Balfour Beatty

South Wokingham Distributor Road - Central Section

Environmental Statement Addendum for Discharge of Condition 14

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Contents

1 **Introduction** 1

1.1 Background 1
1.2 Purpose of this Addendum 1
1.3 Differences between the Original Scheme and Current Scheme 2

2 **Air Quality** 3

2.1 Introduction 3

3 **Archaeology/Cultural Heritage** 4

3.1 Background 4
3.2 Legislation, policy and guidance 4
3.3 Methodology 4
3.4 Assessment 5
Baseline 5
Scheme changes 5
3.5 Assessment of effect, mitigation and residual effects 6
Construction phase 6
Residual effects 6
Operational phase 6
3.6 Conclusions 7

4 **Landscape and Visual** 8

4.1 Introduction 8
4.2 Methodology 8
4.3 Consultation 8

4.4 Scope of the assessment 8
4.5 Site visits 8
4.6 Assessment methodology 8
Landscape assessment methodology 8
Visual assessment methodology 9
Duration of effects 10
4.7 Assessment 10
Landscape Effects during Construction 10
Visual Effects during Construction 11
4.8 Conclusions 21
Landscape Receptor LCA N1: Holme Green Pastoral Sandy Lowland 22
Visual Receptors 22
5 **Biodiversity 23**
5.1 Background 23
Biodiversity 23
5.2 Methodology 24
Biodiversity 24
Biodiversity Net Gain 24
5.3 Assessment 24
Biodiversity 24
5.4 Conclusions 25
Biodiversity 25
Biodiversity Net Gain 25
6 **Geology and Soils 26**
6.1 Introduction 26
6.2 Methodology 26
Significance criteria 26
6.3 Baseline Conditions 27
6.4 Sensitive Receptors 27

6.5 Assessment 28

CONSTRUCTION PHASE 28

Potential effect on construction workers from pre-existing contamination within the underlying soils (if present) 28

6.6 Mitigation 29

6.7 Residual Effects 29

6.8 Conclusions 32

7 **Groundwater 33**

7.1 Background 33

7.2 Methodology 33

7.3 Baseline Conditions 34

7.4 Assessment 35

7.5 Impacts 35

7.6 Conclusions 36

8 **Road Drainage and the Water Environment 37**

8.1 Background 37

8.2 Methodology 37

8.3 Baseline Conditions 38

8.4 Assessment 39

8.5 Conclusions 43

9 **Noise and Vibration 44**

9.1 Introduction 44

9.2 Methodology 44

9.3 Assessment 44

9.4 Conclusions 55

10 **Materials and Waste 57**

10.1 Introduction 57

10.2 Methodology **57**
10.3 Assessment **57**
10.4 Construction **58**
10.5 Operation **58**
10.6 Conclusions **58**
Construction 59
Operation 59
11 **Climate** **60**
11.1 Background **60**
11.2 Mitigation **60**
11.3 Conclusions **60**
12 **Conclusion** **62**
12.1 Conclusion **62**
Appendix A Figures **63**
Appendix B – Extract from FRAP **65**

Tables

Table 4-1 - Visual Effects During Construction 11
Table 8-1 - Sensitive Receptors 39
Table 9-1 - Significance Scale for the Initial Assessment of Construction Noise 45
Table 9-2 - Predicted Construction Noise levels and Magnitude of Impact 46
Table 9-3 - Significance Scale for the Initial Assessment of Construction Vibration 48
Table 9-4 - Predicted Construction Vibration Levels and Magnitude of Impact 49
Table 9-5 - Closest Dwelling to each Compound Location 50
Table 9-6 - Significance Thresholds for Construction Noise (from BS 5228-1) 54

Figures

Figure 9-1 - Satellite Compound – Original Location 51
Figure 9-2 - Satellite Compound – Current Location 51
Figure 9-3 - Main Compound - Original Location 52
Figure 9-4 - Main Compound – Current Location 53
Figure 1-1 - Original Plan (May 2019) 63
Figure 1-2 - Current Plan (September 2024) 64

1 Introduction

1.1 Background

1.1.1. An application for the construction of the South Wokingham Distributor Road (SWDR) between Finchampstead Road and Waterloo Road including a link to Heathlands Road and other associated works was submitted in November 2019 and validated in January 2020 (Planning reference 192928). This was supported by an Environmental Statement dated October 2019. Development of the detailed design to the scheme required the submission of an Addendum to the Environmental Statement which was submitted in March 2021. Planning Consent was granted on 24th May 2021 and this consent was granted subject to certain conditions.

1.2 Purpose of this Addendum

1.2.1. At the time of granting of consent the location of the eastern construction compound and associated haul routes had not been finalised. As a result Condition 14 of the May 2021 consent states the following:

Before commencement of development an Environmental Statement Addendum shall be submitted to assess implications of temporary haul roads, compounds and any other enabling works required to facilitate construction of the road shall be submitted to and approved in writing by the Local Planning Authority and the recommendations of the Addendum shall inform the details submitted pursuant to conditions.

1.2.2. Whilst originally the haul route was anticipated to be at grade it is now intended to be up to 1m above existing ground levels on its approaches to the temporary watercourse crossing. Increases elsewhere are less than this.

1.2.3. WSP has carried out hydraulic modelling to assess the effect of the haul route and temporary crossing on flood risk and the results of this are explained in Technical Note 66439-TN03_P1 _Issue.

1.2.4. Details of the proposed haul road are also set out in Appendix M Flood Risk Activity Permit (Document Number WMHP-BB-SRWG1-WPP-EA-0001) of the Construction Environmental Management Plan (Document Number WMHP-BB-SRWG1-PLN-PM-0001) submitted to discharge Condition 24 of Planning Permission 192928. A relevant extract from the FRAP is included (see Appendix B of this Addendum). In summary, the environmental effect as a result of the temporary haul road is expected to be limited and not extend beyond the site boundary.

1.3 Differences between the Original Scheme and Current Scheme

1.3.1. The differences between the original and current Schemes with respect to the location of haul routes and compound locations can be identified through scrutiny of the Figures 1-1 to 1-2 in Appendix A.

1.3.2. Therefore, this addendum sets out the implications for the revised locations of the eastern construction compound from the west of the link road to a location west of Easthampstead Road and haul routes for the findings of the environmental assessments carried out to date. The following subject areas will be addressed in this addendum

- Air Quality
- Archaeology/Cultural Heritage
- Landscape and Visual
- Biodiversity
- Geology and Soil
- Groundwater
- Road Drainage and the Water
- Environment
- Noise and Vibration
- Materials and Waste
- Climate

2 Air Quality

2.1 Introduction

2.1.1. An assessment of construction phase effects was undertaken as part of the air quality chapter of the Environmental Statement (ES) where it was determined that the site was high risk for dust soiling and medium risk for human health (due to the relatively low background PM10 concentrations). With the appropriate mitigation the residual effects were judged to be negligible and not significant. Since the ES was completed, there have been some amendments to the location of the compounds and the proposed on-site haulage routes. The greatest changes occur around the main compound which has been relocated and the haulage routes adjusted accordingly. This places the compound and on-site haulage route closer to the existing residential dwellings on Easthampstead Road and construction traffic will now likely utilise this road rather than bypassing these properties to the south. However, the overall sensitivity of the surrounding environment and associated risk would not change based on the definitions within the Institute of Air Quality Management's (IAQM) construction guidance. Therefore, the mitigation outlined within the ES is considered sufficient and residual effects will remain negligible and not significant.

2.1.2. Outside of the aforementioned areas, no changes to construction traffic are expected as a result of the changes to the compounds and on-site haulage routes.

3 Archaeology/Cultural Heritage

3.1 Background

3.1.1. Chapter 5 of the January 2021 Environmental Statement (ES) reported the following:

During the construction stage, the direct, permanent long-term residual effects on potential buried / surface palaeoenvironmental remains and archaeological deposits from the prehistoric and post-medieval periods are likely to be neutral or slight adverse following the implementation of suitable mitigation measures.

3.1.2. During the operational stage, the setting of a number of designated assets would be directly affected by the Consented Scheme. Following the implementation of suitable mitigation measures, the direct permanent long-term residual effects on the setting of the Grade I listed Henry Lucas Hospital were assessed as moderate or large adverse, while the direct permanent long term residual effects on the setting of the Grade II* listed Outbuildings at Lucas Hospital, the Grade II* listed Lock's House, the Grade II listed Garden Wall at Lucas Hospital, the Grade II listed Wood's Farm, the Grade II listed Britton's Farmhouse and the Grade II listed Barn at Britton's Farm were assessed as moderate adverse. Similarly, following the implementation of suitable mitigation measures, the direct permanent long-term residual effects on the setting of the Grade II listed Lock's Barn, the Grade II listed Pearce's Farmhouse, the Grade II listed Barn approximately 10m north west of Pearce's Farmhouse and the Grade II listed Granary approximately 8m north west of Pearce's Farmhouse were assessed as slight adverse and the Grade II listed Southbrook and the Grade II listed Luckley House School were assessed as neutral or slight adverse.

3.2 Legislation, policy and guidance

3.2.1. Since the January 2021 ES, the National Planning Policy Framework / NPPF (MHCLG 2019) has been replaced by a revised version, in July 2021 (MHCLG 2021). The policies in this document remain essentially unchanged, however.

3.2.2. Apart from this there have been no changes to the relevant policies and guidance since the January 2021 ES.

3.3 Methodology

3.3.1. The methodology used for the assessment is unchanged since the January 2021 ES. Updated Historic Environment Record (HER) data was obtained for the site from Berkshire Archaeology, while the National Heritage List for England (NHLE) was consulted for any changes to designed assets within the site or the original study area used in the January 2021 ES for the assessment of the possible effect on the setting of designated assets. This study area was based on a ZVI (Zone of Visual Influence). The local planning authority website was also consulted for any changes to archaeological priority areas, conservation

areas or locally listed buildings. Any changes identified from these sources since the January 2021 ES have been noted in the ‘Baseline’ section below.

3.4 Assessment

Baseline

3.4.1. The baseline conditions remain essentially unchanged since the January 2021 ES. No further designated assets have been added to the NHLE for the study area. Since the January 2021 ES one new archaeological investigation, with associated finds and features, has been added to the HER within the site and study area. This was a programme of archaeological trial trench evaluation (HER ref: ERM2511) conducted by Oxford Archaeology in 2019 as part of a separate development scheme for a mixed use development and Suitable Alternative Natural Greenspace (SANG). Part of the area covered by the evaluation included the site. An absence of archaeological remains was identified across the majority of the site, with only field boundaries of little, if any, significance revealed within the site. One small area of enhanced potential was identified within the site, to the west of Britton's Farm, in the vicinity of the Iron Age pit found during the 2018 trial trench evaluation for the Consented Scheme (HER ref: 2347). Here a number of undated diches were identified but it was thought that on balance they were likely to be post-medieval in date, though there was a chance they were also Iron Age. The findings therefore do not change the overall assessment of the baseline conditions.

Scheme changes

3.4.2. Changes to the Consented Scheme which may impact archaeology and cultural heritage are as follows:

- The proposed location of the main site compound has been moved westwards. The original, indicative location was to the immediate south-west of the junction of the SWDR and the Easthampstead Road link at the eastern end of the Scheme. The main site compound is now proposed to be located 120m to the south-west of the junction of the SWDR with Easthamstead Road;
- The proposed footprint of the satellite compound for the bridge works at the western end of the site has been reduced by more than half;
- There have been some changes to the proposed route of the temporary haul road, the main changes being a 170m eastward extension at the far eastern end of the scheme and a 180m southwards extension to the immediate east of the new main compound; and
- An additional temporary crossing for the haul road as it crosses over a tributary of the Emm Brook has been added 70m to the north-west of the new main compound location.

3.5 Assessment of effect, mitigation and residual effects

Construction phase

3.5.1. The changes to the Consented Scheme comprise a number of changes to the location of temporary works. As detailed in Chapter 5 of the January 2021 ES, these temporary works are assumed for the purposes of this assessment to cause ground disturbance to a maximum depth of 0.5mbgl which, given the shallow depth below ground of the natural geology, could cause localised truncation of any archaeological remains present within the footprint of these works (most likely confined to post-medieval agricultural remains of low heritage significance). The changes to the Consented Scheme therefore do not change the assessment of the potential impact of the construction phase on buried archaeology, and therefore, the likely direct, permanent, long-term effects, prior to mitigation, on buried archaeology, as detailed in Chapter 5 of the January 2021 ES, remain valid.

Mitigation

3.5.2. The mitigation measures detailed in Chapter 5 of the January 2021 ES remain valid.

Residual effects

3.5.3. The conclusions detailed in Chapter 5 of the January 2021 ES for the construction phase assessment remain valid, i.e. the direct, permanent long-term residual effects on potential buried / surface palaeoenvironmental remains and archaeological deposits from the prehistoric and post-medieval periods are likely to be neutral or slight adverse following the implementation of suitable mitigation measures.

Operational phase

3.5.4. The changes to the Consented Scheme are all related to temporary works during the construction phase. As detailed in Chapter 5 of the January 2021 ES, temporary effects on the setting of designated above-ground heritage assets at the construction stage were considered insignificant and were scoped out.

3.5.5. There will therefore be no change to the conclusions detailed in Chapter 5 of the January ES in relation to the operational phase. That is, following the implementation of suitable mitigation measures, the direct permanent long term residual effects on setting are likely to be:

- Grade I listed Henry Lucas Hospital and attached waterpumps - moderate or large adverse
- Grade II* listed Outbuildings at Lucas Hospital, Grade II* listed Lock's House and Grade II listed Garden Wall at Lucas Hospital, Grade II listed Wood's Farm, Grade II listed Britton's Farmhouse and Grade II listed Barn at Britton's Farm - moderate adverse.

- Grade II listed Lock's Barn, Grade II listed Pearce's Farmhouse, Grade II listed Barn approximately 10m north west of Pearce's Farmhouse and Grade II listed Granary approximately 8m north west of Pearce's Farmhouse - slight adverse

3.5.6. Grade II listed Southbrook and Grade II listed Luckley House School - neutral or slight adverse.

3.6 Conclusions

3.6.1. A revised construction and operational phase assessment has been undertaken to take account of the changes to the Consented Scheme.

