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FORD ENERGY RECOVERY FACILITY AND WASTE SORTING AND TRANSFER FACILITY, FORD CIRCULAR TECHNOLOGY PARK

ENVIRONMENTAL STATEMENT

CHAPTER 14

NOISE AND VIBRATION

Viridor GRUNDON

14 Noise and vibration

Introduction

14.1 This chapter of the ES assesses the potential impacts and associated likely effects of the proposed development in respect of noise and vibration at the identified nearest noise sensitive receptors (NSRs).

14.2 The following potential impacts have been considered:

- Demolition and construction noise and vibration
- Demolition and construction HGV noise
- Operational road traffic noise
- Operational noise from plant

14.3 This chapter describes the baseline conditions currently existing at the application site, the methods used to assess the potential impacts and likely effects arising from the proposed development and the residual effects following consideration of mitigation measures.

14.4 This chapter is supported by Technical Appendix J. The data sources and references used in the assessment are shown in table 14.1.

United Kingdom Parliament, 1974. Control of Pollution Act Part III - Noise
United Kingdom Parliament, 1990. Environmental Protection Act.
Ministry of Housing, Communities and Local Government, 2019. National Planning Policy Framework.
Department for Environmental, Food and Rural Affairs, 2010. Noise Policy Statement for England.
Ministry of Housing, Communities and Local Government, 2019. Planning practice guidance available from: https://www.gov.uk/government/collections/planning-practice-guidance
British Standards Institution, 2014 and 2019. BS 4142: 2014+A1:2019 Methods for rating and assessing industrial and commercial sound, BSI.
British Standards Institution, 2009 and 2014. BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites, BSI.
Department of Environment, 1988. Calculation of Road Traffic Noise, HMSO.
Highways England, Design Manual for Roads and Bridges – Sustainability & Environment Appraisal LA111 Noise and vibration Revision 1 (2020)
International Organization for Standardization, 1996. ISO 9613: 1996 Part 2 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation. ISO

Table 14.1: References and data sources

Legislation and policy

Legislation

Control of Pollution Act, 1974

14.5 Sections 60 and 61 of the Control of Pollution Act 1974, Part III give the local authority powers for controlling noise arising from construction and demolition works, regardless of whether a statutory nuisance has been caused or is likely to be caused. These powers may be exercised either before works start or after they have started.

Environmental Protection Act, 1990

14.6 Section 79 of the Environmental Protection Act 1990 (as amended) declares a number of items as statutory nuisances. Under the Environmental Protection Act, the local authority is required to periodically inspect its area to detect any nuisance and, where a complaint of a statutory nuisance is made by a person living within its area, to take such steps as are reasonably practicable to investigate the complaint. If a statutory nuisance exists, the local authority is obliged to serve an abatement notice.

National policy

National Planning Policy Framework

14.7 No specific noise criteria are set out in the National Planning Policy Framework (NPPF) or in the Noise Policy Statement for England (NPSE) to which it refers. Regarding noise, the NPPF states that the planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to, or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of noise pollution.

14.8 Paragraph 180 of the NPPF states that:

> *Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
>
> *a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
>
> *b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason…'*

14.9 To achieve these aims, the NPPF refers to the explanatory note in the NPSE.

Noise Policy Statement for England

14.10 The NPSE sets out the long-term vision of government noise policy which is to promote good health and a good quality of life through the effective management of noise within the context of government policy on sustainable development.

14.11 The NPSE outlines the following three aims for the effective management and control of mental, neighbour and neighbourhood noise:

- Avoid significant adverse impacts on health and quality of life
- Mitigate and minimise adverse impacts on health and quality of life
- Where possible, contribute to the improvement of health and quality of life

Guidance

Planning Practice Guidance

14.12 Planning Practice Guidance (PPG) is a web-based resource, which includes a section on noise. This resource provides guidance on how to determine the noise impact in terms of whether a significant adverse effect is likely to occur and / or whether a good standard of amenity can be achieved.

14.13 In line with the NPSE, PPG introduces the following concepts:

- Significant observed adverse effect level (SOAEL): This is the level of noise exposure above which significant adverse effects on health and quality of life occur
- Lowest observed adverse effect level (LOAEL): this is the level of noise exposure above which adverse effects on health and quality of life can be detected
- No observed adverse effect level (NOAEL): this is the level of noise exposure where noise can be heard, but does not cause any change in behaviour, attitude or other physiological response
- No observed effect level (NOEL): this is the level of noise exposure below which no effect at all on health or quality of life can be detected

14.14 Table 14.2 summarises the noise exposure hierarchy, based on the likely average response.

Perception	Examples of outcome	Increasing effect level	Action
Not noticeable	No effect	No Observed Effect	No specific measures
No Observed Adverse Effect Level			
Noticeable and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to	Significant Observed Adverse Effect	Avoid

Perception	Examples of outcome	Increasing effect level	Action
	sleep. Quality of life diminished due to change in acoustic character of the area.		
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Table 14.2: Noise exposure hierarchy

BS 4142:2014+A1:2019 Method for rating and assessing industrial and commercial sound

14.15 BS 4142:2014+A1:2019 provides a method for rating industrial and commercial sound and method for assessing resulting impacts upon people. The method is applicable to fixed plant installations, sound from industrial and manufacturing process and other associated activities.

14.16 The basis of BS 4142:2014+A1:2019 is a comparison between the background noise level in the vicinity of residential locations and the rating level of the noise source under consideration. The relevant parameters in this instance are as follows:

- Background Level, $L_{A90,T}$: defined in the Standard as the 'A' weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, and quoted to the nearest whole number of decibels
- Specific Level, $L_{Aeq,T}$: the equivalent continuous 'A' weighted sound pressure level at the assessment location in the absence of the specific sound source under consideration, over a given time interval, T
- Rating Level, $L_{Ar,T}$: the specific sound level plus any adjustment made for the characteristic features of the noise

14.17 Potential impacts are predicted from the difference between the representative background level at a noise sensitive receptor and the rating level from the noise source considered. The standard suggests that the greater the difference, the greater the magnitude of impact.

14.18 In determining the significance of the impact, BS 4142:2014+A1:2019 requires a consideration of the context of the assessment, i.e. the nature of the existing acoustic environment and the new noise source, and the sensitivity of the affected receptors.

BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites parts 1 and 2

14.19 BS 5228:2009+A1:2014 gives recommendations for basic methods of noise and vibration control relating to construction work. It also provides guidance concerning methods of predicting and measuring noise and vibration and assessing their impacts on those exposed to it. The prediction method considers the noise emission level of proposed plant, the separation distance

between the source and the receiver and the effect of the intervening topography and structures.

14.20 Part 2 of the standard gives recommendations for basic methods of vibration control relating to construction and open sites where work activities/operations generate significant vibration.

14.21 The legislative background to vibration control is described and recommendations are given regarding procedures for the establishment of effective liaison between developers, site operators and local authorities. The standard also provides guidance on measuring vibration and assessing its effects on the environment.

Calculation of Road Traffic Noise, 1988

14.22 Calculation of Road Traffic Noise (CRTN) sets out standard procedures for calculating noise levels from road traffic. The calculation method uses a number of input variables, including traffic flow volume, average vehicle speed and percentage of heavy goods vehicles (HGVs), to predict the $L_{A10,18hour}$ or $L_{A10,1hour}$ noise level for any receptor point at a given distance from the road.

The Design Manual for Roads and Bridges (DMRB), LA 111, 2020

14.23 The Design Manual for Roads and Bridges (DMRB) provides advice on the assessment of noise and vibration impacts due to road traffic. The guidance provides a classification of magnitude of impacts related to changes in road traffic noise levels. As people are less sensitive to noise level changes over time, the classification of impacts is provided in the short term and in the long term. Receptors typically acclimatise to road traffic noise over time, so that the effects are reduced in the long-term.

Methodology

Baseline

Survey methodology

14.24 Unattended noise monitors were installed at LT1, LT2 and LT3 (as shown on figure 14.1) between Friday 7th February 2020 and Friday 14th February 2020. LT1 was installed at a height of 1.5 m above local ground level and under free-field conditions. Noise levels were monitored continuously over the survey period and averaged over 15-minute intervals. The sound level meter calibration was checked upon installation and upon completion of the surveys. No significant drift in calibration was recorded.

14.25 Attended measurements of 15 minutes in duration were taken at seven positions (as shown on figure 14.1) on 7th February 2020:

- ST1: representative of noise levels affecting the nearest noise sensitive receptors on Ford Lane
- ST2: representative of noise levels at noise sensitive receivers along Rodney Crescent
- ST3: representative of noise levels at the south east corner of the site

- ST4: representative of noise levels at the north west corner of the site
- ST5: representative of noise levels at the nearby industrial unit
- ST6: representative of noise levels at noise sensitive receivers along Rollaston Park
- ST7: representative of noise levels at noise sensitive receivers along Yapton Road

14.26 Each measurement was taken at a height of 1.5 m above local ground level and under free-field conditions.

14.27 Full details of the weather conditions and equipment used during the survey are contained in the noise and vibration technical report contained in Technical Appendix J.

Impact assessment

14.28 For each assessment, the sensitivity of receptor has been determined in accordance with figure 14.2. The magnitude of change in noise level and resultant effect levels have been determined in accordance with figures 14.3 and 14.4, respectively, along with the descriptors of effects levels to the NPSE.

14.29 If the degree of effect is moderate or above, then the effect is considered to be significant.

Receptor locations

14.30 The receptor locations considered in this assessment are detailed in table 14.3 and figure 14.5.

Location	Description	Approximate distance from site (m)
R1	Residential dwellings along Ford Lane	200
R2	Residential dwelling set back from Ford Lane	290
R3	Residential dwellings along Rodney Crescent	385
R4	Residential dwellings along Rollaston Park	400
R5	Proposed residential dwellings to the north west of the site	105
R6	Proposed residential dwellings to the south of the site	245
R7	Residential dwellings along Nelson Row	505
R8	Non-residential use at Ford Prison	510
R9	Residential use at Ford Prison	700
R10	Residential property along Ford Road	840

Table 14.3: Receptor locations

14.31 Receptors R5 and R6 are considered within The Landings section of the chapter as these are not existing receptors, but potential future receptors.

14.32 All receptors are deemed to be medium-high sensitivity.

Construction noise

14.33 The construction works associated with the proposed development will involve the use of a variety of working methods which will change throughout the

construction period. Therefore, noise levels from the works are likely to vary significantly over time as the type of construction activities change.

14.34 The exact working methodology and plant to be employed during construction has not been established at this stage in the design. However, following best practice, an estimate of the expected noise levels over a representative period has been undertaken using assumed plant items and the associated noise emission data from BS 5228:2009+A1:2014.

14.35 The significance criteria for construction noise levels at the NSRs have been established by reference to the ABC method described in BS 5228:2009+A1:2014. The thresholds are made relative to the pre-existing ambient noise levels at assessment locations, as shown in table 14.4.

Assessment period	Threshold values, $L_{Aeq,T}$ (dB)		
	Category A	Category B	Category C
Daytime (07:00 – 19:00) Saturday (07:00 – 13:00)	65	70	75
Evening (19:00 – 23:00)	55	60	65
Night time (23:00-07:00)	45	50	55

Table 14.4: BS5228 'ABC' method for construction noise

14.36 A potential significant noise effect is indicated when the construction noise exceeds the threshold level for the category appropriate to the ambient noise level:

- Threshold values of Category A for construction noise should be used when the pre-existing ambient noise level, rounded to the nearest 5 dB, is less than those values shown under Category A
- Threshold values of Category B should be used when pre-existing ambient noise level, rounded to the nearest 5 dB, is equal to values in Category A
- Threshold values of Category C should be used when pre-existing ambient noise level, rounded to the nearest 5 dB, is more than values in Category A

14.37 Construction noise predictions have been based on the methodology contained within BS 5228:2009+A1:2014. This enables predictions to be made of the noise emissions from the construction activities for given distances from the application site boundary.

