



Thurrock Flexible Generation Plant

**Environmental Statement Volume 4: Cumulative Effects Assessment
Chapter 24: Noise and Vibration**

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1. Introduction and Approach

1.1 Purpose of this chapter

1.1.1 This chapter of the Environmental Statement (ES) provides an assessment of the Noise and Vibration effects of the proposed development in combination with other relevant future development projects that have been scoped into the cumulative assessment.

1.1.2 In particular, this cumulative effects assessment (CEA) topic chapter:

- identifies the potential impact interactions of the proposed development in combination with other relevant future development projects;
- identifies the receptors with the potential to be significantly affected by these potential impact interactions and characterises these receptors, including their sensitivity and any relevant environmental thresholds;
- evaluates the likely significant cumulative effects on these key receptors as a result of the proposed development in combination with other development projects;
- identifies any additional mitigation measures that are proposed to prevent, minimise, reduce or offset these significant cumulative effects; and
- taking into account any proposed mitigation measures, evaluates the significance of predicted residual cumulative effects.

1.2 Approach to cumulative assessment

1.2.1 The assessment of Noise and Vibration cumulative effects follows the approach set out in Section 3 of Volume 2, Chapter 4: EIA Methodology.

1.3 Study area

1.3.1 There is no national government guidance or legislation on the extent of the study area to adopt for the assessment of noise effects from power generation infrastructure or the construction or operation of industrial facilities on NSRs. The study areas in this chapter have therefore been chosen on the basis of guidance contained within Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Part 7: Noise and Vibration (Highways Agency *et al.*, 2019), professional judgment of the distances over which significant noise effects may occur and consideration of the likely magnitude and duration of impact and the sensitivity of receptors.

1.3.2 Methodology for the selection of receptors for the assessment of each phase of the main project is set out in Section 2.3 of Volume 3, Chapter 11: Noise and Vibration. During all phases of the cumulative schemes, the study area for noise impacts considers NSRs within 1 km of the main development site boundary.

1.4 Screening of cumulative developments

1.4.1 Volume 4, Chapter 18: Cumulative Effects Assessment Introduction and Screening identifies a short-list of potential cumulative developments that have been screened as potentially relevant to the CEA overall (i.e. for one or more topic areas). From this shortlist of cumulative development projects, Table 1.1 identifies those projects that fall within the zone of influence for Noise and Vibration and have potential for cumulative effects that require assessment in this topic area.

1.4.2 Developments have been shortlisted in Table 1.1 where:

- the conclusions of the environmental assessments for those developments predicted significant effects on receptors within the zone of influence for the proposed Thurrock Flexible Generation Plant development; or
- where there is considered to be potential for effects that were not predicted to be significant for those individual developments but that may become significant in the cumulative scenario; or
- where environmental studies for those developments have not been published but there is sufficient information available about the development to both indicate the potential for cumulative effects and allow assessment.

1.4.3 Where sufficient information about a development to consider its potential for cumulative effects was not publicly available, the development has not been shortlisted.

Table 1.1: Shortlist of relevant cumulative developments.