3.6.2. The results of this Addendum indicate that the residual effects on the buried archaeological remains and the setting of designated assets would remain unchanged from those detailed in Chapter 5 of the January 2021 ES, i.e:

- the residual effects of the construction phase on buried archaeological deposits are likely to be neutral or slight adverse following the implementation of suitable mitigation measures;
- the residual effects of the operational phase on the setting of designated assets, following suitable mitigation measures, is likely to be moderate or large adverse to neutral or slight adverse.

4 Landscape and Visual

4.1 Introduction

4.1.1. This chapter of the report presents the updated assessment of likely significant landscape and visual effects arising from the construction of the Scheme following the revised layout of temporary haul roads, site compounds and enabling works required to construct the Scheme.

4.2 Methodology

4.2.1. The following guidance documents have been used during the preparation of this chapter:

- Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3;
- Interim Advice Note (IAN) 135/10* ;
- Guidelines for Landscape and Visual Impact Assessment, 3rd Edition;
- Landscape Character Assessment - Guidance for England and Scotland ;
- An Approach to Landscape Character Assessment ; and
- Wokingham Borough Landscape Character Assessment (2019) . 4.3

4.3 Consultation

4.3.1. No additional consultation was undertaken in support of this chapter.

4.4 Scope of the assessment

4.4.1. This chapter provides an update to the assessment of the construction impacts to the landscape character and visual amenity within the study area resulting from the temporary haul roads, site compounds and other enabling works required to construct the Scheme, as required under Condition 14 of the planning conditions.

4.5 Site visits

4.5.1. No additional site visits were undertaken in support of this chapter.

4.6 Assessment methodology

4.6.1. This Landscape and Visual Impact Assessment (LVIA) has been undertaken largely in accordance with the DMRB Volume 11 Environmental Assessment, the landscape element for which is outlined in IAN 135/10. The assessment also draws upon best practice guidance, namely Guidelines for Landscape and Visual Impact Assessment 3 (GLVIA 3).

Landscape assessment methodology

4.6.2. Landscape effects can be defined as the changes in the fabric, character and quality of the landscape as a result of a development through: direct effects upon specific landscape elements such as local topography or fabric; indirect effects upon the overall patterns of elements that give rise to landscape character and regional and local distinctiveness; and

effect upon special interests or values such as designated landscapes, conservation sites and cultural associations.

4.6.3. Landscape effects have been assessed using the following steps (in accordance with IAN 135/10):

- Establish baseline conditions and evaluate landscape in respect of character areas,
- quality, features and elements;
- Evaluate the sensitivity of the landscape features and character with reference to its
- capacity to accommodate change arising from the project;
- Assess the magnitude of impacts resulting from the Scheme on landscape features and character, with reference to the scale and nature of change;
- Develop outline mitigation to reduce potential adverse effects;
- Evaluate significance of landscape effects; and
- Assess the cumulative effect of the Scheme.

4.6.4. Refer to Section 1.3 of the Environmental Statement for full details of the assessment methodology.

Visual assessment methodology

4.6.5. Visual effects relate to changes in available views of the landscape and the effect of those changes on people, including: the direct effects of the Scheme upon views through intrusion or obstruction; and the overall effect on visual amenity, be it degradation or enhancement.

4.6.6. Visual effects have been assessed separately using the following steps (in accordance with IAN 135/10):

- Undertake baseline studies including establishing an approximate Zone of Visual Influence (ZVI), identification of visual receptors and their sensitivity to change, and to agree representative viewpoints with the Local Authority;
- Assess magnitude of visual impacts resulting from the Scheme, with reference to the scale and nature of the change;
- Develop mitigation to reduce potential adverse effects;
- Evaluate significance of visual effects; and
- Assess the cumulative effect of the Scheme and the planned mixed-use development.

4.6.7. The selected viewpoint locations were determined with the aim of providing a broad range of views from various directions and were agreed with the Landscape Officer at Wokingham Borough Council. This assessment has considered these agreed viewpoints when considering the potential effects of the revised layout of temporary haul roads, site compounds and enabling works.

Duration of effects

4.6.8. Through the assessment at the following points in time, distinctions may be drawn between temporary, permanent, long-term, medium-term and short-term effects. The timescales of effects are determined as either:

- Short-term/temporary - up to one year or during construction if the construction period exceeds one year;
- Short/Medium-term - one to fifteen years, during which any proposed mitigation planting will have an insufficient mitigating effect in most cases; and
- Long-term/permanent - lasting beyond 15 years, when any proposed mitigation planting is likely to have achieved its mitigating effect.

4.6.9. Refer to Section 1.3 of the Environmental Statement for full details of the assessment methodology.

4.7 Assessment

Landscape Effects during Construction

4.7.1. The following assessment of construction impacts to landscape character are based on previous assessment findings for the Landscape Character Areas (LCAs) and the revised construction activities and site layout as described in Chapter 1. Refer to Figure 6.1 of the Environmental Statement for the landscape character areas.

LCA N1: Holme Green Pastoral Sandy Lowland

4.7.2. The previous assessment of landscape effects on LCA N1 found the construction of the Scheme would result in a magnitude of change in the order of major, resulting in temporary large adverse impacts to landscape character.

4.7.3. The revised layout of site compounds, enabling works and the additional detail now available on haulage routes would result in predicted construction impacts broadly unchanged from those previously assessed. The most significant change relating to landscape character impacts being the relocation of the main site compound and an additional haulage route servicing the construction of the balancing ponds to the south of Ludgrove Lane. The main haulage route would run along the southern side of the Scheme alignment.

4.7.4. The relocation of the main site compound, from east of Easthampstead Road to the west, would not require any additional vegetation clearance or further loss of existing landscape features.

4.7.5. The indicative alignment of the additional haulage route would be several metres north of Ludgrove Lane and so should avoid the need for removal of mature trees. This will avoid the need for the removal of several existing mature trees established along Ludgrove Lane. The removal of these trees would result in an additional loss of a landscape feature, which would result in further adverse effects to the LCA. However, this additional impact would not

significantly increase the predicted magnitude of construction impacts already assessed as major adverse in nature.

4.7.6. Overall, the revised layout of site compounds, haulage routes and enabling works would not materially change the overall assessment findings. The magnitude of change to LCA N1 during construction is considered to remain major in a landscape receptor of medium sensitivity, resulting in an overall effect of large adverse during construction.

Visual Effects during Construction

4.7.7. Table 4-1 below summarises the assessed visual effects for each of the agreed viewpoints and provides an update considering the revised layout of site compounds, haulage routes and enabling works. Refer to Figure 6.3 of the Environmental Statement for the viewpoint locations, and Figures 6.6-6.22 of the Environmental Statement for the viewpoints.

Table 4-1 - Visual Effects During Construction

Receptor location and type	Change during construction	Magnitude of change	Sensitivity to change	Level of effect
1. Locks Farm Transport receptors	Construction activities would form a minor detraction in mid distant views screened by intervening vegetation for these road users. <u>Revised Construction Layout</u> The revised layout of site compounds, haulage routes and enabling works would not change the assessment for this viewpoint.	Road users Medium	Minor	Slight adverse
2. Waterloo Road Transport receptors	Construction activities would generally be screened by intervening roadside vegetation, and construction activities would form a minor detraction in fleeting views for road users.	Road users Medium	Minor	Slight adverse

Receptor location and type	Change during construction	Magnitude of change	Sensitivity to change	Level of effect
	Revised construction layout The revised layout of site compounds, haulage routes and enabling works would not change the assessment for this viewpoint.			
3. Waterloo Road Level Crossing	Construction activities would generally be screened by intervening vegetation roadside, vegetation and construction activities would form a minor detraction in fleeting views for road users. Revised construction layout The revised layout of site compounds, haulage routes and enabling works would potentially increase awareness of construction activities due to the relocation of the main site compound appearing in heavily filtered. Overall potential glimpsed views of the compound would not significantly increase awareness of construction activities and there would be no change to the assessment for this viewpoint.	Road users Medium	Minor	Slight adverse

Receptor location and type	Change during construction	Magnitude of change	Sensitivity to change	Level of effect
4. Brittons Farm Residential receptors and users of PRoW	Due to close proximity to the Scheme, construction activities would be prominent features in the view from this location. Despite the presence of some detracting elements, such as existing pylons and overhead lines, as well as a group of farm buildings surrounded by rough timber fencing, the character would be noticeably altered during the construction phase. <u>Night-time Effects</u> Construction lighting would be visible from Brittons Farm at night-time. Considering it would be seen in context with the well-lit residential areas to the north, and the group of buildings at Eileen Douglas Tack Shops to the west, as well as passing traffic using Waterloo Road and Easthampstead Road, overall there would be a minor adverse to negligible effect which would be direct, short- term/ temporary and not significant. <u>Revised construction layout</u> The revised layout of site compounds, haulage routes and	Residents - High PRoW users - Medium	Major	Large adverse effect which would be direct, short-term/ temporary and **significant**.

Receptor location and type	Change during construction	Magnitude of change	Sensitivity to change	Level of effect
	enabling works would potentially reduce awareness of construction activities due to the relocation of the main site compound. The revised location would be partially visible set behind existing vegetation and buildings. However, due to the close proximity of the Scheme to this viewpoint construction impacts would remain a major detraction and there would be no change to the assessment for this viewpoint.			
5. White Horse Pub Residential; proprietor; workers & customers	Views towards the construction activities would be readily available in the middle ground from this location due to its proximity to the Scheme where it ties in with Waterloo Road. However, the foreground would still be dominated by the existing Waterloo Road, the pub's car park and signs; and taller plant and machinery would also be visible. Night-time Effects Construction lighting would be visible from this location at night-time. Considering it would be seen in	Residents High Propriertor workers medium customers medium-	Moderate	Moderate or large adverse effect which would be direct, short-term/ temporary and **significant**.

Receptor location and type	Change during construction	Magnitude of change	Sensitivity to change	Level of effect
	context with the adjacent well-lit residential properties and buildings at Eileen Douglas Tack Shops on Easthampstead Road, as well as passing traffic using into the new road corridor. The Scheme would introduce elements that are dissimilar to existing features in the view and there would be disruption in terms of noise, colour, and activity. <u>Revised construction layout</u> The revised layout of site compounds, haulage routes and enabling works would potentially reduce views of construction works due to the relocation of the main site compound from view, but overall would not change the assessment for this viewpoint.			
6. Eileen Douglas Tack Shops Transport users; proprietor; workers & customers	Views of construction activities in the middle ground would be clearly visible from this location due to its proximity to the Scheme and relatively open nature of the view. The Scheme would introduce elements that are dissimilar to existing features in the view and there would be	Road users - Medium Proprietors / workers - Medium Customers - Medium	Moderate	Moderate adverse effect, which would be direct, short term/temporary and **significant.**

Receptor location and type	Change during construction	Magnitude of change	Sensitivity to change	Level of effect
	disruption in terms of noise, colour, and activity. <u>Revised construction layout</u> The revised layout of site compounds, haulage routes and enabling works would not change the assessment for this viewpoint.			
7. Star Lane Level Crossing **(Looking east)** Transport receptors	Construction activities, including vegetation removal, would be prominent in the view and views would be opened up into the new road corridor. The Scheme would introduce elements that are dissimilar to existing features in the view and there would be disruption in terms of noise, colour, and activity. <u>Revised construction layout</u> The revised layout of site compounds, haulage routes and enabling works would potentially reduce views of construction works due to the relocation of the main site compound from view, but overall would not change the assessment for this viewpoint.	Road users - Medium	Moderate	Moderate adverse effect, which would be direct, short term/temporary and **significant**.

Receptor location and type	Change during construction	Magnitude of change	Sensitivity to change	Level of effect
8. Star Lane Level Crossing (Looking west) Transport receptors	Revised construction layout The revised layout of site compounds, haulage routes and enabling works would not change the assessment for this viewpoint.	Road users Medium	Minor	Slight adverse
9. Grays Farm (Farmhouse)	Construction activities would form a minor and distant element in distant views screened by intervening vegetation for this receptor. Revised construction layout The revised layout of site compounds, haulage routes and enabling works would not change the assessment for this viewpoint.	Residents - High	Minor	Slight adverse
10. Grays Farm (Footpath) PRoW receptors	Construction activities would be generally screened by existing woodland in the fore of the view, with peripheral and distant awareness of works to the east for users of right of way. Revised construction layout The revised layout of site compounds, haulage routes and enabling works would not change the	PRoW users - Medium	Minor	Slight Adverse

Receptor location and type	Change during construction	Magnitude of change	Sensitivity to change	Level of effect
	assessment for this viewpoint.			
11. Footpath **WOKW 10** PRoW receptors	Due to the location of this viewpoint being centrally within the Scheme, construction activities would be prominent and would create an unusual amount of activity within the existing tranquil outlook. The Scheme would introduce elements that are dissimilar to existing features in the view and there would be disruption in terms of noise, colour, and activity. <u>Revised construction layout</u> The revised layout of site compounds, haulage routes and enabling works would not change the assessment for this viewpoint.	PRoW users - Medium	Major	Moderate or large adverse effect which would be direct, short-term/temporary and **significant**.
12. Footbridge Over Railway Line (PRoW 17) PRoW receptors	Awareness of construction activities would exist but would be limited due to the intervening existing vegetation resulting partial and filtered views. <u>Revised construction layout</u> The revised layout of site compounds, haulage routes and	PRoW users - Medium	Minor	Slight Adverse

Receptor location and type	Change during construction	Magnitude of change	Sensitivity to change	Level of effect
	enabling works would not change the assessment for this view point.			
13. Gipsy Lane Residential receptors	Awareness of construction activities would be extremely constrained for receptors with views to the south due to the channelled views between built elements and the intervening existing vegetation south of the railway line. <u>Revised construction layout</u> The revised layout of site compounds, haulage routes and enabling works would not change the assessment for this viewpoint.	Residents - High	Negligible	Slight Adverse
14. Chapel Green Residential receptors	Views of construction activities would be readily available from this location due to its proximity to the Scheme and open nature of the view. The Scheme would introduce elements that are dissimilar to existing features in the view and there would be disruption in terms of noise, colour, and activity. <u>Night-time Effects</u> Construction lighting would be visible from	Residents - High	Moderate	Moderate or large adverse effect which would be direct, short-term/temporary and **significant**.

