

National Grid Cable Tunnel Replacement Project

Report to inform Habitats Regulations Assessment

December 2023



Quality information

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1 Introduction

1.1 Overview

- 1.1.1 National Grid Electricity Transmission (hereafter National Grid) has developed a proposal for the replacement of a cabled section of the TKRE 400 kV circuits under the River Thames. The Tilbury to Grain and Tilbury to Kingsnorth (TRKE) 400 kV circuits are currently predominantly overhead line, with a cable section installed within a deep tunnel crossing the River Thames. The TKRE Cable Tunnel Replacement Project (hereafter the Proposed Development) relates only to the tunnelled section of these circuits.
- 1.1.2 National Grid is submitting planning applications to Thurrock Council and Gravesham Borough Council for the onshore elements of the Proposed Development. All of the works will be undertaken outside European site boundaries. However, the Thames Estuary & Marshes Special Protection Area (SPA) and Ramsar site lies within 2.5km and Natural England has identified that intertidal mudflats approximately 360m south of the tunnel construction site on the Tilbury side of the river constitute functionally-linked habitat for the SPA/Ramsar. Mucking Flats and Marshes SSSI, the nearest part of the SPA/Ramsar, is located approximately 2.3km to the east of the works at Tilbury.

1.2 Legislative Framework

- 1.2.1 As part of the assessment of a proposed project it is necessary to consider whether the project is likely to have a significant effect (LSE) on areas that have been designated for nature conservation purposes (i.e. 'European Sites', also known as Habitats Site and forming part of the National Site Network).
- 1.2.2 Should it be found that significant effects are likely, an 'Appropriate Assessment' should then be carried out in order to further assess those effects. Plate 1 sets out the legislative basis for an Appropriate Assessment. Consent may only be given for a proposed scheme if, following assessment, it is established that it will not adversely affect the integrity of the designated site.
- 1.2.3 If adverse effects are identified, alternatives should be considered to avoid those effects. However, where no alternative solution exists and so an adverse effect remains, a further assessment should be made of whether the scheme is required for imperative reasons of overriding public interest (IROPI). If the scheme meets that IROPI test, compensatory measures will be required in order to maintain the overall national site network.
- 1.2.4 The need for an Appropriate Assessment is set out in the Conservation of Habitats and Species Regulations 2017 (as amended) (the 2017 Regulations). The 2017 Regulations also apply the precautionary principle¹ to European Sites.
- 1.2.5 Over the years, the phrase 'Habitats Regulations Assessment' (HRA) has come into wide currency to describe the overall process set out in the 2017 Regulations, from the screening for Likely Significant Effects through to identification of IROPI. This has arisen in order to distinguish the overall process from the individual stage of "Appropriate Assessment". Throughout this Report the term HRA is used for the overall process and restricts the use of Appropriate Assessment to the specific stage of that name.

¹ The Precautionary Principle, which is referenced in Article 191 of the Treaty on the Functioning of the European Union, has been defined by the United Nations Educational, Scientific and Cultural Organisation (UNESCO, 2005) as:

"When human activities may lead to morally unacceptable harm [to the environment] that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm. The judgement of plausibility should be grounded in scientific analysis".

Plate 1: The Legislative basis for Appropriate Assessment

Conservation of Habitats and Species Regulations 2017 (as amended)

Regulation 63 of the 2017 Regulations states that:

"A competent authority, before deciding to ... give any consent for a plan or project which is likely to have a significant effect on a European site ... must make an appropriate assessment of the implications for the plan or project in view of that site's conservation objectives... The competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site."

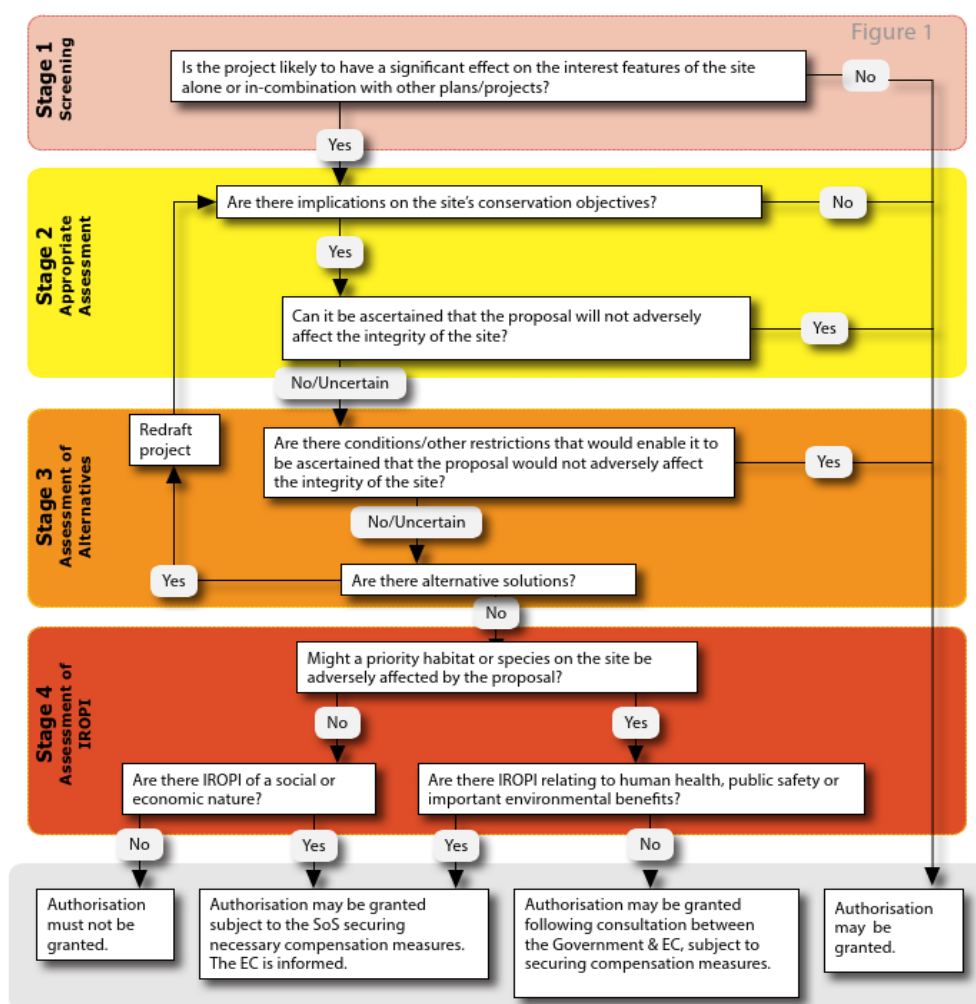
- 1.2.6 Since the Proposed Development is not directly connected with, or necessary to, the management of any part of the National Site Network but do lie in close proximity to functionally linked habitat associated with a one European site, the first step in the process required by the regulations is to determine whether the Proposed Development is likely to have a significant effect on any Special Area of Conservation (SAC), Special Protection Area (SPA) or Ramsar site. That is the purpose of this document.

2 Assessment Methodology

2.1 Introduction

- 2.1.1 This HRA has been carried out with reference to the general EC guidance on HRA² and guidance on HRA published by the UK government in 2021³.
- 2.1.2 The UK left the EU on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 (“the Withdrawal Act”). The transition period ended on 31 December 2020. However, the Withdrawal Act also retains the body of existing EU-derived law within our domestic law. Updates to the Conservation of Habitats and Species Regulations 2019 (as amended) make it clear that the HRA process continues despite Brexit.
- 2.1.3 As such this assessment of LSEs takes account of relevant EU case law (for instance, the Holohan and People over Wind cases, discussed below). Plate 2 below outlines the stages of HRA for projects and each stage covered by this report is discussed below.

Plate 2: Four Stage approach to Habitats Regulations Assessments of Projects



² European Commission, 2001. Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Accessed 04/08/2022 via: [Assessment of plans and projects significantly affecting Natura 2000 sites \(europa.eu\)](https://ec.europa.eu/nature/conservation/habitats/docs/assessment_of_plans_and_projects_significantly_affecting_natura_2000_sites_europa.eu)

³ Department for Levelling Up, Housing and Communities, 2021. Guidance: Habitats Regulations Assessments: Protecting a European site. Accessed 24/03/2021 via: [Habitats regulations assessments: protecting a European site - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site)

2.2 HRA Stage 1 – Screening for Likely Significant Effects

- 2.2.1 The objective of the LSE test is to 'screen out' those aspects of a project that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction (i.e. a pathway) with European sites. The remaining aspects are then taken forward to Appropriate Assessment. The assessment must consider the potential for effects 'in combination' with other plans and projects.
- 2.2.2 This report has been prepared having regard to all relevant case law relating to the 2017 Regulations, the Habitats Directive and Birds Directive. This includes the ruling by the Court of Justice of the European Union (CJEU) in the case of *People Over Wind, Peter Sweetman v Coillte Teoranta (C-323/17)*⁴. This case held that; *"it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site"* (paragraph 40). This establishes that 'mitigation measures' specifically introduced to protect European sites cannot be taken into account at the screening stage, but they can be taken into account in an Appropriate Assessment.
- 2.2.3 However, this ruling has since been qualified by the UK courts. On 15 August 2018, in the case of *Langton*⁵, the High Court ruled that conditions on badger cull licences preventing badger culling near a Special Protection Area or at certain times of year should not be classed as mitigation measures as described in the Sweetman ruling. The judge ruled that these licence conditions were properly characterised as "integral features of the project" and could therefore be relied on for the purposes of habitats screening. His reasoning was that it would be *"contrary to common sense for Natural England to assume that culling would take place at times and places where the applicants did not propose to do so"*. Therefore, restrictions on the *timing* of works which are part of the proponents proposal can be taken into account in HRA Stage 1 – Screening for Likely Significant Effects.
- 2.2.4 In addition, case law has established that it is also permissible to take 'mitigation' measures into account if they would need to be introduced even if there were no European sites present, in order to comply with other legal drivers or are otherwise embedded in the project. For example, it is illegal to pollute watercourses under the Environmental Damage (Prevention and Remediation) (England) Regulations 2015 and the Environmental Permitting (England and Wales) Regulations 2016. Therefore, mitigation measures to protect water quality are routine whether or not the waterbodies in question are part of, or connected to, European sites.
- 2.2.5 This assessment covers all potential impact pathways connecting the TKRE project to Thames Estuary & Marshes SPA/Ramsar site. These impact pathways are identified as:
- Construction related atmospheric noise impacts at either tunnelling site;
- 2.2.6 Construction related visual disturbance (human activity and lighting) impacts at either tunnelling site;
- Potential for disturbance associated with use of the jetty 900m east of the Tilbury shaft site;
 - Water pollution;
 - Construction related air quality impacts; and
 - Construction related noise disturbance impacts from the tunnelling itself beneath the River Thames.
- 2.2.7 There is no standard metric for assessing noise impacts on birds. Two approaches have developed over time. Studies indicate that noise levels in excess of 84dB(A) typically elicit a flight response in birds⁶ while those below 55dB generally elicit no response at all. The same research has led to a

⁴ CJEU, 2018. Judgement of the Court (Seventh Chamber) of 12 April 2018. *People Over Wind and Peter Sweetman v Coillte Teoranta (C-323/17)*. Accessed 04/08/2022 via: [People Over Wind & Sweetman v Coillte Teoranta C-323/17 \(europa.eu\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:62017CJ0323)

⁵ England & Wales High Court, 2018. *Langton, R (on the Application of) v Secretary of State for Environment, Food and Rural Affairs & Anor*. Accessed 04/08/2022 via: [Langton, R \(On the Application Of\) v Secretary Of State For Environment, Food And Rural Affairs & Anor \(bailii.org\)](https://www.bailii.org/eng/gh/ghpages/ghpages.html)

⁶ Cutts, N. & Allan, J., 1999. Avifaunal Disturbance Assessment. Flood Defence Work: Salt End. Environment Agency

recommendation that construction noise levels should generally be kept below 70dB at the bird to avoid disturbance⁷. This has led to the widespread use of 70dB LAmax as an assessment threshold.