ID	Development	Potential cumulative impacts (construction)	Potential cumulative impacts (operation and maintenance)	Potential cumulative impacts (decommissioning)	Receptor(s) affected
006	<p>The construction of a temporary load out and storage area and access to Station Road to enable removal of Pulverised Fuel Ash.</p> <p>Details of the magnitude of noise impact are not available. The impacts have been assessed based on the maximum level which can result from the cumulative scheme without resulting in a significant effect.</p>	<p>Potential impacts occur as a result of operational traffic from the cumulative development on the local road network.</p>	<p>Potential impacts occur as a result of construction activity on the cumulative site and its construction or operational traffic on the local road network.</p>	<p>n/a (no potential for this activity to still be occurring at the time of Thurrock Flexible Generation Plant decommissioning)</p>	<p>Receptors off Low St Lane, receptors along Church Road, Walnut Tree Farm, Havers Lodge, Buckland, receptors off Station Road, Goshem's Farm, Oak Lodge and Barvill's Farm.</p>
012	<p>Application for outline planning permission with some matters (appearance, landscaping, layout and scale) reserved: Proposed development of up to 1,000 dwellings (Use Class C3), a new local road network including a vehicular / pedestrian railway crossing, a new single form entry primary school, local centre including provision for a maximum of 750 sq.m. Use Class A1 (shops) / Use Class A3 (food and drink) / Use Class D1 (non-residential institutions) floorspace, and new areas of open space, including formal recreation.</p> <p>Details of the noise impacts of the construction phase of the scheme are provided in the Noise and Vibration chapter of the ES.</p>	<p>Potential impacts occur as a result of construction activity on the cumulative site and its construction or operational traffic on the local road network.</p>	<p>Potential impacts occur as a result of construction activity on the site and its construction or operational traffic on the local road network.</p>	<p>n/a (no potential for construction by the time of Thurrock Flexible Generation Plant decommissioning)</p>	<p>Receptors off Low St Lane, receptors along Church Road, Walnut Tree Farm, Havers Lodge, Buckland, receptors off Station Road, Goshem's Farm, Oak Lodge and Barvill's Farm.</p>
016	<p>Retention and completion of waste wood processing plant (Class B2/B8) & fire retained area bounded by concrete push walls, erection of buildings to form associated storage, reception/ administration, security, and staff welfare area; formation of impermeable surface to form a lorry parking/waiting area; weighbridge and staff parking area together with associated highways and drainage works</p> <p>Details of the noise impacts of the construction and operational phases of the scheme are provided in the Noise and Vibration report.</p>	<p>Potential impacts occur as a result of construction activity on the cumulative site and its construction traffic on the local road network or operation of plant and operational traffic on the local road network.</p>	<p>Potential impacts occur as a result of construction activity on the cumulative site and its construction traffic on the local road network or operation of plant and operational traffic on the local road network.</p>	<p>Potential impacts occur as a result of operational activity on the cumulative site and operational traffic on the local road network, or decommissioning activity on the cumulative site and its traffic on the local road network.</p>	<p>Byron Gardens, Sandhurst Road and all other properties bounding Fort Road and the railway line</p>
025	<p>Demolition of Tilbury B power station and all associated buildings and structures (including remaining structures from Tilbury A power station). The Jetty will not be demolished.</p> <p>Details of the noise impacts of the scheme are provided in the Noise and Vibration report.</p>	<p>Potential impacts occur as a result of any remaining demolition activity on the cumulative site and its traffic movements on the local road network.</p>	<p>n/a (demolition already largely completed and not expected to be ongoing at the time of Thurrock Flexible Generation Plant operation)</p>	<p>n/a (no potential for demolition to be ongoing by the time of Thurrock Flexible Generation Plant decommissioning)</p>	<p>Byron Gardens, Sandhurst Road and all other properties bounding Fort Road and the railway line</p>