Receptor location and type	Change during construction	Magnitude of change	Sensitivity to change	Level of effect
	this location at night-time. Considering it would be seen in context with the nearby well-lit residential properties on Gypsy Lane and on the southern edge of Wokingham, overall there would be a minor adverse to negligible effect which would be direct, short-term/temporary and not significant. <u>Revised construction layout</u> The revised layout of site compounds, haulage routes and enabling works would not change the assessment for this viewpoint.			
15. Footpath (WOKI 25) PRoW receptors	Due to the location of this viewpoint being located centrally within the Scheme, construction activities would be a dominant influence. The Scheme would introduce elements that are dissimilar to existing features in the view and there would be disruption in terms of noise, colour, and activity. <u>Revised construction layout</u> The revised layout of site compounds, haulage routes and	PRoW Users - High	Major	Moderate or large adverse effect which would be direct, short-term/temporary and **significant**.

Receptor location and type	Change during construction	Magnitude of change	Sensitivity to change	Level of effect
	enabling works would not change the assessment for this viewpoint.			
16. Tesco Roundabout Transport receptors	Receptors would have direct and open views of the construction activities from this location. This would be due to the removal of the existing line of semi-mature broadleaved deciduous trees and hedgerow beneath as well as proximity to the Scheme. The construction activities would introduce increased movement and would be a noticeable detracting element in the view. <u>Revised construction layout</u> The revised layout of site compounds, haulage routes and enabling works would not change the assessment for this viewpoint.	Road Users - High	Moderate	Moderate adverse effect which would be direct, short-term/temporary and **significant**.

4.8 Conclusions

4.8.1. This assessment has found the revised layout of site compounds, haulage routes and enabling works required to facilitate the construction of the Scheme would not alter the findings of the previous assessment of the temporary construction impacts for either landscape character or visual amenity.

4.8.2. It is considered that the alterations to the layout of proposed site compounds, haulage routes and enabling works are relatively minor and would not give rise to a greater magnitude of impact in the context of the wider construction activities.

4.8.3. The following summarises the significant construction effects.

Landscape Receptor LCA N1: Holme Green Pastoral Sandy Lowland

4.8.4. During the construction phase the Scheme will introduce a notable change to the character of the existing agricultural fields in which it will be built. A major magnitude of change along with the temporary nature of construction activities would result in a short to medium-term

4.8.5. effect of large adverse on landscape receptor LCA N1 during construction. The revised layout of site compounds, haulage routes and enabling works will not change this impact.

Visual Receptors

4.8.6. Significant visual effects during the construction phase have been identified for the following receptors:

- Viewpoint 4. Brittons Farm
- Viewpoint 5. White Horse Pub
- Viewpoint 6. Eileen Douglas Tack Shop
- Viewpoint 7. Star Lane Crossing (Looking east)
- Viewpoint 11. Footpath WOKW 10
- Viewpoint 14. Chapel Green
- Viewpoint 15. Footpath WOKI 25 and
- Viewpoint 16. Tesco Roundabout.

4.8.7. The revised layout of site compounds, haulage routes and enabling works will not change these impacts.

5 Biodiversity

5.1 Background

5.1.1. This chapter of the report presents the results of the assessment of likely significant effects arising from the Scheme on Biodiversity arising from the construction of the Scheme following the revised layout of temporary haul roads, site compounds and enabling works required to construct the SWDR, Wokingham. In addition, this addendum outlines the results of the Biodiversity Net Gain (BNG) assessment of the Scheme not previously reported. This BNG assessment was completed by Lanpro[1] (planning ref 250213)

Biodiversity

5.1.2. The ES has previously identified the significant effects arising from the Scheme on biodiversity and has outlined the requirement of avoidance and mitigation during the construction and operational phase of the Scheme. To address the residual effects, this included the requirement to devise a Construction Environmental Management Plan (CEMP) (Planning ref. 242535)

5.1.3. The proposed site compounds and haul roads are located within the site boundary that was assessed during the ES and Ecological Impact Assessment (EcIA). The ecological baseline of the ES therefore covered all areas within the Site Boundary, including those now affected by the revised layout for construction.

Biodiversity Net Gain

5.1.4. Previous Biodiversity Net Gain Assessments were undertaken for earlier iterations of the Scheme, it was decided that the results of these assessments would not be included within the updated biodiversity chapter but that a BNG assessment incorporating the final layout of the Proposed Scheme including construction boundaries would be submitted later in the determination process through condition as part of the planning permission.

An assessment of likely significant effects arising from the Scheme on habitats of ecological value, informed by the BNG process was completed within the Previous ES. The findings of which were that the Scheme would resulting in a temporary, slight adverse Site-scale construction effects upon habitats of ecological value and a permanent, adverse effect at a Local scale upon habitats of ecological importance during operation.

[1] Lanpro (2025) Wokingham Major Highways Programme SWDR and WG1, Bodiversity Net Gain Report

5.2 Methodology

Biodiversity

A review of the ES was completed to identify any deviation from the previous assessment as a result of the amendments to the construction phase of the Scheme that would impact the assessment of effects and subsequent recommendations.

Biodiversity Net Gain

The BNG assessment was undertaken using Defra's Biodiversity Metric 3.0 by Tony Gee, (2021) in relation to the discharge of Condition 15 and more recently by Lanpro using 3.1. The methodology used, the specific boundaries, baseline data and post-development plan are detailed therein.

5.3 Assessment

Biodiversity

5.3.1. The proposed approach to the construction phase of the scheme would not result in a deviation for the previous assessment detailed within the ES. Works associated with the revised layout of temporary haul roads, site compounds and enabling works would remain subject to the avoidance and mitigation strategies for the construction phase outlined within the ES. It is required that the layout takes account of individual features and habitats for retention, complies with construction phase mitigation including Precautionary Methods of Work and adheres to recommended good environmental practice on site.

5.3.2. Otters are to be found within the wider Embrook catchment and so the following precautionary measures have been included:

- Otter ledges will be provided on temporary and permanent road bridges;
- Pollution prevention measures are to be included;
- Pre-work checks for otters have been carried out; and
- All measures are to be supported by compliance check.

5.3.3. Further relevant information is provided within the CEMP.

Biodiversity Net Gain

5.3.4. The results of previous BNG assessments have resulted in an updated outcome to the previously reported effect. As updated, the Scheme will still result in the direct loss of a number of habitats of ecological importance, including hedgerows, standing water, some small areas of wet woodland, and grassland similar to lowland meadow.

5.3.5. The previous BNG assessment groups these grasslands and outlines a total loss area of 3.66ha, with 0.15ha of the habitat retained and 0.67ha enhanced. In the absence of mitigation, this would constitute a permanent adverse effect of significance at a District level. Despite these losses the metric has shown there to be an 5.19% net gain in biodiversity habitat units on-site. The number of habitat units (HU) on-site has increased from 93.32 to 98.16. There is also a 199.29% net gain in hedgerow units (HeU) within the

Site which have increased from 5.83 to 17.44. River units (RU) have also increased from 7.37 to 8.33, totalling a 13.01% net gain. This is an improvement from the previous design scheme which showed a no-net loss for habitats of 3.85% HU, net loss for hedgerows of –75.01% HeU and a net gain for rivers of +16.13% RU.

5.3.6. For wet woodland habitat it remains the case that this habitat has not been compensated for like-for-like within the Proposed Scheme.

5.3.7. The updated BNG assessment undertaken by Lanpro in January 2025 concluded that the Proposed Scheme will result in the creation of 85.92HU, 19.13HeU, and 11.92RU, equating to a gain of 16.33%,18.62%, and 10.78%, respectively. Therefore, the Proposed Scheme achieves an overall scheme-wide biodiversity net gain of at least 10% across the three habitat categories.

5.3.8. All management measures to maintain the Proposed Scheme semi-natural habitats, and the off-site wet woodland, will be confirmed in a Landscape Environmental Management Plan (LEMP Planning Ref 250213) responsibility for which will transfer to the Principal Contractor and eventual operator of the Proposed Scheme.

5.4 Conclusions

Biodiversity

5.4.1. The detailed avoidance and mitigation measures required to address the effects on Biodiversity from the Proposed Scheme as outlined within the previous ES remain valid. These include the avoidance of individual features as identified within the ES and through the appropriate timings of works, the protecting of receptors from disturbance and adhering to good practice environmental site measures. These should be incorporated into the delivery of the construction phase as updated by the revised site layout, including through the CEMP.

Biodiversity Net Gain

5.4.2. Following iterative updates to the Proposed Scheme design, the latest iteration inclusive of the revised construction phase layout demonstrates an improved outcome for all biodiversity unit types, confirming that a net gain is achieved. This corresponds to a permanent, positive effect at a Site scale upon other habitats of ecological importance during operation. Temporary, moderate adverse Site scale construction effects upon habitats of ecological value can be assumed to still occur, and the ES outcome remains unchanged in this regard.

6 Geology and Soils

6.1 Introduction

6.1.1. This addendum reports the outcome of the assessment of likely significant effects arising from the Scheme on Ground Conditions in the context of temporary haul roads, compounds and other enabling works required to facilitate the construction of the SWDR, Wokingham.

6.1.2. The Chapter summarises the assessment methodology, the likely significant effects taking into account national legislation, the further mitigation measures required to prevent, reduce or offset significant adverse effects, and the likely residual effects after these measures have been employed. It should be noted that the addendum will only assess construction impacts relating to the haul roads and site compounds

6.2 Methodology

6.2.1. The legislative framework, policy and guidance utilised for the addendum are the same as those utilised within the ES, however it should be noted that the following guidance has also become relevant, or superseded guidance in the time since the ES was produced.

- National Planning Policy Framework (NPPF) revised in 2021;
- Environment Agency Land Contamination Risk Management (LCRM) (2020);
- Design Manual for Roads and Bridges (DMRB) LA 104 Environmental Assessment and Monitoring (Highways England, 2020);
- DMRB LA 109 Geology and Soils (Highways England, 2020); and;
- DMRB LA 113 Road Drainage and the Water Environment (Highways England, 2020).

6.2.2. Risks arising from land potentially affected by contamination in the areas of the proposed haul roads and compounds have been assessed with due regard to Part 2A, guidance from land contamination risk management set out in LCRM, DMRB, NPPF and Construction (Design and Management) 2015 (as they were in the ES).

6.2.3. Potential sources and receptors have been identified following a desk study review and ground investigation in order to assess the possibility for land to be contaminated, thereby enabling an evaluation of the potential for pathways to exist between them to form complete contaminant linkages under baseline conditions associated with the haul roads and compounds during the construction phase.

Significance criteria

6.2.4. The significance level attributed to each effect has been assessed based on the magnitude of impact from the construction of the Scheme (specifically in the areas of the haul roads and site compounds) and the sensitivity of the affected receptors as outlined in more detail in Chapter 2: Approach to the Assessment of the ES. The sensitivity of the affected receptor is assessed on a scale of very high, high, medium, low and negligible, and the magnitude of

change is assessed on a scale of major, moderate, minor, negligible and no change (as shown in Chapter 2: Methodology and Approach to the Assessment of the ES).

6.3 Baseline Conditions

6.3.1. The proposed site compounds and haul roads are located within the site boundary that was assessed during the ES. Given this, the baseline highlighted within the ES is considered to be appropriate for the purposes of this addendum. A summary of the baseline is provided below. For a further detail about the baseline conditions, the ES should be referred to.

6.3.2. The proposed Scheme runs east to west between Finchampstead Road and Waterloo Road a distance of circa 2.3 km. The Scheme also includes a link off Easthampstead Road and is approximately 400 m in length.

6.3.3. The proposed haul roads run along the length of the Scheme, in general, parallel with the proposed Scheme. There are two site compounds proposed, one to the south of the proposed road alignment, to west of Easthampstead Road; and a satellite compound located to the south of the proposed alignment, at the western end of the alignment. The locations of the proposed haul roads and site compounds in relation of the Scheme are presented in Figures 1-1 to 1-2.

6.3.4. A preliminary desk study unexploded ordnance (UXO) assessment was undertaken and included within the ES. The assessment indicated that the Scheme is likely to have a low UXO hazard level.

6.3.5. A review of Agricultural Land Classification (ALC) mapping (post 1988) indicates that the land soils underlying the Scheme are classified as Grade 2 (Very Good Quality), Grade 3a (Good Quality), Grade 3b (Moderate Quality) and Grade 4 (Poor Quality).

6.3.6. Based on previous ground investigations and a subsequent contaminated land assessment, there is a low likelihood of ground contamination across the majority of the Scheme.

6.4 Sensitive Receptors

6.4.1. Based on the available information, the following potential receptors have been identified during the construction phase of the Scheme:

Human Health

- Construction workers; and
- Adjacent Site users.

Controlled Waters

- Groundwater underlying the Scheme - Secondary A Aquifers (River Terrance Deposits and Bagshot Formation (Bedrock)) and Secondary Undifferentiated Aquifer (Head); and,
- Surface Water e.g. Emm Brook and Luckley Brook.

Buildings and Services

- Below ground services; and,
- Building structures.

Other

- Agricultural soils

6.5 Assessment

6.5.1. It has been assumed that the haul roads and construction compounds will only be present during the construction phases. Therefore, the following section assesses the effects of the haul roads and construction compounds on ground conditions during the construction phase only. The haul roads and construction compounds will be restored following the construction phase. For the purposes of the assessment, it has been assumed that there will be no below ground services or structures installed as part of the construction haul roads and site compounds.

CONSTRUCTION PHASE

Potential effect on construction workers from pre-existing contamination within the underlying soils (if present)

6.5.2. A ground investigation has been undertaken across the Scheme area to allow an assessment of potential contaminant linkages in line with LCRM guidance. The ground investigation identified localised elevated concentrations above the Generic Assessment Criteria with respect to Polycyclic Aromatic Hydrocarbons (PAH). Asbestos was not identified in any of the sample submitted for analysis. Ground gas monitoring identified a very low to low risk from ground gases.