- 2.2.8 An alternative approach is to compare forecast noise levels with current noise levels. Following discussions with Natural England earlier in project development, this latter approach to assessment is used in this HRA document. It is generally assumed that bird hearing is similar to that of humans. The smallest change in sound level that can be perceived as a difference by the human ear is one of 3dB. However, there is an obvious difference between a change being perceptible, and it being so intolerable as to be disturbing. As such, it is considered in this assessment that a 3dB change would be excessively cautious to use as a significance threshold for disturbance. Due to the logarithmic nature of the decibel scale a change of 10dB equates to a doubling of the perceived loudness of a sound and is reasonably likely to be disturbing, although this does depend on the nature of the noise. For the purposes of this assessment a change of 5dB is considered sufficiently precautionary to denote a change which is not just perceptible as a difference but may be disturbing.
- 2.2.9 While there is an acoustic metric called Lpeak, it has no time component and isn't calibrated to human hearing (i.e. it is a measure of 'raw' sound pressure level), so isn't useful for assessment. Human ears perceive sound as an overall level over a short period of time and are more affected by that time-weighted sound level than any instantaneous peak level. The general assumption is that bird hearing is similar to human hearing. Hence LAmax, which is time-weighted and calibrated, is used to represent the maximum. While the Lpeak can let you know the maximum sound pressure measured with a sound level meter, the LAmax gives a better picture of what the general maximum level was and unlike Lpeak it is calibrated to hearing thresholds. In earlier discussions over this project, Natural England provided an unpublished internal guidance document that refers to 'peak noise', but this appears to be simply a colloquial reference to maximum noise levels rather than a specific reference to the Lpeak metric.

2.3 Sound Monitoring

- 2.3.1 Ambient sound levels were monitored at a total of two short term locations for an hour and a half on the 26th and 27th January 2023. The locations and timing of the monitoring were selected to provide representative sound data during daylight hours at intertidal zones to the north and south of The Thames. Both locations were agreed with National Grid and the ecology team in advance of the survey.
- 2.3.2 The aim of the baseline survey was to obtain representative data during daylight hours at the intertidal areas in the vicinity of both proposed schemes. The monitoring procedures adopted conformed to BS 7445⁸ and the equipment was set up to record measurements of LAeq,T, LA90,T, LA10,T and LAFmax sound level indicators over 5-minute sample periods.

Sound Monitoring Locations

- 2.3.3 Two locations in total were specified. Monitoring locations are illustrated in Figure 1 and are set out in Table 1. Twenty-four hours of noise monitoring was undertaken and the LAeq and LAmax were recorded at five minute intervals. The LAeq and the LAmax reported in Table 2 are therefore the average of twenty-four of these 5 minute values.

⁷ Cutts, N., Phelps, A. & Burdon, D., 2009. Construction and waterfowl: Defining sensitivity, response and impacts and guidance. Humber INCA, Institute of Estuarine and Coastal Studies, University of Hull.

⁸ British Standard Institute BS 7445: 2003, 'Description and measurement of environmental noise'

Table 1: Sound Monitoring Locations

ID	Measurement Type	Location/Address	Approx. coordinates (Lat/Long)	Description	Represented Receptors
ST1	Short-term	Thames Estuary Path, Tilbury	51.453249 N, 0.392766 E	Thames Estuary Path, PRow	Intertidal area directly south of proposed New Tilbury CSEC
ST2	Short-term	Saxon Shore Way, Gravesend	51.442942 N, 0.408590 E	Saxon Shore Way, PRow	Intertidal area directly north of proposed Gravesend CSEC

Figure 1: Sound Monitoring Locations



2.4 In-combination Scope

- 2.4.1 Consideration has been given to other projects that would be undertaken in similar locations to the tunnelling over the time period.

3 Relevant European sites

3.1 Thames Estuary & Marshes SPA

Conservation Objectives

- 3.1.1 With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;
- 3.1.2 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;
- The extent and distribution of the habitats of the qualifying features
 - The structure and function of the habitats of the qualifying features
 - The supporting processes on which the habitats of the qualifying features rely
 - The population of each of the qualifying features, and,
 - The distribution of the qualifying features within the site.

Qualifying Features

- 3.1.3 The site is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:
- A082 *Circus cyaneus*; Hen harrier (Non-breeding)
 - A132 *Recurvirostra avosetta*; Pied avocet (Non-breeding)
 - A137 *Charadrius hiaticula*; Ringed plover (Non-breeding)
 - A141 *Pluvialis squatarola*; Grey plover (Non-breeding)
 - A143 *Calidris canutus*; Red knot (Non-breeding)
 - A149 *Calidris alpina alpina*; Dunlin (Non-breeding)
 - A156 *Limosa limosa islandica*; Black-tailed godwit (Non-breeding)
 - A162 *Tringa totanus*; Common redshank (Non-breeding)
 - Waterbird assemblage
- 3.1.4 The 2019 Supplementary Advice to the Conservation Objectives⁹ (SACO) goes into more detail on these vulnerabilities.

3.2 Thames Estuary & Marshes Ramsar site

- 3.2.1 Ramsar sites do not have specific Conservation Objectives but since the interest features are very similar to the SPA the conservation objectives for the SPA are taken to apply to the Ramsar site as well.

Qualifying Features

- 3.2.2 The site qualifies under Article 4.1 of the Directive (79/409/EEC)¹⁰ as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

⁹

<https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9012021&SiteName=thames%20estuary&SiteNameDisplay=Thames+Estuary+and+Marshes+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=&NumMarineSeasonality=8>

¹⁰ English Nature, 2001. Sandlings SPA Classification Citation. Accessed 28/07/2022 via: [Sandlings SPA Classification Citation \(publications.naturalengland.org.uk\)](https://publications.naturalengland.org.uk)

- Ramsar criterion 5 - Assemblages of international importance: Species with peak counts in winter: 45118 waterfowl
- Ramsar criterion 6 – species/populations occurring at levels of international importance:
 - Ringed plover, *Charadrius hiaticula*,
 - Black-tailed godwit, *Limosa limosa islandica*,
 - Grey plover, *Pluvialis squatarola*,
 - Red knot, *Calidris canutus islandica*
 - Dunlin, *Calidris alpina alpina*
 - Common redshank, *Tringa totanus tetanus*

3.2.3 The Supplementary Advice on the Conservation Objectives for Thames Estuary & Marshes SPA contain a table¹¹ showing the months during which the non-breeding birds of the SPA are present. For most species, this starts in September and ends in March. Avocet, black-tailed godwit, redshank and ringed plover are present from July/August. Redshank and hen harrier are the only species still present at the SPA in April. May and June are months during which all SPA birds are absent.

3.2.4 Surveys undertaken for the Thurrock Flexible Generation Plant project¹² from September 2019 to March 2020 covered the area of foreshore (called Area 1 in the surveys) which lies directly riverwards of the GI works planned by National Grid. These data have been referenced in this HRA to be precautionary, although it should be noted that surveys by AECOM for the TKRE project have not identified the same levels of bird use. The surveys show that hen harrier were entirely absent from this area (and from all areas surveyed for the project) during September 2019 to March 2020. They show that redshank were present on this part of the foreshore but were only ever present in very low numbers (a peak count of 3 birds) with the main concentrations being much further east. The surveys for the Thurrock Power Project did not cover April 2020 but redshank numbers in that month were likely to be similar to previous months i.e. between zero and three birds. Three birds is 0.1% of the average redshank population of the Thames Estuary & Marshes SPA according to bird population data for the SPA from 2015-19. Therefore, while redshank are present on the foreshore riverwards of the proposed GI works, available data indicates that they are never present in significant numbers.

3.2.5 In addition to the intertidal zone, Natural England flagged in discussion over this HRA that the ES for the same Thurrock Flexible Generation Plant DCO¹³ had recorded 19 ringed plover (a species for which Thames Estuary & Marshes SPA is designated) on a single occasion using a raft approximately 390m east of the TKRE construction site. Nineteen ringed plover amounts to approximately 2% of the current ringed plover population of the Thames Estuary & Marshes SPA.

¹¹ [Designated Sites View \(naturalengland.org.uk\)](https://naturalengland.org.uk/designated-sites-view)

¹² [Appendix 9.4 \(planninginspectorate.gov.uk\)](https://planninginspectorate.gov.uk/appendix-9.4)

¹³ [https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010092/EN010092-001026-Environmental%20Statement%20Volume%206%20Appendix%209.4%20-%20Foreshore%20Wintering%20Bird%20Surveys%202019-2020%20\(Nov%202020\).pdf](https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010092/EN010092-001026-Environmental%20Statement%20Volume%206%20Appendix%209.4%20-%20Foreshore%20Wintering%20Bird%20Surveys%202019-2020%20(Nov%202020).pdf)

4 Test of Likely Significant Effects

4.1 Noise disturbance

Baseline measurements

- 4.1.1 Due to the particular focus on the intertidal zone flagged by Natural England in early discussions over this project, baseline noise measurements for the crest of the beach (the path just above the mudflats on both sides of the river) are presented below. The area on both sides of the river is relatively noisy due to its industrial setting. As a result, although the LAeq noise levels are relatively low the LMax levels are fairly high. During the daytime this includes frequent (i.e. recorded multiple times during 1hr) brief noise events averaging 70 dB (at Tilbury) and 73 dB (at Gravesend). This indicates a very variable baseline noise environment with considerable fluctuations. At night the average and maximum noise levels are lower as expected, being 46dB (LAeq) and 63 (LMax) at Tilbury.

Table 2: Baseline sound levels

Location	Day		Night	
	LAeq,T dB	LAFmax dB	LAeq,T dB	LAFmax dB
Gravesend	49	73	47	54
Tilbury	45	70	46	63

- 4.1.2 Note that the LMax is not the single loudest noise event during the 24hr recording period. It is the average of the LMax for each 5 minute recording block over the 24hr recording period. Therefore, noise levels of 70dB are frequently experienced on the foreshore (at least every 5 minutes).
- 4.1.3 Specific noise monitoring has not been undertaken at the location of the ringed plover raft 390m east of the tunnel compound. However, the general baseline noise environment is likely to be very similar to that at the Tilbury foreshore monitoring location.
- 4.1.4 Since noise impacts requirement modelling to investigate whether adverse effects will arise, this impact is taken forward to appropriate assessment.

4.2 Visual disturbance during tunnelling

- 4.2.1 The closest that construction works will take place to the intertidal zone at Tilbury is 360m to the north (and 2.3km to the west of the SPA/Ramsar site), while the closest to the ringed plover raft inland is 390m. This is sufficiently distant that construction lighting will not perceptibly change light levels at any location. The closest that construction works will take place to the intertidal zone at Gravesend is 120m to the south (and 640m to the west of the SPA/Ramsar site). This is also sufficiently distant that construction lighting will not perceptibly change light levels at the foreshore or SPA/Ramsar, particularly as there is a 4m high embankment between the ground level at the construction site and the ground level at the intertidal foreshore. Therefore no likely significant effect will arise from visual disturbance.

4.3 Sub-surface disturbance during tunnelling

- 4.3.1 The depth of the tunnel under the river, at the deepest invert level, will be -34.434m at the Tilbury Shaft. The substrate in which the tunnel will be installed is chalk. At a depth of approximately 30m under the River Thames, within a bedrock substrate, tunnel construction will not result in any surface noise or vibration impacts of effects on the water column. This is underlined by comparison with

noise modelling work undertaken for the tunnel of the Lower Thames Crossing. The modelling undertaken for that project is reported in Annex C.8 of the Statement of Common Ground between Lower Thames Crossing and Natural England¹⁴. That analysis concluded that the assessment of underwater noise on marine mammals is an appropriate proxy for diving birds and concluded that any marine mammals in the vicinity of the works would be unable to detect TBM operations above background levels. It was therefore concluded that there is no feasible pathway to an effect from the Lower Thames Crossing, based upon no perceivable change in the noise and the thresholds of cetaceans as a proxy.

