastructure	Predicted Noise Level dB (A)	Impact description	Distance (m) from development infrastructure	Predicted Noise Level dB (A)	Impact description
R20 Glenellen Rd (uninvolved)	105	63	Moderately Intrusive	156	58	Moderately Intrusive
R21 Walla Walla / Jindera Rd (uninvolved)	115	62	Moderately Intrusive	121	61	Moderately Intrusive
R17 Glenellen Rd	130	60	Moderately Intrusive	179	56	Moderately Intrusive

Receiver	Prior to amendment			Post amendment		
	Distance (m) from development infrastructure	Predicted Noise Level dB (A)	Impact description	Distance (m) from development infrastructure	Predicted Noise Level dB (A)	Impact description
(uninvolved)						
R18 Glenellen Rd (uninvolved)	135	60	Moderately Intrusive	190	55	Moderately Intrusive
R19 Glenellen Rd (unoccupied)	190	55	Moderately Intrusive	244	52	Clearly audible
R16 Glenellen Rd (uninvolved)	200	54	Clearly audible	232	52	Clearly audible
R10 Ortlipp Rd (unoccupied)	220	53	Clearly audible	220	53	Clearly audible
R9 Ortlipp Rd (uninvolved)	260	51	Clearly audible	344	47	Clearly audible
R15 Glenellen Rd (uninvolved)	270	50	Clearly audible	270	50	Clearly audible
R11 Ortlipp Rd (unoccupied)	280	50	Clearly audible	280	50	Clearly audible
R23 Nation Rd (uninvolved)	315	48	Clearly audible	315	48	Clearly audible
R1 Klinberg Rd (uninvolved)	330	48	Clearly audible	330	48	Clearly audible
I01 Urana Rd (involved)	433	44	Not noticeable	433	44	Not noticeable

Scenario 2 – Driving of steel posts, erecting frames and installing panels

The erection of panel frames would include the delivery of framing components, the driving of steel posts and the fixing of frames. The cabling would involve trenching, cable laying and backfilling. The framing would precede the cable activities but may be concurrent in adjacent areas. The predicted noise impacts from these activities have been calculated as described above and are displayed below (Table 5).

As detailed within Section 6.6.3 of the EIS, the assessment prior to amendment found that construction noise levels at 49 of the total 64 modelled receivers were unlikely to exceed the NMLs.

As above, the layout amendments have since provided a larger distance buffer between the residences along Glenellen Road and the solar farm construction works, reducing the predicted noise levels for residences. Refer to Table 5 below. Where the buffer from receivers and infrastructure has increased, the distance has been highlighted grey for easy reference.

The Revised CNIA summarised in Table 5 below shows no change to the number of receivers that are likely to exceed the NML. However, as a result of the amended layout, receivers 20, 21, 17, 18, 19, 16 (on

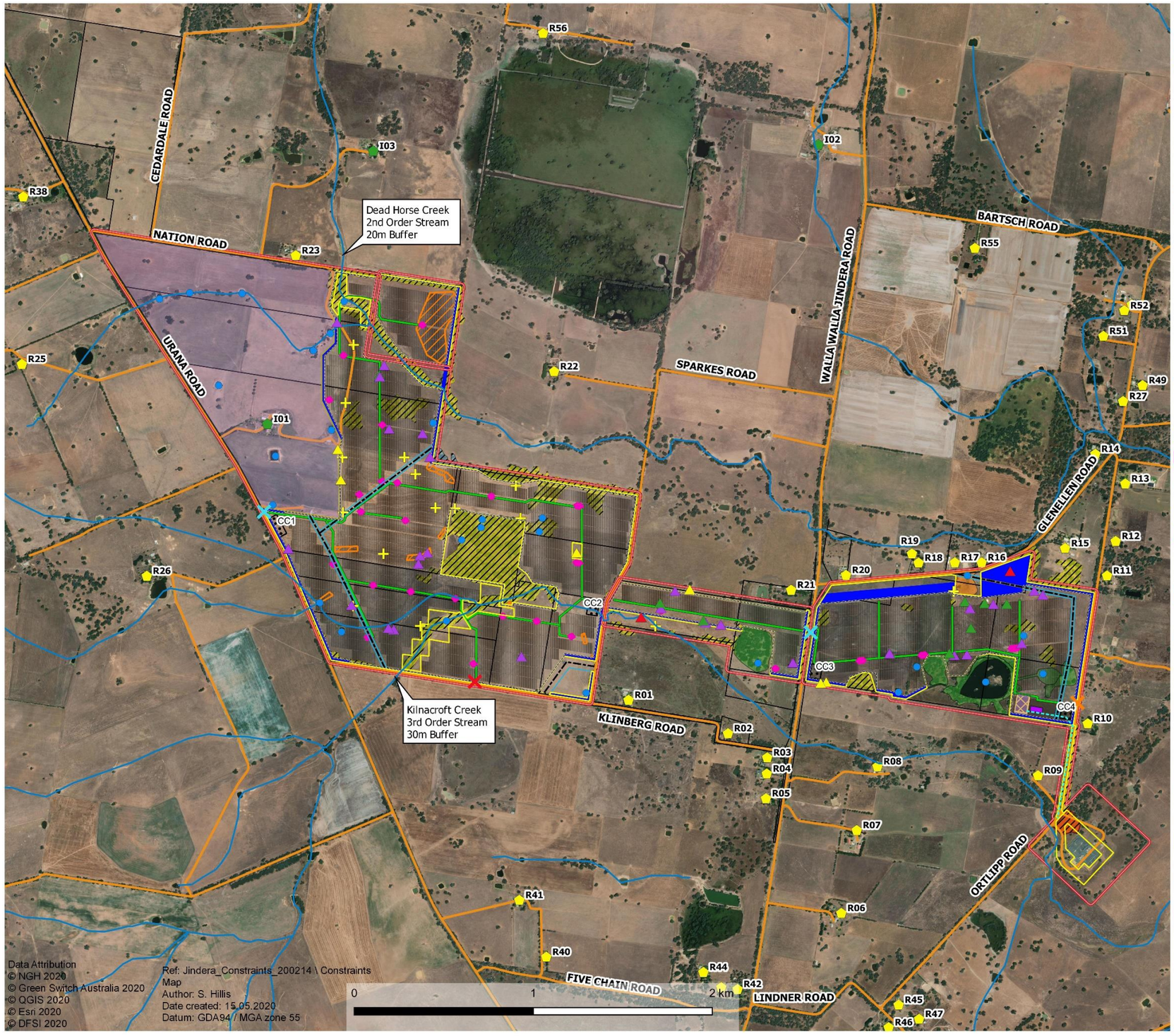
Glenellen Road) and 9 (on Ortlipp Road) will experience on average a predicted noise level reduced by 3 dB(A).