6.5.3. Construction workers will be exposed to any contaminants that are present in the Made Ground, or that are present in the ground after migrating from contaminant sources, during any earthworks or site clearance that includes disturbing or clearing the Made Ground. There is potential for exposure to asbestos or other contaminants during any earthworks or site clearance if it is present in the Made Ground. They will be affected by inhalation of dusts, gases or vapours, dermal contact with soil and groundwater and ingestion of soil and dust. However, the length of direct exposure will be limited to the duration of works in which they are directly involved, and thus the effect will be short term. Any health effects from the potentially contaminated soil and groundwater could have a medium to long term effect.

6.5.4. The risk from UXO across the Scheme was identified as being low, therefore the need for mitigation is not considered to be required.

6.5.5. The sensitivity of construction workers is medium to high and the magnitude of change, prior to mitigation, is high. Therefore, there is likely to be a direct, permanent, medium to

long-term moderate to major adverse effect (significant) on construction workers prior to the implementation of mitigation measures (see below).

6.6 Mitigation

6.6.1. It has been assumed that the following practices are adhered to as standard good practice during the construction of haul roads and site compounds. These measures are proposed as part of a future Construction Environmental Management Plan (CEMP):

- Use of appropriate Personal Protective Equipment at all times during the construction works;
- Provision of adequate hygiene facilities for washing and changing;
- Excavated soils will be used on-site wherever possible;
- Implementation of an appropriate temporary drainage system will be required in order to minimise the potential risks of contamination or excess sediment reaching nearby surface water;
- Any contaminated material encountered on-site, the handling, storage and removal will be subject to current waste management legislation and guidance;
- The presence of contaminants and the associated risks will be explained to ground workers before they begin work;
- Fuel storage on-site to be carried out under best practice i.e. integrally bunded containers; Plant refuelling to be carried out using best practice techniques and any spills to be controlled with spill kit;
- Dust suppression measures (e.g. damping down) will be implemented to minimise the potential for dust generation; and,
- Wheel washing of Site vehicles will be carried out in order to minimise the potential for dust generation.

6.6.2. It has been assumed that excavated material will be managed under a Materials Management Plan (MMP). If disposal of the material is required, it will be appropriately classified and disposed to licenced facilities.

6.7 Residual Effects

6.7.1. The sensitivity of construction workers is medium to high and, the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a direct, temporary, medium-term negligible residual effect (not significant) on construction workers following the implementation of mitigation measures.

Impact on human health of adjacent Site users

6.7.2. Adjacent Site users may come into contact with contaminants via dermal contact, ingestion or inhalation pathways as a result of dust generated during the construction and use of the haul roads and site compounds.

6.7.3. The sensitivity of adjacent Site users is considered to be high and the magnitude of impact prior to mitigation is considered to be negligible given the limited contaminants identified

during the ground investigation. Therefore, there is likely to be a direct, temporary, short-term, adverse effect on adjacent Site users of Slight significance prior to implementation of mitigation measures.

Mitigation

6.7.4. The majority of the effects from the haul roads and construction compounds during the construction phase will be addressed through the implementation of the measures within the CEMP.

6.7.5. Contaminated ground materials that cannot be reused will be suitably managed to prevent or minimise the potential for contaminants to enter the environment (and thereby minimise the potential for impacts to sensitive receptors prior to off-site disposal). This may be achieved through implementation of a Materials Management Plan (MMP), produced in accordance with Contaminated Land: Applications in Real Environments (CL:AIRE) guidance[2], or similar materials management protocols (i.e. an environmental permit or exemption). This will ensure that all imported or reused soil are suitable and do not have the potential to significantly affect human health.

Residual Effects

6.7.6. The sensitivity of adjacent Site users is considered to be high and the magnitude of impact following mitigation is considered to be no change. Therefore, the effect on adjacent Site users is considered to be of Neutral significance following implementation of mitigation measures.

Degradation in quality of Controlled Waters during Construction Activities

6.7.7. Exposure of contaminated soils may increase the leachability of contaminants to groundwater specifically the aquifers underlying the Scheme. This leachate could affect controlled waters by lateral and vertical migration.

6.7.8. Spills associated with the haul roads and compounds would have the potential to affect the aquifers underlying the Scheme and surface water courses within the vicinity.

6.7.9. On-site storage of potentially contaminated material prior to removal or remediation could result in entrainment and dissolution of contaminants in surface water and infiltration to the underlying aquifers.

6.7.10. Below-ground drains or services may act as a preferential pathway for contaminants, which may migrate into the aquifer.

[2] CL:AIRE, The Definition of Waste: Development Industry Code of Practice, Version 2, March 2011

6.7.11. The sensitivity of the Controlled Waters associated with the Scheme is considered to be medium and the magnitude of impact prior to mitigation (while considering embedded mitigation) is considered to be negligible. Therefore, there is likely to be a direct, temporary, short-term, adverse effect on the Secondary A aquifer of Neutral or Slight significance prior to implementation of mitigation measures.

Mitigation

6.7.12. Measures detailed in the CEMP will be used to mitigate the effects to Controlled Waters, including but not limited to management of run-off, appropriate containment of fuel (i.e. bunded), procedures to deal with accidental spillage (e.g. spill kits), the protocol for managing unexpected ground contamination and appropriate material management.

6.7.13. New service trenches required for the haul roads and site compounds will be designed and constructed to prevent the migration of contaminants that are identified.

Residual Effects

6.7.14. The sensitivity of the Controlled Waters associated with the Scheme is considered to be medium and the magnitude of impact following mitigation is considered to be no change. Therefore, the effect on Controlled Waters is considered to be of Neutral significance following implementation of mitigation measures.

Loss of agricultural land

6.7.15. The development of the proposed haul roads and site compounds is assumed to include the stripping and temporary storage of topsoil. Therefore, there is the potential to effect agricultural land by means of damage to soils. It has been assumed that the areas to be developed with the haul roads and site compound will be reinstated following the construction phase.

6.7.16. The sensitivity of agricultural soils is considered to be high and the magnitude of impact prior to mitigation is considered to be moderate. Therefore, the effect on agricultural land is considered to be Moderate significance prior to the implementation of mitigation measures.

Mitigation

6.7.17. A detailed Agricultural Land Classification survey is required to establish the quality of agricultural land which is affected by the Scheme. The survey will help to inform the design of the haul roads and site compounds, as well as establish the sensitivity of the soil to handling and movement.

6.7.18. Although the haul roads and site compounds will only be present for a relatively short time period, the design should take in to account the degradation of agricultural land and aim to preserve and reinstate higher quality agricultural soils, where possible.

Residual Effects

6.7.19. The sensitivity of agricultural soils is considered to be high and the magnitude of impact following mitigation is considered to be negligible. Therefore, there is likely to be a direct,

permanent, long-term effect on agricultural land of slight significance following implementation of mitigation measures.

6.8 Conclusions

6.8.1. Based on the assessment undertaken and assuming that mitigation measures are employed, there are likely to be the following residual effects as a result of the construction haul roads and site compounds:

- A direct, temporary, medium-term negligible effect (not significant) on construction workers;
- A neutral significant to adjacent Site users;
- A neutral effect to Controlled Waters within the vicinity of the Scheme; and
- A direct, permanent, long-term effect on agricultural land of slight significance.

6.8.2. Overall, the effects relating to Ground Conditions have been identified to be negligible to slight, therefore are considered to be not significant.

7 Groundwater

7.1 Background

7.1.1. This addendum reports the outcome of the assessment of likely significant effects arising from the Scheme on Hydrogeology in the context of the change of location of the eastern construction compound and associated temporary haul roads, required to facilitate the construction of the SWDR, Wokingham.

7.1.2. The Chapter summarises the baseline conditions at the site, the assessment methodology, the likely significant effects taking into account national legislation and the embedded mitigation measures required to prevent, reduce or offset significant adverse effects. It should be noted that the addendum will only assess construction phase impacts relating to the new location of the site compound and associated haul roads.

7.1.3. This addendum is intended to be read in conjunction with the environmental statement (ES) that has previously been produced in 2019, with particular reference to Chapter 10 Road Drainage and Flood Risk and Chapter 8 Geology and Soils.

7.2 Methodology

7.2.1. The legislative framework, policy and guidance utilised for the addendum are the same as those utilised within the ES, however it should be noted that the following guidance has also become relevant, or superseded guidance in the time since the ES was produced.

- Design Manual for Roads and Bridges (DMRB) LA 104 Environmental Assessment and Monitoring (Highways England, 2020);
- DMRB LA 109 Geology and Soils (Highways England, 2020); and;
- DMRB LA 113 Road Drainage and the Water Environment (Highways England, 2020).

7.2.2. Potential groundwater attributes/receptors have been identified following a desk study review and ground investigation.

7.2.3. The significance level attributed to each effect on the attributes/receptors has been assessed based on the magnitude of impact from the construction compound and associated haul roads and the sensitivity of the affected receptor/attribute as outlined in more detail in Chapter 2: Approach to the Assessment of the ES. The sensitivity of the affected attribute/receptor is assessed on a scale of very high, high, medium, low and negligible, and the magnitude of change is assessed on a scale of major, moderate, minor, negligible and no change (adverse or beneficial).

7.2.4. The criteria used to determine the sensitivity of groundwater attributes/receptors are shown in Chapter 10 Flood Risk and Drainage of the ES.

7.2.5. The likely magnitude or extent of an impact (or change) on an attribute/receptor is established by assessing the degree of the impact relative to the nature and extent of the proposed works, Chapter 10 Flood Risk and Drainage of the ES.

7.2.6. Once the sensitivity of the attribute (receptor) and the magnitude of the impact / change are both established, the potential effect can then be derived by combining the two assessments in a simple matrix as set out in **Table 2-2** within Chapter 2 Approach to the Assessment of this ES.

7.3 Baseline Conditions

7.3.1. The proposed site compound and associated haul roads are located within the site boundary that was assessed during the ES. Given this, the baseline highlighted within the ES is considered to be appropriate for the purposes of this addendum. A summary of the baseline is provided below, with particular emphasis on the location under consideration, where data is available. For a further detail about the baseline conditions, the ES should be referred to.

7.3.2. The locations of the proposed site compound and associated haul roads in relation of the Scheme are presented in Appendix A.

Geology and Hydrogeology

7.3.3. The geology identified beneath the wider Scheme, based on ground investigations and information from the BGS indicates that the majority of the site is underlain by bedrock of London Clay Formation comprising clay, silt and sand. A small section of the site towards the west is situated on bedrock of Bagshot Formation comprising sand.

7.3.4. The Bagshot Formation and River Terrace deposits are defined as a Secondary A Aquifers which the Environment Agency defines as ‘permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers’. The Head Deposits are defined as a ‘secondary undifferentiated aquifer’, such a classification being assigned in cases where it has not been possible to attribute a specific category. Groundwater may be present in the Head Deposits but groundwater flow is likely to be low or negligible. The London Clay is classified as Unproductive Strata.

7.3.5. Groundwater monitoring undertaken in 2018 and 2019 indicates that shallow (<1 mbgl) groundwater is present in the superficial deposits and bedrock (full details provided in Table 1-5, Chapter 10 of the ES and further referenced therein). Based on the cohesive nature of the Head Deposits and London Clay Formation, the water in these strata is likely to be perched pockets within granular bands. Perched groundwater was also encountered in the Made Ground. Groundwater in the River Terrace Deposits is likely to be in hydraulic continuity with the Emm Brook and Luckley Brook, groundwater is likely to flow in the direction of these surface water bodies.

7.3.6. The Defra ‘Magic’ map application indicates that the proposed compound is not located within a groundwater Source Protection Zone and there are no Source Protection Zones within 2 km of the proposed site. There may be private abstractions in the vicinity of the Scheme. but it is not possible to consider these further at this stage.

7.3.7. The site is located within a Nitrate Vulnerable Zone and Drinking Water Safeguard Zone.

7.3.8. Based on the above information it is considered likely that the compound could be located on or in close proximity to Bagshot Beds and/or River Terrace Deposits, both of which are Secondary A Aquifers and are likely to be associated with shallow groundwater.

7.4 Assessment

7.4.1. It has been assumed that the haul roads and construction compounds will only be present during the construction phases. Therefore, the following section assesses the effects of the construction compound under consideration and the associated haul roads on ground conditions during the construction phase only and assumes they will be reinstated following the construction phase. For the purposes of the assessment, it has been assumed that there will be no below ground services or structures installed as part of the construction compound and haul roads.

7.4.2. Through the adoption of best practice construction methods, operational management and design of the Scheme, there are several embedded mitigation measures which will reduce the risk and likelihood of potential impacts on groundwater. The measures should be developed and set out in the Construction Management Plan (CMP) and implemented through a Construction Environmental Management Plan (CEMP) for the Scheme.

Sensitive Receptors

7.4.3. Based on the available information, the following potential groundwater receptors have been identified during the construction phase of the Scheme:

- Secondary A Aquifers (River Terrance Deposits and Bagshot Formation (Bedrock))
- Secondary Undifferentiated Aquifer (Head)

Importance of the Receptor

7.4.4. The groundwater in the Head deposits as a secondary undifferentiated aquifer is classified as a receptor of low importance. The groundwater in the Secondary A Aquifers (Bagshot Formation and River Terrace Deposits) in light of their likely connection surface water bodies is classified as a receptor of medium importance.

7.4.5. Therefore, for this assessment the overall importance of the receptor (shallow groundwater) is deemed to be high.

7.5 Impacts

7.5.1. The following potential impacts on the shallow groundwater prior to mitigation have been identified:

- Potential effects on quality of groundwater, due to accidental leaks and spillages;
- Potential increase in physical contamination (turbidity) of groundwater due to ground disturbance

7.5.2. There are not expected to be any impacts on groundwater flow as there are no major below ground structures proposed.

7.5.3. As these impacts are only expected during construction they will be mitigated via the CEMP and therefore are expected to be of negligible magnitude.

Significance

7.5.4. Combining the Importance of the receptor (high) with the magnitude of the impact (negligible) this would result in a negligible significance of potential effects.