4.3.2 Although the TKRE tunnel is to be at the same depth as Lower Thames Crossing's tunnel, it is a much smaller tunnel with commensurately smaller boring machinery and noise impacts:

- TKRE tunnel diameter = 4m (internal) 4.5m (external)
- Lower Thames Crossing tunnel diameter = 15m (internal) 16.5m (external).

4.3.3 Given Lower Thames Crossing was able to conclude no likely significant effect from the boring of a tunnel more than three times the diameter of that for TKRE, it is possible to conclude that there will be no indirect effects from the TKRE tunnel boring process on the river 30m above, or the SPA between 600m and 2.3km downstream.

4.4 Water pollution

4.4.1 As noted earlier is illegal to pollute watercourses under the Environmental Damage (Prevention and Remediation) (England) Regulations 2015 and the Environmental Permitting (England and Wales) Regulations 2016. Standard pollution control measures will therefore be deployed during construction to ensure that no watercourses are polluted, whether or not they are connected to the River Thames (and thus the Thames Estuary & Marshes SPA/Ramsar site).

4.4.2 A number of environmental design and management measures will be employed as standard best practice to minimise impacts to controlled waters during the construction of the Proposed Development. These will be incorporated into the Outline CEMP to be prepared alongside the Environmental Statement. Potential environmental impacts that will be avoided, prevented, reduced or offset through the implementation of these mitigation measures include:

- contamination of natural soils, contamination of groundwater with concrete, paste or grout;
- pollution and degradation of water quality of any underlying aquifer;
- infiltration and/or runoff into the local drainage/sewerage network - pollution of drainage and sewerage network and any adjacent surface water features;
- run-off and infiltration of contaminants from material stockpiles; and
- contamination of drainage and sewerage network and/or groundwater.

4.4.3 These measures will be deployed to comply with legislation irrespective of the presence of Thames Estuary & Marshes SPA/Ramsar site downstream and will ensure no likely significant effects.

4.5 Construction-related air quality impacts

4.5.1 To remove spoil from the site, and deliver construction materials, an existing jetty will be used on the Tilbury side of the river, approximately 1.9km upstream of Thames Estuary & Marshes SPA/Ramsar site. Due to the length of the construction programme the number of forecast barge movements equates to one two-way barge movement every 2.5 days on average i.e. very low given how busy the tidal River Thames is as a shipping channel, and the main shipping channel out to the Thames Estuary is a minimum of 400m from the SPA/Ramsar site. All the roads used to access the

¹⁴ [https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010032/TR010032-004422-National%20Highways%20-%20Other-%205.4.1.6%20SoCG%20between%20\(1\)%20National%20Highways%20and%20\(2\)%20Natural%20England_v3.0_clean.pdf](https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010032/TR010032-004422-National%20Highways%20-%20Other-%205.4.1.6%20SoCG%20between%20(1)%20National%20Highways%20and%20(2)%20Natural%20England_v3.0_clean.pdf)

construction site also lie over 2km from the SPA/Ramsar site. Since traffic only has a potential significant impact on nitrogen deposition and associated air pollutants when location within 200m of a European site¹⁵, no likely significant effects will arise. Similarly, on the Gravesend side of the river all construction traffic routes are located at least 600m from the Thames Estuary & Marshes SPA/Ramsar site and generally further afield.

4.6 Disturbance from jetty use

- 4.6.1 To remove spoil from the site, and deliver construction materials, an existing jetty will be used on the Tilbury side of the river, approximately 1.9km upstream of Thames Estuary & Marshes SPA/Ramsar site. No changes to existing lighting of the jetty will be required since no nocturnal barge movements will be associated with the project. Since this is an existing jetty being used by an aggregate company to bring in spoil from other projects, the wader and waterfowl population of the area are habituated to the use of this jetty and this will not be materially changed by the project.

4.7 Conclusion

- 4.7.1 It is concluded that there will be no likely significant effect on Thames Estuary & Marshes SPA/Ramsar site either alone or in combination with other plans or projects, except through noise impacts.

¹⁵ See [Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations - NEA001](#) and [air-quality-impacts-on-nature-sites-2019.pdf](#) (iaqm.co.uk)

5 Appropriate Assessment

5.1 Noise disturbance

Construction noise

5.1.1 Average (LAeq) noise levels were modelled for six construction phases:

- Phase 1: Site set up;
- Phase 2: Piling and excavation;
- Phase 3: Tunnelling;
- Phase 4: Installation;
- Phase 5: Reinstatement; and
- Phase 6: Impact piling for the overhead line.

5.1.2 The tunnel will be driven from the Tilbury side, so Phase 3 was not modelled for the Gravesend side of the River Thames. In addition to LAeq, LMax levels were calculated for the noisiest plant likely to be used at either Tilbury or Gravesend:

- Breaker (Tilbury only);
- Dumper or bulldozer (Tilbury and Gravesend); and
- Loading shovel (Tilbury only).

5.1.3 Maps showing construction noise contours are depicted in Appendix A. Most works will be undertaken during the day. The exception is during Phase 3 (Tunnelling) at Tilbury when the treatment plants in particular will run 24hrs. If noise levels do not exceed the baseline then they will not be audible as distinct noises. While the quality of a noise can also be relevant, the distance of the Proposed Development from the foreshore or inland ringed plover raft (360-390m) and the nature of the existing noise environment, with considerable influence from human activity, mean that the quality of the noise created during works will not be materially different from the existing soundscape.

Tilbury

Day works

5.1.4 Comparison with the baseline levels presented in Table 2 shows that at Tilbury the mudflats will be subject to an average noise level due to the works of up to 45dB. This would occur during Phase 1 (Site Set Up). During the later phases the noise level at the mudflats is forecast to be lower being 35-40dB. In other words, the average noise levels at the mudflat will be at or below the current baseline levels and thus not audible above them. Moreover, due to the presence of other sensitive nesting bird species in the general area, unrelated to HRA, the project intends to surround the construction site with close-board noise fencing. This will reduce noise levels by approximately 10dB meaning that the average noise levels experienced across the foreshore will be well below current baseline levels.

5.1.5 The LMax levels at the foreshore from all phases at Tilbury are forecast to be well below the baseline LMax levels at the foreshore, with the highest levels during use of the breaker. An LMax of 45dB (with occasional areas reaching 50dB at the crest of the beach) is forecast at the foreshore during these operations, which is well below the baseline foreshore LMax of 70dB. With the noise fencing introduced to protect other features in place, the LMax will be 35-40dB, at least 30dB below the baseline (i.e. six times quieter).

- 5.1.6 In addition to the intertidal zone, the raft identified in the Thurrock Flexible Generation Plant DCO ES approximately 390m east of the TKRE construction site which supported nineteen ringed plover would, with the noise fencing introduced to protect other features, be subject to similar noise levels to the foreshore during works i.e. 30-35dB LAeq and LAmix levels well below the recorded baseline and therefore not audible above the baseline.

Night works

- 5.1.7 During Phase 3 (tunnelling), there will be noise generated at night due to the 24hr operation of the treatment plants. For simplicity it is assumed that noise levels at night during Phase 3 will be similar to those during the day, although in practice it is likely less noise would be generated. During Phase 3 average noise levels of 40-45 dB LAeq would be generated at the foreshore and at the ringed plover raft inland. Without mitigation they would therefore be a minimum of 1 dB lower than baseline levels. Taking account of the noise fencing introduced to protect other features, they would be a minimum of 11dB lower than baseline levels and therefore would not be audible above the baseline.

Gravesend

- 5.1.8 Comparison with baseline levels presented in Table 2 shows that at Gravesend the mudflats will be subject to an average noise level due to the works of up to 50dB. This would occur during Phase 1 (Site Set Up) and Phase 5 (Reinstatement). During the other phases the noise level at the mudflats is forecast to be lower being up to 45dB. In other words, even during the noisiest phases the construction noise levels will be within 1dB of baseline levels (these being 49dB), which would not be perceptible as a difference. Moreover, due to the presence of other sensitive nesting bird species in the general area, unrelated to HRA, the project intends to surround the construction site with close-board noise fencing. This will reduce noise levels by approximately 10dB meaning that even during Phases 1 and 5 the average noise levels experienced across the foreshore will be well below current baseline levels.
- 5.1.9 The LAmix levels at all phases at Gravesend are forecast to be well below the baseline LAmix levels, with the highest levels during use of the dumper or bulldozer. An LAmix of 50dB or below is forecast at the foreshore during this operation, which is well below the baseline LAmix of 73dB.

Conclusion

- 5.1.10 It can therefore be concluded that birds using the mudflats, or the ringed plover using the raft 390m east of the Proposed Development on the Tilbury side, will not be disturbed by noise associated with construction of the tunnel, either at Tilbury or Gravesend. It can therefore be concluded that no adverse effect on integrity will occur on the Thames Estuary & Marshes SPA/Ramsar site.

5.2 In-combination Assessment

- 5.2.1 Consideration has been given to other projects that would be undertaken in similar locations to the TKRE tunnelling works over the time period (not including ongoing work which has already been captured in the baseline noise monitoring).
- 5.2.2 Two Nationally Significant Infrastructure Projects (NSIPs) overlap with the Proposed Development: Lower Thames Crossing (TR010032) and Thurrock Flexible Generation Plant (EN010092).
- Lower Thames Crossing (Planning Inspectorate Reference: TR010032), which is a NSIP. This scheme has not yet been consented and any potential cumulative effects would therefore be subject to the approval of the application and the timescales for construction. Nonetheless, an initial high-level appraisal has been carried out below to inform this report based on the information supplied in support of the DCO submission (October 2022);
 - Thurrock Flexible Generation Plant (Planning Inspectorate Reference: EN010092) which is also a NSIP. The supporting Transport Assessment for this development has been reviewed and the scheme proposes to utilise a similar road network to the Proposed Development during the

construction phase. Therefore, an initial high-level appraisal has been carried out below to inform this report; based on the information supplied in support of the DCO submission (February 2020);

- Replacement surface water outfall at Tilbury Power Station (REF: 21/00947/FUL). This is considered to be a minor scheme which is unlikely to give rise to any significant cumulative effects as no TA or Transport Statement was prepared in support of the planning application. It is therefore proposed to scope this scheme out from the assessment of cumulative effects within the Environmental Appraisal Report;
- New Combined Cycle Gas Power Station with a generating capacity up to 2,500 megawatts (MW), Open Cycle Gas Turbines with a generating capacity up to 300MW and an energy storage facility, all on the Tilbury Power Station site (REF: 18/00549/SCO). This scheme will be reviewed as part of the Environmental Appraisal Report, subject to an application/EIA being submitted.
- Use of the land at the former Tilbury B Power Station for a temporary period of no more than 5 years for the external storage of HGVs, new motor vehicles and miscellaneous port-related product with associated minor works (REF: 21/01927/FUL). This is a minor (temporary) scheme which is unlikely to give rise to any significant cumulative effects as no Transport Assessment or Transport Statement was prepared in support of the planning application. The scheme has been consented and the land is in use. It will be captured by the baseline scenario and it is therefore proposed to scope this scheme out from the assessment of cumulative effects within the Environmental Appraisal Report; and
- Environmental Impact Assessment Screening Opinion for the variation of conditions relating to the continued use of land for inert waste and soils recycling, primary aggregates extraction, processing, and sale together with ancillary facilities and access (REF: 21/01108/SCO). This is an existing site which will be captured by the baseline scenario, and it is therefore proposed to scope this scheme out from the assessment of cumulative effects within the Environmental Appraisal Report.