ID	Development	Potential cumulative impacts (construction)	Potential cumulative impacts (operation and maintenance)	Potential cumulative impacts (decommissioning)	Receptor(s) affected
042	<p>Tilbury2: A new port facility acting alongside the existing Port of Tilbury. This will involve the extension of existing jetty facilities and the dredging of berth pockets in the River Thames, and land works and facilities for: a "Roll-On / Roll-Off" (Ro-Ro) terminal for importing and exporting containers on road trailers; a facility for importing and processing bulk construction materials; and areas of external storage for a variety of goods such as imported cars.</p> <p>The project also involves the construction of road and rail links to the site from adjacent networks.</p> <p>Details of the noise impacts of the construction and operational phases of the scheme are provided in the Noise and Vibration chapter of the ES. After a review of the DCO examination phase documents, it is apparent that no further noise results were produced for any phase of the scheme.</p>	<p>Potential impacts occur as a result of construction activity on the cumulative site, if ongoing, and/or operation of plant and traffic on the local road network, and impacts from the vessel traffic on the Thames.</p>	<p>Potential impacts occur as a result of operation of plant, operational traffic on the local road network and impacts from the vessel traffic on the Thames.</p>	<p>Potential impacts occur as a result of operational activity as described, or decommissioning activity on the cumulative site, and its traffic on the local road network.</p>	<p>Byron Gardens, Sandhurst Road and all other properties bounding Fort Road and the railway line, Farm off Gun Hill, St James' Church, Cooper Shaw Road, receptors off Low St Lane, receptors along Church Road, Walnut Tree Farm and Havers Lodge.</p>
050	<p>EIA Screening Opinion - Application for a Certificate of Lawfulness of Proposed Use or Development: Proposed processing of biofuels and other suitable waste derived feedstocks into a manufactured clean gas product (Use Class B2).</p> <p>Details of the magnitude of noise impact are not available at the screening stage.</p>	<p>Potential impacts occur as a result of construction activity on the cumulative site and its construction traffic on the local road network or operation of plant and operational traffic on the local road network.</p>	<p>Potential impacts occur as a result of construction activity on the cumulative site and its construction traffic on the local road network or operation of plant and operational traffic on the local road network.</p>	<p>Potential impacts occur as a result of operational activity on the cumulative site and operational traffic on the local road network, or decommissioning activity on the cumulative site and its traffic on the local road network.</p>	<p>Byron Gardens, Sandhurst Road and all other properties bounding Fort Road and the railway line</p>
058	<p>The Lower Thames Crossing will be a new road crossing connecting Essex and Kent. Located east of Gravesend and Tilbury, this new crossing will offer the improved journeys, new connections and network reliability, and economic benefits that only a new, alternative crossing, away from Dartford, can provide.</p> <p>Details available are severely limited with regards to the predicted impact of noise and vibration; all available information has been derived from the Preliminary Environment Information Report (PEIR).</p>	<p>A road scheme of this size has the potential to impact all nearby NSRs. Although details of the proposal and its impacts with regards to noise are unclear at this stage due to limited detail in the PEIR, there are expected to be significant impacts both during construction of the scheme, including traffic on local roads.</p>	<p>A road scheme of this size has the potential to impact all nearby NSRs. Although details of the proposal and its impacts with regards to noise are unclear at this stage due to limited detail in the PEIR, there are expected to be significant impacts both during construction and operation of the scheme, including traffic on local roads.</p>	<p>A road scheme of this size has the potential to impact all nearby NSRs. Although details of the proposal and its impacts with regards to noise are unclear at this stage due to limited detail in the PEIR, there are expected to be significant impacts during operation of the scheme, including traffic on local roads.</p>	<p>All assessed receptors</p>

1.5 Identifying cumulative developments affecting each receptor

1.5.1 Table 1.2 to Table 1.4 summarise the cumulative developments that have the potential to cause cumulative effects at each identified receptor, the sensitivity of that receptor to cumulative impacts, and the starting position to the cumulative effects assessment, which is the predicted residual effect of Thurrock Flexible Generation Plant alone during construction, operation and decommissioning (as established in Volume 3, Chapter 11: Noise and Vibration). Receptors are taken to be representative of other NSRs in the surrounding area, and have been named for the most affected receptors in the areas.

Table 1.2: Summary of cumulative developments affecting each receptor (construction).

Receptor affected	Sensitivity of receptor to cumulative effects	Standalone effect of Thurrock Flexible Generation Plant on receptor	Cumulative development(s) with the potential to affect this receptor
Byron Gardens	Medium	No change	016, 025, 042, 050, 058
Clarendon Road	Medium	No change	025, 042, 058
Goshems Farm	Medium	Negligible adverse (not significant)	012, 058
Havers Lodge	Medium	Negligible adverse (not significant)	012, 042, 058
Oak Lodge	Medium	Negligible adverse (not significant)	012, 058
Buckland	Medium	Negligible adverse (not significant)	012, 058
St James' Church	Medium	Negligible adverse (not significant)	042, 058
Walnut Tree Farm	Medium	Negligible to minor adverse (not significant)	012, 042, 058

Table 1.3: Summary of cumulative developments affecting each receptor (operation and maintenance).