7.6 Conclusions

7.6.1. Based on the assessment undertaken and taking into account the mitigation measures embedded in the CEMP, the likely significance of potential effects of the re-location of the construction compound and associated haul roads on groundwater is expected to be negligible and it is considered that there will be no residual effects.

8 Road Drainage and the Water Environment

8.1 Background

8.1.1. This chapter forms an addendum to the Road Drainage and the Water Environment chapter that was previously submitted to support the planning application for the Central and Western section of the SWDR which was subsequently granted approval by Wokingham Borough Council's Planning Committee on 18th May 2021.

8.1.2. Therefore, this addendum reports the outcome of the assessment of likely significant effects that the proposed temporary haul roads, change of location of the eastern site compound and other enabling works could have on the water environment and flood risk. It should be noted that this addendum assesses construction phase impacts only. The proposed temporary haul roads and site compounds are shown on the Proposed Site Layout Plan, presented as Figure 1-1 to 1-2 in Appendix A.

8.1.3. This Chapter describes the assessment methodology, the baseline conditions at the Site and in the surrounding area, any mitigation adopted for the purposes of the assessment, a summary of the likely significant effects, the further mitigation measures required to prevent, reduce or offset any significant negative effects, and the likely residual effects after these measures have been employed.

8.2 Methodology

8.2.1. The legislative framework, policy and guidance presented in the original Road Drainage and Water Environment Chapter are, for the most part, still current and valid for this addendum. It should be noted that the following documents have superseded those presented in the original Chapter, however the updates have no bearing on the outcome of this assessment.

- The National Planning Policy Framework (NPPF), MHCLG 2021;
- The NPPF Flood Risk and Coastal Change Planning Practice Guidance (PPG), DCLG 2021; and,
- Wokingham Borough Council Strategic Flood Risk Assessment, 2020

8.2.2. The assessment utilises the methodology outlined within DMRB LA 113 Road Drainage and the Water Environment.

8.2.3. The assessment takes account of the construction phase through:

- Estimation of the importance of the attribute.
- Estimation of the magnitude of the impact.
- Assessment of the significance of effects based on the importance of the attribute and magnitude of the impact.

8.2.4. The significance level attributed to each effect has been assessed based on the magnitude of change due to the Scheme and the sensitivity / importance of the affected receptor / attribute. The sensitivity of the affected receptor is assessed on a scale of very high, high,

medium or low, and the magnitude of change is assessed on a scale of major, moderate, minor or negligible (both adverse or beneficial).

8.2.5. The criteria used to determine the sensitivity of water receptors / attribute, the magnitude of impact on an attribute and the potential effect are the same as presented in the original ES chapter and is in line with the DMRB LA 113 and LA 104 guidance.

8.3 Baseline Conditions

8.3.1. The proposed temporary haul roads, enabling works and the proposed change in location of the eastern site compound are located with the red line boundary for the Scheme. Therefore, the baseline conditions, as documented within the original Road Drainage and Water Environment Chapter are considered to be appropriate for this addendum. A summary of the key baseline conditions and receptors is given below and in Table 9-1 respectively.

8.3.2. The site is crossed east to west by the Emm Brook and several of its tributaries, including the Luckley Brook. The Emm Brook and its tributaries are classified as Ordinary Watercourse, east of the confluence of the Emm Brook Tributary.

8.3.3. To the west of Easthampstead Road there is a Thames Water balancing pond which was designed to alleviate flood risk associated with the Upper Emm Brook tributary which conveys combined fluvial and surface runoff flows at this location. The fluvial flows emanate from the ordinary watercourse's small upstream catchment and the surface runoff flows emanate from two Thames Water sewers (1750mm and 1200mm diameter) serving existing development to the north of the Waterloo – Reading railway.

8.3.4. Groundwater monitoring has been undertaken at the site to determine the proximity of groundwater levels to ground level. High groundwater levels were recorded in all boreholes which were inspected from the period March 2018 to April 2019.

8.3.5. The Site is located within a Nitrate Vulnerable Zone (NVZ) for surface water and also lies within an Environment Agency designated Surface Water Drinking Water Safeguard Zone.

8.3.6. The highest flood risks to the Scheme arise from fluvial, pluvial and groundwater sources and are summarised below. The risk of flooding to and from the Scheme in terms of coastal and tidal, sewer and drainage infrastructure, and artificial sources is low to negligible.

Table 8-1 - Sensitive Receptors

Water Environment Receptor		Sensitivity
Surface Water Features	Emm Brook (Main River)	High
	Luckley Brook (Ordinary Watercourse) – tributary of Emm Brook	Medium
	Other drains and ponds identified within 500m of the Site	Low
Groundwater Body		High
Water Supply		Medium
Flood Risk - Scheme	Essential Infrastructure (NPPF vulnerability classification)	Very High
Water Quality – Scheme	Emm Brook	Medium
	Luckley Brook (Ordinary Watercourse) – tributary of Emm Brook	Medium
Land-Based Designations	Nitrate Vulnerable Zone (Surface Water)	Medium
	Environment Agency Drinking Water Safeguard Zone (Surface Water)	Medium

8.4 Assessment

Relevant Elements of the Scheme and Establishing the Pre-Mitigation Scenario

8.4.1. The following assessment assesses the effects of the proposed temporary haul roads, change in location of the eastern site compound and other enabling works on the water environment and flood risk during the construction phase only.

8.4.2. Through the adoption of best practice construction methods the risk and likelihood of potential impacts on the water environment and flood risk would be reduced. The measures are set out in the Construction Management Plan (CMP) and implemented through a Construction Environmental Management Plan (CEMP) for the Scheme.

8.4.3. Best practice recommendations for the prevention of contamination are outlined in more detail in the CEMP, and agreed with relevant statutory consultees prior to commencement of construction works. Mitigation measures include compliance with relevant legislation and guidance, and best practice measures in line with the Considerate Contractors Scheme and Site handbook for the construction of SUDS[3] (CIRIA C698). Measures will be used for erosion prevention and sediment control plan to reduce the quantity of sediment entrained in runoff and to prevent hydromorphological changes to surface water features.

8.4.4. The following likely significant environmental effects identified remain unchanged from the previous assessment:

- Potential increase in physical contamination (i.e. sedimentation) of surface water bodies, due to ground disturbance;
- Potential effects on quality of water resources, due to accidental leaks and spillages;
- Short-term increase in flood risk due to construction activities; and,
- Short term alterations to groundwater flow and quality.

Potential Increase in Physical Contamination (i.e. Sedimentation) of Surface Water Bodies, due to Ground Disturbance

- The following mitigation measures will be implemented during the construction phase to manage the risk of physical contamination (sedimentation) of the water environment on Site:
- Working areas shall be clearly defined to ensure the disturbance of soils is minimised, where possible;
- If ground contamination is encountered during construction works, work will stop immediately and measures will be taken to prevent disturbance and mobilisation of contaminants, until the contamination has been treated in-situ or removed for off-Site treatment;
- Haul routes and accesses shall be clearly defined to minimise risk of accidents;
- The cleaning of vehicles wheels prior to leaving Site;

[3] CIRIA, 2007 ‘Site handbook for the construction of SUDS’ available at https://www.ciria.org/ItemDetail?iProductCode=C698&Category=BOOK [accessed December 2020]

- If stock piling and plant and vehicle washing, occur in close proximity to a watercourse they should be separated from the watercourse with barriers (e.g. sediment fences) to prevent surface runoff from these sites entering the watercourse;
- It is anticipated that surface water run-off from the various construction areas within the Site could be managed by the use of temporary bunding and settlement ponds to protect the receiving water environment from excess water, sediment load and contaminants. Settlement ponds allow for isolation and on-site treatment of sediment laden or chemically contaminated surface water runoff prior to discharge, following agreement with the appropriate authority, or use of other appropriate means of disposal;
- Where possible avoid excavating into the watercourse and limit the extent of disturbance. Where any in-channel works is required, in-stream sediment control measures should be in place.
- Controlled and covered waste storage areas;
- Works will be undertaken in the dry and away from the watercourses as much as practically possible to minimise the release of sediment into the surface water bodies;
- Dust Management Plan (i.e. damping down);
- Installation of systems such as silt traps/fences and swales designed to trap silty water including adequate maintenance and monitoring of these to ensure effectiveness, particularly after adverse weather conditions;
- The extent of vegetation clearance should be limited to the areas necessary to install the culvert and outfall headwalls to reduce the amount of sediment released during clearance and the potential release of sediment from bare ground following clearance;
- Provision of environmental awareness training for Site workers;
- Drainage strategy to be implemented on a phase by phase basis as part of the design solution; and,
- Use of inert, uncontaminated material during construction.

Potential Effects on the Water Quality of Water Resources, due to Accidental Leaks and Spillages

8.4.5. The following mitigation measures will be implemented during the construction phase to manage the risk of chemical and biological contamination (primarily associated with leaks and spillages) entering the water environment on Site. These spillages could potentially lead to degradation of water quality, which is particularly relevant as the site lies within an Environment Agency Drinking Water Safeguard Zone. The mitigation measures are:

- Preparation of incident response plans, prior to construction, which should be present on-site throughout construction to inform contractors of required actions in the event of a pollution incident;
- Spillages and leaks will be immediately contained in line with the incident response plan;
- On-site availability of oil spill clean-up equipment including absorbent material and inflatable booms for use in the event of an oil spill or leak;

- Wherever possible, plant and machinery will be kept away from the drainage system and watercourses;
- Use of drip trays under mobile plant;
- Construction materials brought to the Site should be free of any contaminated material, so as to avoid any possible contamination of watercourses; and,
- Wet cement should not come into contact with surface water or near the streams and drainage ditches. Cement should be poured in dry conditions and consideration should be given to use of fast drying cement.

Short Term Increase in Flood Risk due to Construction Activities

8.4.6. The following mitigation measures will be implemented during the construction phase to manage flood risk and increased surface water runoff:

- Concurrent phasing of Site preparation, earthworks and construction and operational works may be required for the Site and the potential for construction activities to occur within the Site at the same time as other phases become operational;
- The drainage strategy will be implemented on a phase by phase basis as part of the design solution;
- Movement of materials around the Site will be managed under an appropriate Materials Management Plan to ensure the placement of materials does not change the flood risk. Materials will not be stockpiled in the floodplain or in such a way that will increase flood risk off-Site; and,
- Best practice construction measures will be adopted in line with the Considerate Contractors Scheme and CIRIA C698 to minimise the risk of flooding during construction.

8.4.7. The temporary crossing across the Emm Brook will be designed and constructed to have a clear span and an appropriate freeboard above the design flood level. It will also accommodate a mammal ledge to facilitate the passage of mammals. The requirement for this ledge means that the haul road is raised up more than average on the approaches to the crossing (compared to its overall length).

8.4.8. The crossing and haul route have been hydraulically modelled by WSP and the results summarised in WSP Technical Note 66439-TN03_p1_issue. The conclusion of the modelling was that the observed variations in water levels only affected land in the vicinity of the proposed crossing, with all variations contained within the site boundary. Flood level increases in the channel were a maximum of approximately 11mm in channel and approximately 29mm in the 2D floodplain domain. Therefore, the effect of the temporary haul road and its associated temporary crossing on flood risk is fairly limited, with those effects being limited to the confines of the site boundary.

8.4.9. The flood compensation area within the Suitable Alternative Natural Greenspace will be constructed prior to the proposed infilling of the Easthampstead Road basin.

8.4.10. It is also assumed that in areas where the temporary haul road crosses the existing Emm Brook tributary that the proposed diversions of the tributary will be undertaken first.

Short Term Alterations to Groundwater Flow and Quality

8.4.11. The following mitigation measures should be implemented during the construction phase, to manage the risk of alterations to groundwater flow and quality, on-site during construction:

- Pile casing during piling and isolation of the area around the piling from surface water until piling is complete;
- If perched groundwater is encountered within the made ground or superficial deposits at the Site, during the establishment of the foundations, dewatering may be required. The most appropriate method of dewatering will be chosen at this stage, which may include the enclosure of the excavation by sheet piling. Piezometers could be used outside of the sheet-pile to monitor groundwater levels;
- If ground contamination is encountered during construction works, work will stop immediately and measures will be taken to prevent disturbance and mobilisation of contaminants, until the contamination has been treated in-situ or removed for off-site treatment;
- Water arising from excavations will require disposal into the Thames Water sewer network, if uncontaminated. The removal of silts will be conducted by the settlement ponds, implemented as part of the temporary drainage strategy, described above; and,
- Damp proof membranes will be incorporated during construction, to prevent the ingress of shallow groundwater.

8.4.12. The inclusion of the above mitigation measures will ensure that the significance of effects during the construction stage is neutral for the considered sensitive receptors.

8.5 Conclusions

8.5.1. In summary, the assessment has concluded, considering the mitigation measures embedded in the CEMP, that the likely significance of potential effects of the re-location of the construction compound, temporary haul roads, and other enabling works on the water environment and flood risk is expected to be neutral and it is considered that there will be no residual effects.

9 Noise and Vibration

9.1 Introduction

9.1.1. Chapter 7 of the March 2021 Environmental Statement Addendum (Mar21ESA) reported the outcome of the assessment of likely significant effects arising from the South Wokingham Distributor Road (SWDR) Central Section (hereafter referred to as 'the Scheme') in terms of noise and vibration.

9.1.2. The potential effects during both the construction and operation of the Scheme on sensitive receptors within the study area were given due consideration in the Mar21ESA.

9.1.3. Since the submission of the planning application and associated documents in March 2021, the Scheme has been subject to further detailed design, which has resulted in some changes to the layout of the haul roads and compounds required to facilitate the construction of the road.

9.1.4. Condition 14 (assessment of construction impacts) attached to the planning approval made provision for the preparation of an Environmental Statement Addendum (Cond14ESA) to assess the implications of any such changes, with the Cond14ESA being submitted to Wokingham Borough Council (WBC) prior to commencement of the development.

9.1.5. This section considers the implications of changes to the layout of the haul roads and compounds in relation to construction phase noise and vibration.

