13. NOISE AND VIBRATION

This chapter summarises the findings of the supplementary noise and vibration assessment undertaken to address updates to the project description made since the Surat Gas Project Environmental Impact Statement (EIS) (Coffey Environments, 2012b) was finalised.

The Supplementary Noise and Vibration Assessment, prepared by Sonus Pty Ltd (Sonus), is included in Appendix 11. The study supplements the Noise and Vibration Impact Assessment presented in Appendix N of the EIS, the main findings of which are summarised in Chapter 20 of the EIS.

The revised project description is provided in Chapter 3, Project Description, however aspects relevant to noise and vibration are also discussed in this chapter. In addition to the study findings, a list of key issues raised in submissions is presented, with responses to all issues provided in Part B, Chapter 19, Submission Responses.

13.1 Studies and Assessments Completed for the EIS

This section provides an overview of the noise and vibration impact assessment completed for the EIS and the main conclusions from that assessment. Sonus was engaged to conduct the noise and vibration impact assessment for the EIS.

The noise and vibration impact assessment involved the identification of the baseline noise environment, modelling of potential noise sources, and assessment of potential noise impacts associated with the project. At the time the assessment was conducted, the site location and facility design were yet to be finalised. As such, the noise and vibration impact assessment was based on a typical site layout and indicative equipment, with the site assumed to be located in an acoustic environment typical of the project development area.

The assessment involved a desktop study to determine the existing acoustic environmental values that may be affected by noise and vibration from the project, in line with the Environmental Protection (Noise) Policy 2008 (Qld). Noise measurements were then conducted at four locations to determine the existing acoustic environment within the project development area.

Noise modelling was undertaken for expected noise sources at a typical production facility and production well. Receptor sites for the modelling of noise were selected to represent a range of distances and directions from any nominal location. Noise levels were modelled based upon known sound levels from typical construction and operational equipment.

Noise was modelled for a range of distances from the project components using the CONCAWE noise propagation model (Manning, 1981). The model is widely accepted as an appropriate sound propagation model for predicting noise over significant distances, and takes into account topography, ground absorption, air absorption and meteorological conditions.

The assessment of vibration impacts of the project on sensitive receptors was based on previous measurements of vibration levels at similar facilities, with similar equipment and settings.

Noise from the operation of the project was found to achieve the proposed noise conditions with the incorporation of acoustic treatment and other mitigation measures in place.

Construction noise levels were found to achieve the criterion at sites located 3 km or greater from production facility sites, and 1 km or greater from production wells and pipelines. If construction

activities were to be undertaken at distances less than these, acoustic treatment may need to be applied to meet the criteria.

Vibration levels were predicted to be below the threshold of human detection and to not cause structural damage at sensitive receptors located at distances greater than 100 m from the activity. Should construction activity occur within 100 m from a sensitive receptor, vibration monitoring at that receptor will be undertaken to monitor against the proposed vibration criteria.

Potential noise and vibration levels associated with increases in traffic volumes resulting from project activities were found to be consistent with current levels.

Commitments relating to the mitigation of noise and vibration impacts were developed based on expert advice from Sonus. Table 13.1 lists the noise and vibration commitments presented Attachment 8 of the EIS.

Table 13.1 Noise and vibration commitments presented in the EIS

No.	Commitment
C011	Ensure all engines, machinery equipment and pollution control mechanisms are operated and maintained in accordance with manufacturers' recommendations.
C301	Where noise reduction devices are deemed necessary, ensure devices (such as mufflers, low-noise fans and possibly enclosures) are fitted and work correctly.
C302	Operate equipment and handle materials in a manner that does not cause unnecessary noise (e.g., excessive revving or dropping materials).
C304	Manage noise in accordance with the relevant environmental authority conditions. Where night-time activities are planned (10 p.m. to 6 a.m.) and are likely to exceed the prescribed noise criteria, conduct prior consultation with affected parties.
C305	Consult with those who may be affected by increased noise levels due to construction activities with particular reference to the type and timing of works.
C306	Conduct a risk-based assessment or potential vibration monitoring during any construction activity that occurs within 100 m of a sensitive receptor that might be subject to vibration
C307	Implement a grievance management system that responds to noise complaints. If necessary, undertake noise monitoring of construction activities to facilitate a response to the grievance.
C309	Preferential selection of sites in sparsely populated areas.
C310	Site-specific, detailed noise modelling of production facilities and the application of acoustic treatments where the modelled noise from facilities exceeds the established noise criteria at one or more sensitive receptors. Consideration of intrinsically quieter equipment or design of acoustic treatments such as hospital-grade exhaust systems and mufflers, or barriers and equipment housing will be given.
C311	Locate equipment associated with production wells and associated wellhead infrastructure at a distance of 200 m or more from a sensitive receptor.
C312	Consider the following factors prior to any blasting operations being conducted: • The type of rock and stratigraphy being blasted and any associated faulting. • The distance of the blast site from sensitive receptors. • The type, size and number of charges used. • The depth and manner in which the charge is installed. • The meteorological conditions. • Methods of controlling blast noise and vibration, such as mats or smaller blasts.

Table 13.1 Noise and vibration commitments presented in the EIS (cont'd)

No.	Commitment
C313	Where practicable, schedule planned flaring events (e.g., those preceding shut-down maintenance) for the period between 6 a.m. and 10 p.m.
C317	Implement monitoring and inspection of avoidance, mitigation and management measures to ensure the residual impacts continue to be negligible throughout the lifetime of the project.
C318	If directed by the administering authority in response to a valid noise complaint, undertake noise monitoring in accordance with the DERM (2000) Noise Measurement Manual.

13.2 Study Purpose

The supplementary noise and vibration assessment addresses updates to the project description since the EIS was finalised.

13.2.1 Project Description Updates

This section provides a summary of the updates to the project description that are addressed through the supplementary noise and vibration assessment. The updates arose as a result of further refinement of the field development plan and the basis for design of coal seam gas infrastructure.

Central Gas Processing Facility

Gas collected in the gathering systems will be piped to one of the eight planned central gas processing facilities (CGPFs). Two of the CGPFs will have water treatment facilities located adjacent to them. In the EIS this arrangement was referred to as an integrated processing facility. This term will no longer be used and the facilities will be referred to by their function i.e., CGPF and water treatment facility.

Each facility will comprise one to three compressor trains that each has capacity to process 75 TJ/d of gas. These facilities will typically compress 75 to 225 TJ/d of gas (in contrast to between 30 and 150 TJ/d of gas presented in the EIS). A sparing capacity of one additional train may be adopted at each facility (75 TJ/d).

Water Treatment Facilities

The number of water treatment facilities and associated storage facilities (dams) has been reduced from the six described in the EIS, to two.