Receptor affected	Sensitivity of receptor to cumulative effects	Standalone effect of Thurrock Flexible Generation Plant on receptor	Cumulative development(s) with the potential to affect this receptor
Byron Gardens	Medium	Minor adverse (not significant)	016, 042, 050, 058
Gun Hill Farm	Medium	Minor adverse (not significant)	042, 058
Galsworthy Road	Medium	Minor adverse (not significant)	016, 042, 050, 058
Havers Lodge	Medium	Minor to moderate adverse (not significant)	006, 012, 042, 058
Buckland	Medium	Moderate adverse (not significant)	006, 012, 042, 058
St James' Church	Medium	Minor adverse (not significant)	042, 058
Clarendon Road	Negligible adverse (not significant)	Negligible adverse (not significant)	042, 058

Table 1.4: Summary of cumulative developments affecting each receptor (decommissioning).

Receptor affected	Sensitivity of receptor to cumulative effects	Standalone effect of Thurrock Flexible Generation Plant on receptor	Cumulative development(s) with the potential to affect this receptor
Byron Gardens	Medium	No change	016, 042, 050, 058
Clarendon Road	Medium	No change	042, 058
Goshems Farm	Medium	Negligible adverse (not significant)	058
Havers Lodge	Medium	Negligible adverse (not significant)	042, 058
Oak Lodge	Medium	Negligible adverse (not significant)	058
Opposite Buckland	Medium	Negligible adverse (not significant)	058
St James' Church	Medium	Negligible adverse (not significant)	042, 058

Receptor affected	Sensitivity of receptor to cumulative effects	Standalone effect of Thurrock Flexible Generation Plant on receptor	Cumulative development(s) with the potential to affect this receptor
Walnut Tree Farm	Medium	Negligible to minor adverse (not significant)	042, 058

2. Assessment of Cumulative Effects

2.1.1 Cumulative effects have been considered on a scheme by scheme or group of schemes basis per type of receptor, due to the particular nature of the way noise combines. The logarithmic nature of noise means that the biggest schemes highly dominate the noise environment.

2.2 Construction phase of Thurrock Flexible Generation Plant

Residential Receptors

2.2.1 As described in Table 2.7 of Volume 3, Chapter 11: Noise and Vibration, all residential receptors are defined as having medium sensitivity.

Cumulative Scheme 042 – Tilbury2

2.2.2 The maximum level experienced at the closest residential receptors to the cumulative scheme ranges from 50 to 77 dB during the construction phase of the scheme, 55 dB during daytime operation and 51 dB during night-time operation, all assessed at the closest receptors in the vicinity of Byron Gardens.

2.2.3 The maximum level due to the construction of Thurrock Flexible Generation Plant is predicted to occur during piling operations within Zone A, and results in a level of 39 dB at the same receptor as those assessed by the cumulative scheme. As a result, the cumulative level of between 50 and 77 dB is dominated by the cumulative scheme.

2.2.4 If construction of Thurrock Flexible Generation Plant, during the worst-case phase above, were to operate continuously throughout a 24 hour period, the noise levels at the receptor due to the development would still be 39 dB. The levels from the operation of cumulative scheme 042 at night were predicted to be 51 dB, the combination of which results in a cumulative level of 51 dB at the receptors on and surrounding Byron Gardens, which is dominated by cumulative scheme 042. 51 dB is defined in Table 2.3 of Volume 3, Chapter 11 as moderate impact, and would constitute a +11 dB rating level difference above the background sound level, which by the methodology described in BS 4142:2014+A1:2019 is indicative of a significant adverse effect at a receptor of medium sensitivity, depending on the context.

2.2.5 However, it should be noted that these impacts are dominated by the cumulative scheme, and the same receptors affected by impacts from Thurrock Flexible Generation Plant construction phase alone were predicted to experience a magnitude of impact that is 'no change' to 'negligible'.

2.2.6 Tilbury2 ES concludes that construction activities have the potential to give rise to temporary, direct, adverse effects at receptors in Tilbury overlooking the proposed road and rail links. Therefore, Tilbury2 construction and Thurrock Flexible Generation Plant construction phases in combination also have the potential to cause adverse impacts at medium sensitivity receptors in the vicinity of Byron Gardens, giving rise to an adverse effect, however Thurrock Flexible Generation Plant would not contribute meaningfully to this adverse effect.