14.38 Table 14.5 details the significance of effects for demolition and construction noise.

Description	Magnitude of impact	Adverse effect level
Predicted construction noise levels are less than or equal to the threshold value at receptor	Negligible	NOAEL
Predicted construction noise levels are ≤3 dB above the threshold value at receptor	Slight	LOAEL
Predicted construction noise levels are 3-4.9 dB above the threshold value at receptor	Moderate	SOAEL
Predicted construction noise levels are 5-9.9 dB above the threshold value at receptor	Substantial	SOAEL
Predicted construction noise levels are above the threshold value at receptor by 10 dB or more	Very Substantial	SOAEL

Table 14.5: Demolition and construction noise significance criteria

Construction traffic noise

14.39 Noise levels generated by construction traffic on the local highways have been calculated following the haul route method set out in Annex F.2.5 of BS 5228:2009+A1:2014.

Construction vibration

14.40 Vibration levels from piling may be perceptible at distances up to 100 m from the works. Of the receptors identified, the closest existing receptor is 200 m away from the site boundary.

14.41 Therefore, significant effects are not expected to occur due to demolition and construction vibration at existing receptor locations. No further assessment of demolition and construction vibration is provided in this chapter.

Operational noise assessment

14.42 The operational noise assessment will comprise:

- Determination of rating noise levels from fixed plant and site processes, using the methodology of BS 4142:2014+A1:2019
- Prediction of plant and site process noise emissions to the nearest sensitive receptors
- Assessment of the changes in road traffic noise levels due to the operation of the site.

Operational noise limits

14.43 Operational noise limits will be set based on the background noise levels measured during the baseline survey. In accordance with BS 4142:2014+A1:2019, the rating noise level limits will be set equal to the representative background noise levels, allowing for any penalties for acoustic characteristics of the noise.

Noise emissions from plant and site processes

14.44 Using the benchmarking measurement results, a noise prediction model of the site has been built to predict noise emissions to the nearest receptor locations. The model uses the calculation method of ISO9613-2:1996 and allows for the effects of building massing, site topography, ground absorption and any screening.

14.45 Table 14.6 details the significance of effects for operational noise based on the numerical difference between predicted Rating Level and the prevailing Background Level at a receptor and the criteria from BS 4142:2014+A1:2019.

Description	Magnitude of impact	Adverse effect level
Predicted Rating Level is below the prevailing Background Level at the receptor.	No Effect	NOEL
Predicted Rating Level is between 0 dB and +2.9 dB compared to the prevailing Background Level at the receptor.	Negligible	NOAEL

Predicted Rating Level is between 3.0 dB and 4.9 dB above the prevailing Background Level at the receptor.	Slight	LOAEL
Predicted Rating Level is between 5 dB and 9.9 dB above the prevailing Background Level at the receptor.	Moderate	SOAEL
Predicted Rating Level is ≥10 dB above the prevailing Background Level at the receptor.	Substantial	SOAEL

Table 14.6: Operational noise significance criteria

Changes in road traffic noise levels

14.46 The proposed development, when completed, has a potential to change traffic flows on the existing roads in the area surrounding the application site. The results have been assessed using the guidance on long-term changes in traffic noise levels in LA111 (DMRB). The magnitude of the predicted impact in noise levels uses the scale shown in table 14.7.

Change in Traffic Basic Noise Level $L_{A10,18h}$ dB	Magnitude of impact	Adverse effect level
≥ 10.0	Substantial	SOAEL
5.0 to 9.9	Moderate	SOAEL
3.0 to 4.9	Slight	LOAEL
< 3.0	Negligible	NOAEL

Table 14.7: Magnitude of Impact - Road Traffic Noise Changes (long term)

14.47 The change in noise levels between the baseline year (2018) and 2025 with committed development and construction of the proposed development, have been assessed against the short-term criteria of LA111. The magnitude of the predicted impact in noise levels uses the short-term scale shown in table 14.8.

Change in Traffic Basic Noise Level $L_{A10,18h}$ dB	Magnitude of impact	Adverse effect level
≥ 5.0	Substantial	SOAEL
3.0 to 4.9	Moderate	SOAEL
1.0 to 2.9	Slight	LOAEL
< 1.0	Negligible	NOAEL

Table 14.8: Magnitude of Impact - Road Traffic Noise Changes (short term)

Consultation

14.48 The Environmental Health teams at Arun District Council and West Sussex County Council were consulted by email to agree the scope and assessment methodology, and assessment criteria.

14.49 A subsequent email was issued to Arun District Council on the 5th February 2021 to respond to comments and requests made by Arun District Council in a Regulation 25 request (dated 20th November 2020). The Regulation 25 request was made by West Sussex County Council for application number WSCC/036/20, as set out in chapter 5. A copy of this email is set out in Technical Appendix J.

Limitations and uncertainties

14.50 All reasonable measures have been undertaken to reduce uncertainty in the baseline noise survey data and the calculations detailed in this assessment.

14.51 Uncertainty has been minimised by completing unattended measurements over daytime, evening, weekend and night-time periods. Attended measurements were completed (where possible) at the nearest receptor locations to support the unattended measurements. Results have also been rounded to the nearest A-weighted decibel.

14.52 The baseline noise prediction model was calibrated to the noise survey results for road traffic noise sources, and accounts for intervening topography and existing building massing. The model uses the calculation method of ISO9613-2:1996.

14.53 Plant noise emissions are based on benchmarking measurements from an existing energy from waste facility (i.e. the Lakeside EfW facility at Slough) and based on indicative plant noise emission levels stated by the engineering design team.

Baseline

Attended noise survey results

14.54 A summary of the attended survey results is shown on table 14.9. Three measurements of 15-minutes in duration were taken during daytime periods (12:00-19:30).

Measurement position	Representative $L_{Aeq,T}$ (dB)	Highest L_{AFmax} (dB)	Lowest $L_{A90,15mins}$ (dB)
ST1 (Ford Lane)	68	86	38
ST2 (Rodney Crescent)	46	60	43
ST3 (South-east corner of site)	58	86	40
ST4 (North-west corner of site)	52	75	39
ST5 (Industrial units along Rollaston Park)	55	77	47
ST6 (Residential along Rollaston Park/Beagle Drive)	65	87	45
ST7 (Yapton Road)	66	88	52

Table 14.9 Attended noise survey results summary

14.55 The noise climate at ST1 was dominated by traffic noise from Ford Lane. Some noise from vehicles on Ford Road was also audible. No noise from the existing waste management site was audible.

14.56 The noise climate at ST2 was dominated by site traffic noise from the industrial park, some traffic noise from Ford Road and birdsong was also audible. No noise from the existing waste management site was audible.

14.57 The noise climate at ST3 was dominated by site traffic movements at the existing waste management site. Traffic from surrounding roads along with a loud drain cover directly opposite the measuring position at LT3 were also audible, along with occasional air traffic.

14.58 The noise climate at ST4 was dominated by site traffic movements and birdsong. Some works from nearby industrial units was audible along with distant road traffic noise. Occasional train passbys were also audible, along with occasional aircraft noise.

14.59 The noise climate at ST5 was dominated by works noise from industrial units, and occasional traffic along Rollaston Park. Distant road traffic noise and occasional aircraft noise was also audible.

14.60 The noise climate at ST6 was dominated by birdsong and traffic along Rollaston Park. Works noise audible from industrial units, along with distant traffic noise and occasional air traffic.

14.61 The noise climate at ST7 was dominated by road traffic noise along Yapton Road. Distant traffic noise and occasional aircraft noise was also audible.

14.62 Noise measurements were not completed at Ford Prison. However, the noise climate receptors R8 and R9 is expected to comprise road traffic noise from Ford Road, and other prison site activity.

Unattended noise survey results

14.63 Full details of the unattended survey results are provided in Technical Appendix J.

14.64 The noise climate LT1 was dominated by site traffic movements from the existing waste management site. Some aircraft noise from Gatwick Airport was audible. Typical daytime average noise levels ranged from 52-56 dB $L_{Aeq,16hour.}$ Daytime background noise levels ranged from 46-49 dB $L_{A90,15min.}$ Daytime maximum noise levels were dictated by individual vehicle movements on and off the existing waste management site. Night-time average noise levels ranged from 48-58 dB $L_{Aeq,8hour}$. Night-time background noise levels ranged from 44-49 dB $L_{A90,15min}$. Night-time maximum noise levels were expected to be dictated by traffic noise along surrounding roads.

14.65 The noise climate LT2 was dominated by air traffic movements and train passbys. Occasional site traffic was audible. Typical daytime average noise levels ranged from 47-55 dB $L_{Aeq,16hour}$. Daytime background noise levels ranged from 39-47 dB $L_{A90,15min.}$ Daytime maximum noise levels were dictated by individual vehicle movements on and off the existing waste management site. Night-time average noise levels ranged from 41-59 dB $L_{Aeq,8hour}$. Night-time background noise levels ranged from 31-47 dB $L_{A90,15min}$. Night-time maximum noise levels were expected to be dictated by traffic noise along surrounding roads.

14.66 The noise climate LT3 was dominated by traffic along Ford Road and site movements on and off site. A loud drain cover directly opposite measuring position also caused loud, impulsive events. Typical daytime average noise levels ranged from 64-67 dB $L_{Aeq,16hour}$. Daytime background noise levels ranged from 41-53 dB $L_{A90,15min.}$ Daytime maximum noise levels were dictated by traffic along Ford Road, and the loud drain cover directly opposite the measurement position. Night-time average noise levels ranged from 56-63 dB $L_{Aeq,8hour}$. Night-time background noise levels ranged from 34-48 dB $L_{A90,15min}$. Night-time maximum noise levels were expected to be dictated by traffic along Ford Road, the loud drain cover directly opposite the measurement position, and traffic from surrounding roads.

Future baseline

14.67 The change in road traffic noise levels due to traffic growth and committed development is assessed in the effects post-construction section of this chapter, under the sub-heading changes in road traffic noise levels.

Effects during construction

14.68 Demolition and construction noise emission thresholds have been calculated based on the methodology set out in BS 5228:2009+A1:2014 and measured ambient noise levels on site. The thresholds are summarised in table 14.10.

NSR considered	Prevailing ambient noise level during daytime period, $L_{Aeq,T}$ (dB)	BS5228 noise emission category	Construction noise threshold at NSR, dB $L_{Aeq,T}$ Daytime (07:00-19:00) and Saturdays (07:00-13:00)	Construction noise threshold at NSR, dB $L_{Aeq,T}$ Saturdays (13:00-19:00)
R1: Ford Lane	68	C	75	65
R2: Ford Lane	68	C	75	65
R3: Rodney Crescent*	46	A	65	55
R4: Residential dwellings along Rollaston Park/Beagle Drive	62	A	65	55
R7: Residential dwellings along Nelson Row	65	B	70	60
R8: Non-residential use at Ford Prison**	52	A	65	55
R9: Residential use at Ford Prison**	56	A	65	55
R10: Residential dwelling along Ford Road***	68	C	75	65

Table 14.10: Demolition and construction noise thresholds at NSR

*Based on rear façade levels taken from the noise prediction model, and verified against the results of the attended survey at measurement position ST2.
**Predicted from the noise prediction model.
***Noise level is assumed to be the same as noise data measured at survey location LT3. It is believed noise levels will be similar to those at receptor location R8.

14.69 Noise emissions during site preparation and construction activities (including site traffic) have been calculated at the nearest NSRs. The emissions were calculated based on a number of assumptions relating to construction methods and plant. The actual construction noise levels may vary depending on the type of activity, periods of operation, and distances between source of noise and receivers. However, conservative assumptions have been made regarding these parameters.