9.2 Methodology

9.2.1. The approach adopted for this assessment is essentially a comparative one, involving the following steps:

- consider the findings reported in the Mar21ESA with respect to construction phase noise and vibration, identifying where significant effects occur and why;
- compare and contrast the original and current plans illustrating the layout of the haul roads, compounds and other enabling works; and
- consider qualitatively whether any changes are likely to result in any new significant adverse effects and if so identify appropriate mitigation to avoid, prevent, reduce or, if possible, offset any such effects.

9.3 Assessment

Summary of Mar21ESA Construction Noise and Vibration Assessment

9.3.1. The Mar21ESA reports the outcome of an assessment of construction noise and vibration, which followed the guidance set out in BS 5228:2009+A1:2014 (Code of practice for noise and vibration control on construction and open sites – Part 1: Noise and Part 2: Vibration), as is appropriate in the UK.

Noise

9.3.2. The assessment of construction noise was a quantitative one with noise levels being predicted at sample receptors using the methods set out in Annex F of BS 5228-1:2009+A1:2014. Four key activities were considered, two of which occur along the length of the Scheme ('excavation and earthworks' and 'road surfacing'), with the other two activities being location specific – 'piling works at the Emm Bridge' and 'tie-in works to existing roads' at the extremities of the Scheme.

9.3.3. The significance scale for the initial determination of the potential for significant effects in relation to construction noise was presented in Table 7-7 of the Mar21ESA, which is reproduced below for ease of reference. It can be seen that three scales are presented, which are dependent on the level of ambient noise affecting the receptor, with the Category A values being used where ambient noise levels are relatively low and Category C values being used where ambient noise levels are relatively high. Only the daytime period was considered since the Scheme is essentially off-line and does not involve any interaction with live railways or other constraints that might dictate out-of-hours working. An exception to this may be tie-in works to existing highways, where some limited and very short-term out-of-hour works may be required.

Table 9-1 - Significance Scale for the Initial Assessment of Construction Noise

Potential Significance of effect	**Magnitude of Impact**	**LAeq,T (dB), 07:00-19:00 weekday and 07:00-13:00 Saturday [1]**		
		Category A	**Category B**	**Category C**
Significant	Major	≥71	≥76	≥81
	Moderate	66 – 70	71 – 75	76 – 80
Not significant	Minor	61 – 65	66 – 70	71 – 75
	Negligible	≤60	≤65	≤70

Note:

[1] These are free-field construction noise levels (on the basis that the BS 5228-1 ABC categories have been determined using free-field ambient noise levels). For the weekday daytime and Saturday morning periods (which typically represent 'normal working hours') the assessment period, T, is the full duration of the shift.

9.3.4. The above table relates to the initial assessment of significance for construction noise. The duration and context of the impact also need to be considered when determining the significance of effect. However, at the time the Mar21ESA was being prepared, detailed information on construction techniques and equipment was not available. Consequently, the construction phase calculations undertaken at that time were considered preliminary and only sufficient for an indicative assessment of likely significance. For this reason, the significance of effect in relation to construction noise was determined solely on the basis of the thresholds set out in Table 9-1.

9.3.5. Construction noise calculations were made assuming groups of construction plant items for each activity with each of those plant items assigned a source sound power level from BS 5228-1 (Annex C) and an operating duration (in terms of a percentage 'on-time'). It was assumed that there would be a clear line of sight between source and receiver with intervening ground being acoustically absorbent.

9.3.6. Whilst the activities and their associated plant were selected as being reasonably representative of those that are likely to occur during the works, the BS 5228-1 predictions were considered representative of a worst-case scenario, on the basis that all plant items relevant to a particular activity would be operating at the closest point within the works site to the relevant receptor.

9.3.7. The construction noise assessment identified that for most receptors, the worst-case daytime noise levels were expected to have a negligible impact. Table 9-2 summarises adverse impacts other than of negligible magnitude that were identified in the Mar21ESA at two receptors, Britton's Farm and Rosedene.

Table 9-2 - Predicted Construction Noise levels and Magnitude of Impact

	Britton's Farm		**Rosedene, Easthampstead Road**	
Ambient noise	**Low (BS 5228-1 Category A)**		**Medium (BS 5228-1 Category B)**	
Distance (noise source to receptor)	**55 m**		**22 m**	
Excavation and earthworks	**65 dB $LA_{eq,T}$**	**Minor impact**	**75 dB $LA_{eq,T}$**	**Moderate impact**

	Britton's Farm		Rosedene, Easthampstead Road	
Road surfacing	**63 dB $LA_{eq,T}$**	**Minor impact**	**72 dB $LA_{eq,T}$**	**Moderate impact**
Bridge works	**n/a (>300 m)**	**-**	**n/a (>300 m)**	**-**
Tie-in and road surfacing	**n/a (>300 m)**	**-**	**74 dB $LA_{eq,T}$**	**Moderate impact**

9.3.8. For most receptors, the worst case daytime noise levels were anticipated to have a negligible impact and so overall, the noise impact arising from the construction of the Scheme was judged to be limited. However, there were a couple of exceptions:

- Due to the proximity of Britton's Farm to the Scheme, potential adverse impacts of minor magnitude were identified for 'excavation and earthworks' and 'road surfacing'. These were judged to be a slight-moderate, non-significant effect prior to the implementation of mitigation measures.
- Due to the proximity of Rosedene to the Scheme, potential adverse impacts of moderate magnitude were identified for 'excavation and earthwork', 'road surfacing' and 'tie-in and road surfacing'. These were judged to be a moderate-large, significant effect prior to the implementation of mitigation measures.

9.3.9. Consideration was given in the Mar21ESA to the provision of appropriate mitigation and ultimately it was concluded that following the implementation of mitigation measures it is likely that there would be a direct, temporary, short-term residual adverse impact of no more than minor magnitude (a slight-moderate, non-significant effect).

9.3.10. Overall, regardless of ambient noise category and construction activity, provided works are no closer than approximately 55 metres, the predictions indicate that adverse impacts of no worse than minor magnitude (a slight-moderate, non-significant effect) are likely to arise, providing that:

- the works avoid the most sensitive periods of the day;
- noise is kept to a minimum through the adoption of best practicable means and other best practice measures, and
- residents are kept informed through effective community liaison.

Vibration

9.3.11. The assessment of construction vibration was a quantitative one with vibration levels being predicted at sample receptors using the empirical formulae set out in Annex E of BS 5228-2:2009+A1:2014. Two key activities were originally considered – the bored piling required

for the Emm Brook bridge construction and vibratory rollers required during the earthworks and/or road construction road.

9.3.12. In fact, the nearest receptor to the bridge works (Knoll Farm) is in excess of 160 metres away and so vibration from any bored piling in the vicinity of Emm Brook bridge was discounted. Therefore vibratory compaction was taken to be representative of an activity, which would be likely to generate reasonable worse case levels of vibration at potentially affected receptors.

9.3.13. The significance scale for the initial determination of potentially significant effects in relation to construction vibration was presented in Table 7-9 of the Mar21ESA, which is reproduced below for ease of reference.

Table 9-3 - Significance Scale for the Initial Assessment of Construction Vibration

Potential significance of effect	**Magnitude of impact**	**Threshold level, day or night (PPV [1] mm.s-1)**
Significant	Major	≥2.1
	Moderate	1.1 – 2.0
Not significant	Minor	0.6 – 1.0
	Negligible	≤0.5
Note: [1] PPV = peak particle velocity		

9.3.14. The above table relates to the initial assessment of significance for construction vibration. As for noise, the duration and context of the impact also needs to be considered when determining the significance of effect. However, as noted previously, detailed information on construction techniques and equipment was not available at the time the Mar21ESA was being prepared. Consequently, the construction phase calculations undertaken at that time were considered preliminary and only sufficient for an indicative assessment of likely significance. For this reason, the significance of effect in relation to construction vibration was determined solely on the basis of the thresholds set out in Table 9-3.

9.3.15. Vibration predictions were determined using the empirical formulae from BS 5228-2 and based on the assumption that there is a 33% probability of the predicted peak particle velocity (PPV) vibration level being exceeded (and a 67% probability that it is not). It was

assumed that a Dynapac CA 301 single drum roller[4] would be operated under 'steady-state' conditions using the high amplitude setting.

9.3.16. The construction vibration assessment identified that for most receptors, the worst-case daytime noise levels were expected to have a negligible impact.

9.3.17. Table 9-4 summarises adverse impacts other than of negligible magnitude that were identified in the Mar21ESA at two receptors, Britton's Farm and Rosedene.

Table 9-4 - Predicted Construction Vibration Levels and Magnitude of Impact

	Britton's Farm		**Rosedene, Easthampstead Road**	
Distance (vibration source to receptor)	55 m		22 m	
Vibratory compaction	0.7 $mm.s^{-1}$ PPV	Minor impact	2.7 $mm.s^{-1}$ PPV	Major impact
Bridge works (bored piling)	n/a (>160 m)	-	n/a (>160 m)	-
Note: [1] PPV = peak particle velocity				

9.3.18. For most receptors, the worst case vibration levels were anticipated to have a negligible impact and so overall, the vibration impact arising from the construction of the Scheme was judged to be limited. However, there were a couple of exceptions:

- Due to the proximity of Britton's Farm to the Scheme (55 metres), potential adverse impacts of minor magnitude were identified during 'vibratory compaction'. These were judged to be a slight-moderate, non-significant effect prior to the implementation of mitigation measures.

[4] The Dynapac CA 301 single drum roller has a 2.13 metres drum width and an amplitude of 1.72 mm on high setting (and 0.84 mm on low setting).

- Due to the proximity of Rosedene to the Scheme (22 metres), potential adverse impacts of major magnitude were identified for 'vibratory compaction'. These were judged to be a large-very large, significant effect prior to the implementation of mitigation measures.

9.3.19. Consideration was given in the Mar21ESA to the provision of appropriate mitigation and ultimately it was concluded that following the implementation of mitigation measures it is likely that there would be a direct, temporary, short-term residual adverse impact of no more than minor magnitude (a slight-moderate, non-significant effect).

9.3.20. Overall, provided works are no closer than approximately 45 metres the predictions indicate that potential adverse impacts of no worse than minor magnitude (a slight-moderate, non-significant effect) are likely to arise, providing that:

- the works avoid the most sensitive periods of the day;
- vibration is kept to a minimum through the adoption of best practicable means and other best practice measures, and
- residents are kept informed through effective community liaison.

Compound Locations

9.3.21. Figure 9-1 (original location) and Figure 9-2 (current location) show the layout of the satellite compound with the nearest dwelling – Chapel Green House – shown as a point of reference. Figure 9-3 (original location) and Figure 9-4 (current location) show the layout of the main compound with the nearest dwelling – Britton's Farm and East Lodge respectively – shown as a point of reference. It is clear that the main change between the original and current construction site playout plans is the location of the main compound, which has moved approximately 500 metres to the west.

9.3.22. The nearest dwellings to each compound, and the associated separation distance, are presented in the Table 9-5.

Table 9-5 - Closest Dwelling to each Compound Location

	Original plan – March 2019	**Current plan – July 2021**
Satellite compound	Chapel Green House | 85 m	
Main compound	Britton's Farm | 80 m	East Lodge | 90 m
Note: Approximate distances are from the receptor to the nearest part of the designated storage area		

