

## 17. CHAPTER 17 INTERACTION AND ACCUMULATION OF EFFECTS

### 17.1 Introduction

In accordance with the EIA Regulations, an ES should give consideration to 'cumulative effects'. By definition, these are effects that result from incremental changes caused by past, present, or reasonably foreseen future actions together with the Amended Proposed Development. For cumulative assessment, two types of effect are considered:

- The combined effect of individual effects, for example visual, noise, airborne dust, or traffic on a single receptor; and
- The combined effects of several developments that may on an individual basis, be insignificant, but cumulatively have a significant effect. This considers the Amended Proposed Development together with other developments that are proposed but not operational at the time of the assessment.

This Chapter of the ESA provides an update to Chapter 17: Interaction and Accumulation of Effects within Volume 1 of the ES and should therefore be read in conjunction with that chapter. The aim of this Chapter is to assess any changes to the interaction and accumulation of effects predicted in the ES following the changes made to the Proposed Development and the updated assessments for the Amended Proposed Development detailed within Chapters 7 to 16 of Volume 1 of this ESA.

#### 17.1.1 Combined Effects of Cumulative Developments

The combined effects of the Amended Proposed Development with other developments have been considered within the technical chapters (ESA Volume 1 Chapters 7 to 16), following an update to the considered cumulative developments (as detailed within Table 2.1 and Table 2.2, Chapter 2, ESA Volume 1, and shown on Figure 2.1, ESA Volume 2). The assessments concluded that the assessment of cumulative effects remains unchanged as detailed in the ES and are therefore not considered further here.

### 17.2 Assessment Methodology

This Chapter therefore focuses on the combined effect of individual effects as discussed above.

The assessment scope and methodology outlined in ES Volume 1 Chapter 17 remains unchanged, and so should be referred to when reviewing this Chapter. The only changes that need to be noted are that this Chapter assesses the interaction and accumulation of the effects detailed in the ESA, not the ES, and that these effects are assessed as a result of the Amended Proposed Development. The details of the Amended Proposed Development can be found in ESA Volume 1, Chapter 5, and as the same receptors have been assessed throughout the ESA as were assessed in the ES, the receptors detailed in Tables 17.3, 17.4, and 17.5 in ES Volume 1 Chapter 17 remain unchanged and considered here.

As with the ES, ecological receptors (detailed in ESA Volume 1, Chapter 8) have not been considered, as no significant impacts were identified. Similarly, air quality effects (detailed in ESA Volume 1, Chapter 13) have also been scoped out of this Chapter as, although the additional air emissions risk assessment (ESA Volume 3, Technical Appendix 13.8) has been carried out for the Amended Proposed Development, no additional significant effects are predicted and no exceedances of air quality standards are predicted outside of the Site or within the adjacent SSSI (in relation to critical levels). Traffic and Transport, Sustainability, Climate Change, and Cultural Heritage and Archaeology have also not been included in this assessment as the Amended Proposed Development has not changed the conclusions of those assessments as provided within the ES.

The majority of the non-negligible magnitude effects of the Amended Proposed Development arising in two or more chapters remain the same as detailed for the Proposed Development within Tables 17.3, 17.4, 17.5 in Chapter 17, ES Volume 1. This is predominantly due to the use of EIA

methodology, where the sensitivity of a receptor and the magnitude of change combine to produce a level of effect. While the Amended Proposed Development includes additional embedded mitigation measures and further management measures for potential impacts, these have rarely changed the reported magnitude of change or the overall level or significance of effect for most receptors, especially as most predicted effects were already non-significant in terms of the EIA Regulations.

Those residual effects that have changed with the Amended Proposed Development are detailed within Table 17.1 below. These are all from the Landscape and Visual Impact Assessment (Chapter 7, ESA Volume 1), and are mainly due to the focussing of extraction activities into small micro-phases; the removal of the Temporary Processing Areas (1-3); the change in phase order allowing the conveyor and maintenance / haul road to be extended progressively across the Site; additional mitigation and amenity measures; and improvement to the proposed restoration scheme (as shown on Figures 7.12 – 7.14 in ESA Volume 2).

**Table 17.1 Non-Negligible Magnitude Effects Arising in Two of More Chapters**

Chapter / Effect Type	Receptor	Sensitivity / Magnitude of Effects	Residual Permanent Effect
<b>Temporary Construction Phase Effects</b>			
Chapter 7: Landscape and Visual Impact Assessment	Landscape Character: IL10 Ranskill (BDLCA). Including Sutton & Lound SSSI, Sutton & Lound LWS & Idle Valley Nature Reserve.  Including the Site: Areas A, B, C	Medium Sensitivity / Small Magnitude	Minor adverse. Resulting from temporary construction works.
<b>Temporary Operational and Restoration Phase Effects</b>			
Chapter 7: Landscape and Visual Impact Assessment	Wetland Fisheries, Low Lound Road (VP11) (NT Sutton BOAT7)	High (Residential receptor & PRoW User) / Medium (Road User) Sensitivity / Medium (on VP) / Small (on PRoW) Magnitude	Up to Minor-moderate adverse for PRoW users and Minor adverse for road users. Resulting from short-term lagoon embankment removal during restoration.
<b>Permanent Restoration Phase Effects</b>			
Chapter 7: Landscape and Visual Impact Assessment	Landscape Character: IL10 Ranskill (BDLCA). Including Sutton & Lound SSSI, Sutton & Lound LWS & Idle Valley Nature Reserve.  Including the Site: Areas A, B, C	Medium Sensitivity / Large Magnitude of Change	Moderate-major beneficial.