14.70 Noise emissions from each of the following anticipated construction activities was calculated:

- Demolition
- Substructure
- Superstructure

- Earthworks
- External works

Demolition and construction noise assessment

14.71 Demolition and construction noise modelling have been completed to predict the likely noise levels for existing and proposed receptors.

14.72 Based on the construction programme, 7 scenarios have been identified:

- Scenario 1 – Build WSTF
- Scenario 2 – Build WSTF and demolish existing WTS
- Scenario 3 – Demolish existing WTS
- Scenario 4 – Construct ERF and excavate to lower ground level
- Scenario 5 – Construct ERF
- Scenario 6 – Construct ERF and landscaping
- Scenario 7 – Landscaping

14.73 Each scenario presents a typical construction day based on the likely activities on site, rather than individual discrete activities.

14.74 Details of the plant items used in the calculations for each activity, and the modelling assumptions and inputs are provided in Technical Appendix J.

14.75 All modelled scenarios allow for 2.4m site hoarding around the site perimeter.

14.76 The noise contours for each scenario are provided in figures 14.6-14.12. Note that the noise levels shown are the free-field noise levels, and do not include a +3 dB façade reflection. The noise contours represent noise levels that are predicted to be ≥55 dB $L_{Aeq,T}$ at a height of 1.5m above ground level. This threshold has been selected as this is the lowest of the construction noise thresholds for Saturday working (13:00-19:00) and demonstrates a worst-case scenario. Therefore, the noise contours would reduce in size for construction working between Monday to Friday (07:00-19:00) and Saturday (07:00-13:00).

14.77 The assumed work areas have been input to the model at the height stated in Technical Appendix J. Each area assumes that all plant associated with the designated activity would operate within that area. Where there are two activities operating in a given scenario, this may be an overprediction of the total number of plant items that are operating on site. For example, scenario 2 (Build WTSF and demolish existing WTS) would allow for all plant associated with superstructure and demolition activities, as detailed in Technical Appendix J.

14.78 The results of the construction noise assessment are shown in table 14.11. A +3 dB façade reflection has been applied to the predicted results for residential receptors. The levels are predicted at a height of 1.5m above ground level to represent ground floor level.

Scenario	Receptor location and predicted noise level ($L_{Aeq,T}$ dB) at ground floor level (1.5m height)							
	R1	R2	R3	R4	R7	R8	R9	R10
1. Build WSTF	39	43	43	43	46	40	37	37
2. Build WSTF and demolish existing WTS	51	51	50	46	49	43	41	39
3. Demolish existing WTS	52	51	51	43	48	42	42	39
4. Construct ERF and excavate to lower ground level	56	55	53	45	51	46	47	43
5. Construct ERF	51	51	49	40	47	41	42	38
6. Construct ERF and landscaping	48	47	45	43	42	36	35	33
7. Landscaping	48	48	46	46	45	39	38	37

Table 14.11: Demolition and construction noise assessment (ground floor)

14.79 The results of the construction noise assessment, predicted at 4m above ground level to represent first floor level, are shown in table 14.12. A +3 dB façade reflection has been applied to the predicted results for residential receptors.

Scenario	Receptor location and predicted noise level ($L_{Aeq,T}$ dB) at first floor level (4m height)							
	R1	R2	R3	R4	R7	R8	R9	R10
1. Build WSTF	39	43	46	44	47	44	39	39
2. Build WSTF and demolish existing WTS	52	51	51	46	50	47	43	41
3. Demolish existing WTS	53	51	52	44	49	46	43	40
4. Construct ERF and excavate to lower ground level	58	55	54	47	52	49	48	45
5. Construct ERF	52	51	49	41	47	44	43	39
6. Construct ERF and landscaping	49	47	45	44	43	39	36	34
7. Landscaping	49	48	47	46	46	42	39	38

Table 14.12: Demolition and construction noise assessment (first floor)

***Predicted at a height of 1.5m as R2 is understood to be single storey**

14.80 The results of the calculations show that the predicted construction noise levels are below the thresholds set in table 14.10, except for at receptor R1 (due to scenario 4) where the Saturday (13:00-19:00) threshold may be exceeded, for a period of up to 6 months.

14.81 The lowest threshold of 65 dB $L_{Aeq,T}$ that applies between Monday to Friday (07:00-19:00) and Saturday (07:00-13:00) is not predicted to be exceeded at any receptor location.

14.82 Vehicles and cranes used in the construction works will be fitted with reversing alarms and horns for safety. Reversing alarms can generate a sound level of up to 90 dB(A) at 1 m from the source. Assuming unscreened hemispherical propagation over 200 m, the resulting noise level would be up to 44 dB(A) at the nearest receptor (R1). This is significantly below the construction noise threshold and therefore noise impacts are not expected from reversing alarms.

14.83 Therefore, demolition and construction noise are expected to result in short term negligible effects for works between Monday to Friday (07:00-19:00) and Saturday (07:00-13:00), for all seven modelled scenarios. Short term slight

adverse effects are predicted at receptor location R1 for works on Saturday (13:00-19:00) but these effects are not considered significant.

Construction traffic assessment

14.84 Noise from construction traffic was calculated using the haul route method set out in BS 5228:2009+A1:2014. Details of the calculations can be found in Technical Appendix J.

14.85 The receptors most exposed to construction traffic noise will be the receptors along Ford Road, on Nelson Row (R7), and further along Ford Road (R8). The receptors at R7 and R8 are approximately 23 m and 10 m from the centre of the carriageway respectively.

14.86 During Saturday hours of 13:00-19:00, HGV movement numbers will be reduced when lower construction noise thresholds apply, to reduce the potential effect levels experienced by the receptors.

14.87 Calculated noise levels from table 14.13 include a 3 dB correction to provide the noise level at the façade of the dwelling. Noise levels at the receptors are below the construction noise thresholds set out in BS 5228:2009+A1:2014. Therefore, it is expected that demolition and construction HGV traffic noise will result in short term negligible effects.

Receptor	Period	Speed (km/h)	Distance from centre of haul route (m)	Two way HGV movements per period	Noise Level (dB $L_{Aeq,T}$)
Nelson Row (R7)	Weekday daytime (07:00-19:00)	40	23	102	61
	Peak workday hour			15	63
	Saturday (07:00-13:00)			13	62
	Saturday (13:00-19:00)			4	58
Ford Rd (R10)	Weekday daytime (07:00-19:00)		10	102	65
	Peak workday hour			15	67
	Saturday (07:00-13:00)			13	66
	Saturday (13:00-19:00)			4	61

Table 14.13: Construction traffic noise assessment

Grid connection

14.88 During the construction phase a grid connection will need to be made so that the ERF can supply energy to the National Grid. The local distribution network operator (Scottish and Southern Electricity (SSE)) will be responsible for connecting the ERF to the National Grid. As such the planning application boundary does not include the grid connection route from the proposed development site to the existing substation to the north of Arundel Road / A27 near Crockerhill, which is the closest available point of connection for the ERF.

14.89 The construction noise emissions along the grid connection route are expected to be similar in nature and duration to those of typical road and utilities works. Therefore, short term negligible effects are expected.

Effects post-construction

14.90 A 3D noise prediction model was prepared to calculate the plant and activity noise emissions from the proposed facility at each NSR. Daytime levels were predicted at a height of 1.5m and night-time noise levels were predicted at a height of 4m at the façade. The exceptions to this are receptors R2, R8 and R9.

14.91 R2 is understood to be single storey. The levels predicted for receptor location R2 are therefore at a height of 1.5m above ground level for both daytime and night-time periods.

14.92 R8 and R9 are modelled at a height of 4m for daytime and night-time periods. For R8, it is assumed that both storeys of the building could be used, although this is expected to be for daytime hours only if the building is for non-residential use. Both storey levels of R9 will be occupied during daytime and night-time periods and so the levels are predicted at 4m to represent the first floor, which will have the least screening to the existing and proposed noise sources.

14.93 The noise predictions have been undertaken in accordance with ISO9613-2.

14.94 The noise sources associated with the facility used in the model are detailed in table 14.14.

Area/Plant Item	Noise level	Reference
Process areas	85 dB L_{Aeq} reverberant level	Benchmarking measurements
Turbine hall	85 dB L_{Aeq} reverberant level	Benchmarking measurements
Tipping hall	80 dB L_{Aeq} reverberant level	Benchmarking measurements
Air cooled condensers	80 dB L_{wA} per m^2	Benchmarking measurements
Stacks	89 dB L_{wA} at the top of stacks	Assumed from previous schemes
Transformer	87 dB L_{wA}	Benchmarking measurements
Lorries (44t)	106 dB L_{wA} moving point sources	BS 5228:2009+A1:2014 C8.19
Refuse collection vehicles (26t)	107 dB L_{wA} moving point sources	BS 5228:2009+A1:2014 C11.16
WTSF (Loading shovel)	81 dB L_{Aeq} reverberant level	BS 5228:2009+A1:2014 C6.34

Table 14.14: Noise sources in model

14.95 Where the results of benchmark noise measurements have been used, the highest measured ambient reverberant sound level in each area of the facility has been used. This is considered representative of a worst-case scenario, as variations of noise levels are expected to occur within each area of the facility.

14.96 Based on experience on similar projects, a sound power of 89 dB L_{wA} at the top of each stack has been assumed in the noise prediction model.

14.97 The following external envelope and inherent mitigation measures were included in the model:

- An external envelope to be a composite cladding panel system (or equivalent) rated at least R_w 35 dB will be installed
- The roof will provide a performance of R_w 23 dB
- Non-acoustic weather louvres to the ERF and WSTF (assuming to provide R_w 4 dB attenuation)
- The boundary screening (bunds and fencing) provide up to 10.4m screening

- The screen around the air cooled condensers and boundary screening (fences) comprise a minimum density of 10kg/m^2. All boundary screens must contain no gaps and must extend down to ground level (where applicable). The noise from the condensers is modelled as emitting from just below the bottom of the screen to provide a worst case assessment
- Standard roller shutter doors rated at least R_w 15 dB.

14.98 The number of HGVs accessing the site during evening and night-time periods have been input to the model as advised by the transport assessment. However, night-time HGV movements are understood to be confined to the hours of 06:00-07:00 Monday to Friday.

14.99 Saturday HGV movements are expected to be confined to 08:00-18:00. Therefore, the daytime operational noise assessment is applicable to the likely noise emissions for Saturdays.

14.100 Daytime HGV movements (44t lorries and 26t refuse collection vehicles (RCV)) in the model have been input based on the results of the transport assessment but have been factored to account for the baseline daytime HGV movements. This includes 100 baseline two-way HGV movements (67 RCVs and 33 44t lorries) as would have been present during the baseline noise survey. It is understood that more typically, baseline HGV movements are 72 two-way HGV movements. The model therefore considers the increase over the baseline HGV movements along the site access road off Ford Road, and the total number of HGV movements serving both the ERF and WSTF on site.

14.101 Of the HGVs serving the ERF, the model assumes that 90% will use the tipping hall. 10% of HGVs are assumed to use the site perimeter road and enter the IBA loading and/or residue areas before leaving site. All HGVs serving the ERF between the hours of 06:00-07:00 have been modelled to use the tipping hall. The model does not consider any HGVs using the site perimeter road during these hours.

14.102 Lorry and RCV speeds were assumed to be 20 mph on the site access road and 10 mph on site. These are conservative assumptions as noise exposure will increase with lower HGV speeds.

14.103 Following BS 4142:2014+A1:2019, penalties should be added to the specific noise level at a receptor to account for acoustic features such as tonality, intermittency and impulsivity, if such features are discernible at the receptor. From the noise input data, no plant items have been deemed to be tonal. Therefore, a tonality penalty has not been applied to the calculated specific noise levels. The facility will therefore be designed so that tonal plant is not operated on the site.