Figure 9-1 - Satellite Compound – Original Location

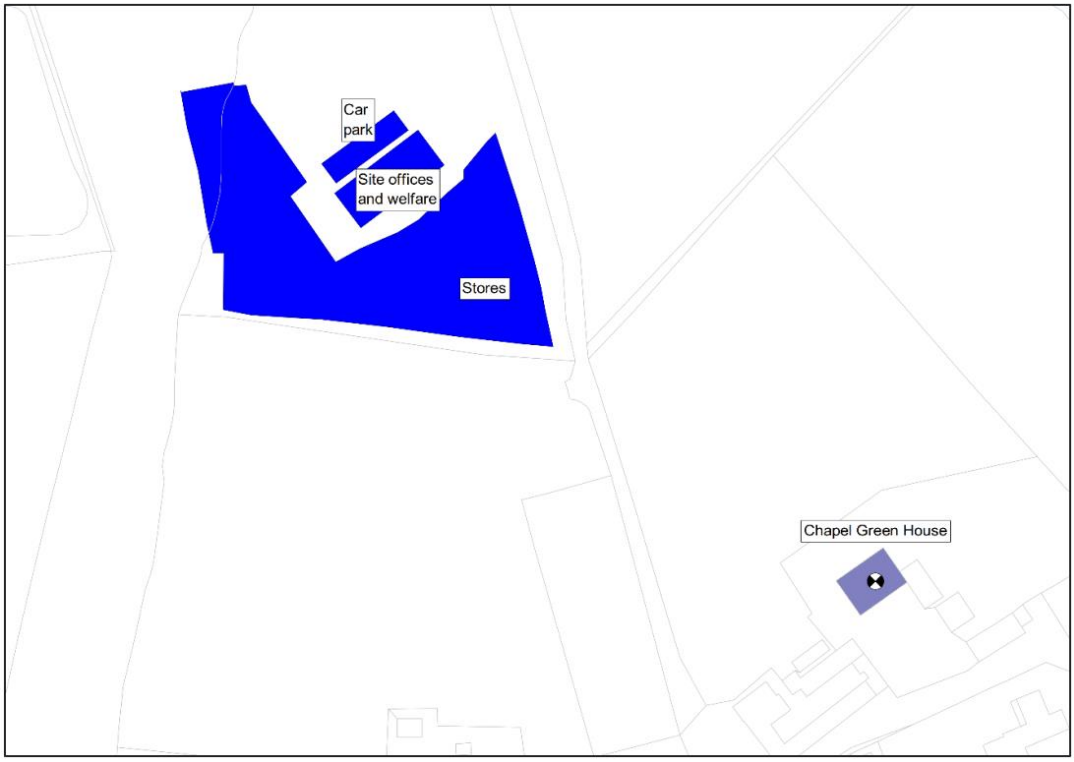


Figure 9-2 - Satellite Compound – Current Location

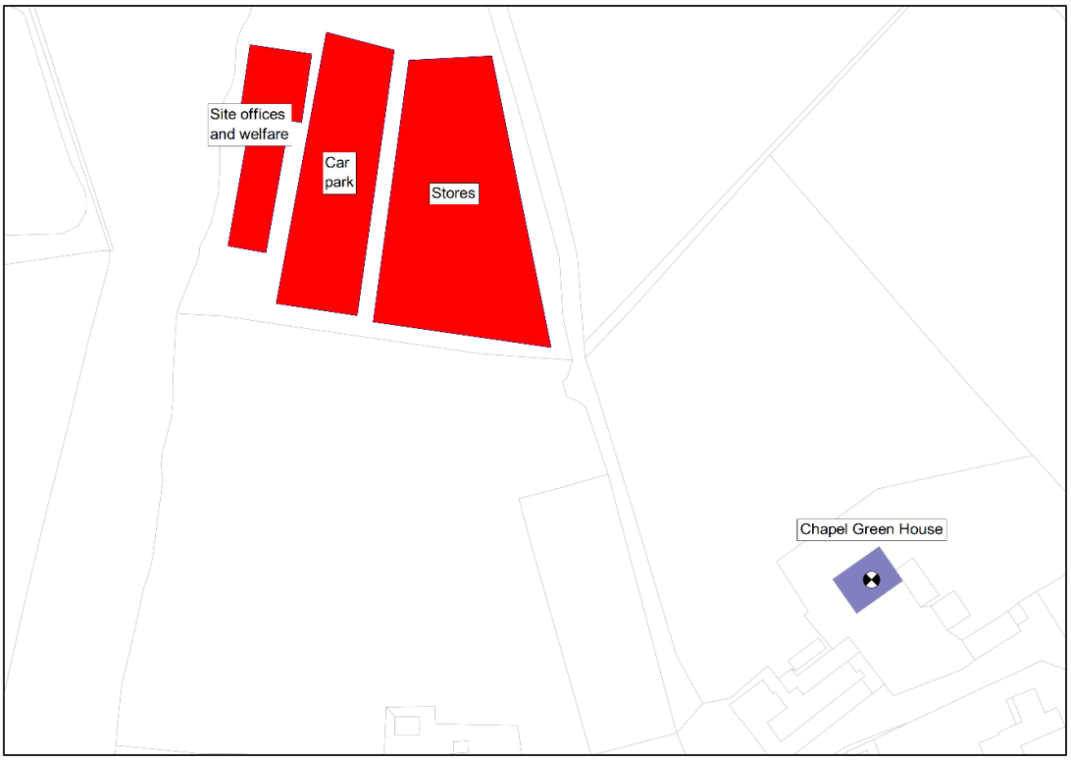


Figure 9-3 - Main Compound - Original Location

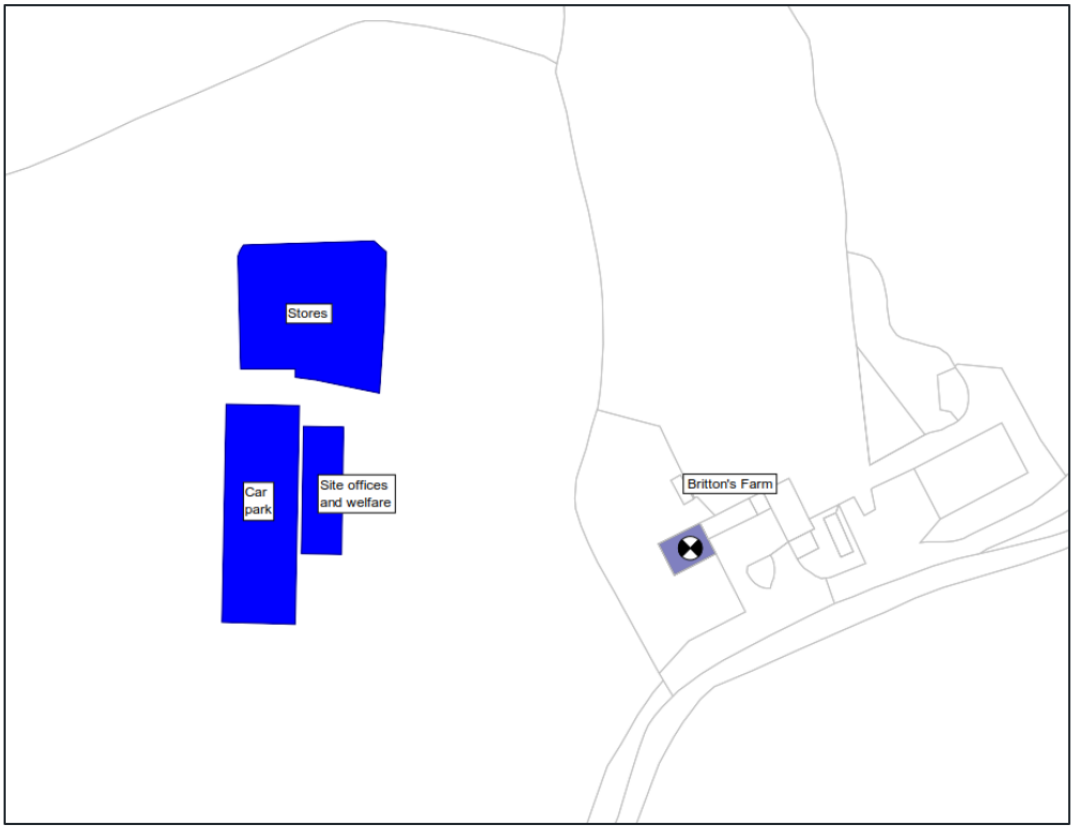
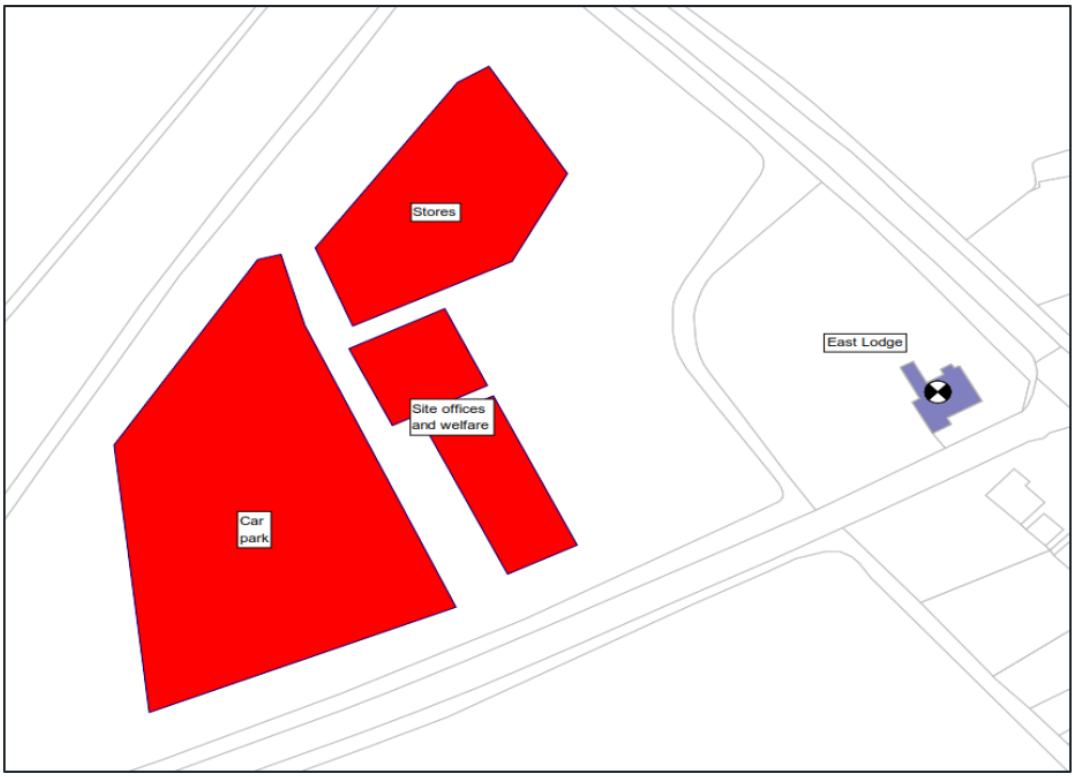


Figure 9-4 - Main Compound – Current Location



Haul Route

9.3.23. The current primary haul route follows a very similar alignment to that previously considered in the Mar21ESA, with both traversing a short distance south of the Scheme itself. It can be concluded that the small variations in alignment of the haul routes would not alter the noise or vibration level received at the nearest dwellings.

Compound Locations

9.3.24. By reference to Figure 9-1 and Figure 9-2 it can be seen that although the layout of the satellite compound has changed, its broad location has not. It can be concluded that no notable change in noise or vibration levels would be expected at the nearest dwelling as a result of the proposed changes.

9.3.25. By reference to Figure 9-3 and Figure 9-4 and Table 9-5, it can be seen that the main compound has moved to the west by approximately 500 metres. The nearest dwelling to the current location (East Lodge) is now slightly further away (at 90 metres) than was the case for the original main compound location and Britton's Farm (80 metres). However, the difference in separation distance between the two locations is relatively small and so no notable change in the absolute level of noise or vibration levels would be expected at the nearest respective dwelling as a result of the proposed changes.

9.3.26. Once they are set-up, compounds are expected to have a limited impact in terms of noise and vibration.

9.3.27. The plans show a generator required to power the office accommodation and welfare facilities and there will be staff and visitor car movements to/from the compound each working day. In addition, some plant movements can be expected at each compound relating to the storage of material and maintenance of equipment, but all these sources are occasional and unlikely to contribute significantly to the noise or vibration levels that would be created by the construction of the Scheme itself.

9.3.28. The generator will operate continuously (i.e. day and night), but it will be silenced and, if necessary, screened. A typical steady sound level for an operating generator would be 61 dB LAeq,T at 10 metres. Allowing for distance and acoustically absorbent ground cover in the intervening area between the compound and nearest dwelling (now some 90 metres away) the generator would be unlikely to generate an activity noise level in excess of 40 dB LAeq,T at the nearest receptor. This level is below the threshold of significant adverse effects determined in accordance with the BS 5228-1 ABC method for the more sensitive night-time period where ambient noise levels are low (i.e. Category A) as shown in Table 9-6.

Table 9-6 - Significance Thresholds for Construction Noise (from BS 5228-1)

Assessment category and threshold value period	**Threshold value in dB ($L_{Aeq,T}$)**		
	Category A	**Category B**	**Category C**
Night-time (23:00-07:00)	45	50	55
Evenings and weekends (19:00-23:00 weekdays, 13:00-23:00 Saturdays and 07:00-23:00 Sundays)	55	60	65
Daytime (07:00-19:00) and Saturdays (07:00-13:00)	65	70	75

9.4 Conclusions

9.4.1. Since the submission of the planning application and associated documents in March 2021, the Scheme has been subject to further detailed design, which has resulted in some changes to the layout of the haul roads and compounds required to facilitate the construction of the road.

9.4.2. Condition 14 (assessment of construction impacts) attached to the planning approval made provision for the preparation of an Environmental Statement Addendum (Cond14ESA) to assess the implications of any such changes, with the Cond14 ESA being submitted to Wokingham Borough Council (WBC) prior to commencement of the development.

9.4.3. Consequently, this section has considered the implications of changes to the layout of the haul roads, compounds and other enabling works in relation to construction phase noise and vibration.

9.4.4. The approach adopted for this assessment is essentially a comparative one, involving the following steps:

- consider the findings reported in the Mar21ESA with respect to construction phase noise and vibration, identifying where significant effects occur and why;
- compare and contrast the original and current plans illustrating the layout of the haul roads, compounds and other enabling works; and
- consider qualitatively whether any changes are likely to result in any new significant adverse effects and if so identify appropriate mitigation to avoid, prevent, reduce or, if possible, offset and such effects.

9.4.5. The current primary haul route follows a very similar alignment to that previously considered in the Mar21ESA, with both traversing a short distance south of the line of the SWDR Scheme itself. It can be concluded that the small variations in alignment of the haul routes would not alter the noise or vibration level received at the nearest dwellings.

9.4.6. With respect to the compounds, no notable changes to the likely impacts are anticipated as a result of the following:

- Once they are set-up, compounds are expected to have a limited impact in terms of noise and vibration.
- The Mar21ESA notes (in paragraph 7.3.61) that although some tie-in works to the existing highways may be undertaken out-of-hours, in general construction activities are likely to be carried out during core daytime hours. This includes the compound, although the generator required to power the office accommodation and welfare facilities is likely to operate continuously. A simple quantitative assessment has demonstrated that the resultant level at the nearest receptor is likely to be below the threshold of significant adverse effects for the most stringent night-time period and where ambient noise levels are low.

- From the assessment presented in the Mar21ESA it can be concluded that as long as separation distances between construction plant and receptor are in excess of 55 metres, adverse impacts of no more than minor magnitude (a slight-moderate, non-significant effect) would be expected. Table 9-5 identifies that the closest dwelling to each compound lies in the range 80-90 metres and so no significant effects are anticipated from either compound.
- Although the main compound location has changed and so the nearest potentially affected dwelling has also changed, adverse impacts of no more than minor magnitude (a slight-moderate, non-significant effect) would be expected and so no notable changes to the likely impacts are anticipated.
- All construction activities will be managed and controlled through the following: preparation and implementation of a Construction Environmental Management Plan;
  - adoption of best practice measures set out in the Mar21ESA;
  - adoption of Best Practicable Means at all times; and
  - provision of information to residents and other interested parties potentially affected by the works.

10 Materials and Waste

10.1 Introduction

10.1.1. An assessment of Materials & Waste was presented in Chapter 9: Materials and Waste of the Environmental Statement Addendum (dated March 2021 ESA) for the proposed SWDR (Planning application reference - 192928). In response to the change in location of the construction compounds and haul routes, this addendum has been produced to identify and report (by comparison with the original assessment) any changes to the likely significant adverse environmental effects from the consumption of material assets and/or the generation and disposal of waste.