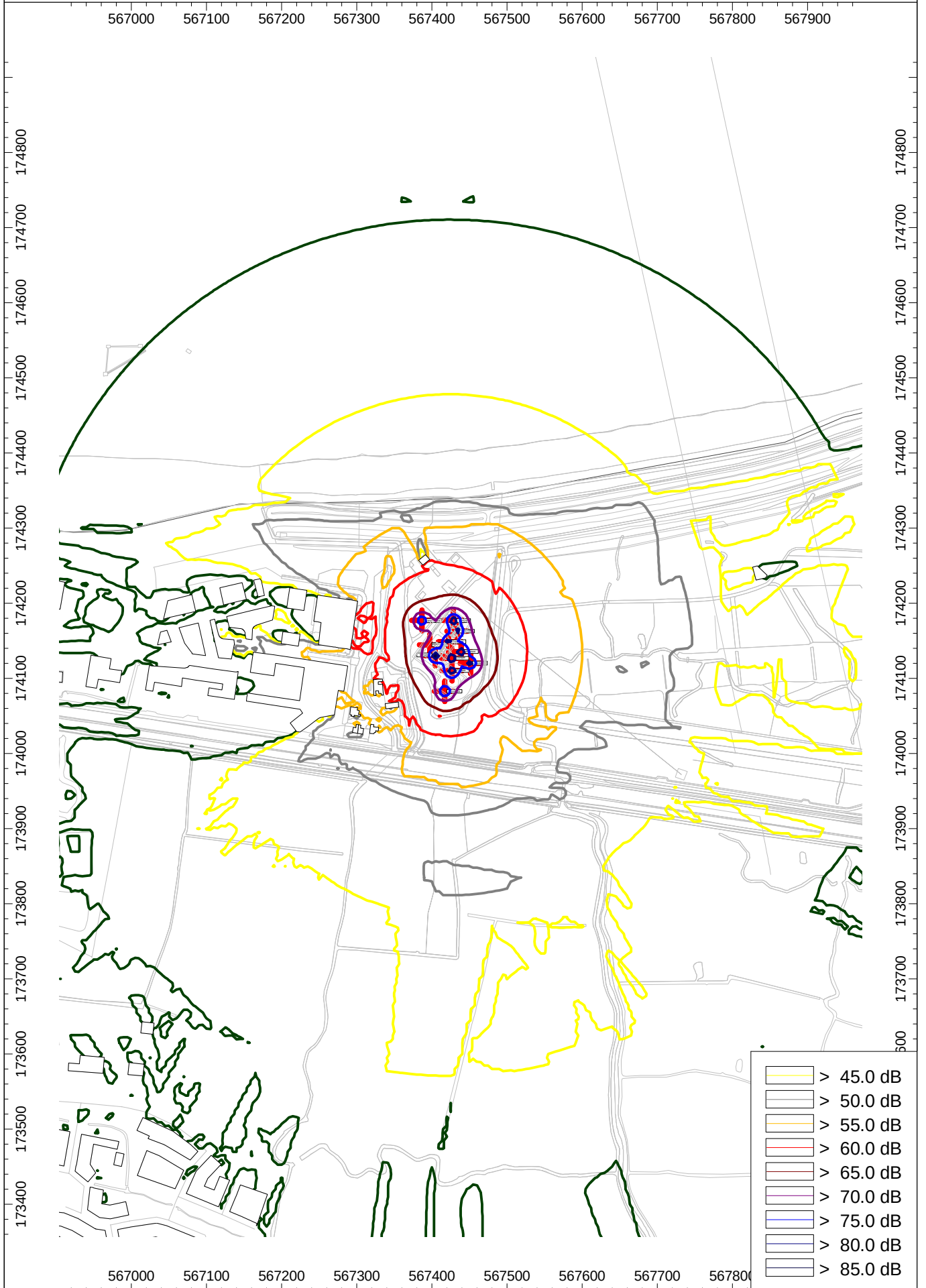
- 5.2.3 The cumulative developments within the Tilbury study area cover an extensive area including the Proposed Development site. They are generally industrial in nature which reflects the characteristic land use present within the landscape along with the potential addition of the Lower Thames Crossing which would introduce a large linear infrastructure development.
- 5.2.4 The cumulative developments within the Gravesend study area are more limited but similarly reinforce the existing land uses other than the Lower Thames Crossing which will introduce large scale linear infrastructure across the River Thames immediately adjacent to and across the Proposed Development site area.
- 5.2.5 It has been established that the Proposed TKRE Development in isolation would not result in an adverse effect on the integrity of the Thames Estuary & Marshes SPA/Ramsar site, largely due to its distance from the SPA/Ramsar site, coupled with the presence of noise fencing for other purposes during tunnel construction, and the fact that operation of the tunnel will have no impact pathways to the SPA/Ramsar site. It is considered that the Proposed Development would also not operate cumulatively with these proposed developments to result in an adverse effect on integrity 'in combination'. This is because the zone of influence of the TKRE during construction does not overlap with that of any of the other projects mentioned in this section. Moreover, construction noise at the SPA/Ramsar, or identified areas of functionally linked habitat closest to the TKRE project, will be sufficiently far below baseline levels that no disturbance will arise even in combination with other plans or projects.

6 Conclusion

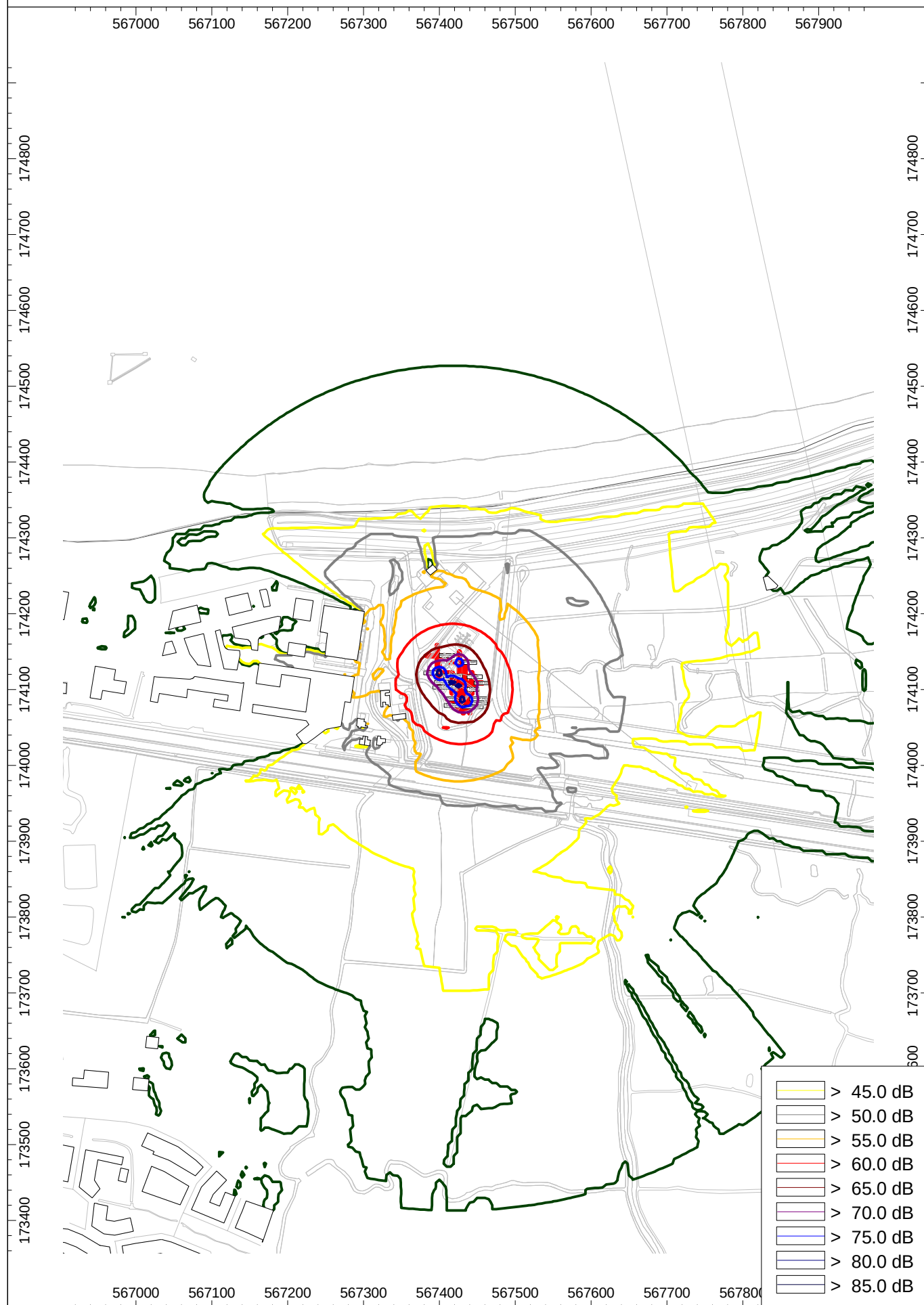
- 6.1.1 It is concluded that there will be no adverse effect of the Proposed Development on the integrity of the Thames Estuary & Marshes SPA/Ramsar site either alone or in combination with other plans or projects.

Appendix A Noise contour maps

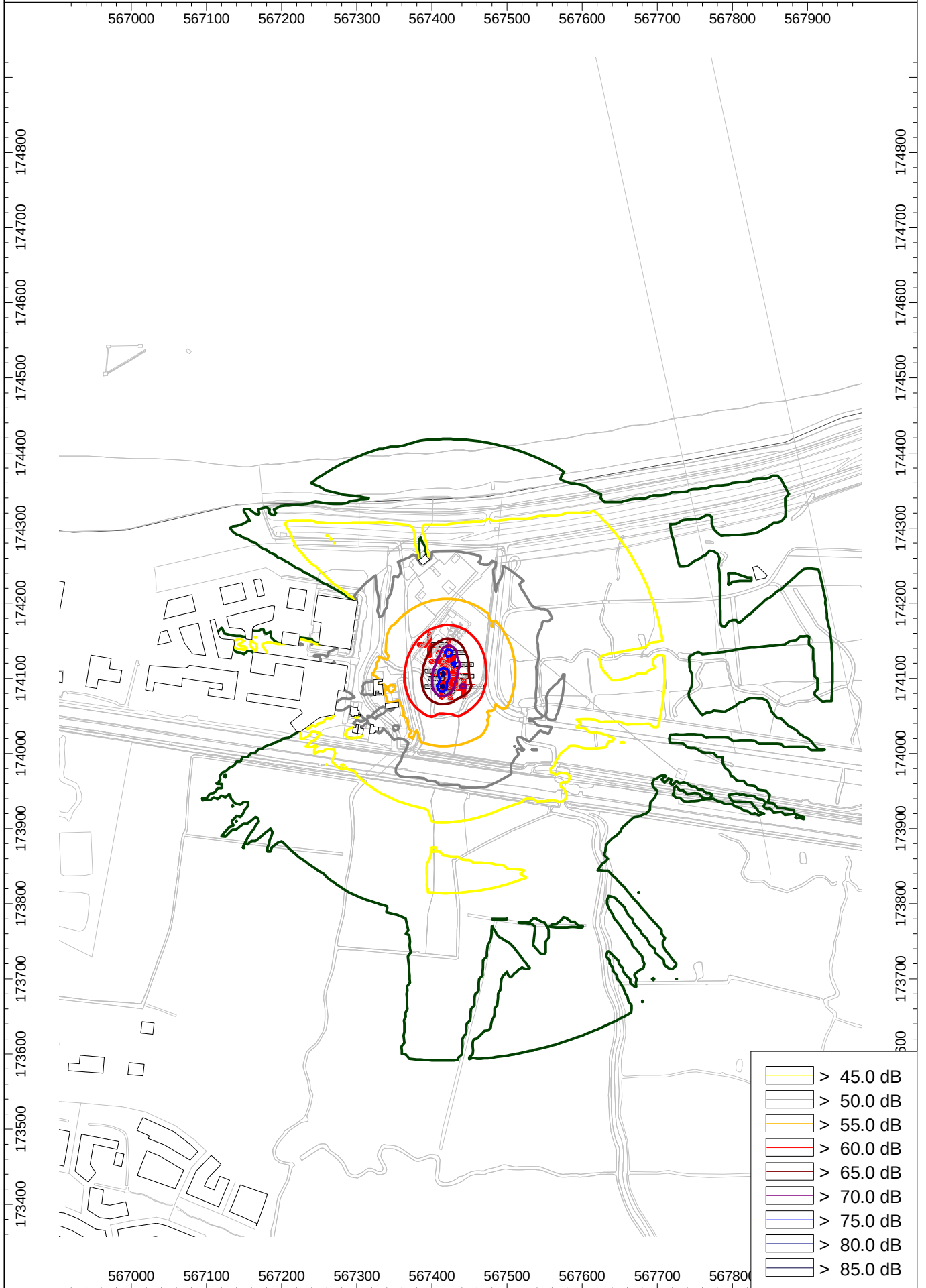
Gravesend Site Set Up - LAeq,T Noise Contours