The main noise sources associated with the water treatment facilities will include those previously considered in the EIS for water treatment, with additional electric motors, steam compressors and pressure control valves.

Production Wells

The EIS described production wells as a single well located on one well pad. Wells will now be drilled from both single well pads and multi-well pads. The multi-well pads will be comprised of up to 12 wells per pad, approximately 8 m apart.

Power Options

Potential options for power generation have been updated since the EIS was finalised. The self-generation option was considered as the preferred option in the EIS, with power supplied by the Queensland electricity grid described as the alternate power supply option under consideration.

The alternate option of grid power is now Arrow's preferred option. Self-generated power may still be necessary until connection to a third party's infrastructure can be made.

Flaring Strategy

Ramp-up flaring may result from wells that are commissioned prior to the commissioning of any of the 8 CGPFs (compared to 12 assessed in the EIS). Planned and unplanned maintenance flaring at CGPFs includes partial (i.e., one train) and full shutdowns. This strategy is a change compared to what was assessed in the EIS and is due to the increased capacity of a CGPF and larger train sizes. No gas will be flared at a field compression facility.

13.2.2 Assessment Criteria

The assessment has maintained the noise and vibration criteria described in the EIS. The night-time noise criterion of 28 dB(A) was considered for both the EIS and the supplementary noise and vibration assessment given that it represents the most stringent criterion.

Blasting has not been considered as a part of the supplementary noise and vibration assessment, nor is it anticipated to occur at any stage of the project. If blasting does occur, it will be conducted in accordance with criteria discussed within Chapter 20 and Appendix N of the EIS.

13.3 Study Method

The supplementary noise and vibration assessment has been conducted in accordance with the methods described in the EIS. The CONCAWE model was rerun for relevant project components during the operations phase with noise level data revised to reflect the project description updates discussed above.

13.3.1 Modelling Assumptions

A refined selection of equipment types and configurations at the CGPFs and multi-well pads have been modelled in the supplementary noise and vibration assessment to represent indicative equipment to be used during operations. These revisions reflect project description updates and are detailed in Section 5.5 of the Supplementary Noise and Vibration Assessment (Appendix 11).

Permanent and temporary power generation scenarios and modelling configurations were considered for the operation of a maximum capacity CGPF, and multi-well pad of up to 12 wells, as a part of the supplementary noise and vibration assessment.

For the temporary power scenario at a CGPF, a review of available power generation equipment found that small and medium capacity units would be suitable. As the detailed design and procurement strategy has not yet been developed, the specific type of power generation equipment has not been selected. To capture the range of possible scenarios to meet the 50 MW of temporary power generation requirement for a CGPF, the assessment considered a configuration (configuration 1) comprising 47 engines each with a capacity of 1.1 MW, and another configuration (configuration 2) comprising 10 gas turbines each with a capacity of 5.7 MW. Modelling configurations for the CGPF have also been revised to include the co-located water treatment facilities and revised flaring strategy.

For the temporary power scenario at a multi-well pad with a power requirement of 720 kW (to power up to 12 wells), the assessment considered a 749 kW engine.

The revised modelling scenarios are summarised in Table 13.2 below.

Table 13.2 Revised modelling scenarios

Scenario	Description
PAD P	Multi-well pad with permanent power supply from the grid
PAD T	Multi-well pad with temporary power: 749 kW engine
CGPF P	CGPF with permanent power supply from the grid
CGPF T1	CGPF with temporary power, configuration 1: 47 x 1.1 MW engines
CGPF T2	CGPF with temporary power, configuration 2: 10 x 5.7 MW gas turbines
Water treatment facility	Water treatment facility adjacent to the CGPF
Flare	Noise from the revised flaring strategy

13.3.2 Noise Modelling

Assessment locations from which the predicted noise levels generated by operation of project facilities, were nominated as follows:

- From the CGPF, the assessment locations considered were 1 km, 1.5 km, 2 km, 3 km and 5 km in the north, east, south and west directions.
- The assessment locations considered from the multi-well pads were 200 m, 250 m, 300 m, 350 m, 400 m, 450 m and 500 m in the same relative directions.

The revised assessment locations and relative directions were selected to provide a sound indication of the variations in noise levels at different distances from the facilities. The predicted noise levels were determined for both pre- and post-implementation of noise mitigation measures.

13.4 Study Findings

This section describes the key findings of the supplementary noise and vibration assessment, including any changes to the impacts that were described in the EIS.

13.4.1 Noise

The information on construction equipment is consistent with the assumptions considered in the EIS. The predicted construction noise levels outlined in the EIS for construction equipment remain valid, as do noise levels associated with decommissioning activities. The following sections describe the predicted noise levels associated with the operation of the project taking into account the project description updates discussed in Section 13.2.1.

Multi-well Pads

Operational noise levels associated with the multi-well pads were assessed for the permanent and temporary power scenarios shown in Table 13.2. The modelled noise levels are presented in Table 13.3.

Table 13.3 Modelled operational noise levels at assessment locations for the multi-well pads