## 17.3 Assessment of Effects

As detailed within Section 17.4 within Chapter 17, ES Volume 1, this section considers the effects of the interrelationship between the individual effects identified for each residential receptor and environmental resource frequented by people. Table 17.1 in this Chapter demonstrates that only the effects on Landscape Character and Wetland Fisheries/Lound Low Road have changed since the ES assessment, and therefore these are the only receptors which are revisited in this assessment. The results for all the other receptors remain unchanged from the ES and can be found within Section 17.4 of Chapter 17, ES Volume 1.

### 17.3.1 Landscape Character Area: IL10 Ranskill (BDLCA) Landscape Viewpoints (3,4,5,6 and 9) and Noise (NSR 5,6,7 and 8)

#### 17.3.1.1 Construction Effects

During construction, the key impacts that people would observe relate to the setup of the Site infrastructure (the maintenance / haul road, conveyor, and the Main Processing Site). The Amended Proposed Development's updated phasing order (from west to east) means the conveyor and maintenance / haul road do not have to be built all the way to the east of the High-Rise within the first few years of the lifetime of the Amended Proposed Development, and they can instead be extended progressively as extraction continues. While PRoW users and nearby visual receptors would be affected (in terms of noise and visual impacts) by the progressive extension once it reaches the vicinity of the receptor, the overall impact of the maintenance / haul road is reduced, particularly for the early stages of the Amended Proposed Development. The conveyor and maintenance / haul road are also further screened from view by being constructed at depth within the extraction void to utilise the screening offered by the extraction face and existing lagoon embankments. This has therefore reduced the overall impact on the character of the area to minor adverse (refer to Table 7.1, ESA Volume 1, Chapter 7).

Given that it is only the effect on landscape character that has changed since the ES, the overall cumulative effect with regard to construction is considered to be unchanged from the ES – i.e. a detectable but non-material change, which is therefore considered to be minor.

#### 17.3.1.2 Operational and Restoration Effects

No changes to the operational and restoration impacts have been detailed within the ESA, and therefore the overall cumulative minor effect concluded in the ES remains unchanged and valid.

#### 17.3.1.3 Post Restoration

The Updated Indicative Restoration Plan (ESA Volume 2, Figures 7.12 – 7.14) for the Amended Proposed Development includes further provision of shallow wetland habitats (such as reedbed, scrapes, and ponds) while reducing the amount of pasture and focussing habitats such as wet grassland and woodland into larger blocks. This suits the landscape character by prioritising the wetland habitats that are common within the Site's surroundings, and therefore provides a moderate-major beneficial effect to landscape character. The restoration plan also benefits ecological receptors and hydrology (through the inclusion of drainage), and therefore the cumulative effect determined in the ES remains unchanged and valid.

## **17.3.2 Wetland Fisheries. Landscape Receptor (VP11 and R9) and Noise (NSR 1)**

### **17.3.2.1 Construction Effects**

No changes from the construction impacts noted in the ES have been detailed in the ESA, and therefore the conclusions drawn in the ES remain unchanged – i.e. effects would be negligible and therefore cumulative effects aren't considered.

### **17.3.2.2 Operational and Restoration Effects**

During operation of the Amended Proposed Development, the embankment adjoining the northern boundary of the Site and the hedgerow and mature trees fronting Lound Low Road would be retained to screen views of extraction activities. Once extraction within the nearest phases (HR P5 and HR P6) has been completed, the embankment would be removed to provide fill for the restoration works. However, the Amended Proposed Development incorporates additional embedded mitigation (including a proposed bund, allowing the existing hedgerow to grow taller, and additional planting) in order to screen views into the Site as the embankment is removed. The effects are therefore considered minor-moderate adverse for PRow users and minor adverse for road users, although they are short-term and temporary effects.

Given the reduced visual effect and the predicted operational noise effect detailed within the ES, the overall cumulative effect is considered to be unchanged from the ES.

## **17.4 Statement of Significance**

This Chapter has updated the assessment of the interrelationship of effects detailed within Chapter 17, ES Volume 1, following the updated technical assessments for the Amended Proposed Development. The approach has followed the methodology detailed within the ES, and only Landscape and Visual receptors have been highlighted as having a change in residual effect due to the Amended Proposed Development. This is due to using the EIA methodology, where receptor sensitivity has not changed, and mitigation and management measures within the updated scheme have not fundamentally affected the magnitude of change (even though in reality these measures would reduce and mitigate potential impacts) and therefore the significance of residual effects remain the same as reported in the ES.

Given that most effects have stayed consistent with the ES in terms of the EIA Regulations, the cumulative effects of the Amended Proposed Development have not changed from those detailed within the ES. Thus, the effects in combination remain as a detectable but non-material change and are assessed as minor and non-significant in all cases during construction, operational and restoration phases. A major beneficial and significant effect to the landscape of the Site is predicted due to the implementation of the Updated Indicative Restoration Plan, and this effect is predicted to be larger on landscape character than previously concluded in the ES due to the prioritisation of shallow wet habitats that reflect the surrounding area.