2.2.7 Tilbury2 ES also reports a number of significant effects during the operation of the scheme. Therefore, Tilbury2 operational and Thurrock Flexible Generation Plant construction phases in combination also have the potential to cause adverse impacts at medium sensitivity receptors in the vicinity of Byron Gardens, giving rise to an adverse effect, however Thurrock Flexible Generation Plant would not contribute meaningfully to this adverse effect.

Cumulative Scheme 058 – The Lower Thames Crossing

2.2.8 There is very little information currently available from the PEIR with regard to noise at any stage of the scheme. It is, however, considered likely that a road scheme of this size will have significant effects on nearby residential NSRs during the construction and operational phases, particularly with regard to piling and to tunnelling under the River Thames, prior to any mitigation that the scheme may employ.

2.2.9 It is anticipated that the scheme will have an impact at all receptors assessed for Thurrock Flexible Generation Plant; however, due to the proposed location directly adjacent to Thurrock Flexible Generation Plant gas connection route, it is expected that the closest residential NSR at Havers Lodge will be the most affected.

2.2.10 During the construction phase of Thurrock Flexible Generation Plant, the maximum level experienced at Havers Lodge is predicted to be 50 dB, as a result of HDD drilling within Zone C. This is 15 dB below the daytime threshold of impact of noise from construction, and so Thurrock Flexible Generation Plant would make no significant contribution to the cumulative level, which would be due to the cumulative scheme dominating the sound environment.

2.2.11 Therefore, the cumulative impact due to the combination of the construction of Thurrock Flexible Generation Plant and the construction or operation of the Lower Thames Crossing is anticipated to be at least moderate to major at the most affected receptors. A moderate to major impact at a medium sensitivity receptor will result in a moderate to major adverse cumulative effect, however Thurrock Flexible Generation Plant would not contribute meaningfully to this adverse effect.

Cumulative Scheme 025 – The Demolition of Tilbury B Power Station

- 2.2.12 The maximum level experienced by the closest receptors to cumulative scheme 025 is 52 dB during daytime demolition Scenario B. Substantial demolition work has already been completed at the time of writing, with the main power station buildings removed, but this level has been used as a worst-case to represent any demolition work that could still be ongoing at the time of Thurrock Flexible Generation Plant construction.
- 2.2.13 The maximum level due to the construction of Thurrock Flexible Generation Plant is predicted to occur during piling operations within Zone A, and results in 39 dB at the same receptor. As a result, the cumulative level of 52 dB is dominated by the cumulative scheme.
- 2.2.14 The planning statement for cumulative scheme 025 indicates that there are no plans for night-time operations.
- 2.2.15 The cumulative level of 52 dB is predicted to cause a negligible impact at the closest receptor, Byron Gardens, which is classified as having medium sensitivity. A negligible cumulative impact at a medium sensitivity receptor will result in a negligible cumulative effect, which is not considered significant in EIA terms.

Smaller Cumulative Schemes 012, 016, and 050

- 2.2.16 There are a number of other, smaller proposed schemes which share zones of impact with Thurrock Flexible Generation Plant, two of which are directly adjacent to the Thurrock Flexible Generation Plant application boundary, the other further to the east. Due to the spatial spread of the cumulative schemes, the only receptors which are predicted to be impacted by all schemes are those in the vicinity of Havers Lodge.
- 2.2.17 There is insufficient information available to quantitatively assess the magnitude of potential cumulative noise impacts from these schemes together with Thurrock Flexible Generation Plant. However, the maximum level predicted at Havers Lodge due to the construction of Thurrock Flexible Generation Plant alone is 50 dB, which occurs during HDD drilling within Zone C. This level is 15 dB below the indicative threshold of significant impact from short term construction works and leads to a negligible effect.
- 2.2.18 As such, any significant cumulative impact (were that to occur) would be due to the cumulative schemes rather than the contribution of Thurrock Flexible Generation Plant.