14.104 A 3dB penalty has been applied for impulsivity which may just be perceptible at the noise receptor to obtain the resultant rating levels. This penalty has been applied to account for HGV movements on site and on the access road, and noise activity from the WSTF, e.g. handling of waste which may be audible over the typical noise climate. However, it should be noted that these noise sources and impulsive noise characteristics are already present on site.

14.105 The results of the noise model are summarised in table 14.15. Background noise levels have been determined using the noise prediction model that is calibrated to road traffic noise sources. The predicted levels have been verified for receptor location R3 using the noise survey data from locations LT3 and ST2. The background levels for receptor R7 are taken from the results of the baseline survey. Rating levels are at the receptor façade location and do not include a façade reflection. The specific and rating noise levels are in terms of daytime 1-hour periods and night-time 15-minute periods. All noise levels and rating level excesses have been rounded to the nearest whole decibel.

NSR considered	Background Level, $L_{A90,T}$ (dB)		Predicted Specific Noise, $L_{Aeq,T}$ (dB)		Resulting Rating Level, $L_{Ar,T}$ (dB)		Excess of rating level over background noise level (dB)	
	Daytime	Night-Time	Daytime	Night-Time	Daytime	Night-Time	Daytime	Night-Time
R1	40	35	34	30	37	33	-3	-2
R2	39	32	37	31	40	34	1	2
R3	41	36	31	29	34	32	-7	-4
R4	37	31	32	30	35	33	-2	2
R7	45	34	40	29	43	32	-2	-2
R8	41	36	35	29	38	32	-3	-4
R9	40	35	32	26	35	29	-5	-6
R10	40	36	27	25	30	28	-10	-8

Table 14.15: Predicted operational noise levels

14.106 The results of the noise model for 06:00-07:00 when HGVs are operational during night-time periods are summarised in table 14.16.

NSR considered	Background Level, $L_{A90,1\text{-hour}}$ (dB)	Predicted Specific Noise, $L_{Aeq,1\text{-hour}}$ (dB)	Resulting Rating Level, $L_{Ar,1\text{-hour}}$ (dB)	Excess of rating level over background noise level (dB)
	Night-Time	Night-Time	Night-Time	Night-Time
R1	37	35	38	1
R2	37	37	40	3
R3	39	35	38	-1
R4	35	32	35	0
R7	41	41	44	3
R8	37	35	38	1
R9	37	32	35	-2
R10	40	29	32	-8

Table 14.16: Operational night-time noise levels between 06:00-07:00

14.107 During daytime periods, the following effect levels are predicted at the existing sensitive receptors:

- No effects at R1, R3, R4, R7, R8, R9 and R10
- Long term negligible effects at R2

14.108 The following night-time effect levels are predicted at the existing sensitive receptors:

- No effects at R1, R3, R7, R8, R9 and R10
- Long term negligible effects at R2 and R4

14.109 The following night-time effect levels at existing sensitive receptors are predicted between 06:00-07:00 when HGVs will be operational:

- No effects at R3, R9 and R10
- Long term negligible effects at R1, R4 and R8
- Long term slight adverse effects at R2 and R7

14.110 It should be noted that the existing site comprises noise from the waste transfer station and the arrival and departure of lorries/refuse collection vehicles. Therefore, the magnitude of impact may be lessened for the nearest noise sensitive receptors due to the current context of the site, i.e. there are already impulsive characteristics to the noise.

14.111 Noise prediction modelling contours are provided in figures 14.13-15.

Changes in road traffic noise levels during and post-construction

14.112 Road traffic noise levels have been calculated using the annual average weekday traffic (AAWT) (18-hour) data for the following scenarios:

- 2018 Baseline year
- 2025 Do Nothing (future baseline year)
- 2026 Do Nothing (future baseline year) with committed development
- 2026 Do Something with committed and proposed development
- 2025 Baseline year with committed development and construction of the proposed development.

14.113 Calculations have not been completed for the site access road as HGV vehicles on the site access road have been included in the plant noise and activity noise assessment.

14.114 Calculations have not been completed for road traffic links that are predicted to have flows less than 1000 vehicles (the site access road and Crookthorn Lane south of the A259), as the calculation methodology of CRTN is not appropriate for predicted flows less than 1000 movements in an 18-hour period.

14.115 The resultant change in road traffic noise levels are detailed in table 14.17.

Road	Change in Basic Noise Level at 10m dB L_{A10}				
	2018 Baseline to 2025 Do Nothing	Baseline to 2026 Do Nothing with committed development	2018 Baseline to 2026 Do Something with committed and proposed development	2026 Do Nothing with committed development to 2026 Do Something	2018 Baseline to 2025 Baseline with committed development and construction (short term)
North End Road (North of Ford Lane)	0.8	0.8	0.8	0.0	0.8
Ford Lane (North End Road – Ford Lane)	1.8	1.8	1.8	0.0	1.8

Road	Change in Basic Noise Level at 10m dB L_{A10}				
	2018 Baseline to 2025 Do Nothing	Baseline to 2026 Do Nothing with committed development	2018 Baseline to 2026 Do Something with committed and proposed development	2026 Do Nothing with committed development to 2026 Do Something	2018 Baseline to 2025 Baseline with committed development and construction (short term)
Ford Lane (Ford Lane-Station Road/Ford Road)	0.8	0.8	0.8	0.0	0.8
Station Road	0.5	0.6	0.6	0.0	0.6
Ford Road (Ford Lane/Station Road to Access Road)	0.5	0.5	0.5	0.0	0.5
Rollaston Park	0.3	0.3	0.3	0.0	0.3
Church Lane (South of Horsemere Green Lane)	1.6	1.6	1.9	0.3	2.0
A259 Crookthorn Lane (West of Ford Road)	1.0	1.0	1.1	0.1	1.1
A259 Crookthorn Lane (East of Ford Road)	0.7	0.7	0.8	0.1	0.8
B2233 Yapton Road	1.1	1.1	1.1	0.0	1.1
A259 Grevatt's Lane (West of B2233 Yapton Road)	0.8	0.9	1.0	0.1	1.0
B2233 Yapton Road (South of Rollaston Park)	0.8	0.8	0.8	0.0	0.8
A259 Burndell Road	0.8	0.8	0.8	0.0	0.8
Bilsham Road	1.0	1.0	1.0	0.0	1.0
B2233 Main Road	1.0	1.0	1.0	0.0	1.0
North End Road (south of Ford Lane)	1.8	1.8	1.8	0.0	1.8

Table 14.17: Changes in road traffic noise levels

14.116 The predicted increase in road traffic noise levels on all road links, due to the operation of the proposed development, results in long term negligible effects.

14.117 The predicted change in road traffic noise levels between the baseline year (2018) and 2025 with committed development and construction of the proposed development, presents short term slight adverse effects on:

- Ford Lane (North End Road - Ford Lane)
- Church Lane (South of Horsemere Green Lane)
- A259 Crookthorn Lane (West of Ford Road)
- B2233 Yapton Road
- A259 Grevatt's Lane (West of B2233 Yapton Road)
- Bilsham Road
- B2233 Main Road
- North End Road (south of Ford Lane)

14.118 However, it should be noted that the increase in noise level is mostly due to traffic growth and committed development between 2018 and 2025. The

construction traffic in 2025 does not cause an increase in the noise level over the 2018 baseline to 2026 'Do Nothing' with committed development scenario, except for:

- Church Lane (South of Horsemere Green Lane) where the noise level in 2025 is +0.4 dB higher than the noise level predicted in 2026;
- A259 Crookthorn Lane (West of Ford Road) where the noise level in 2025 is +0.1 dB higher than the noise level predicted in 2026;
- A259 Crookthorn Lane (East of Ford Road) where the noise level in 2025 is +0.1 dB higher than the noise level predicted in 2026; and
- A259 Grevatt's Lane (West of B2233 Yapton Road) where the noise level in 2025 is +0.1 dB higher than the noise level predicted in 2026.

14.119 These noise level increases would be considered to represent short term negligible effects, which are not significant.

14.120 The short-term change in noise levels on all other road links to those discussed above present short term negligible effects, which are not significant.

Mitigation and monitoring

Demolition and construction

14.121 BPM as defined by the Control of Pollution Act 1974, will be implemented as part of the working methodology. This will serve to minimise the noise and vibration effects at receptors nearest to the construction works. The reduction in noise levels provided through the implementation of BPM will vary depending on the nature of the works.

14.122 Typical BPM measures which will be considered, where reasonably practical, include:

- Programming noisy works so that these do not occur during Saturday working hours of 13:00-19:00
- Plan working hours to take account of the effects of noise and vibration upon persons in areas surrounding site operations and upon persons working on-site
- Where reasonably practicable, adopt quiet working methods, using plant with lower noise emissions
- Where reasonably practicable, adopt working methods that minimise vibration generation
- Locate plant away from noise and vibration sensitive receptors, where feasible
- Use silenced and well-maintained plant conforming with the relevant EU directives relating to noise and vibration
- Avoid unnecessary revving of engines and switch off equipment when not required
- Keep internal haul routes well maintained
- Start-up plant and vehicles sequentially rather than all together
- Carry out regular inspections of noise mitigation measures to ensure integrity is maintained at all times

- Provide briefings for all site-based personnel so that noise and vibration issues are understood, and mitigation measures are adhered to
- Manage plant movement to take account of surrounding receptors, as far as is reasonably practicable

14.123 If work is required to extend into periods beyond the agreed hours, separate authorisation will be requested from with the local authority.

Operational noise

14.124 Inherent mitigation measures designed into the scheme include high performance (R_w 35 dB) cladding to the ERF and WSTF, and site boundary screening of up to 10.4m in height. Screening has also been allowed for around the air cooled condensers.

14.125 All reasonable measures have been taken in the site layout design to reduce noise exposure to the nearest receptors. During the detailed design of the facilities, low noise emission plant would be sought to reduce operational noise levels at the nearest receptors. As such, additional mitigation is not proposed.

14.126 Continuous on-site monitoring is not proposed during the operational phase of the facility. However, commissioning measurements will be completed to demonstrate compliance with the predicted plant and activity noise emission levels.

Residual effects

14.127 No significant residual effects are expected for existing receptors.

Cumulative effects

Demolition and construction

14.128 Due to the distance between site and the nearest cumulative schemes (other than the proposed residential development at the Land at Ford Airfield as discussed in 'The Landings' section below), cumulative demolition and construction effects are deemed unlikely.

Operational noise

14.129 The road traffic noise assessment considers the predicted change in road traffic noise levels with and without cumulative development and has concluded that the effects will be negligible.

The Landings

14.130 The Landings is a proposed residential development for the Land at Ford Airfield. A planning application has been submitted to Arun District Council (application reference F/4/20/OUT).

14.131 The proposed residential development adjoins the western boundary of the proposed development site discussed in this chapter.

14.132 This section of the chapter considers the possible demolition and construction, and operational noise effects should the proposed residential development be consented and new noise sensitive receptors are introduced.

14.133 An assessment of demolition and construction noise and vibration, and operational noise levels has not been provided for the wider SD8 allocation of H SP2c (SD8) of the Arun Local Plan 2011-2031. No planning permission for residential development exists for this area and therefore a robust assessment cannot be provided. The wider allocation is sited next to the eastern boundary of the existing and proposed development.

Demolition and construction

14.134 The demolition and construction noise thresholds at the identified receptor locations R5 and R6 would be 65 dB $L_{Aeq,T}$ (Monday to Friday 07:00-19:00 and Saturday 07:00-13:00) and 55 dB $L_{Aeq,T}$ (Saturdays 13:00-19:00).