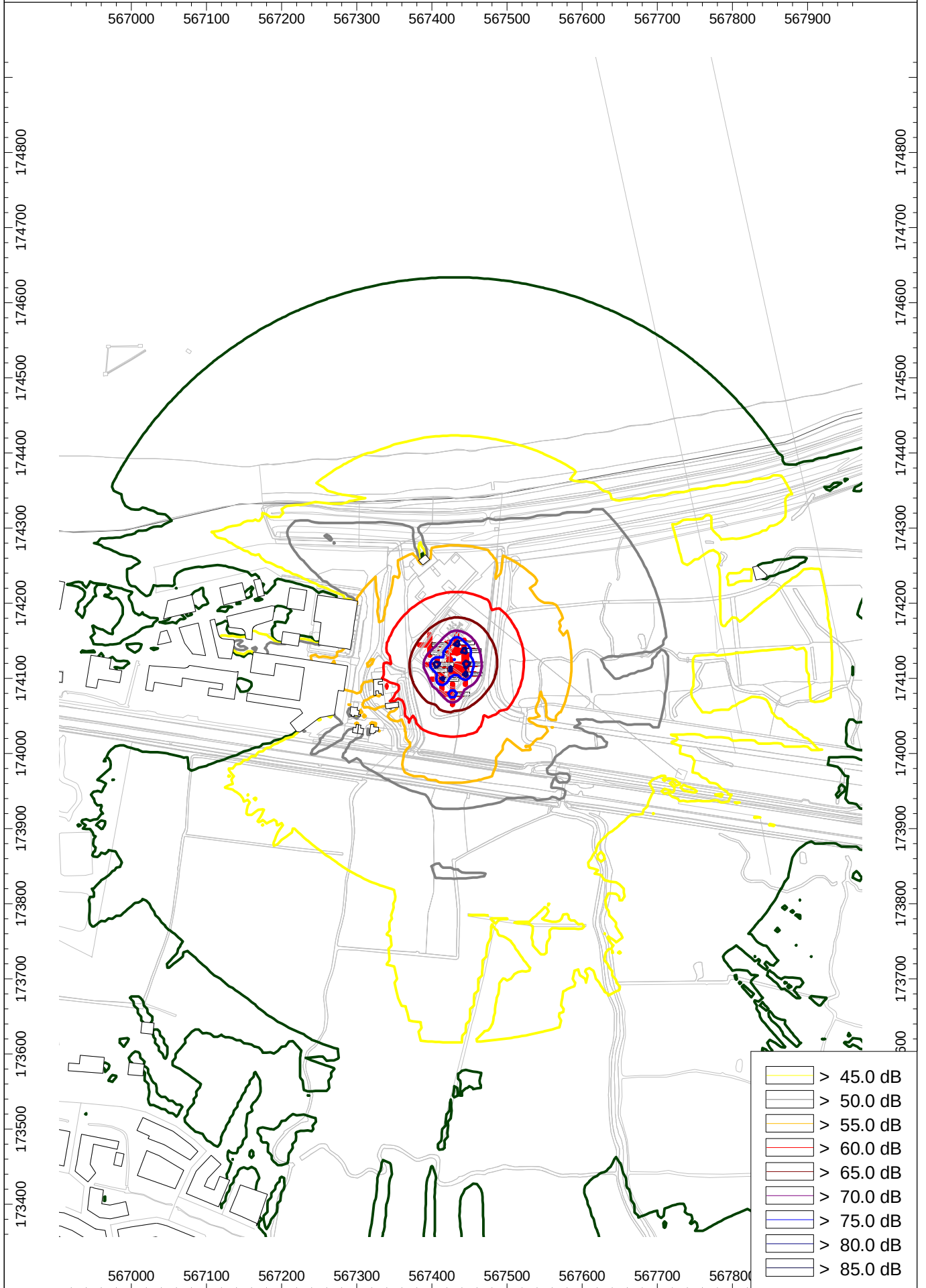
Gravesend Piling and Excavation - LAeq,T Noise Contours



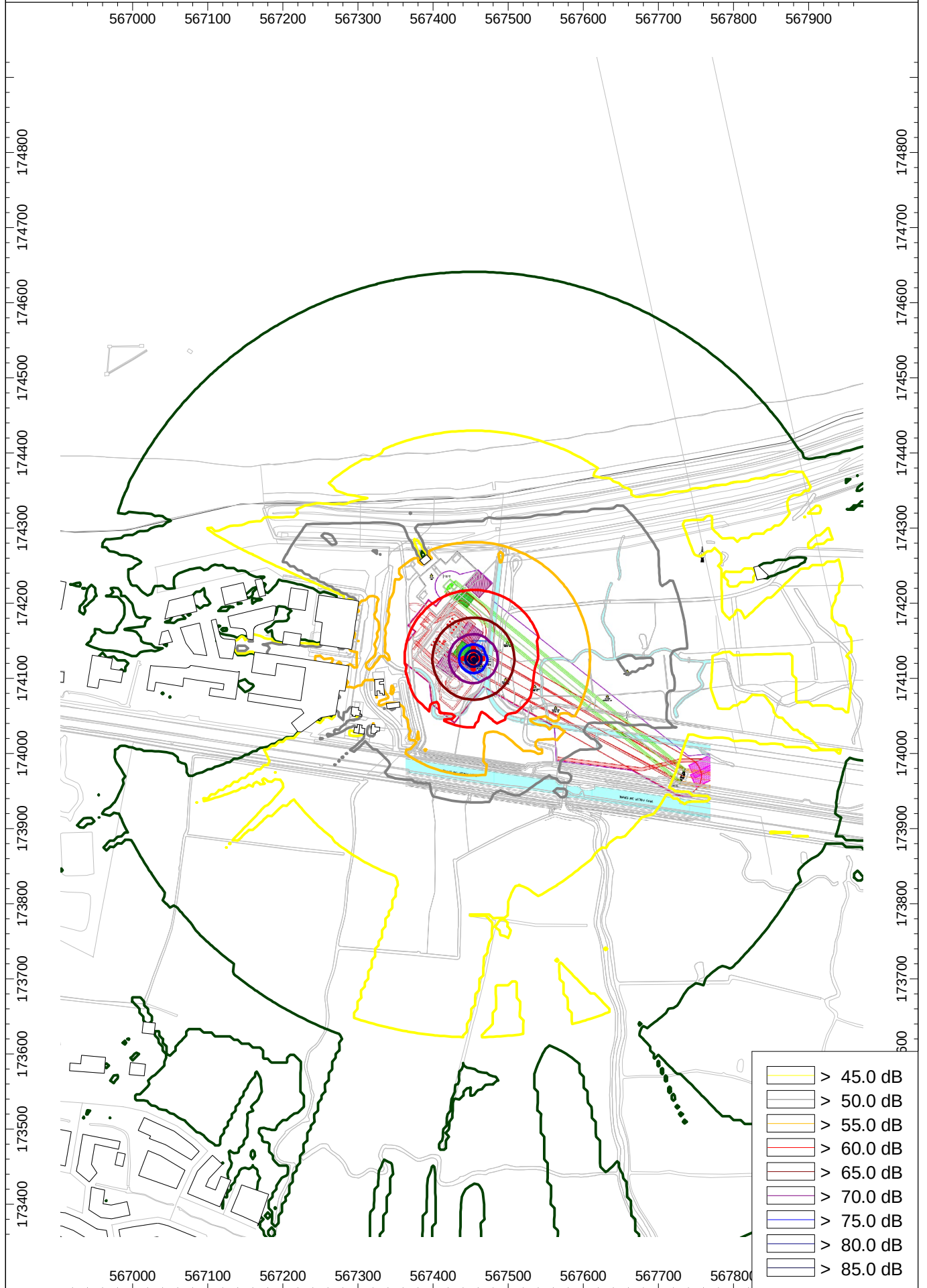
Gravesend Installation - LAeq,T Noise Contours



Gravesend Reinstatement - LAeq,T Noise Contours



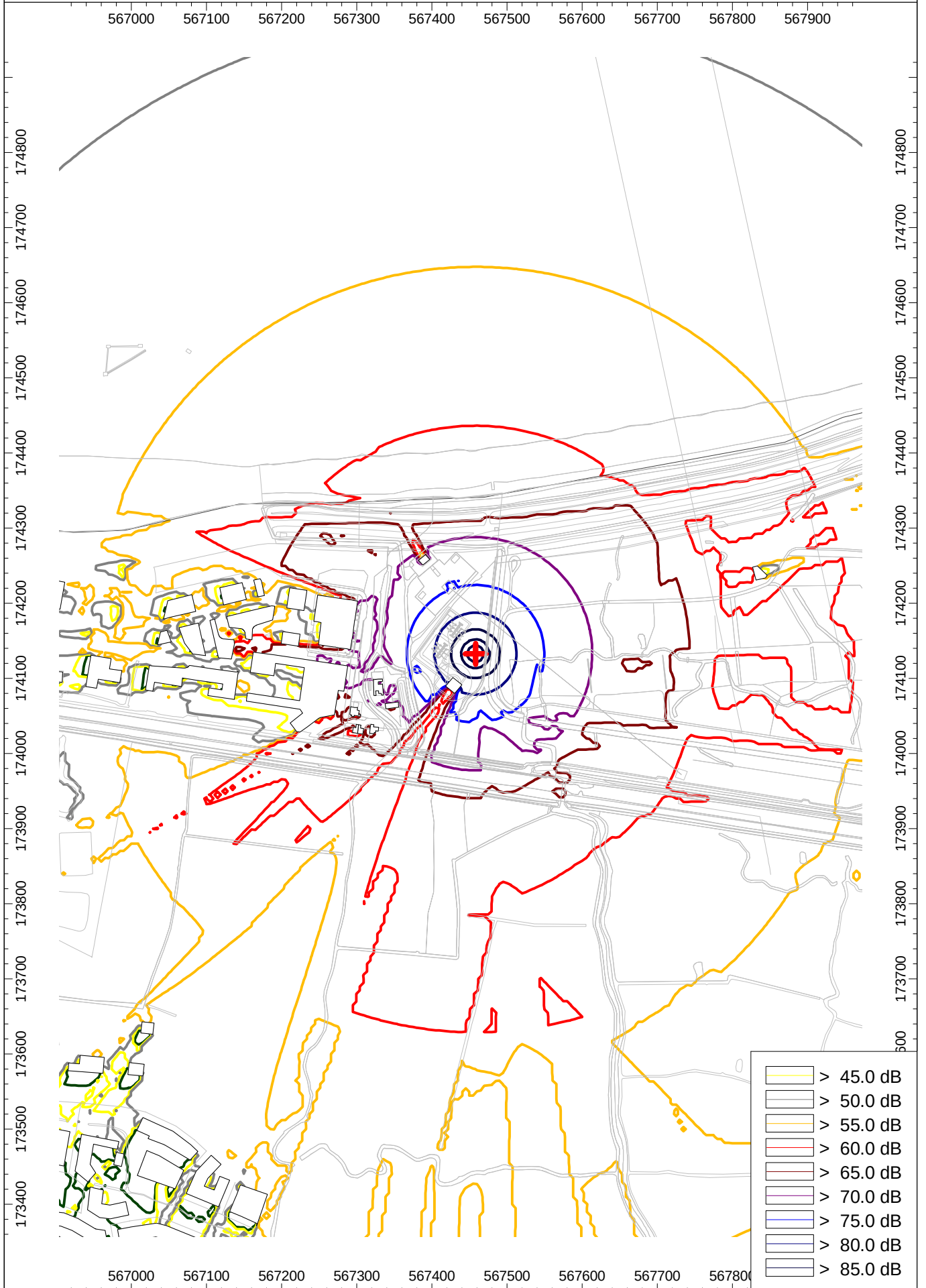
Gravesend Pylon Piling - LAeq,T Noise Contours