10.1.2. No change to the assessed elements of Materials and Waste is required as a result of the design updates to the Proposed Scheme, i.e. the assessed elements remain: materials resources required, and waste generated and disposed of, by the Proposed Scheme during the construction phase and first year of operation.

10.1.3. The legislative framework, study area, baseline conditions, potential impacts, assessment methodology and assessment assumptions and limitations as reported in March 2021 ESA Chapter 9 also remain unchanged and hence valid.

10.1.4. There is no update to the types and / or quantities of materials required, and waste generated and disposed of, by the Proposed Scheme as originally reported in 'Assessment of Significant Effects Pre-Mitigation' in Section 9.7 of March 2021 ESA Chapter 9.

10.2 Methodology

10.2.1. For the both the original assessment and this addendum, IEMA's Guide to Materials and Waste in Environmental Impact Assessment (April 2020)[5] has been used to assess the potential impacts and effects from the Proposed Scheme, using the process and significance criteria it sets out. Method W1 (Void Capacity, as detailed in the IEMA Guide) has been used to best reflect the scale and nature of the Proposed Scheme.

10.2.2. It is also confirmed that the proposed methodology and significance criteria as reported in March 2021 ESA Chapter 9 remain unchanged and hence valid.

10.3 Assessment

10.3.1. The assessment as reported in March 2021 ESA was undertaken using:

[5] IEMA (2020) Materials and Waste in Environmental Impact Assessment (link)

- data from the Proposed Scheme Bill of Quantities (BoQ) (noting that only 36% of the line items within the BoQ were provided with accompanying data); and
- an upscaling factor of 20% on available data, to reflect the increase in size of the Proposed Scheme since the original BoQ was produced. Note: this upscaling was not applied to the bridge structure on the Proposed Scheme, as the dimensions of this asset remained consistent.

10.3.2. Both the original assessment and the evaluation in this addendum should therefore be treated with a commensurate level of caution given the data gaps within the BoQ.

10.4 Construction

10.4.1. No changes have been made to the types and quantities of materials required to construct the Proposed Scheme. The data on materials required for the Proposed Scheme can be found in Table 9-16 and 9-17 in Section 9.7 of March 2021 ESA Chapter 9.

Materials

10.4.2. The findings of the assessment are that effects from materials consumption are not significant. Assessment findings therefore remain unchanged from March 2021 ESA Chapter 9.

Waste

10.4.3. The findings of the assessment are that the effects from waste generation and disposal are not significant. Assessment findings therefore remain unchanged from March 2021 ESA Chapter 9.

10.5 Operation

Materials

10.5.1. The significance of effects for materials during the first year of operation pre-mitigation remains neutral and not significant, and therefore unchanged from the assessment presented in Chapter 9 of the March 2021 ESA.

Waste

10.5.2. For waste the effect of the Proposed Scheme on waste is considered to be slight and therefore not significant, and therefore remains unchanged from Chapter 9 in the March 2021 ESA.

10.6 Conclusions

10.6.1. Residual effects for both materials and waste in both the construction and operation of the Proposed Scheme remain unchanged from March 2021 ESA Chapter 9.

Construction

Materials

10.6.2. The effects from material consumption as a result of the Proposed Scheme are slight adverse and not significant.

Waste

10.6.3. The effect of the Proposed Scheme on landfill capacity is slight adverse and not significant.

Operation

Materials

10.6.4. The effect of the Proposed Scheme on materials during operation is neutral and not significant.

Waste

10.6.5. The effect of the Proposed Scheme in relation to waste generation and disposal during operation is expected to be slight and not significant.

11 Climate

11.1 Background

11.1.1. An assessment of the potential impact of the scheme during both the construction stage and the operational phase was carried out in support of the consented planning application. As this condition relates purely to construction the operational phase is not considered further in this addendum.

11.1.2. The assessment found that based on the estimated emissions and the percentage of the carbon budgets, the emissions are not anticipated to have a material impact on the ability of the Government to meet its carbon reduction targets. The construction works for the Scheme are anticipated to generate 28.8ktCO2e, equating to 0.00113% of the 3rd UK carbon budget. The Scheme option without the Strategic Development Location (SDL) is anticipated to have a net increase in GHG emissions, however this is considered to be negligible (between 0.00005% and 0.00012%). For the Scheme option with the SDL, a net increase in GHG emissions is anticipated, however the impact on the carbon budget is anticipated to be negligible (between 0.00005% and 0.00174%.

11.1.3. The construction phase of the Scheme will generate GHG emissions due to the manufacturing, supply and transport of construction materials and the use of construction plant. The generation of GHG emissions will be adverse. The IEMA guidance on assessment of GHG emissions in EIA states that all emissions are significant. However, LA114 requires assessments to only report on significant effects where increases in GHG emissions will have a material impact on the ability of the Government to meet its carbon reduction targets. The impact on carbon budgets for the construction of the Scheme are not anticipated to have a material impact on the ability of the Government to meet its carbon reduction targets.

11.2 Mitigation

11.2.1. A number of options for mitigation measures to reduce the impact of GHG emissions during construction have been identified in the Environmental Statement. It is expected that good working practices will be employed on the project, and where practical, mitigation measures including the recommendations in the Environmental Statement chapter will be implemented during the scheme’s construction.

11.2.2. The implementation of mitigation measures is anticipated to have a beneficial effect, particularly in relation to the generation of GHG emissions during the construction phase.

11.3 Conclusions

11.3.1. As has been noted the original findings in relation to climate impacts from the scheme were not anticipated to have a material impact on the ability of the Government to meet its carbon reduction targets. The changes in the location of one of the construction compounds and

minor changes to the haul route will not have any significant implications for the outcome of the previous assessment.

12 Conclusion

12.1 Conclusion

12.1.1. This addendum has been prepared to assess the potential effect the change in moving one construction compound in the east of the scheme and the alignment of associated haul route on the outcome of the Environmental Statement carried out in support of the planning application.

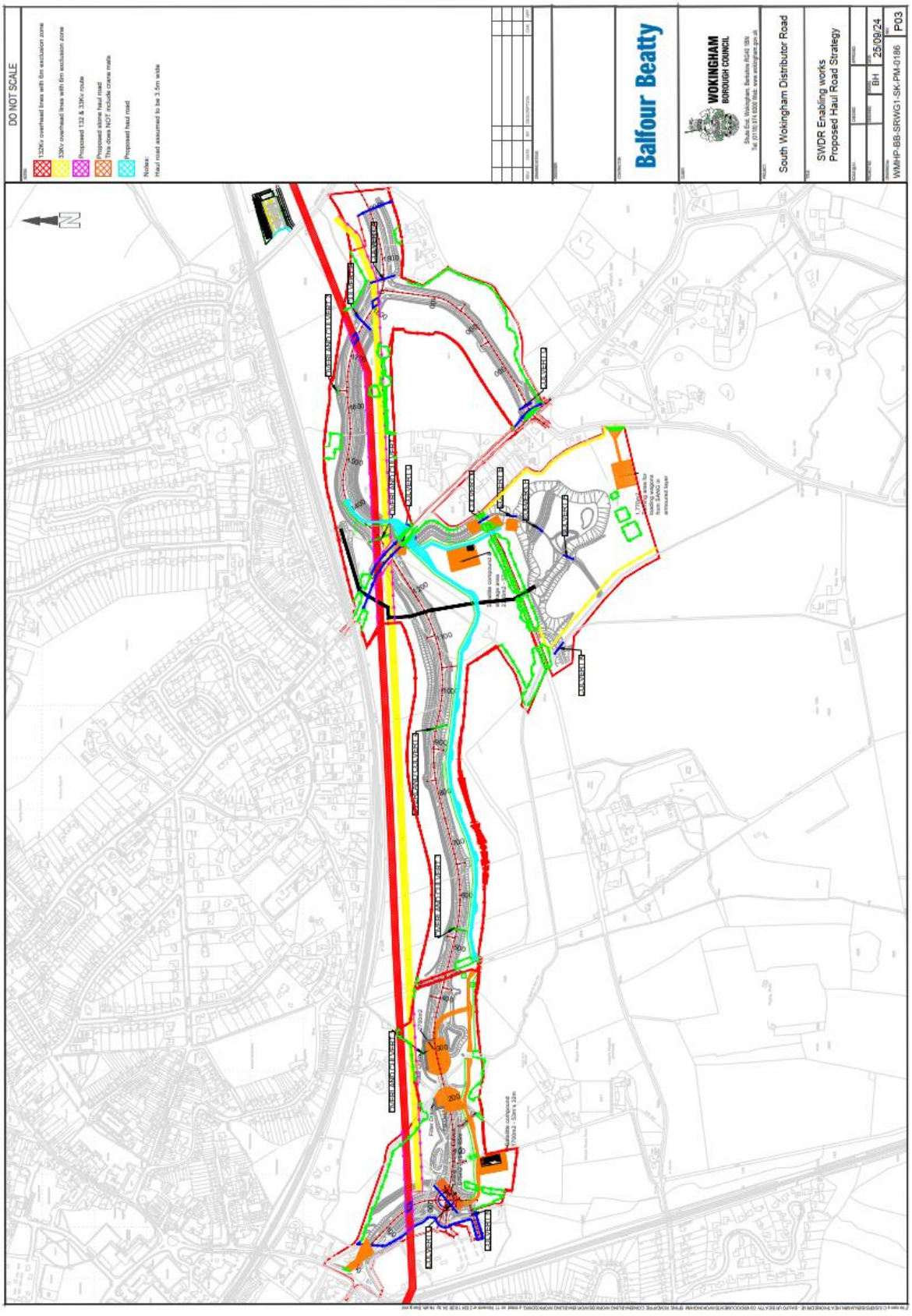
12.1.2. The technical areas assessed in the Environmental Statement have been reviewed to take account of the changes focussing on the construction phase given that the changes relate to the construction phase only.

12.1.3. Overall, the conclusion of this addendum is that the changes to the location of the eastern construction compound and to the alignment of the haul route will not have a significant effect upon the findings of the Environmental Statement that supported the application for planning consent.

Appendix A Figures

Figure 1-1 - Original Plan (May 2019)

Figure 1-2 - Current Plan (September 2024)



Appendix B – Extract from FRAP

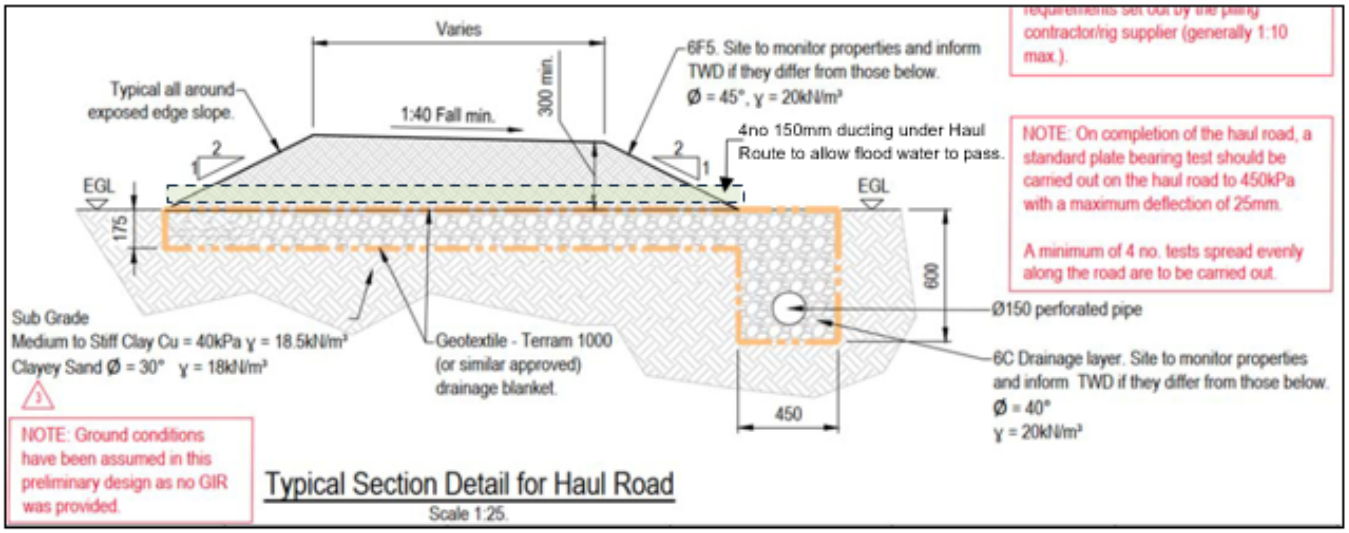
Balfour Beatty

Work Package Plan
Template Form: HSES-TF-0011d

Sequence of works – Site Setup and Haul Routes

- Heras fencing will be installed around the site. This fencing will be delivered to the site by the supplier and offloaded using suitable lifting equipment into the work area. This will then be walked out and erected by Balfour Beatty around the perimeter of the site.
- The topsoil from within the works footprint is to be stripped and stockpiled within the site boundary for reuse within the project. Topsoil stockpiles are not to exceed 2m in height. Topsoil bunds will be located outside of Flood Zone 3 where possible.
- A haul road will be constructed throughout the length of the site which will act as the main route to the work areas to construct the scheme. Figure 4 above shows proposed position of site compound (for enabling) and haul road route
- Where the haul road lies within Flood Zone 3 then the haul road will be constructed as Figure 7 below.
- A drainage layer will be installed under the length of the haul road for collecting any rainwater runoff from the stone hard standing and adjacent land. The filter drain will be lined with terram so that it filters out any silt, before draining to collection point. All Discharge points will be filtered through straw bails and pumped through a siltbuster before discharging into the local ditches ordinary watercourses
- Minimum of 300mm 6F5 will be placed and compacted to form the haul road with a 1:2 slope to exposed edges and 1:40 cross fall to shed water into the drainage channel. Final detail subject to temporary works design sign off by Temporary Works Designer.
- Where the haul route is within Flood Zone 3 and higher than adjacent ground, then 4no 150mm diameter pipes will installed at 20m intervals across the haul road to allow the water to flow across in the event of flooding events.

Figure 7: Typical Section of Haul Road within 8m of Watercourse & Flood Zone 3



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