



Thurrock Flexible Generation Plant

Environmental Statement Volume 4: Cumulative Environmental Assessment Chapter 29: Geology, Hydrogeology and Ground Conditions

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1. Introduction and Approach

1.1 Purpose of this chapter

- 1.1.1 This chapter of the Environmental Statement (ES) provides an assessment of the geology, hydrogeology and ground condition effects of the proposed development in combination with other relevant future development projects that have been scoped into the cumulative assessment.
- 1.1.2 In particular, this cumulative effects assessment (CEA) topic chapter:
- identifies the potential impact interactions of the proposed development in combination with other relevant future development projects;
 - identifies the receptors with the potential to be significantly affected by these potential impact interactions and characterises these receptors, including their sensitivity and any relevant environmental thresholds;
 - evaluates the likely significant cumulative effects on these key receptors as a result of the proposed development in combination with other development projects;
 - identifies any additional mitigation measures that are proposed to prevent, minimise, reduce or offset these significant cumulative effects; and
 - taking into account any proposed mitigation measures, evaluates the significance of predicted residual cumulative effects.

1.2 Approach to cumulative assessment

- 1.2.1 The assessment of geology, hydrogeology and ground conditions cumulative effects follows the approach set out in ES Volume 2, Chapter 4: EIA Methodology, Section 3.

1.3 Study area

- 1.3.1 The extent of the study area is a buffer of up to 250 m from the order limits, in line with the main assessment, which is considered sufficient to account for off-site sources.

1.4 Screening of cumulative developments

- 1.4.1 ES Volume 4, Chapter 18: Cumulative Effects Assessment Introduction and Screening identifies a short-list of potential cumulative developments that have been screened as potentially relevant to the CEA overall (i.e. for one or more topic areas). From this shortlist of cumulative development projects, Table 1.1 identifies those projects that fall within the zone of influence for geology, hydrogeology and ground conditions and have potential for cumulative effects that require assessment in this topic area.
- 1.4.2 Developments have been shortlisted in Table 1.1 where:
- the conclusions of the environmental assessments for those developments predicted significant effects on receptors within the zone of influence for the proposed Thurrock Flexible Generation Plant development; or
 - where there is considered to be potential for effects that were not predicted to be significant for those individual developments but that may become significant in the cumulative scenario; or
 - where environmental studies for those developments have not been published but there is sufficient information available about the development to both indicate the potential for cumulative effects and allow assessment.
- 1.4.3 Where sufficient information about a development to consider its potential for cumulative effects was not publicly available, the development has not been shortlisted.

Table 1.1: Shortlist of relevant cumulative developments.

ID	Development	Potential cumulative impacts (construction)	Potential cumulative impacts (operation and maintenance)	Potential cumulative impacts (decommissioning)	Receptor(s) affected
012	Urban expansion of Linford and East Tilbury	Potential for earthworks to mobilise ground contamination or create preferential pathways to groundwater with lateral migration off site. Inhalation of soil derived airborne dusts.	Potential for contaminated runoff from highway drainage to pollute soil and/or controlled waters.	Not applicable.	Human health receptors, groundwater (including aquifers), groundwater abstraction licences for potable water supply, and surface watercourses
025	Demolition of Tilbury B Power Station	Potential for earthworks to mobilise ground contamination or create preferential pathways to groundwater with lateral migration off site. Inhalation of soil derived airborne dusts.	Not applicable.	Not applicable.	Human health receptors, groundwater (including aquifers), groundwater abstraction licences for potable water supply, and surface watercourses
042	Tilbury2	Potential for earthworks/dredging activities to mobilise ground contamination or create preferential pathways to groundwater with lateral migration off site. Inhalation of soil derived airborne dusts.	Potential for contaminated runoff from highway drainage to pollute soil and/or controlled waters. Potential for maintenance dredging to mobilise contamination with lateral migration off site.	Not applicable.	Human health receptors, groundwater (including aquifers), groundwater abstraction licences for potable water supply, and surface watercourses
058	Lower Thames Crossing	Potential for earthworks to mobilise ground contamination or create preferential pathways to groundwater with lateral migration off site. Inhalation of soil derived airborne dusts.	Potential for contaminated runoff from highway drainage to pollute soil and/or controlled waters.	Not applicable.	Human health receptors, groundwater (including aquifers), groundwater abstraction licences for potable water supply, and surface watercourses

1.5 Identifying cumulative developments affecting each receptor

- 1.5.1 Table 1.2 and Table 1.3 summarise the cumulative developments that have the potential to cause cumulative effects at each identified receptor, the sensitivity of that receptor to cumulative impacts, and the starting position to the cumulative effects assessment, which is the predicted residual effect of Thurrock Flexible Generation Plant alone during construction, operation and decommissioning (as established in ES Volume 3).
- 1.5.2 As described in Table 1.1, no developments with likely significant cumulative impacts during the decommissioning phase of Thurrock Flexible Generation Plant have been identified.