14.135 The results of the construction noise assessment for receptors R5 and R6 are shown in table 14.18. A +3 dB façade reflection has been applied to the predicted results. The levels are predicted at a height of 1.5m above ground level to represent ground floor level.

Scenario	Receptor location and predicted noise level ($L_{Aeq,T}$ dB) at ground floor level (1.5m height)	
	R5	R6
1. Build WSTF	56	47
2. Build WSTF and demolish existing WTS	58	49
3. Demolish existing WTS	57	46
4. Construct ERF and excavate to lower ground level	59	53
5. Construct ERF	54	48
6. Construct ERF and landscaping	54	41
7. Landscaping	54	47

Table 14.18: Demolition and construction noise assessment (ground floor)

14.136 The results of the construction noise assessment, predicted at 4m above ground level to represent first floor level, are shown in table 14.19. A +3 dB façade reflection has been applied to the predicted results.

Scenario	Receptor location and predicted noise level ($L_{Aeq,T}$ dB) at first floor level (4m height)	
	R5	R6
1. Build WSTF	58	49
2. Build WSTF and demolish existing WTS	60	50
3. Demolish existing WTS	59	47
4. Construct ERF and excavate to lower ground level	62	54
5. Construct ERF	56	49
6. Construct ERF and landscaping	55	43
7. Landscaping	55	48

Table 14.19: Demolition and construction noise assessment (first floor)

14.137 Based on the weekday daytime (07:00-19:00) and Saturday (07:00-13:00) thresholds, demolition and construction noise levels from the proposed ERF and WSTF development are expected to result in short term negligible effects at R5 and R6.

14.138 At R6, effects would be short term and negligible for both ground and first floor levels during Saturday hours of 13:00-19:00.

14.139 At R5, during Saturday hours of 13:00-19:00, demolition and construction noise levels are expected to result in:

- Short term slight adverse effects at ground floor level during scenario 1 (Build WSTF) and scenario 3 (Demolish existing WTS)
- Short term moderate adverse effects at ground floor level during scenario 2 (Build WSTF and demolish existing WTS) and scenario 4 (Construct ERF and excavate to lower ground level)
- Short term slight adverse effects at first floor level during scenario 5 (Construct ERF)
- Short term moderate adverse effects at first floor level during scenario 1 (Build WSTF) and scenario 3 (Demolish existing WTS)
- Short term substantial adverse effects at first floor level during scenario 2 (Build WSTF and demolish existing WTS) and scenario 4 (Construct ERF and excavate to lower ground level)

14.140 However, it is considered unlikely that residential dwellings will be built at receptor location R5 during demolition and construction scenarios 1-4.

14.141 Chapter 5 Construction Methodology and Phasing of the Environmental Statement for Ford Airfield (application F/4/20/OUT) states that, '*Demolition and Construction of the Development is anticipated to commence in 2020/2021, subject to gaining planning permission, and span approximately 10 years. The construction works would begin in the north and south of the Site and progress to the centre of the Site. Overall, the construction process is expected to be completed by 2030/2031*.'

14.142 Receptor R5 is deemed to be within the centre of the proposed housing development site, i.e. within Phase 3 of the proposed residential development. It is not expected that dwellings at this location will be built until late in the construction programme, e.g. 2030/2031. The construction of the proposed ERF and WSTF is expected to be completed within a 51-month programme, with the demolition and construction works for the WSTF being completed in Phases 1 and 2 which are expected to be a total of 9 months in duration, at the closest point to receptor location R5.

14.143 Dwellings at receptor location R5 are included in construction noise modelling scenarios 5-7 of the modelling. The expected effect levels for scenarios 5-7 would be short term negligible to slight adverse.

14.144 If the potential employment use buildings to the east of the site boundary (as shown on the Illustrative Masterplan of application F/4/20/OUT) were built and in place prior to the ERF and WSTF construction works, the construction noise threshold would be 65 dB $L_{Aeq,T}$ for works Monday to Friday (07:00-19:00), assuming that the units would be occupied during weekdays. However, it should be noted that the ABC method described in BS 5228:2009+A1:2014 for setting construction noise thresholds is intended for dwellings only.

14.145 When assessed to the 65 dB $L_{Aeq,T}$ threshold, the following demolition and construction noise effects would apply (the effect levels vary due to the location of the potential employment use buildings):

- Short term negligible effects
  - Scenarios 1, 5, 6 and 7
- Short term negligible to slight adverse effects
  - Scenario 2
- Short term negligible to moderate adverse (significant) effects
  - Scenario 3
- Short term negligible to substantial adverse (significant) effects
  - Scenario 4

14.146 However, it is considered unlikely that potential employment use buildings will be built and in-use before the ERF and WSTF is constructed. Therefore, demolition and construction noise significant effects are not expected to occur for potential future employment use receptors.

14.147 Construction vibration levels from piling may be perceptible at distances up to 100 m from the works. The nearest proposed residential dwellings are expected to be at a distance of 105 m from the proposed development site boundary.

14.148 Construction vibration would not be expected to be perceivable at the nearest proposed residential receptor locations. Due to the proposed construction phasing of the Land at Ford Airfield, residential dwellings are not expected to be built and occupied prior to the ERF and WSTF developments.

14.149 If the potential employment use buildings are built and occupied prior to the ERF development, vibration from construction of the ERF and landscaping works may be perceivable to the nearest employment use buildings. Works associated with demolition of the existing WTS and construction of the WSTF would be expected to be of sufficient distance from the potential employment use buildings, for vibration to not be perceptible.

14.150 Due to a lack of construction phasing information with associated programme dates for the Land at Ford Airfield development, it is not possible to fully assess potential significant effects from the demolition and construction activities associated with the proposed ERF and WSTF development on future residential receptors. It is also not possible to fully assess the cumulative construction noise impact on existing residential receptors, should both the Land at Ford Airfield and proposed ERF/WSTF developments be consented. If both schemes were consented and construction phases were to align, the baseline noise levels may increase in the short-term to account for construction of both schemes simultaneously.

14.151 Considering the demolition and construction programme for the proposed ERF and WSTF development, and the available phasing information for the construction of future residential dwellings, it is unlikely that significant effects due to demolition and construction noise of the proposed development will occur. BPM would be implemented throughout the demolition and construction phase of the proposed development to minimise the potential for significant effects. It is expected that BPM would be introduced for the construction of the

residential development to reduce the risk for significant effects on existing receptors.

Operational noise

14.152 The results of the noise model are summarised in table 14.20. Background noise levels have been determined using the noise prediction model that is calibrated to road traffic noise sources. Rating levels are at the receptor façade location and do not include a façade reflection. The specific and rating noise levels are in terms of daytime 1-hour periods and night-time 15-minute periods. All noise levels and rating level excesses have been rounded to the nearest whole decibel.

NSR considered	Background Level, $L_{A90,T}$ (dB)		Predicted Specific Noise, $L_{Aeq,T}$ (dB)		Resulting Rating Level, $L_{Ar,T}$ (dB)		Excess of rating level over background noise level (dB)	
	Daytime	Night-Time	Daytime	Night-Time	Daytime	Night-Time	Daytime	Night-Time
R5	41	36	36	36	39	39	-2	3
R6	40	35	36	35	39	38	-1	3

Table 14.20: Predicted operational noise levels

14.153 The results of the noise model for 06:00-07:00 when HGVs are operational during night-time periods are summarised in table 14.21.

NSR considered	Background Level, $L_{A90,1\text{-hour}}$ (dB)	Predicted Specific Noise, $L_{Aeq,1\text{-hour}}$ (dB)	Resulting Rating Level, $L_{Ar,1\text{-hour}}$ (dB)	Excess of rating level over background noise level (dB)
	Night-Time	Night-Time	Night-Time	Night-Time
R5	37	36	39	2
R6	37	37	40	3

Table 14.21: Operational night-time noise levels between 06:00-07:00

14.154 During daytime periods, plant and activity noise would result in long term negligible effects at receptor locations R5 and R6.

14.155 Night-time operational noise could result in long term slight adverse effects at receptor locations R5 and R6.

14.156 Night-time operational noise between 06:00-07:00, Monday to Friday, when HGVs will be operational, could result in long term negligible effects at receptor location R5, and long term slight adverse effects at receptor location R6.

14.157 These assessment outcomes assume that proposed residential dwellings would be located at the minimum distances from the existing and proposed facilities, to the nearest residential dwelling locations as shown on the masterplan for the Land at Ford Airfield development. If the proposed residential dwellings were at a greater distance from the proposed development, the activity noise levels and resultant effect levels may reduce.

14.158 With the potential employment use to the east of the site boundary (as part of application F/4/20/OUT) the predicted magnitude of impact would not change for any of the assessed existing or proposed receptor locations.

14.159 If the potential employment buildings are built as shown on the Illustrative Masterplan, the dominant noise sources at the façade locations would be HGV movements on the existing site access road, and on site. These noise sources are currently present at the location of the potential employment use buildings. Therefore, the potential employment use buildings would need to be designed to within best-practice guideline internal noise levels for employment use (e.g. internal noise level guidelines for offices to BS 8233:2014) to provide suitable internal working conditions.

Fall-back position

14.160 The noise assessment submitted to inform the application for the gasification scheme detailed the following predicted effects:

- Short term negligible noise and vibration effects during construction
- Long term negligible noise and vibration effects during operation

14.161 The operational noise assessment was completed in accordance with BS 4142:1997. This standard was revised in 2014 and 2019 (BS 4142:2014+A1:2019). The assessment contained in this chapter and technical report are to the latest guidance.

14.162 There are two differences in the assessment approach between the previous assessment and the assessment contained in this chapter.

14.163 The previous assessment did not include noise from HGVs on site within the BS 4142 assessment. HGVs on the site access road and on site have been included in the assessment contained in this chapter as they are an inherent noise source of the site activity. The methodology of BS 4142:1997 did not require HGV noise on site to be considered.

14.164 BS 4142:1997 suggested an acoustic character correction of +5 dB for any distinguishable features to the site noise. The noise from site was argued to not be tonal, intermittent or impulsive. The methodology of BS 4142:2014+A1:2019 provides a wider range of penalties to be applied to the specific noise level (to obtain the rating level) dependent upon the nature of the noise source and the expected perceivability over the typical noise climate. As such, this assessment includes a +3 dB penalty for impulsivity due to the arrival / departure of HGVs and the sorting of waste within the WSTF, although the current noise emissions from the site will comprise these noise sources. This is deemed to be a fair assessment of the current and future noise emissions.

14.165 Condition 28 *Noise Limits* of the existing consent states that '*The rating level of noise emitted from the site (determined in accordance with BS4142:1997) shall not exceed a level of 35dBA at any time. Noise levels are to be measured at the boundaries of the nearest residential premises'.*

14.166 It should be noted that this condition was put in place based on the previous noise assessment which did not allow any acoustic character corrections for the noise and did not include HGV noise within the total rating levels. Therefore, the rating levels reported in that assessment are equal to the specific noise levels, i.e. the actual noise levels emitted from the facility.

14.167 If the contribution of HGV noise on the site access road and on site are removed from the calculated specific noise levels presented in this chapter, the level of 35 dB(A) would be achieved at each existing receptor location assessed in this chapter.

14.168 Therefore, the predicted noise levels for the proposed development would be deemed to be compliant with this condition, when assessed as per the previous application methodology.

14.169 An updated baseline survey was completed in February 2020 (prior to the Covid-19 lockdown) to inform the assessments contained in this chapter. With consideration of the updated baseline noise levels and the assessments contained in this chapter, the construction and operational effects between the proposed and consented scheme are expected to be the same.