Table 5 Predicted noise levels for Scenario 2.

Receiver	Prior to amendment			Post amendment		
	Distance (m) from development infrastructure	Predicted Noise Level dB (A)	Description	Distance (m) from development infrastructure	Predicted Noise Level dB (A)	Description
R20 Glenellen Rd (uninvolved)	105	66	Moderately Intrusive	156	60	Moderately Intrusive
R21 Walla Walla Jindera Rd (uninvolved)	115	65	Moderately Intrusive	121	64	Moderately Intrusive
R17 Glenellen Rd (uninvolved)	130	63	Moderately Intrusive	179	59	Moderately Intrusive
R18 Glenellen Rd (uninvolved)	135	62	Moderately Intrusive	190	58	Moderately Intrusive
R19 Glenellen Rd (Unoccupied)	190	58	Moderately Intrusive	244	55	Moderately Intrusive
R16 Glenellen Rd (uninvolved)	200	57	Moderately Intrusive	232	55	Moderately Intrusive
R10 Ortlipp Rd (Unoccupied)	220	56	Moderately Intrusive	220	56	Moderately Intrusive
R9 Ortlipp Rd (uninvolved)	260	54	Clearly audible	344	50	Clearly audible
R15 Glenellen Rd (uninvolved)	270	53	Clearly audible	270	53	Clearly audible
R11 Ortlipp Rd (Unoccupied)	280	53	Clearly audible	280	53	Clearly audible
R23 Nation Rd (uninvolved)	315	51	Clearly audible	315	51	Clearly audible
R1 Klinberg Rd (uninvolved)	330	50	Clearly audible	330	50	Clearly audible
I01 Urana Rd (involved)	433	47	Clearly audible	433	47	Clearly audible
R8	440	47	Clearly audible	440	47	Clearly audible

Receiver	Prior to amendment			Post amendment		
	Distance (m) from development infrastructure	Predicted Noise Level dB (A)	Description	Distance (m) from development infrastructure	Predicted Noise Level dB (A)	Description
Walla Walla Jindera Rd (uninvolved)						
R12 Ortlipp Rd (unoccupied)	460	46	Clearly audible	460	46	Clearly audible
R13 Ortlipp Rd (uninvolved)	480	45	Not noticeable	480	45	Not noticeable

Appendix A – Proposed Layout



JINDERA SOLAR FARM CONSTRAINTS

- Project Boundary
- Development Footprint
- Pannel Array
- Proposed Subdivision

Residences
- Associated
- Non-associated
- Roads
- Proposed Transmission Route
- Existing Transmission Lines
- Existing Transmission Line Easement

Access Locations
- Construction/Operational

Emergency/Maintenance
- Emergency/maintenance access
- Emergency access
- Internal Access Tracks
- Cadastre
- Fences
- Proposed Vegetative Screening
- Inverters
- Battery Storage
- Construction Compounds
- Solar Substation
- Transgrid Substation
- Isolated Aboriginal Artefacts
- Modified Cultural Trees
- Artefact Scatters
- Farm Dams
- Drainage Lines

Paddock Trees
- Hollow Bearing Tree - Retain
- Non-hollow Bearing tree - Retain
- Hollow bearing tree - Remove
- Non-hollow bearing tree - Remove

Plant Community Type
- PCT 9: River Red Gum - Wallaby Grass tall woodland wetland
- PCT 266: White Box Grassy Woodland
- PCT 277: Blakely's Red Gum - Yellow Box grassy tall woodland
- PCT 360: Gilgai Wetland Community
- BC TEC
- EPBC TEC

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