Total cumulative effects

- 2.2.19 As previously discussed, the nature of noise means that any assessment of the noise impacts of multiple schemes under construction or operating simultaneously is going to be dominated by the loudest of the schemes. In the scenario of all cumulative schemes being under construction or operating at the same time as the construction of Thurrock Flexible Generation Plant, Tilbury2 (cumulative scheme 042), in any phase, will dominate the noise environment to the west, and the Lower Thames Crossing (scheme 058), in any phase, will dominate to the east. In combination adverse impacts are anticipated at receptors closest to those schemes. Adverse impacts at medium sensitivity receptors will give rise to significant adverse effects, however the contribution of Thurrock Flexible Generation Plant to these effects is predicted to be small.

Further mitigation or enhancement

- 2.2.20 No further mitigation is considered to be required on behalf of Thurrock Flexible Generation Plant to mitigate impacts from construction activity.

2.3 Operation and maintenance phase of Thurrock Flexible Generation Plant

Residential Receptors

- 2.3.1 As described in Table 2.7 of the Volume 2, Chapter 11: Noise and Vibration, all residential receptors are defined as having medium sensitivity.

Cumulative Scheme 042 – Tilbury2

- 2.3.2 The maximum level experienced at the closest residential receptors to the cumulative scheme ranges from 50 to 77 dB during the construction phase of Tilbury2, and 55 dB and 51 dB during daytime and night-time operation respectively.
- 2.3.3 The specific sound level experienced due to the operation of Thurrock Flexible Generation Plant during operation is predicted to be 42 dB at same receptors on Byron Gardens, resulting in a BS 4142:2014+A1:2019 rating level difference of +2 dB, +6 dB and +8 dB during the daytime, evening and night-time periods respectively.

- 2.3.4 According to the Standard, a rating level difference of +10 dB is considered to be potentially indicative of a significant adverse effect at a receptor of medium sensitivity, depending on the context. During the daytime period, when Thurrock Flexible Generation Plant is most likely to operate, the specific level due to the operation of Thurrock Flexible Generation Plant alone is 8 dB below the threshold for potential significant impacts.
- 2.3.5 During the daytime period, specific levels from Tilbury2 are predicted to be between 50 and 77 dB, which indicates that any significant cumulative impact would be dominated by the cumulative scheme. The same is true of the evening period evening and night-time periods, if Thurrock Flexible Generation Plant were operating (with the same predicted specific sound level).
- 2.3.6 Tilbury2 ES concludes that construction activities have the potential to give rise to temporary, direct, adverse effects at receptors in Tilbury overlooking the proposed road and rail links. Therefore, Tilbury2 construction and Thurrock Flexible Generation Plant operational phases in combination also have the potential to cause adverse impacts at medium sensitivity receptors in the vicinity of Byron Gardens, giving rise to an adverse effect. Thurrock Flexible Generation Plant would contribute to this adverse effect; however it is predicted that the effect will be dominated by Tilbury2.
- 2.3.7 Tilbury2 ES also reports a number of significant effects during the operation of the scheme. Therefore, Tilbury2 and Thurrock Flexible Generation Plant operational phases in combination also have the potential to cause adverse impacts at medium sensitivity receptors in the vicinity of Byron Gardens, giving rise to an adverse effect, however Thurrock Flexible Generation Plant would not contribute meaningfully to this adverse effect.

Cumulative Scheme 058 – The Lower Thames Crossing

- 2.3.8 There is very little information currently available from the PEIR with regard to noise at any stage of the scheme. It is, however, considered likely that a road scheme of this size will have significant impacts on nearby residential NSRs, prior to any mitigation that may be employed.
- 2.3.9 The most affected receptors due to the operation of Thurrock Flexible Generation Plant are in the area of Havers Lodge, due to the highest specific levels, and Buckland, due to a lower background level. During the daytime, when Thurrock Flexible Generation Plant is most likely to operate, the rating level differences at these two receptors are both +1 dB. Both night-time rating level differences are on the threshold of significant adverse effect at a receptor of medium sensitivity (depending on the context), with +9 dB predicted at Buckland and +11 dB at Havers Lodge.