- Short Term Measurement Locations
- Long Term Measurement Locations

Figure 14.1 Noise measurement locations

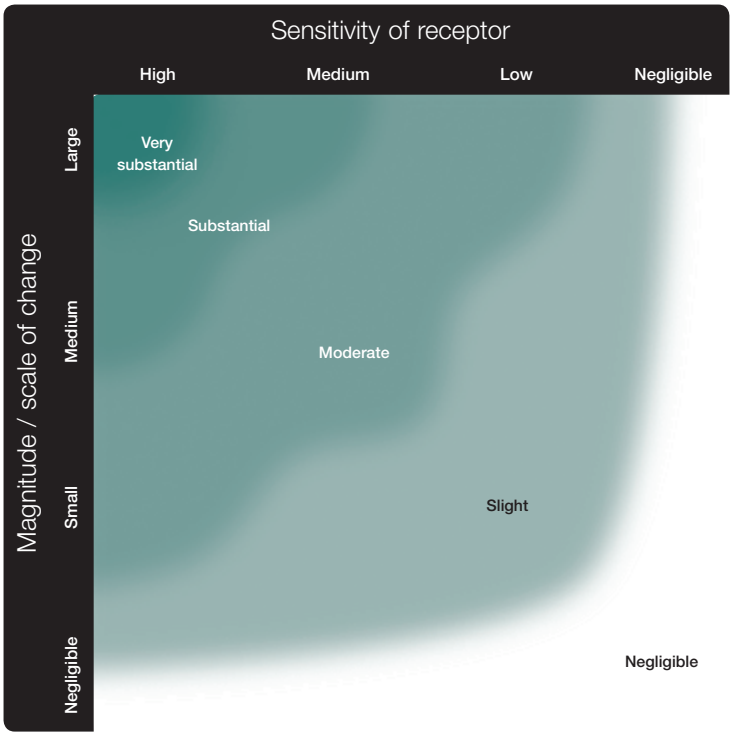
Sensitivity of receptor – Noise

Figure 14.2 Receptor sensitivity (noise and vibration)

Magnitude of change – Noise

Figure 14.3 Impact magnitude (noise and vibration)

Determination of significance matrix – Noise



Professional judgement can be used to vary the category where specific circumstances dictate, for example due to the vulnerability or condition of the receptor.

For example, schools would normally be considered sensitive to construction noise, but would not be so if all works were undertaken outside school opening times. The reason for and nature of any variation will be made clear in the assessment.

Degrees of effect

Very substantial:
Greater than 10.0 dB LAeq change in sound level perceived at a receptor of great sensitivity to noise.

Substantial:
Greater than 5.0 dB LAeq change in sound level at a noise sensitive receptor, or a 5.0 to 9.9 dB LAeq change in sound level at a receptor of great sensitivity to noise.

Moderate:
A 3.0 to 4.9 dB LAeq change in sound level at a sensitive or highly sensitive noise receptor, or a greater than 5.0 dB LAeq change in sound level at a receptor of some sensitivity.

Slight:
A 3.0 to 4.9 dB LAeq change in sound level at a receptor of some sensitivity.

Negligible:
Less than 2.9 dB LAeq change in sound level and / or all receptors are of negligible sensitivity to noise or marginal to the zone of influence of the proposals.

Significance

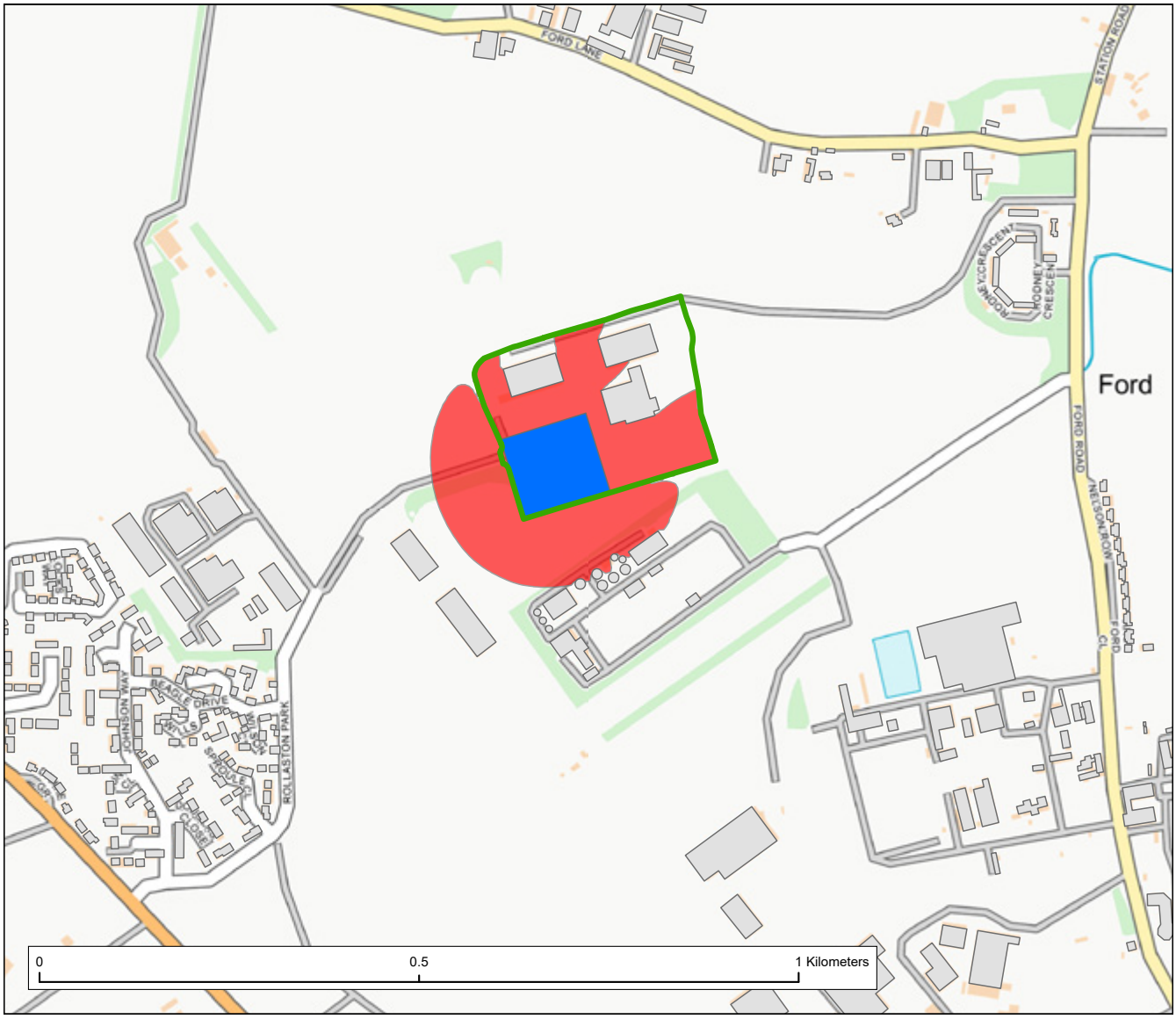
If the degree of effect is moderate or above, then the effect is considered to be significant.

Figure 14.4 Degree of effect matrix (noise and vibration)