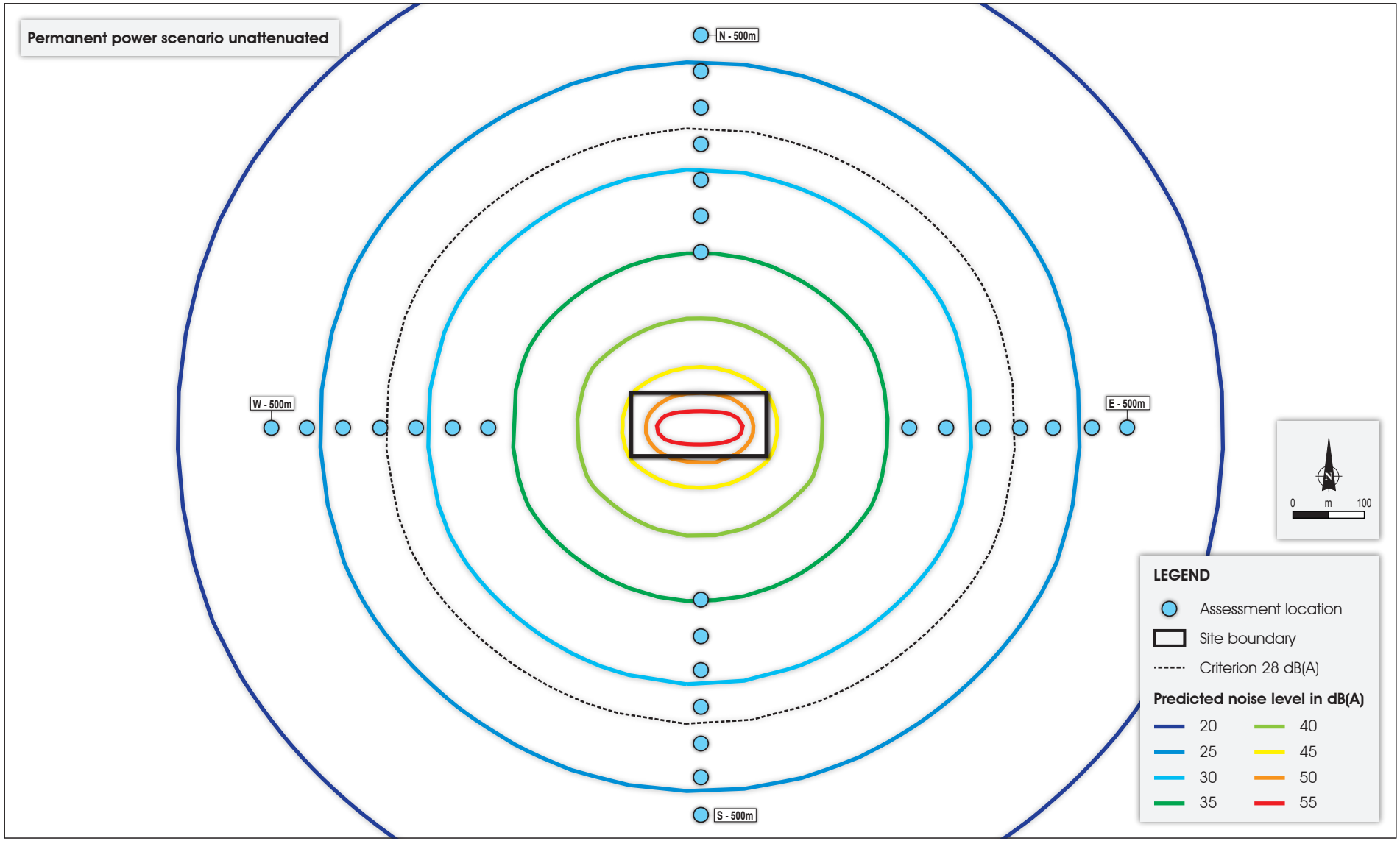
Assessment Location (shown as distance (m) from site boundary)	Long-term Night-time Noise Criterion (dB(A))	Modelled Noise Level (dB(A)) by Relative Direction			
		North	East	South	West
Permanent Grid Power Scenario (PAD P)					
200	28	**35**	**34**	**35**	**34**
250		**33**	**31**	**33**	**31**
300		**31**	**30**	**31**	**29**
350		**29**	28	**29**	28
400		27	26	27	26
450		25	25	26	25
500		24	23	24	23
Temporary Power Scenario (PAD T)					
200	28	**45**	**42**	**45**	**47**
250		**42**	**40**	**43**	**44**
300		**41**	**39**	**41**	**42**
350		**39**	**37**	**40**	**40**
400		**37**	**36**	**38**	**38**
450		**36**	**34**	**36**	**37**
500		**35**	**33**	**35**	**35**

Note: Values in bold indicate that the modelled noise level exceeds the noise criterion.

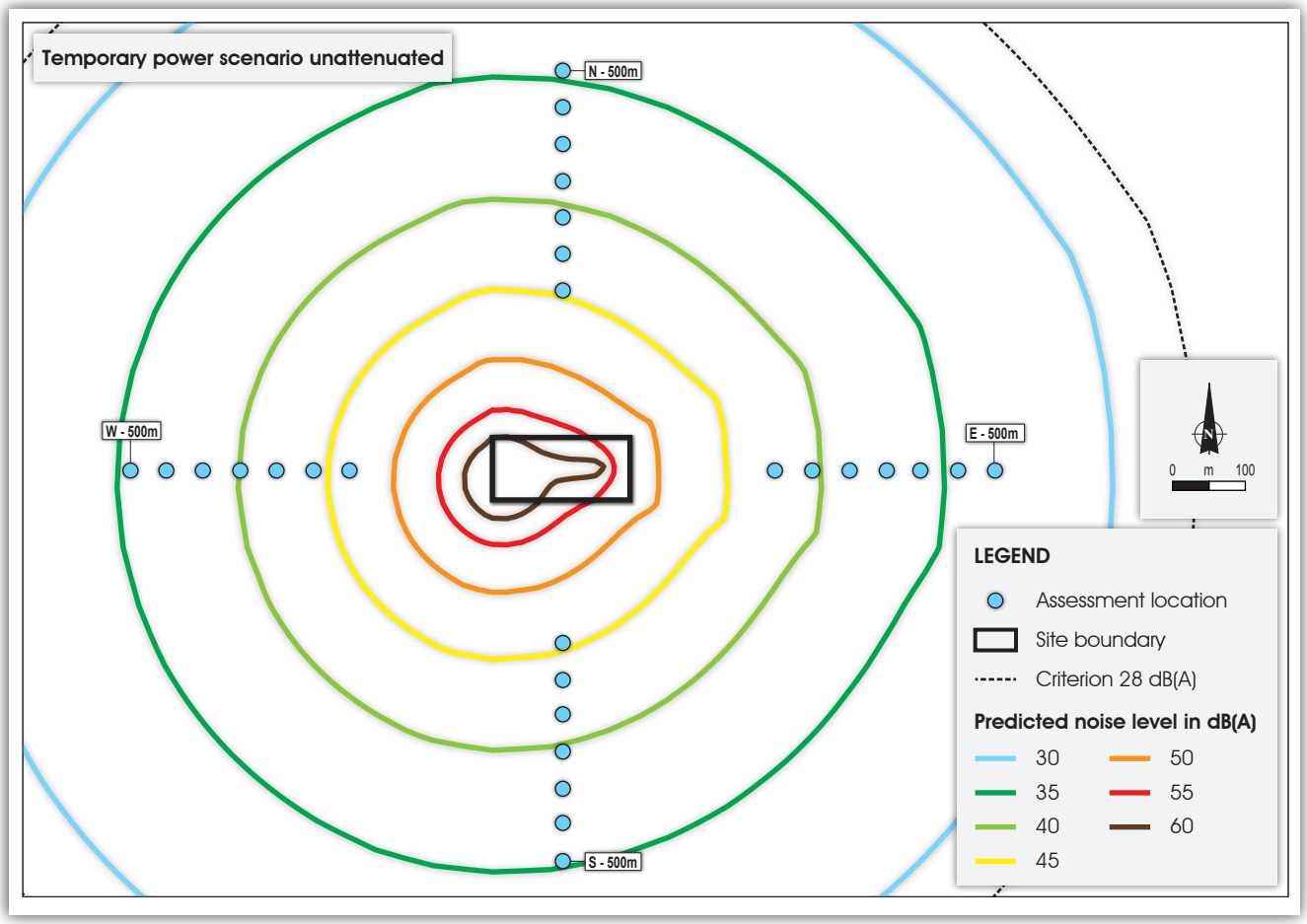
Modelling indicates that operational noise levels from the multi-well pads with power supply from the grid will achieve the long-term night-time noise criterion of 28 dB(A) at a distance of at least 400 m from the site boundary. The EIS determined that the night-time noise criterion would be met at a distance of 200 m from a single production well powered by the grid. Operational noise levels associated with the multi-well pads with temporary power supply may exceed the noise criterion of 28 dB(A) for all of the assessment locations considered (up to 500 m from a multi-well pad) without additional acoustic treatment or natural noise mitigating features such as trees. Predicted noise levels modelled without acoustic treatment are shown as noise contours around the multi-well pad for the permanent grid power scenario modelled in Figure 13.1, and the temporary power scenario in Figure 13.2.