- 2.3.10 If the construction phase of the Lower Thames Crossing were to overlap with the operational phase of Thurrock Flexible Generation Plant, it is considered likely that significant impacts would occur. During the operational phase of Thurrock Flexible Generation Plant, the predicted rating levels result in the scheme being on the threshold of having a significant impact, therefore it is probable that lower sound levels than those described in BS 5228-1:2009+A1:2014 will result in a significant cumulative effect.
- 2.3.11 During the daytime, any cumulative impact of the two schemes operating simultaneously would be dominated by the Lower Thames Crossing. As such, were there to be a significant adverse effect from the Lower Thames Crossing, the cumulative contribution from Thurrock Flexible Generation Plant is not predicted to cause or materially increase the significance of effect.
- 2.3.12 During the night-time, there considered to be high potential for a magnitude of cumulative impact that would cause a significant adverse effect on the medium sensitivity receptors. However, a road scheme of the size of the Lower Thames Crossing is likely to dominate the future sound environment. As such, a significant adverse effect is considered likely with or without the cumulative contribution of Thurrock Flexible Generation Plant.

Smaller Cumulative Schemes 006, 012, 016, and 050

- 2.3.13 Due to the spatial spread of the cumulative schemes, the only receptors which are predicted to be impacted by all schemes are those in the vicinity of Havers Lodge. There is insufficient information available to quantitatively assess the magnitude of potential cumulative noise impacts from these schemes together with Thurrock Flexible Generation Plant. However, the maximum level predicted at Havers Lodge during the operational phase is 43 dB, equivalent to a +1 dB rating level difference during the daytime. This is 9 dB below the threshold at which significant adverse effects are likely to occur, as defined by BS 4142 (BSI, 2019). It is therefore considered that while a significant cumulative impact is possible, Thurrock Flexible Generation Plant would not have a meaningful contribution to the effect.

Total cumulative effects

- 2.3.14 As for the construction assessment in section 2.2, the noise impacts of multiple schemes will be dominated by the loudest of the schemes. In the scenario of all cumulative schemes being under construction or operating at the same time as the operation of Thurrock Flexible Generation Plant, Tilbury2 (cumulative scheme 042), in any phase, will dominate the noise environment to the west, and the Lower Thames Crossing (scheme 058), in any phase, will dominate to the east. In combination adverse impacts are anticipated at receptors closest to those schemes. Adverse impacts at medium sensitivity receptors will give rise to significant adverse effects, however the contribution of Thurrock Flexible Generation Plant to these effects is predicted to be small.

Further mitigation or enhancement

- 2.3.15 No further mitigation is considered to be required on behalf of Thurrock Flexible Generation Plant to mitigate impacts from operational activity.

2.4 Decommissioning phase of Thurrock Flexible Generation Plant

Residential Receptors

- 2.4.1 As described in Table 2.7 of the Volume 2, Chapter 11: Noise and Vibration, all residential receptors are defined as having medium sensitivity.

Cumulative Scheme 042 – Tilbury2

- 2.4.2 The maximum level experienced at the closest residential receptors to the cumulative scheme is 55 dB during daytime operation and 51 dB during night-time operation. The decommissioning phase of Tilbury2 is not discussed within the ES.
- 2.4.3 The maximum level due to the decommissioning of Thurrock Flexible Generation Plant results in a level of 39 dB at the same receptors on Byron Gardens. As a result, the cumulative level of 55 dB is dominated by the cumulative scheme.
- 2.4.4 During the Thurrock Flexible Generation Plant decommissioning, receptors are predicted to experience a magnitude of impact that is 'no change' to 'negligible'. Therefore there is no potential for Thurrock Flexible Generation Plant to make a material contribution to a significant cumulative effect.

Cumulative Scheme 058 – The Lower Thames Crossing

- 2.4.5 There is very little information currently available from the PEIR with regard to noise at any stage of the scheme. It is, however, considered likely that a road scheme of this size will have significant impacts on nearby residential NSRs during its operational phase, prior to any mitigation that may be employed. It is anticipated that the scheme will have an impact at all receptors assessed as part of the main assessment; however, due to the proposed location directly adjacent to Thurrock Flexible Generation Plant gas connection route, it is expected that the closest residential NSR at Havers Lodge will be the most affected.
- 2.4.6 During the decommissioning phase of Thurrock Flexible Generation Plant, the maximum level experienced at Havers Lodge is predicted to be 50 dB. This is 15 dB below the daytime threshold of impact of noise, and so Thurrock Flexible Generation Plant would make no significant contribution to the cumulative level, which would be due to the cumulative scheme dominating the sound environment.