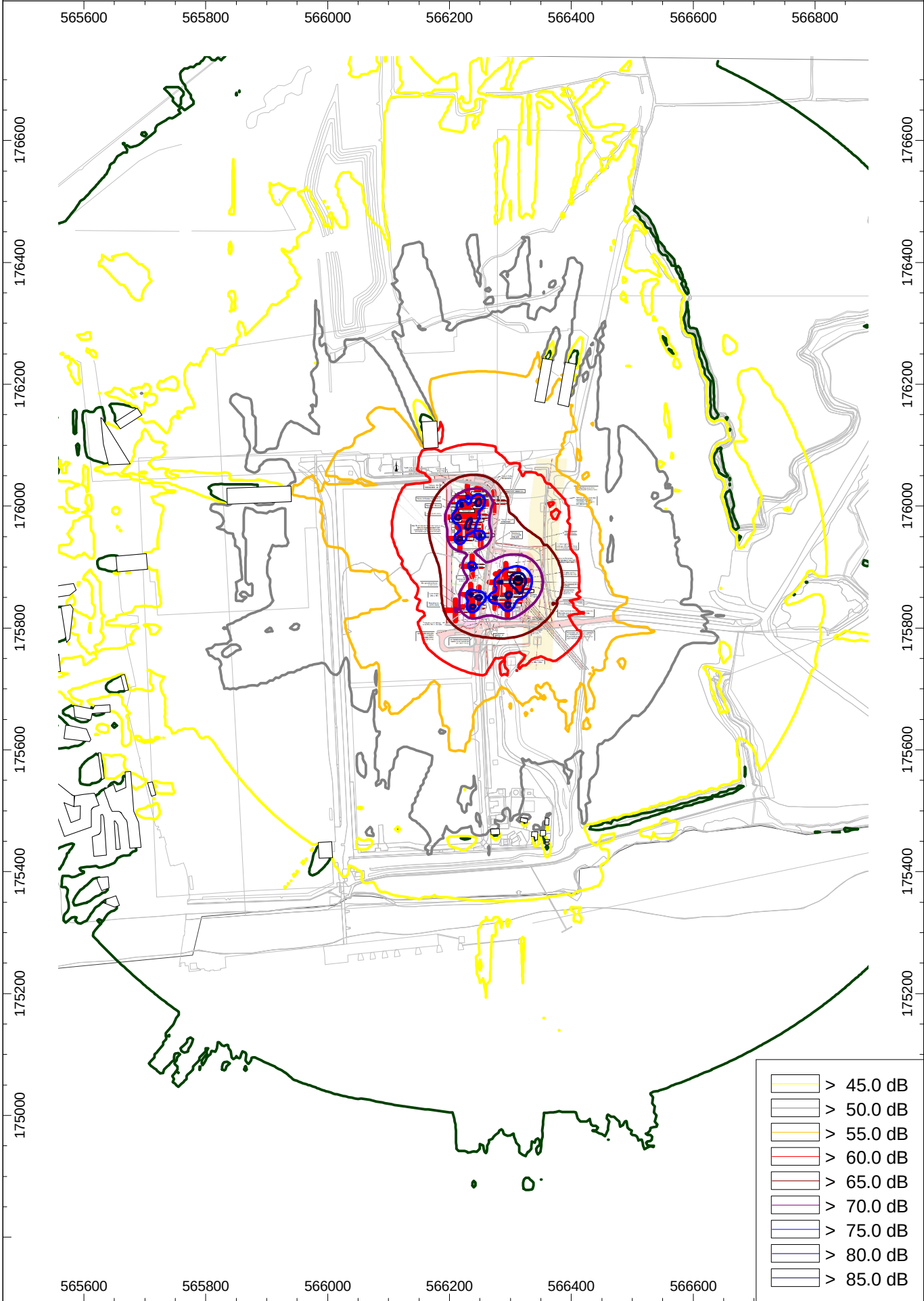
Gravesend Dumper or Bulldozer - L_Amax Noise Contours



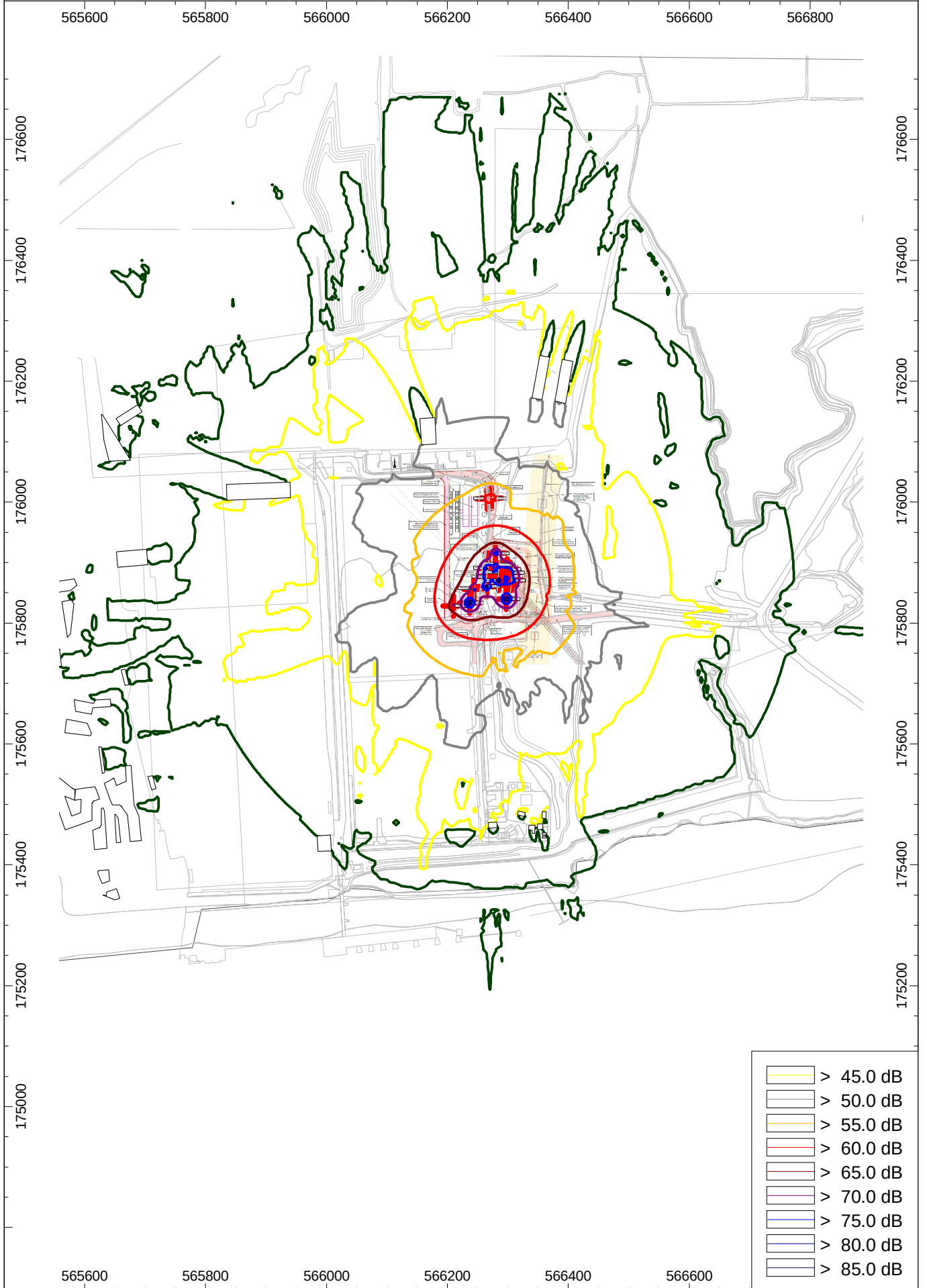
Tilbury Pylon Piling - L_Amax Noise Contours



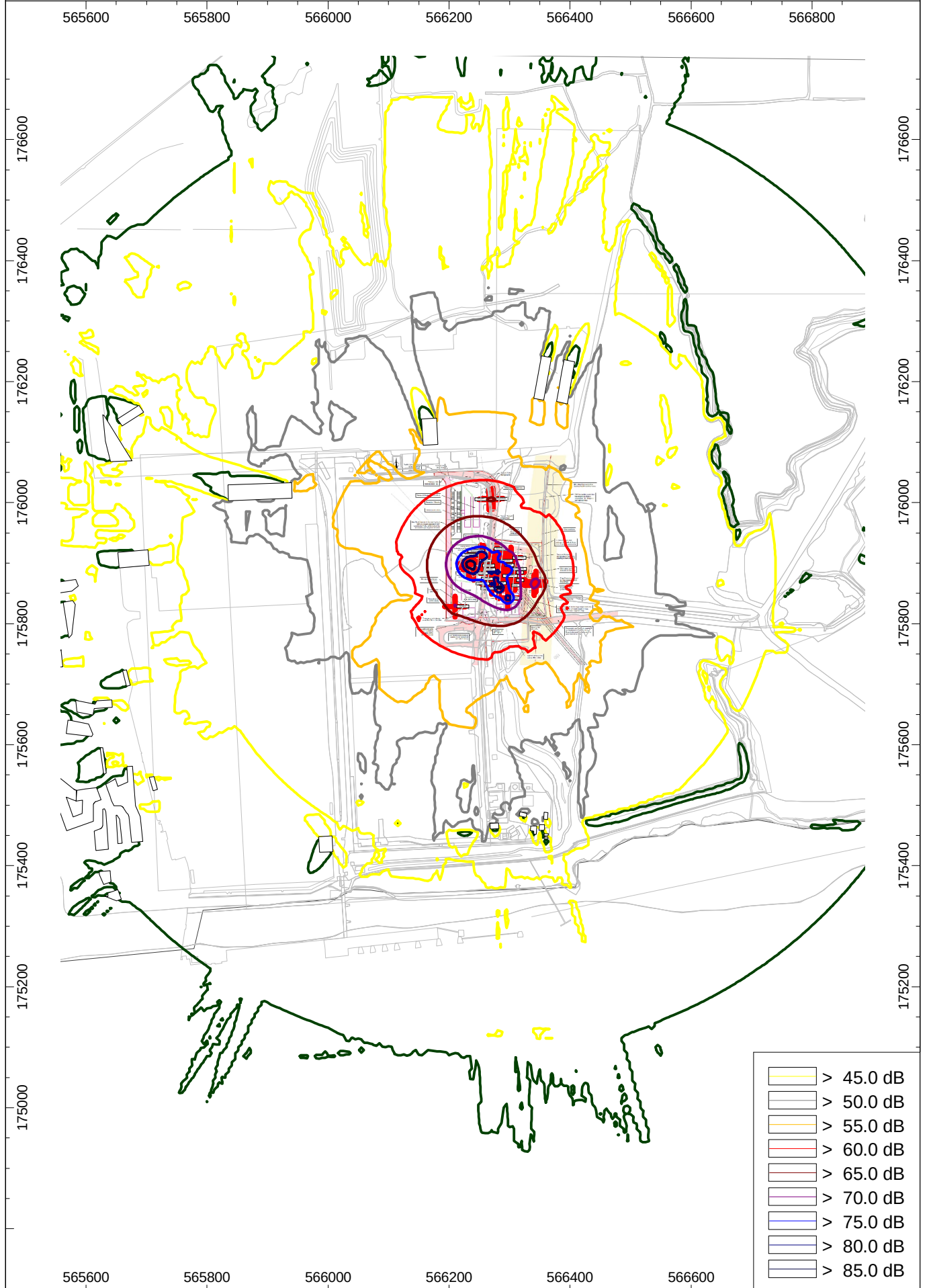
Tilbury Site Set Up - LAeq,T Noise Contours