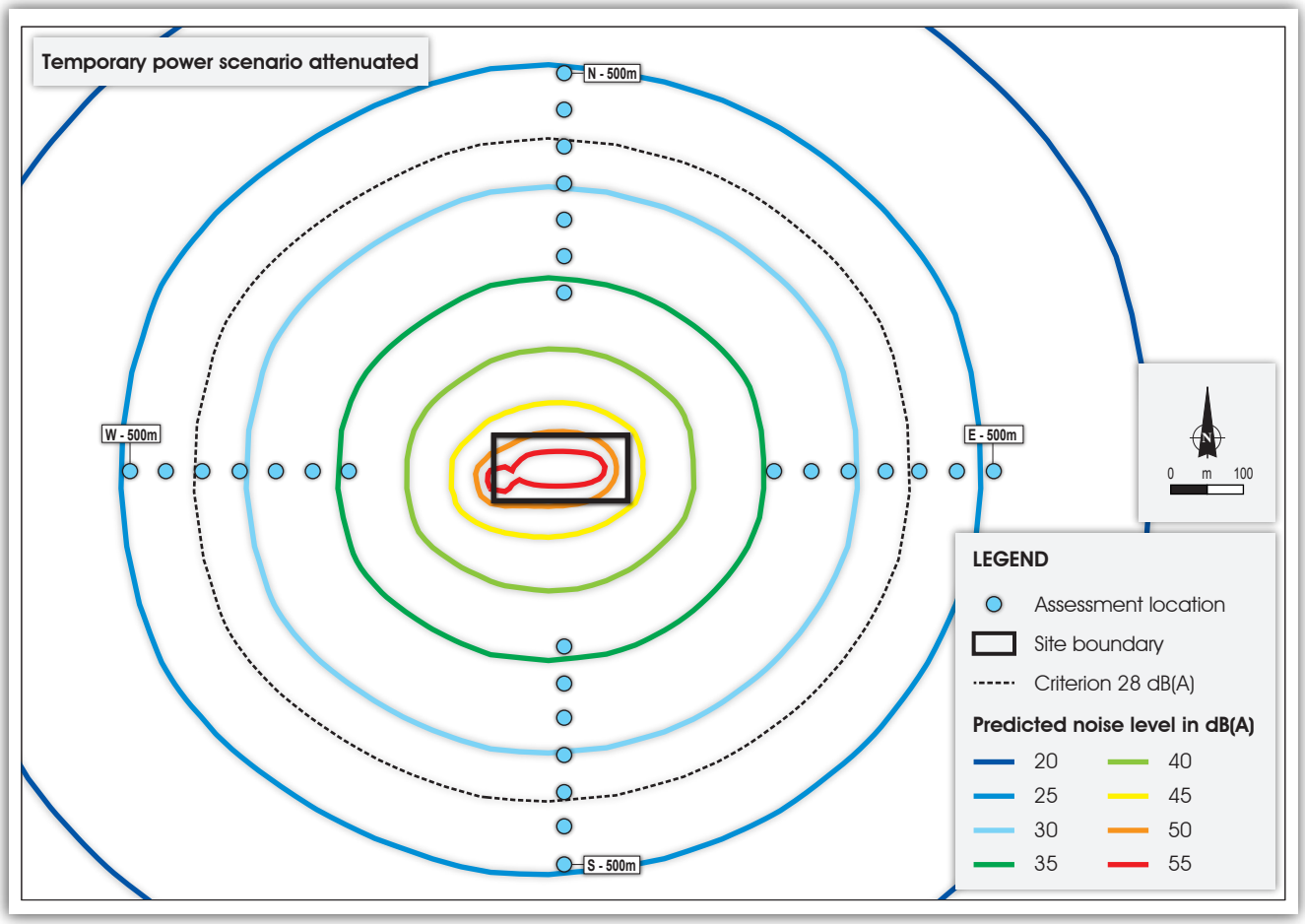
Central Gas Processing Facility

Operational noise levels associated with the CGPFs were assessed for the permanent and temporary power scenarios shown in Table 13.2. The modelled noise levels are presented in Table 13.4.



	coffey environments	Date: 20.06.2013 File Name: 7040_12_F13.01_JO	Arrow Energy Surat Gas Project	arrow energy go further	Noise contours surrounding multi-well pad with power supply from the grid	Figure No: 13.1





coffey environments	Date: 20.06.2013 File Name: 7040_12_F13.02_VS	Arrow Energy Surat Gas Project	arrow energy go further	Noise contours surrounding multi-well pad with temporary power scenario	Figure No: 13.2

Table 13.4 Modelled operational noise levels at assessment locations for the CGPFs

Assessment Location (shown as distance (km) from centre of facility)	Long-term Night-time Noise Criterion (dB(A))	Modelled Noise Level (dB(A)) by Relative Direction			
		North	East	South	West
Permanent Grid Power Scenario (CGPF P)					
1	28	**51**	**49**	**50**	**50**
1.5		**45**	**44**	**44**	**44**
2		**41**	**40**	**40**	**40**
3		**34**	**34**	**34**	**34**
5		25	24	25	25
Temporary Power Configuration 1 (CGPF T1)					
1	28	**54**	**52**	**54**	**53**
1.5		**48**	**47**	**48**	**47**
2		**44**	**43**	**44**	**43**
3		**37**	**37**	**37**	**37**
5		28	28	28	28
Temporary Power Configuration 2 (CGPF T2)					
1	28	**54**	**53**	**55**	**53**
1.5		**48**	**48**	**49**	**48**
2		**44**	**44**	**45**	**44**
3		**38**	**38**	**38**	**38**
5		**29**	**29**	**29**	**29**