Receptor Locations

Proposed Landings Receptor Locations

Figure 14.5 Noise sensitive receptor locations



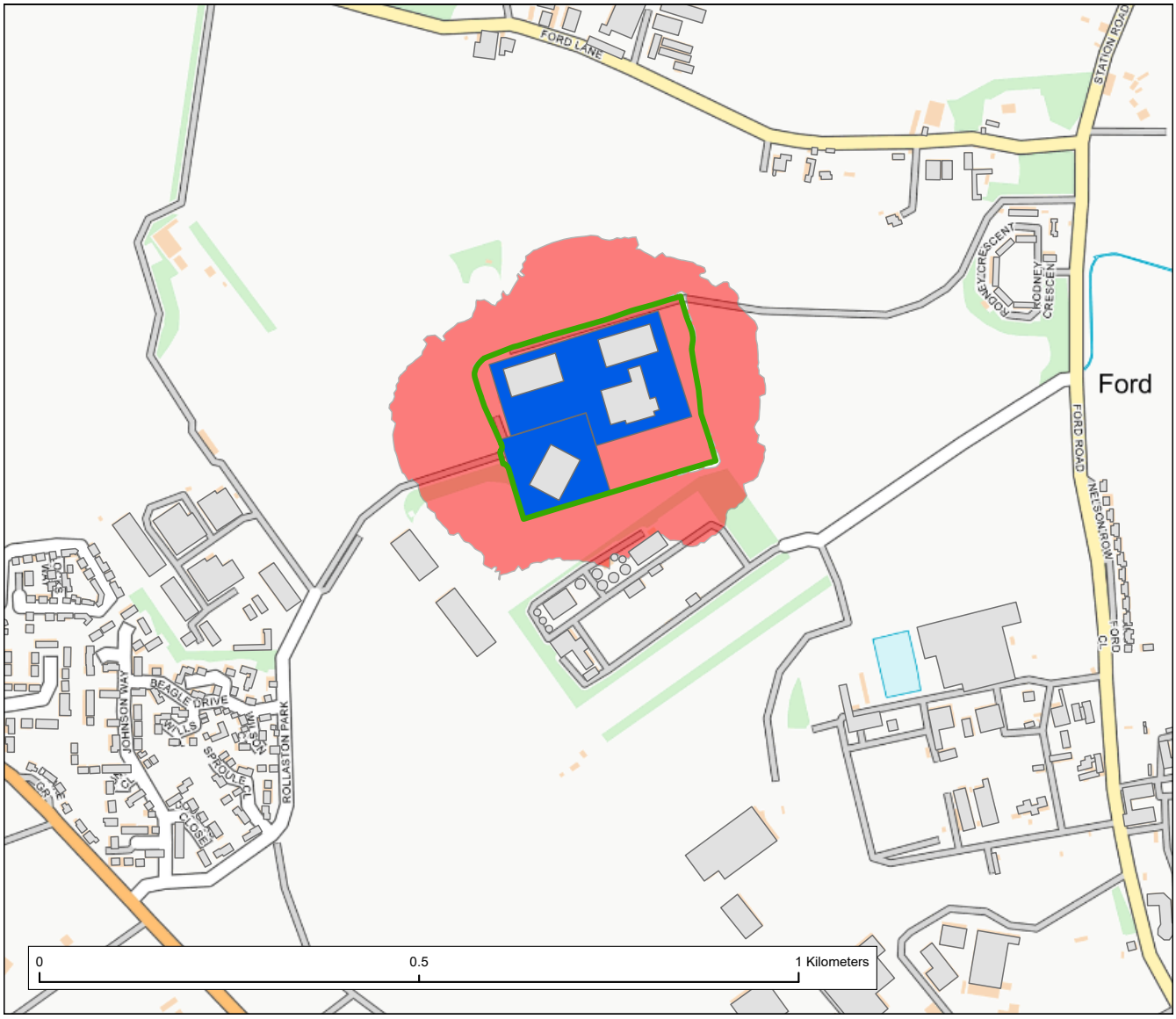
Buildings

Assumed work areas

≥ 55 dB LAeq,T construction noise levels

Hoarding 2.4m height

Figure 14.6 Scenario 1 - Build WSTF



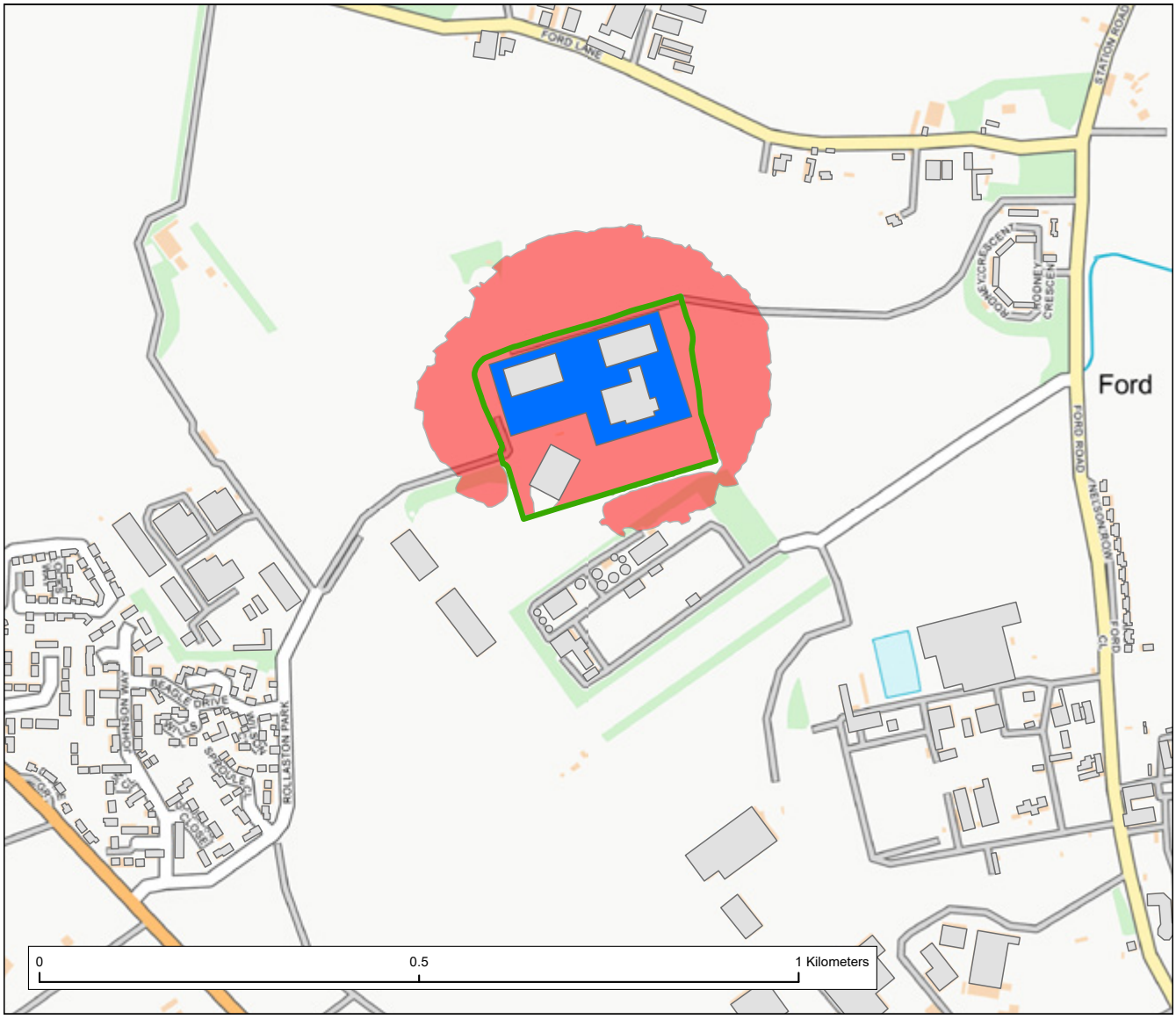
Buildings

Assumed work areas

≥ 55 dB LAeq,T construction noise levels

Hoarding 2.4m height

Figure 14.7 Scenario 2 – Build WSTF and demolish existing WTS



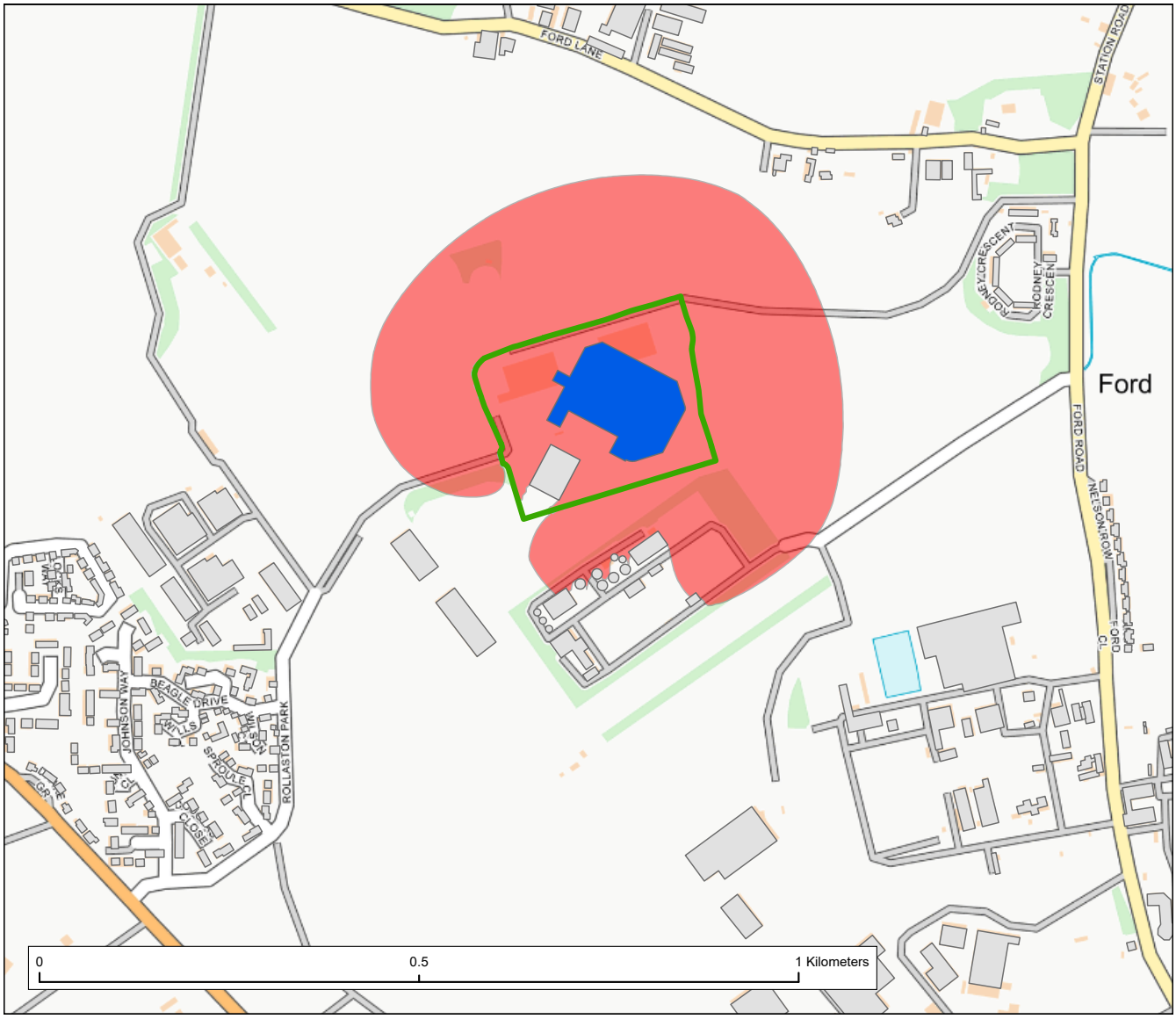
Buildings

Assumed work areas

≥ 55 dB LAeq,T construction noise levels

Hoarding 2.4m height

Figure 14.8 Scenario 3 – Demolish existing WTS



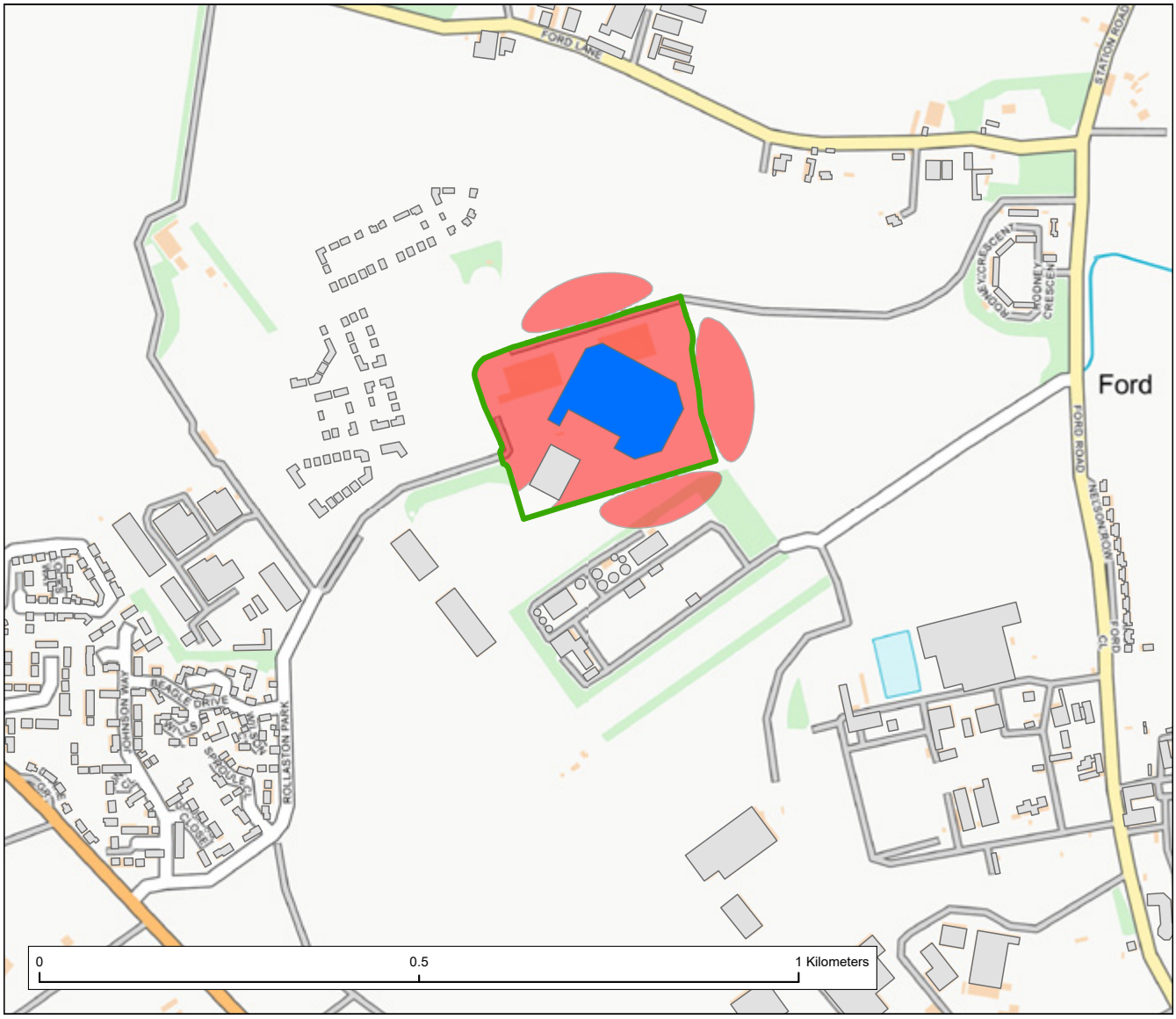
Buildings

Assumed work areas

≥ 55 dB LAeq,T construction noise levels