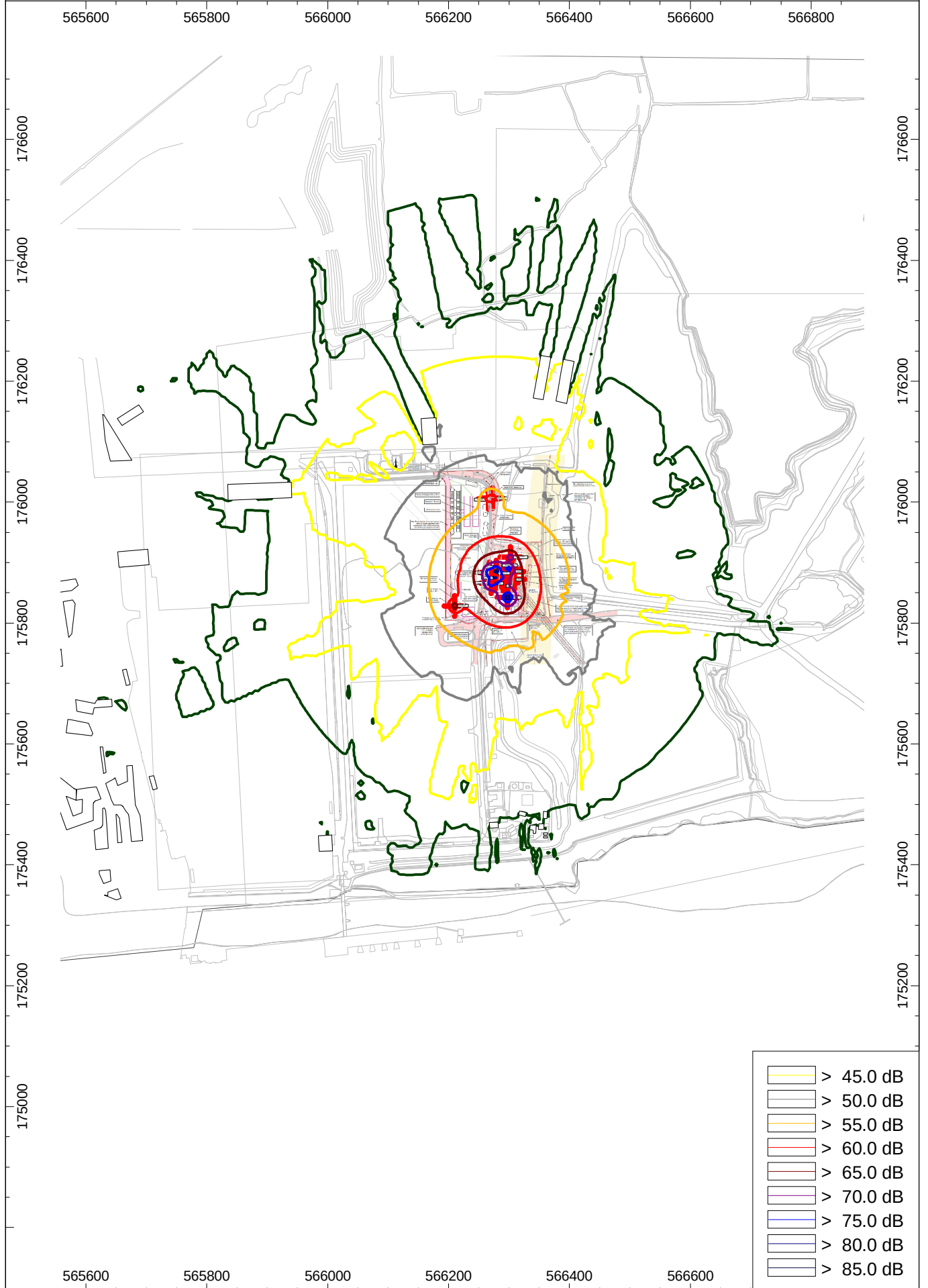
Tilbury Piling/ Excavation - LAeq,T Noise Contours



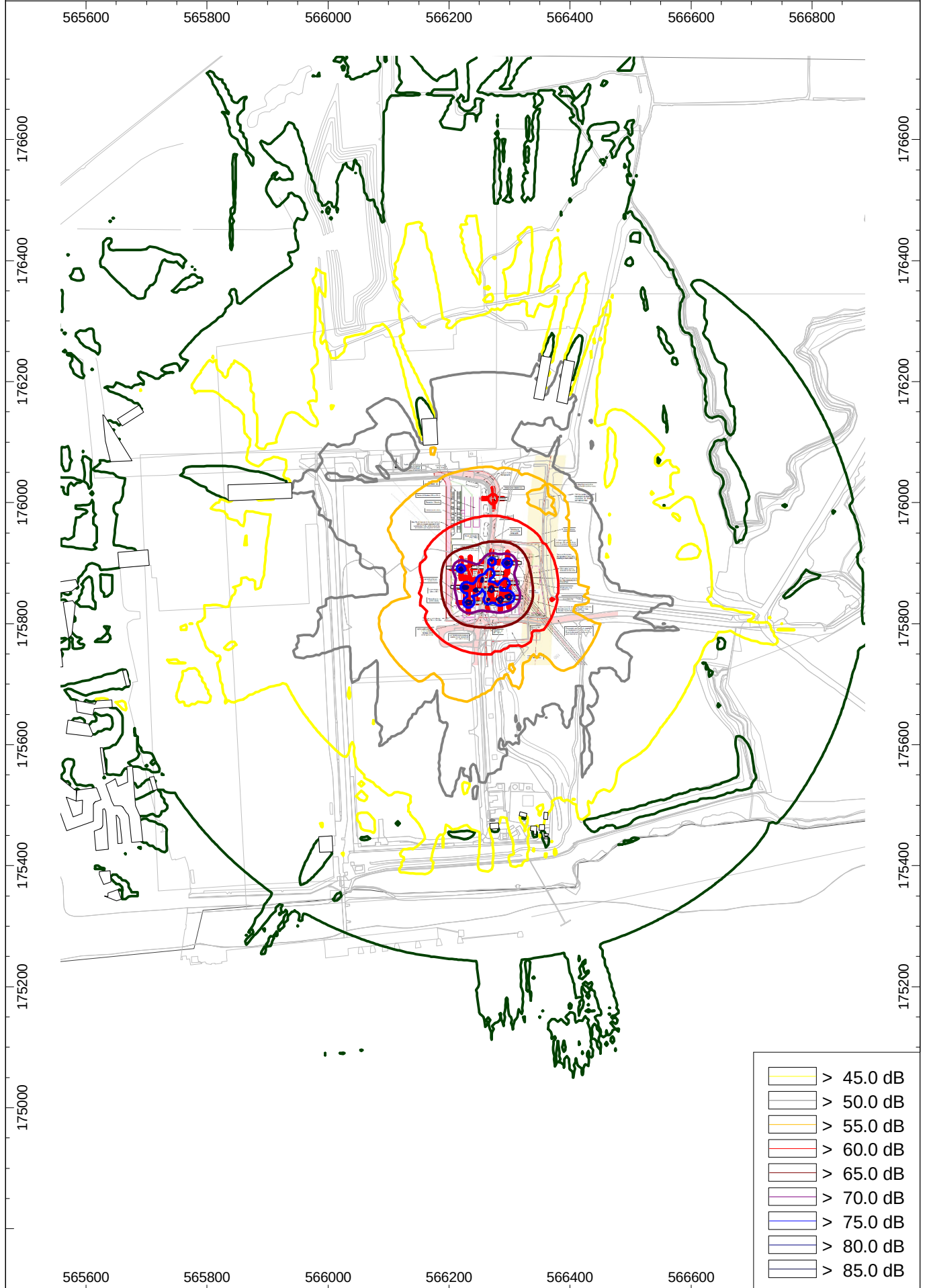
Tilbury Tunneling - LAeq,T Noise Contours



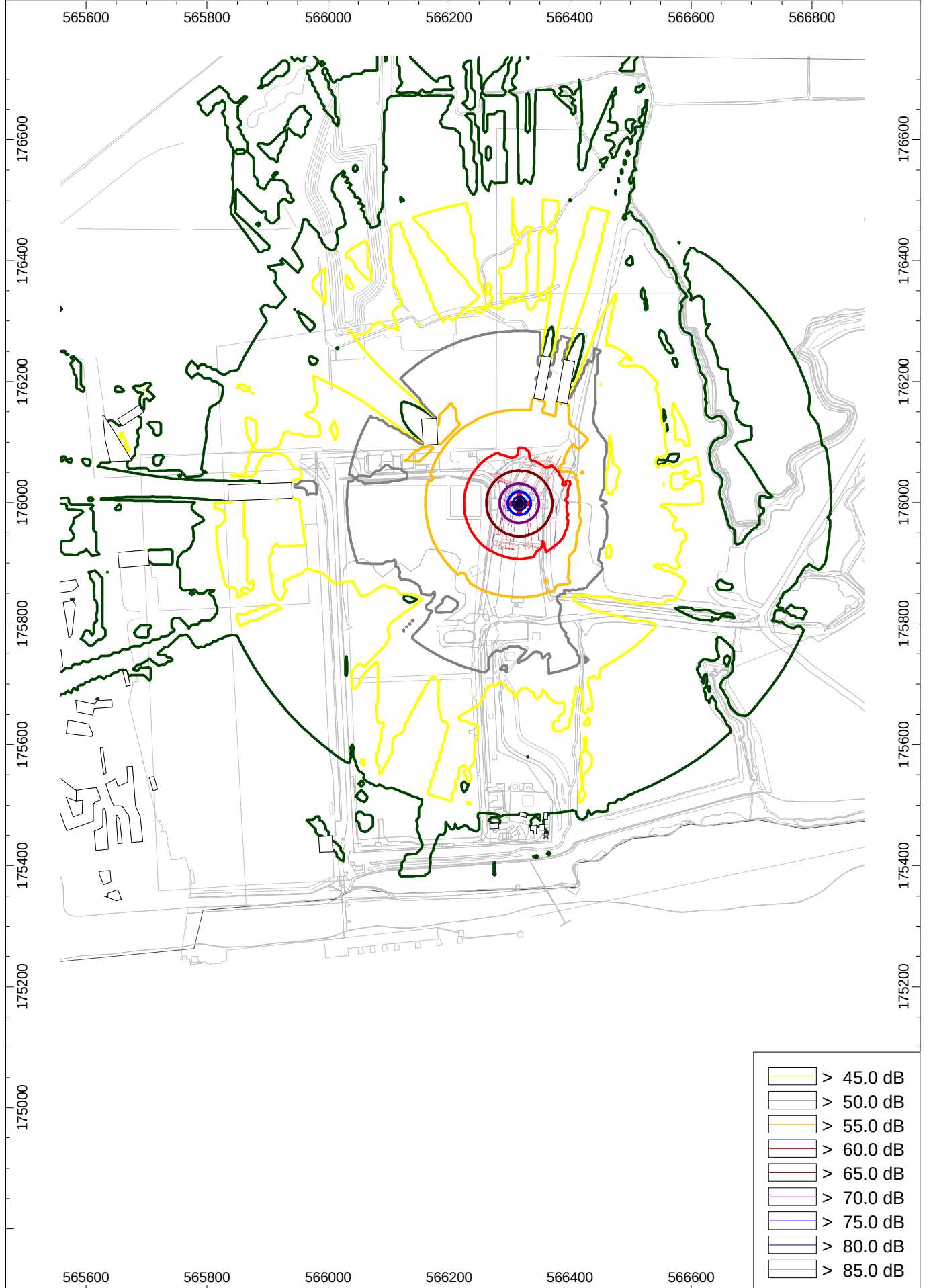
Tilbury Installation - LAeq,T Noise Contours