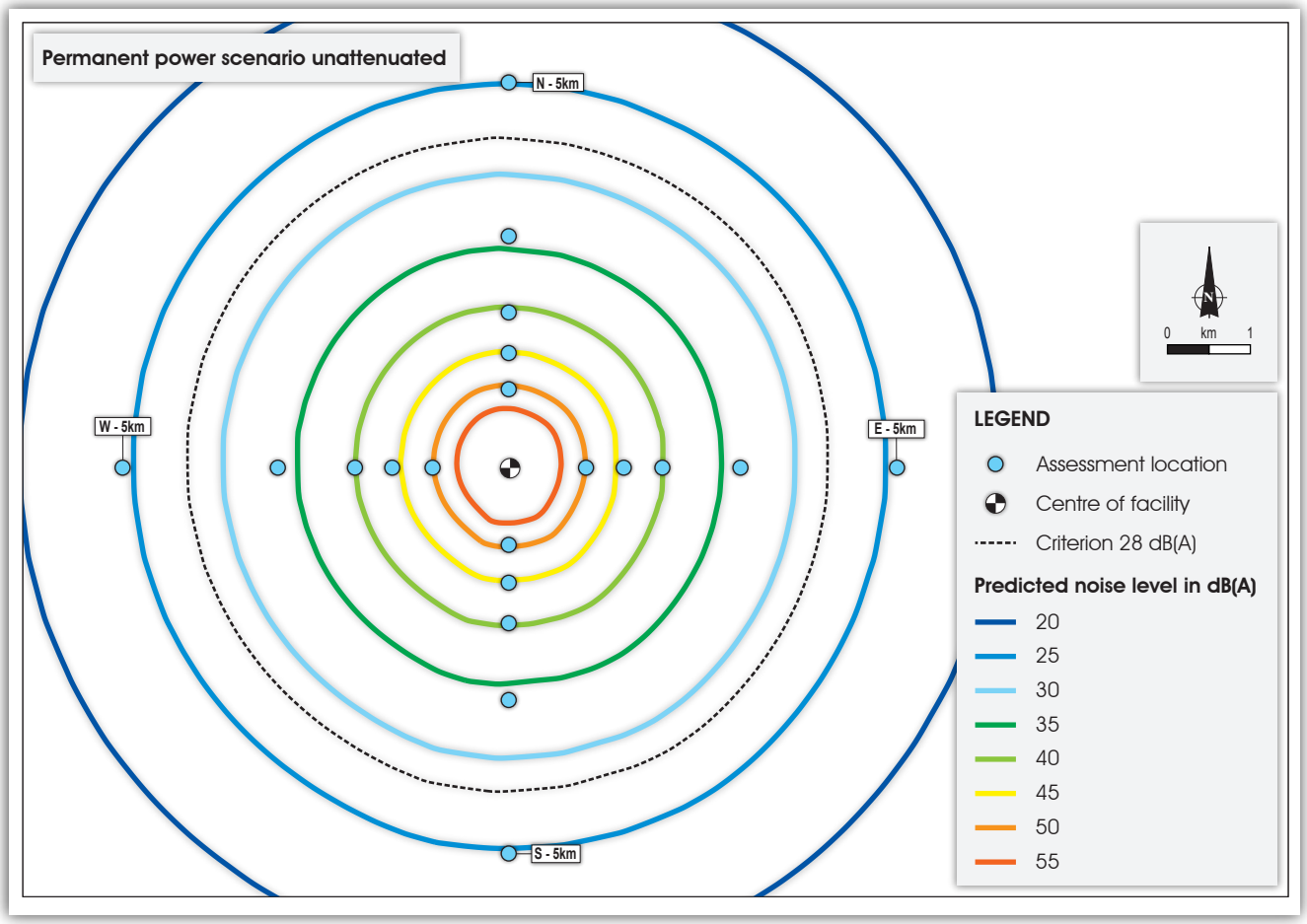
Note: Modelled levels do not include noise associated with a water treatment facility or significant flaring events.

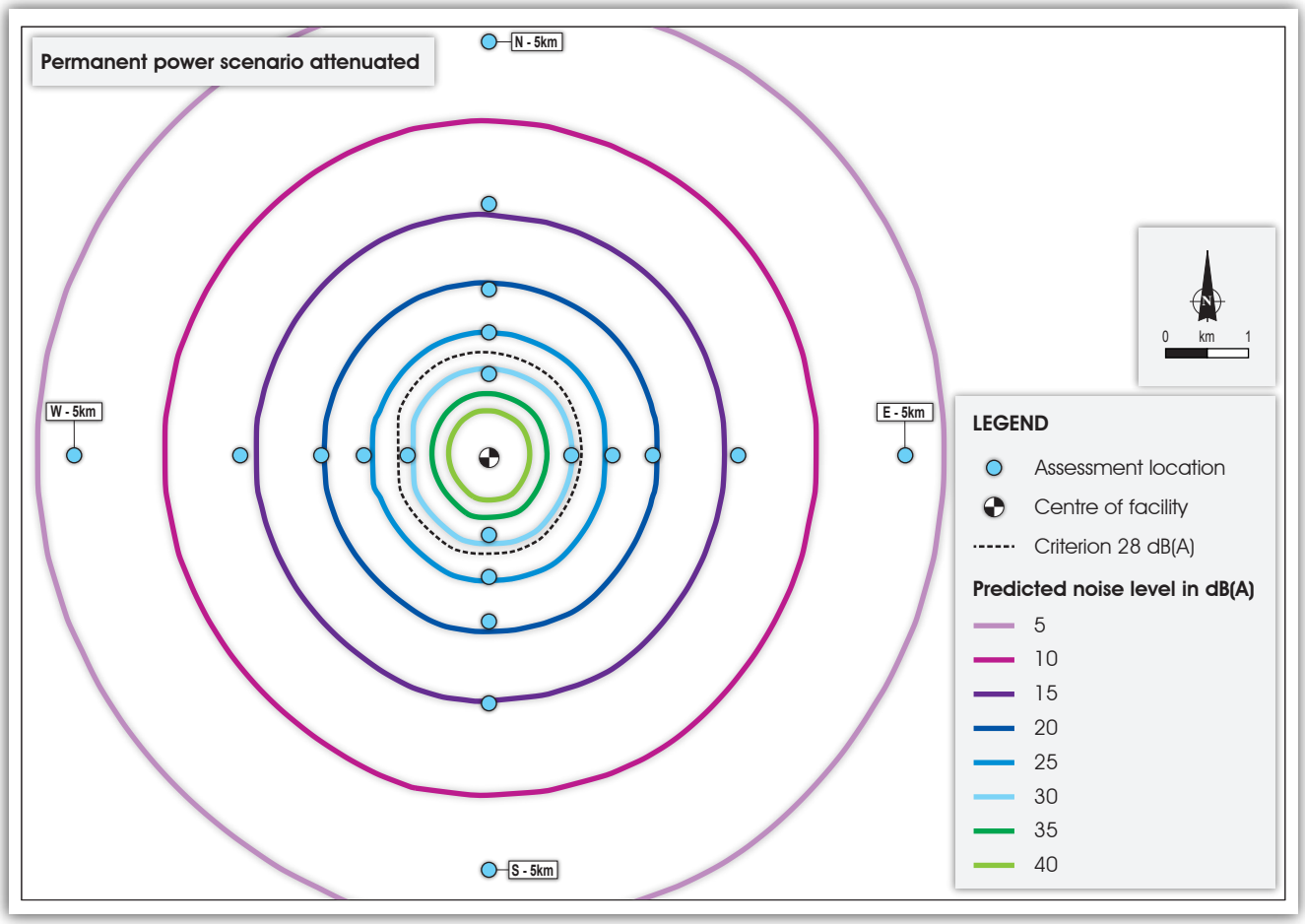
Modelling indicates that operational noise levels associated with the CGPF will exceed the long-term night-time noise criterion of 28 dB(A) at the majority of assessment locations under the three power scenarios assessed, without additional acoustic treatment being applied. The exception is for the permanent and temporary power configuration 1 (i.e., scenarios CGPF P and CGPF T1) where the noise criterion was met at a distance of at least 5 km from facilities.