Hoarding 2.4m height

Figure 14.9 Scenario 4 – Construct ERF and excavate to lower ground level



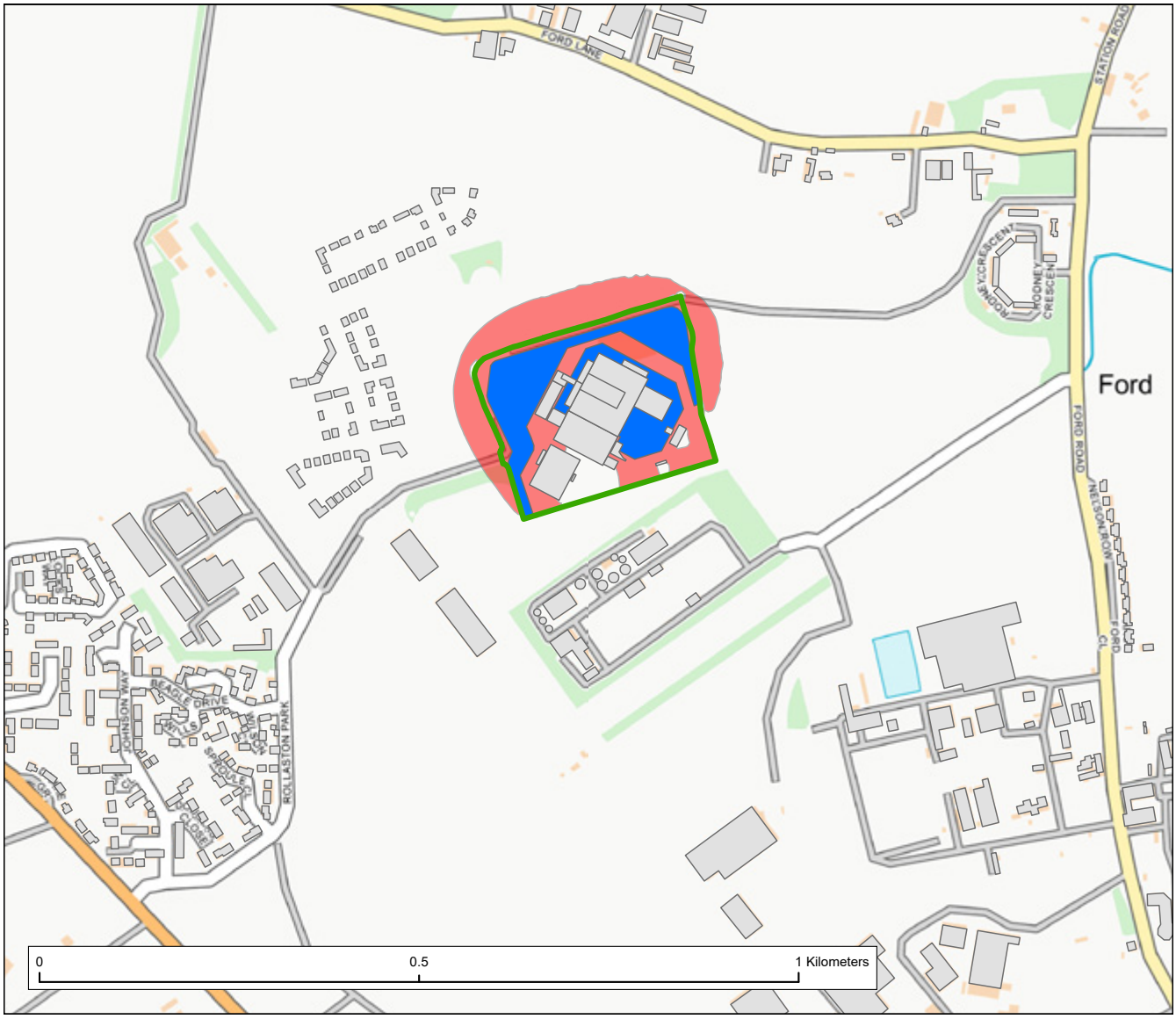
Buildings

Assumed work areas

≥ 55 dB LAeq,T construction noise levels

Hoarding 2.4m height

Figure 14.10 Scenario 5 – Construct ERF



Buildings

Assumed work areas

≥ 55 dB LAeq,T construction noise levels

Hoarding 2.4m height

Figure 14.11 Scenario 6 – Construct ERF and landscaping

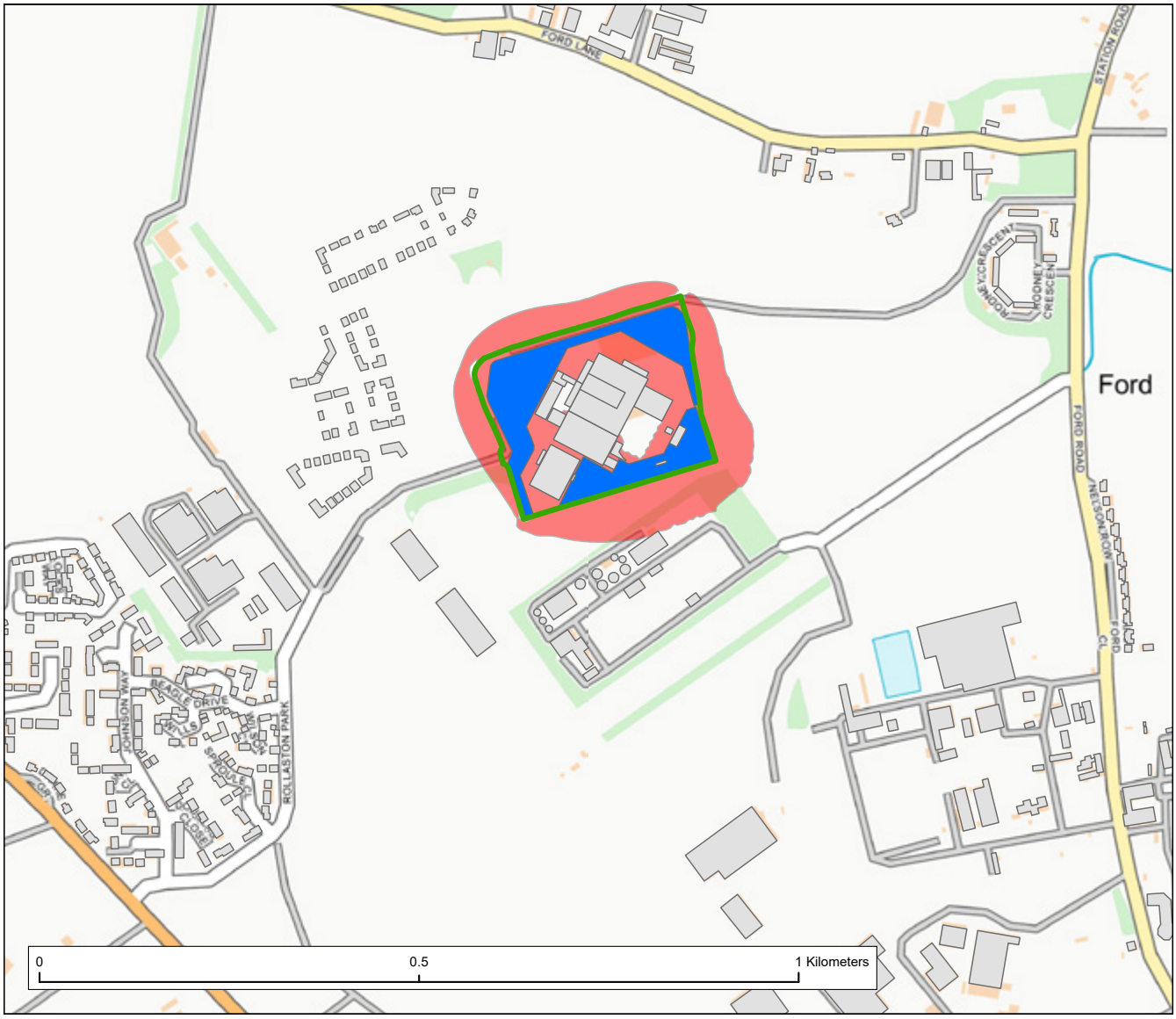


Figure 14.12 Scenario 7 – Landscaping

Figure 14.13 Daytime Noise Contours (07:00-23:00) at 1.5m height

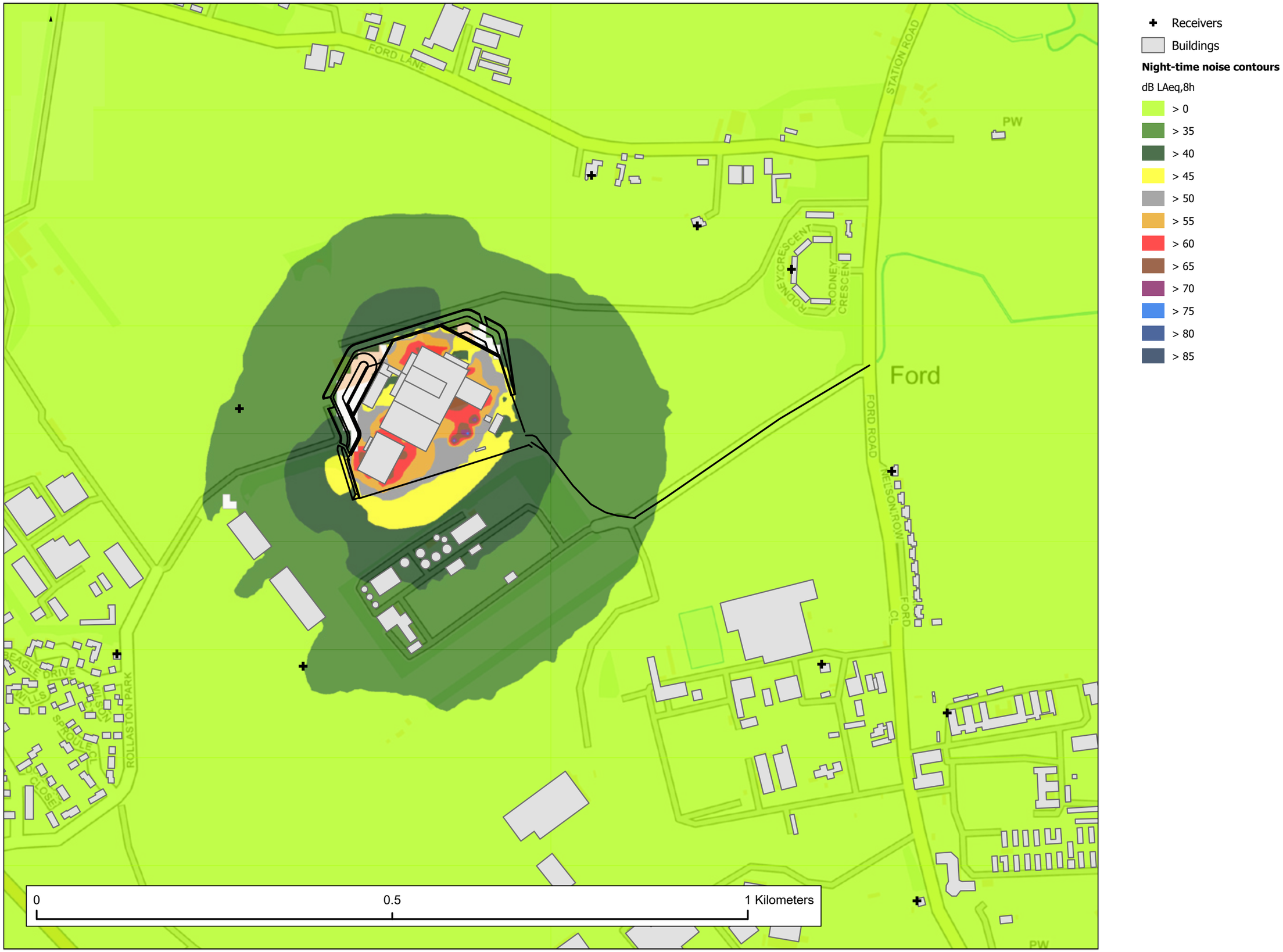


Figure 14.14 Night-time noise contours (23:00-07:00) at 4m height

Figure 14.15 Night-time noise contours with HGVs (06:00-07:00) at 4m height