Smaller Cumulative Scheme 016 and 050

- 2.4.7 When these schemes are assessed in isolation with Thurrock Flexible Generation Plant, any cumulative impact is predicted to be wholly due to the cumulative scheme, due to the negligible or lower impacts predicted as a result of Thurrock Flexible Generation Plant alone.

Total cumulative effects

- 2.4.8 As for the both previous assessments, the noise impacts of multiple schemes will be dominated by the loudest of the schemes. In the scenario of all four cumulative schemes being operating or being decommissioned at the same time as the decommissioning of Thurrock Flexible Generation Plant, Tilbury2 (cumulative scheme 042), during either phase, will dominate the noise environment to the west, and the Lower Thames Crossing (scheme 058), during either phase, will dominate to the east. In combination adverse impacts are anticipated at receptors closest to those schemes. Adverse impacts at medium sensitivity receptors will give rise to significant adverse effects, however the contribution of Thurrock Flexible Generation Plant to these effects is predicted to be small.

Further mitigation or enhancement

- 2.4.9 No further mitigation is considered to be required on behalf of Thurrock Flexible Generation Plant to mitigate impacts from decommissioning activity.

2.5 Conclusions

- 2.5.1 The Noise and Vibration effects of the proposed development have been assessed in combination with other relevant future development projects that have been scoped in to the cumulative assessment. Cumulative schemes have been selected based on distance from the boundary of the Thurrock Flexible Generation Plant site, and short listed based on the conclusions of the individual environmental assessments, and where this was unavailable, based on the information about the developments and the likelihood of them having a significant impact in combination with other schemes.
- 2.5.2 All receptors identified within the study areas are of medium sensitivity. Cumulative effects were considered on a scheme by scheme or group of schemes basis per type of receptor. The logarithmic nature of noise means that the biggest schemes highly dominate the noise environment.
- 2.5.3 During the construction phase of Thurrock Flexible Generation Plant, cumulative schemes 042 (Tilbury2) and 058 (the Lower Thames Crossing) both have the potential to individually cause significant adverse cumulative effects, however in both cases the effect is due to the cumulative scheme and Thurrock Flexible Generation Plant does not make a meaningful contribution to the cumulative level. In the scenario of all cumulative schemes being under construction or operating at the same time as the construction of Thurrock Flexible Generation Plant, Tilbury2, will dominate the noise environment to the west, and the Lower Thames Crossing will dominate to the east. In combination adverse cumulative effects are anticipated at receptors closest to those schemes, however Thurrock Flexible Generation plant is not predicted to contribute meaningfully to these effects.
- 2.5.4 During the operational phase of Thurrock Flexible Generation Plant, it is predicted that there is a potential for an adverse cumulative effect with Tilbury2 and the Lower Thames Crossing construction or operational phases, however in both cases the effect is due to the cumulative scheme and Thurrock Flexible Generation Plant does not make a meaningful contribution to the cumulative level. As with the construction phase, Tilbury2 will dominate the noise environment to the west and the Lower Thames Crossing will dominate to the east.
- 2.5.5 During the decommissioning phase of Thurrock Flexible Generation Plant, it is predicted that there is a potential for an adverse cumulative effect with Tilbury2 and the Lower Thames Crossing operational phases, however in both cases the effect is due to the cumulative scheme and Thurrock Flexible Generation Plant does not make a meaningful contribution to the cumulative level.
- 2.5.6 No further mitigation or management is recommended following the assessment of cumulative effects, outside of those described in Volume 6 Chapter 11 Noise and Vibration.

3. Reference List

British Standards Institution (BSI) (2014) British Standard 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites - Part 1: Noise. London, BSI.

British Standards Institution (BSI) (2019) British Standard 4142:2014+A1:2019. Methods for rating and assessing industrial and commercial sound. London, BSI.

The Highways Agency, Transport Scotland, Welsh Government and the Department for Regional Development Northern Ireland (2019) Design Manual for Roads and Bridges, Volume 11, Section 3, Part 7: Noise and Vibration (LA 111)