Modelled noise levels for the CGPF presented in the EIS indicated that without acoustic treatment, the night-time noise criterion would be met at least 5 km from a facility under the temporary power scenario modelled. Predicted noise levels modelled without acoustic treatment are shown as noise contours around the CGPF for the permanent grid power scenario in Figure 13.3, and temporary power configuration 2 in Figure 13.4. Contours for temporary power configuration 2 were selected for these figures to show noise contours which represent the worst-case temporary power configuration modelled.

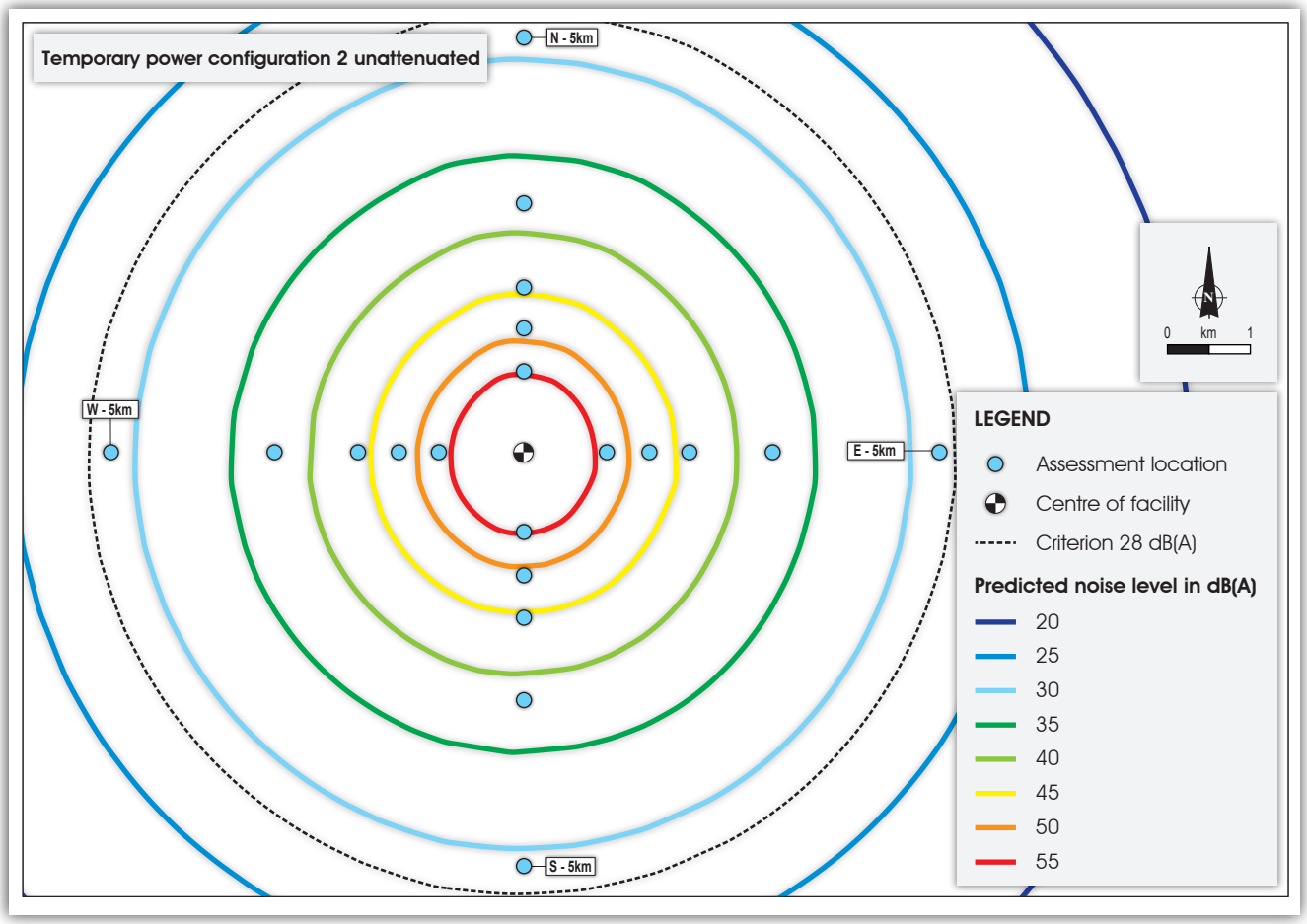
Central Gas Processing Facility and Water Treatment Facility