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

Receptor affected	Sensitivity of receptor to cumulative effects	Standalone effect of Thurrock Flexible Generation Plant on receptor	Cumulative development(s) with the potential to affect this receptor
Human health receptors	High	Minor adverse (not significant)	All
Secondary A aquifers	Medium	Minor adverse (not significant)	All
Principal aquifer	High	Minor adverse (not significant)	All
Groundwater abstraction for potable water supply	Very high	Moderate adverse (not significant)	All
Surface watercourses	Low to medium	Negligible adverse (not significant)	All

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

Receptor affected	Sensitivity of receptor to cumulative effects	Standalone effect of Thurrock Flexible Generation Plant on receptor	Cumulative development(s) with the potential to affect this receptor
Secondary A aquifers	Medium	Negligible adverse (not significant)	12, 42, 58

Receptor affected	Sensitivity of receptor to cumulative effects	Standalone effect of Thurrock Flexible Generation Plant on receptor	Cumulative development(s) with the potential to affect this receptor
Principal aquifer	High	Minor adverse (not significant)	12, 42, 58
Groundwater abstraction for potable water supply	Very high	Minor adverse (not significant)	12, 42, 58
Surface watercourses	Low to medium	Negligible adverse (not significant)	12, 42, 58

2. Assessment of Cumulative Effects

2.1 Construction phase of Thurrock Flexible Generation Plant

Potential for earthworks to mobilise unexpected ground contamination or create preferential pathways to groundwater

- ~~2.1.1~~ The potential magnitude of impact from Thurrock Flexible Generation Plant alone was considered to be minor, leading to a negligible to moderate adverse effect on receptors of low to very high sensitivity.
- ~~2.1.2~~ The potential impact of Tilbury B Power Station demolition, if still ongoing at the time of Thurrock Flexible Generation Plant construction, is also predicted to be negligible with mitigation and control measures being implemented for that work.
- ~~2.1.3~~ The potential impact of other relevant cumulative developments identified within the 250 m study area is also considered to be minor in all cases due to the requirement for other developments to appropriately investigate, assess and remediate any contamination encountered.
- ~~2.1.4~~ ~~2.1.1~~ The potential for cumulative impacts with the identified relevant developments to occur is therefore considered to be **negligible**. Minor cumulative impacts on receptors of **low to very high** sensitivity would result in a **negligible to minor adverse** cumulative effect, which is not significant in EIA terms.
- ~~2.1.5~~ Additionally, the adoption of good working practice and implementation of control measures during construction for all developments will minimise pollution.
- ~~2.1.6~~ ~~2.1.2~~ If the construction phase of the Flexible Generation Plant occurs at the same time as one or more of the relevant **cumulative** developments within the 250 m study area, the any potential for cumulative impacts to occur is therefore considered to be would be unlikely to be any greater than **minor**. All developments will need to appropriately investigate, assess and remediate any contamination encountered. Furthermore they will be required to adopt good working practice and implement any necessary control measures during construction in order to minimise pollution. In accordance with the methodology set out in Table 2.3 of Chapter 4 in the ES, Mminor cumulative impacts on receptors of **low to very high** sensitivity would result in a **negligible to moderate or major adverse** cumulative effect. Based on professional judgement and acknowledging the aforementioned mitigation and control measures required to be in place, the cumulative effect is deemed moderate adverse at worst, which is not significant in EIA terms.

Potential for construction activity to cause soil or groundwater contamination

- ~~2.1.7~~ ~~2.1.3~~ The potential magnitude of impact from Thurrock Flexible Generation Plant alone was considered to be negligible, leading to a negligible to minor adverse effect on receptors of low to very high sensitivity.
- ~~2.1.8~~ The potential impact of relevant cumulative developments identified within the 250 m study area is also considered to be minor in all cases due to the requirement for other developments to implement suitable control measures and good practice for pollution prevention.
- ~~2.1.9~~ ~~2.1.4~~ If the construction phase of the Flexible Generation Plant occurs at the same time as one or more of the relevant **cumulative** developments within the 250 m study area, any the potential for cumulative impacts to occur is therefore considered to be **minor** would be unlikely to be any greater than **negligible**. All developments will be required to implement suitable control measures and good practice for pollution prevention. Negligible Minor cumulative impacts on receptors of **low to very high** sensitivity would result in a **negligible to moderate-minor adverse** cumulative effect, which is not significant in EIA terms.

Further mitigation or enhancement

- ~~2.1.10~~ ~~2.1.5~~ No additional mitigation is required.

Residual effects

- ~~2.1.11~~ ~~2.1.6~~ No significant residual effect is predicted.

2.2 Operation and maintenance phase of Thurrock Flexible Generation Plant

Pollution of Soils and/or Controlled Waters

- 2.2.1 The potential magnitude of impact from Thurrock Flexible Generation Plant alone was considered to be negligible, leading to a negligible to minor adverse effect on receptors of low to very high sensitivity.
- 2.2.2 The potential impact of the Lower Thames Crossing is also predicted to be negligible due to the proposed embedded mitigation that is described for that development, which includes appropriate drainage systems to minimise risk of pollution to soils or controlled waters.

2.2.3 Similarly, the road network serving the proposed expansion of Linford and East Tilbury, and Tilbury2 will require appropriate drainage.

2.2.4 The potential for cumulative impacts with the identified relevant developments to occur is therefore considered unlikely to be any greater than ~~minor~~negligible. ~~Minor~~Negligible cumulative impacts on receptors of **low** to **very high** sensitivity would result in a **negligible to minor adverse** cumulative effect, which is not significant in EIA terms.

Further mitigation or enhancement

2.2.5 No additional mitigation is required.

Residual effects

2.2.6 No significant residual effect is predicted.

2.3 Decommissioning phase of Thurrock Flexible Generation Plant

Pollution of Soils and/or Controlled Waters

2.3.1 As set out in Table 1.1, no cumulative developments with likely significant cumulative impacts during the decommissioning phase of Thurrock Flexible Generation Plant have been identified, and no significant cumulative effects are anticipated.

Further mitigation or enhancement

2.3.2 No additional mitigation is required.

Residual effects

2.3.3 No significant residual effects are predicted.

2.4 Conclusions

2.4.1 Any cumulative effects which may occur are not considered significant in terms of geology, hydrogeology and ground conditions.