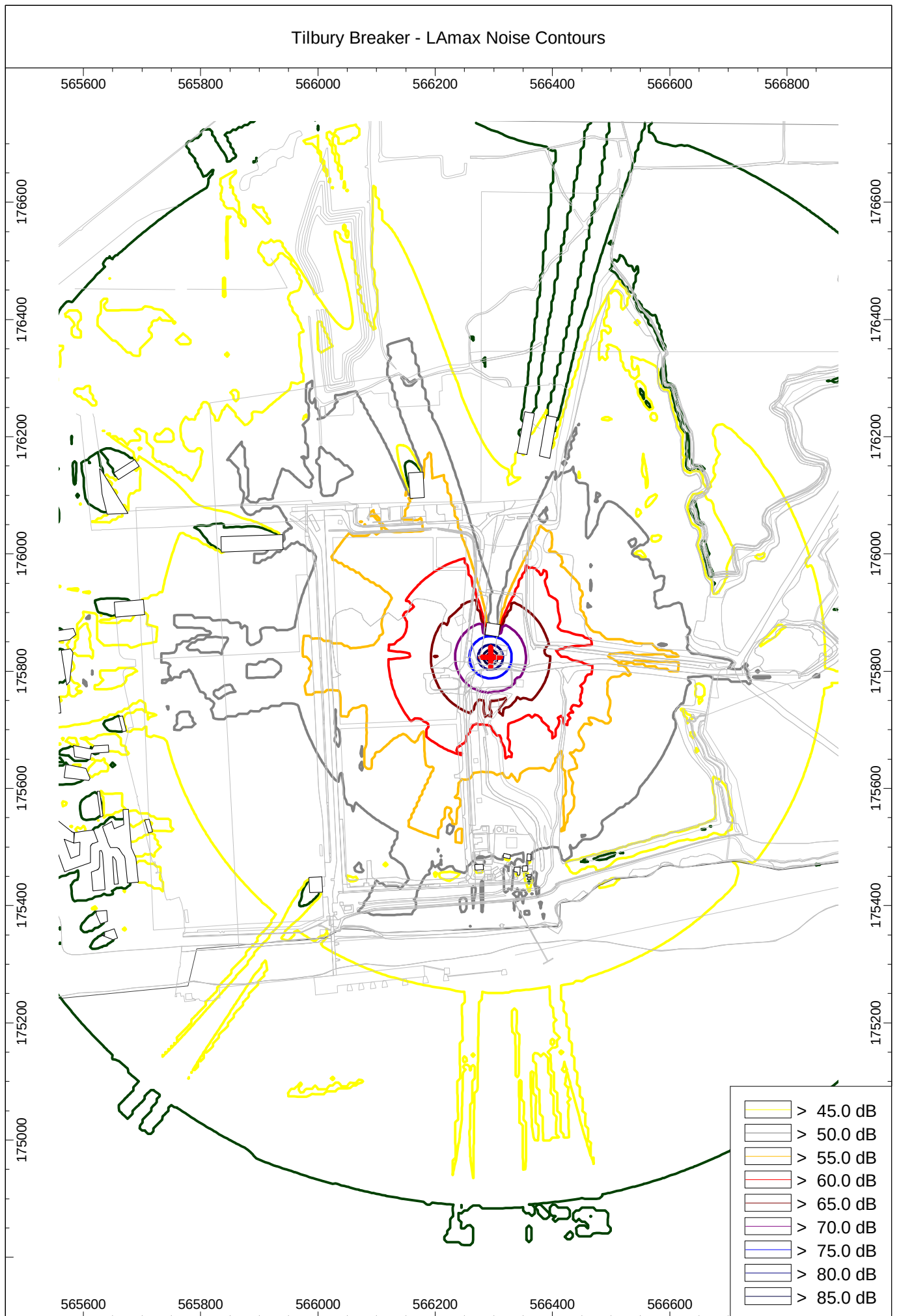
Tilbury Reinstatement - LAeq,T Noise Contours



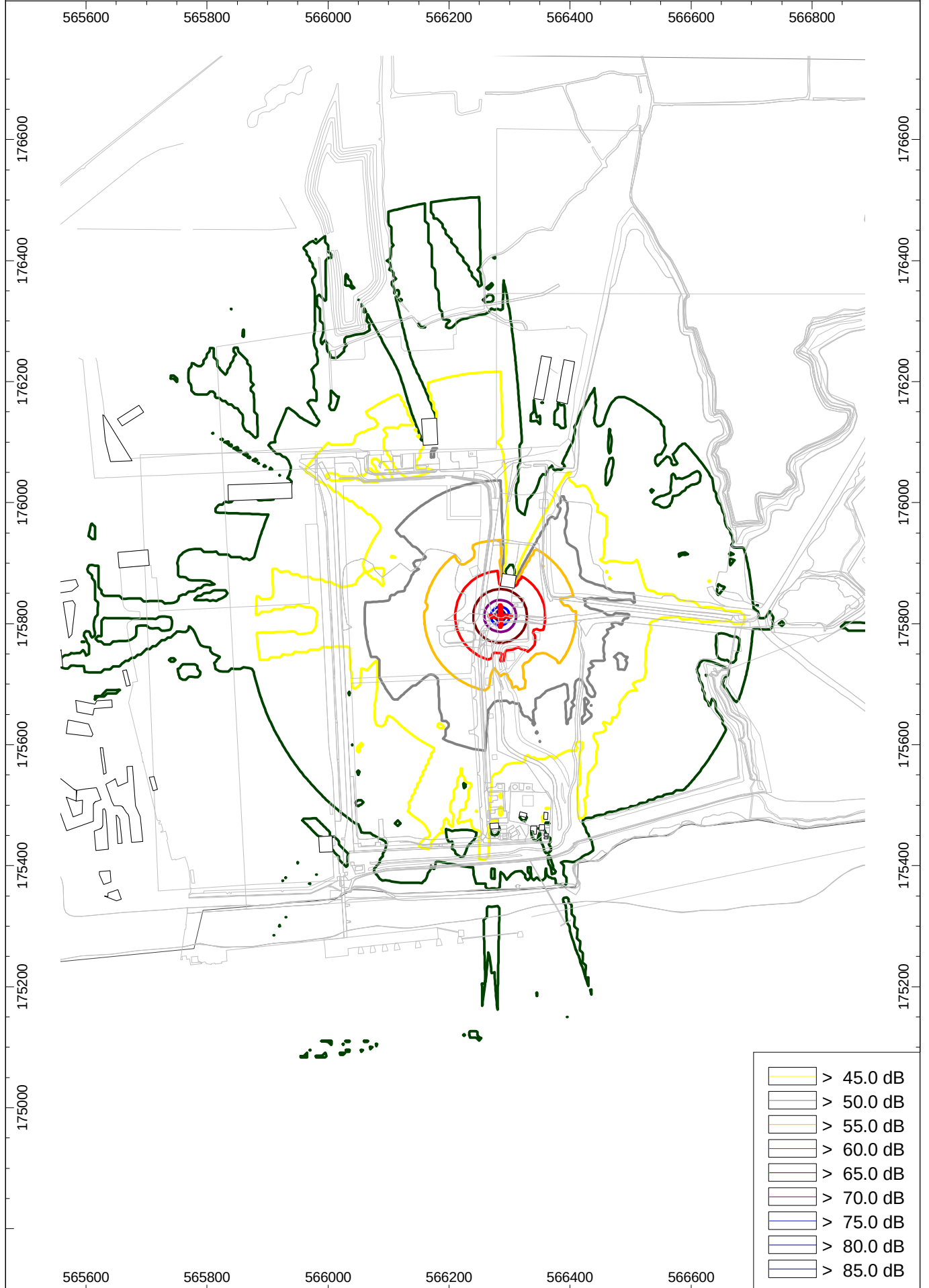
Tilbury Pylon Piling - LAeq,T Noise Contours



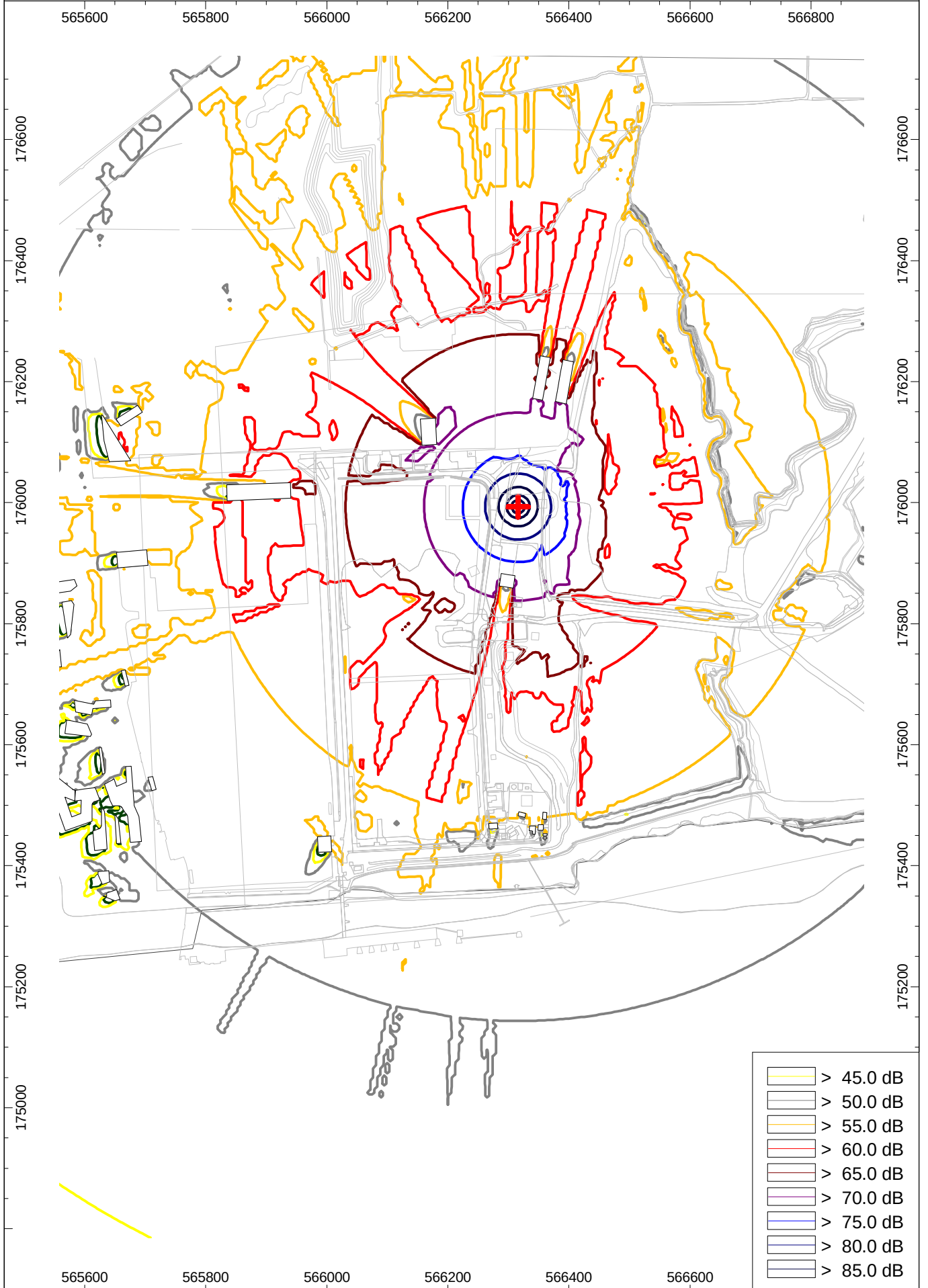
Tilbury Breaker - LAmax Noise Contours



Tilbury Dumper or bulldozer - L_Amax Noise Contours



Tilbury Pylon Piling - L_Amax Noise Contours



Tilbury Loading Shovel - LAmox Noise Contours