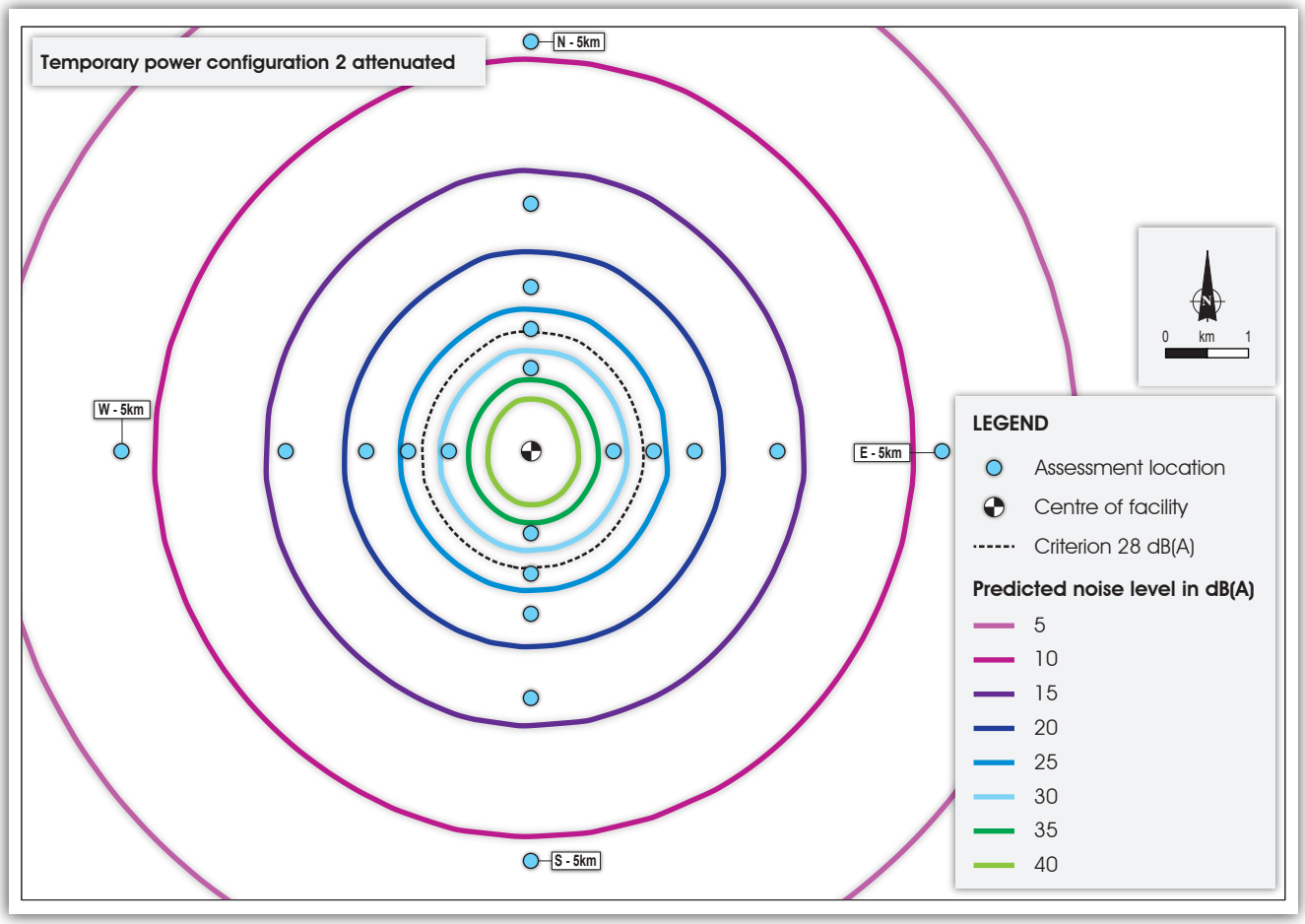
Water treatment facilities will be located adjacent to the CGPFs, hence the cumulative noise levels associated with the operation of the two facilities were considered. Based on the assumption that the CGPF will be designed to achieve the long-term night-time noise criterion of 28 dB(A), the noise contribution from the water treatment facility will need to be 18 dB(A) or less to ensure that it does not increase the total noise level above the criterion.





coffey environments	Date: 20.06.2013 File Name: 7040_12_F13.03_VS	Arrow Energy Surat Gas Project	arrow energy go further	Noise contours surrounding CGPF with power supply from the grid	Figure No: 13.3





coffey environments	Date: 20.06.2013 File Name: 7040_12_F13.04_VS	Arrow Energy Surat Gas Project	arrow energy go further	Noise contours surrounding CGPF with temporary power configuration 2	Figure No: 13.4

Modelling indicates that the unattenuated water treatment facility noise contribution limit of 18 dB(A) can be achieved at distances of 3 km or greater from the facility. In order to achieve the criterion at distances within 3 km of facilities, acoustic treatment may need to be incorporated.

Modelled operational noise levels associated with the water treatment facilities are presented in Table 13.5.

Table 13.5 Modelled operational noise levels at the assessment locations for water treatment facilities

Assessment Location (shown as distance (km) from centre of CGPF)	Noise contribution limit (dB(A))	Modelled Noise Level (dB(A)) by Relative Direction			
		North	East	South	West
1	18	**39**	**40**	**41**	**39**
1.5		**33**	**34**	**35**	**33**
2		**29**	**30**	**30**	**29**
3		**22**	**23**	**23**	**22**
5		12	13	13	12

Note: Values in bold indicate that the modelled noise level exceeds the noise criterion.

Flaring

Modelled noise levels for the ramp-up and upset condition (planned and unplanned maintenance) flaring indicate that noise levels at least 1.5 km from the CGPF will achieve the long-term night-time noise criterion of 28 dB(A). The modelled noise levels are presented in Table 13.6 below. Noise modelling of unattenuated flaring for the EIS indicated that noise levels from gas flaring would achieve the night-time criterion of 28 dB(A) at locations 2 km or greater from the flare.

Table 13.6 Modelled noise levels at the assessment locations from flaring events

Assessment Location (shown as distance (m) from centre of CGPF)	Long-term Night-time Noise Criterion (dB(A))	Modelled Noise Level (dB(A)) by Relative Direction			
		North	East	South	West
Ramp-up Flaring – 72 TJ/d					
1	28	**30**	**30**	**29**	28
1.5		23	22	23	22
2		18	18	18	18
3		12	12	12	12
5		4	4	4	4
Planned and Unplanned Maintenance Flaring – 75 TJ/d for 48 hours 4 times a year					
1	28	**30**	**30**	**29**	28
1.5		23	22	23	22
2		18	18	18	18
3		12	12	12	12
5		4	4	4	4

Table 13.6 Modelled noise levels at the assessment locations from flaring events (cont'd)

Assessment Location (shown as distance (m) from centre of CGPF)	Long-term Night-time Noise Criterion (dB(A))	Modelled Noise Level (dB(A)) by Relative Direction			
		North	East	South	West
Planned and Unplanned Maintenance Flaring – 225 TJ/d for 24 hours once a year					
1	28	**35**	**35**	**34**	**33**
1.5		28	27	28	27
2		23	23	23	23
3		17	17	17	17
5		9	9	9	9

Note: Values in bold indicate that the modelled noise level exceeds the noise criterion.

13.4.2 Vibration

Updates to the project description have not resulted in significant changes to the type of equipment or the assessment locations considered. The vibration impacts as outlined in the EIS for project construction and operations therefore remain valid.

13.4.3 Traffic Noise and Vibration

A review was undertaken of the potential noise and vibration impacts from the estimated off-site traffic generated by the project due to updates to traffic data assessed as a part of the Supplementary Roads and Transport Assessment, Appendix 10.

The maximum 4% increase in traffic volume expected to be generated by the project across the region is predicted to result in an increase of less than 1 dB(A) above current noise levels. Similarly, a 35% cumulative increase in traffic volumes expected to be generated by all activity in the region by 2025 is predicted to result in an increase in noise levels of approximately 1 dB(A) above current levels.

The impact from the additional vehicles on the road will be similar to the impact from existing vehicles using the road network. As such, the finding outlined in the EIS remains valid.

13.4.4 Potential Impacts and Management Measures

Where the modelled noise levels were found to exceed proposed noise criteria, mitigation measures in the form of acoustic treatment have been considered to manage potential impacts. The potential acoustic treatment options considered in the supplementary noise and vibration assessment are consistent with those outlined in the EIS and will be refined during detailed design.

Multi-well Pads

Mitigation and management measures, such as an insulated acoustic barrier, may be required to achieve the long-term night-time noise criterion of 28 dB(A) at nominated separation distances (between the nearest assessment location and the multi-well pad) for the multi-well pads (comprising 12 well heads) with temporary power supply. Application of typical attenuation measures (such as those presented in the EIS which resulted in an 80 m separation distance from single well pads), result in a separation distance of 400 m for a multi-well pad with 12 well heads. Siting constraints will determine the need for further acoustic treatment, if required.

Predicted noise levels modelled with acoustic treatment are shown as noise contours around the multi-well pad for the temporary power scenario in Figure 13.2.

Modelling of noise levels associated with single production wells in the EIS predicted that the long-term night-time noise criterion could be achieved at a distance of 200 m for the grid power scenario without acoustic treatment, which reduced to 80 m once treatment was incorporated.

Noise levels associated with the grid power scenario modelled for the multi-well pad are predicted to meet the long-term night-time noise criterion at 400 m or greater without attenuation. Siting constraints will determine the need for further acoustic treatment, if required.

Central Gas Processing Facility

Modelling indicates that with the application of acoustic treatment for all power scenarios, the long-term night-time noise criterion of 28 dB(A) will be achieved at a separation distance 1.5 km from the CGPF. This criterion can be achieved with the application of noise attenuation to specific noise sources at the CGPF, for all distances assessed. Application of typical attenuation measures (such as those presented in the EIS which resulted in a 1 km separation distance), result in a separation distance of 1.5 km for a CGPF for the updated configurations. Siting constraints will determine the need for further acoustic treatment, if required. Noise modelling for a CGPF in the EIS determined that the noise criterion of 28 dB(A) could be met at distances of 1 km or greater following the implementation of acoustic treatment.

Central Gas Processing Facility and Water Treatment Facility

Acoustic treatment has been considered at the main noise sources at the CGPF and water treatment facility to achieve the cumulative long-term night-time criterion of 28 dB(A) at assessment locations 1.5 km, 2 km and 3 km from the facilities. As such, attenuation at the water treatment facility will be designed to achieve a noise level of 18 dB(A) so as not to exceed the criterion. Modelling indicates that the noise level of 18 dB(A) can be achieved for distances of 1.5 km or greater, following implementation of acoustic treatment at the water treatment facility. Siting constraints will determine the need for further acoustic treatment, if required.

Noise levels modelled with acoustic treatment are shown as noise contours around the CGPF for the grid power scenario in Figure 13.3, and temporary power configuration 2 in Figure 13.4.

Low Frequency Noise

Potential low-frequency noise levels that could result inside typical dwellings were re-modelled as a result of updates to the project description. The modelling indicated that low frequency noise levels from a CGPF for which acoustic treatment has been applied, would achieve the noise criterion of 20 dB(A) during the evening and night-time and 25 dB(A) during the day, in accordance with the former Department of Environment and Resource Management (DERM) Assessment of Low Frequency Noise Draft Guideline (DERM, 2002). This finding is consistent with the findings of the EIS.

Impact on Livestock

Noise and vibration levels from the project are expected to be similar to those outlined in the EIS. As such, potential impacts on livestock detailed in the EIS remain valid.

Cumulative Assessment

The noise and vibration impacts associated with the project remain largely unchanged from those discussed in the EIS. Given this, no change is expected to the cumulative noise and vibration impacts reported in the EIS.

13.5 Conclusion

The findings of the supplementary noise and vibration assessment indicate that predicted construction and decommissioning noise levels described in the EIS remain valid. Similarly, predicted vibration impacts at sensitive receptors presented in the EIS for project construction and operation remain valid.

Operational noise levels are generally consistent with those reported in the EIS. Based on the updated modelling, the long-term night-time noise criteria can be achieved at a minimum distance from the facility which is reduced through varying levels of acoustic treatment.

Predicted noise levels associated with the operation of the maximum size multi-well pads for both the permanent and temporary power scenarios modelled, were higher than those reported in the EIS for the single wells. Under the grid power scenario, the long-term night-time noise criterion will be achieved at separation distances of 400 m without attenuation, compared to 200 m for single wells in the EIS. Under the temporary power scenario modelled, noise levels are expected to meet this criterion at distances of 400 m or greater with typical attenuation measures such as those presented in the EIS.

Noise modelling of the CGPF for the permanent and temporary power scenarios modelled indicates that operational noise levels can achieve the long-term night-time noise criterion of 28 dB(A) at distances of 1.5 km or greater with acoustic treatment. Siting constraints will determine the need for further acoustic treatment, if required.

As the potential noise and vibration impacts from the project remain largely consistent with the findings of the EIS, the conclusions for the cumulative impact assessment remain valid. The management measures presented in the EIS also remain valid and no changes to the noise and vibration commitments as a result of the study findings are proposed.

13.6 Issues Raised in Submissions

Submissions on the EIS raised a range of issues relating to noise and vibration. The issues fall in broad topics which are listed below.

- Buffer distances and sensitive receptors.
- Compliance with noise and vibration criteria.
- Construction noise and vibration.
- Consultation on noise and vibration impacts.
- Environmental authority conditions.
- Mitigation and management measures.
- Modelling results and analysis.
- Noise impacts on farming activities.
- Noise impacts on flora and fauna.
- Study method.
- Traffic noise and vibration.

The topics list is provided to give an idea of the types of issues that have been raised in relation to noise and vibration and for which responses have been provided under the heading ‘Noise and Vibration’ in Part B, Chapter 19, Submission Responses.