

East West Rail Phase 2

Compound A1: Land northeast of Charbridge Lane

Environmental Appraisal Report

Network Rail



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1. Overview of appraisal

Summary of Findings

The site for Compound A1 lies on the north side of the OXD line, on the outskirts of Bicester approximately 2km east of the centre. To the west of the site is Bicester Road, Launton Allotments and the A4421, beyond which is the urban area of Bicester and an extensive area of industrial units; to the north and east of the site are open agricultural area; to the south of the site, beyond the OXD line, are Manor Farm and The Tythe Barn wedding venue and the north end of Launton, including St Mary's Church. The Langford Brook flows in a south westerly direction near the northern boundary

The compound entrance will be from the adjacent Bicester Road, with the HGV route being via the A4421 which meets Bicester Road at the roundabout next to the site. The compound will include 42 units for office accommodation and welfare facilities in three storeys of fourteen as well as car parking spaces for staff and operatives. Excavated topsoil and subsoil from the compound site will be stored in the southern part of the site, with the laydown area for construction materials and plant in the lower, southern part of the site, closest to the railway. The HGV route to the compound will be from the A4421, along which there is no requirement for any improvement works associated with this proposal.

Land use and agriculture – The agricultural land at compound A1 is expected to be Sub-grade 3b land. The temporary land take of less than 50 ha of Sub-grade 3b land will be of negligible magnitude and significance. Compound A1 represents less than 5% of the total agricultural land of Farm 2A-1. The construction of the compound will not result in new severance or adverse impact on farm infrastructures, land use or enterprise. The effect of compound A1 on the farm holding will be of negligible magnitude and negligible significance. The use of the compound for preliminary works will be controlled through the CoCP so that the effects on adjacent agricultural land will be of negligible magnitude and negligible significance. Following construction of the Project, the temporary land take will be reinstated to agriculture in accordance with a Soil Management Plan.

Cultural heritage – The perimeter of the site contains Iron Age to Roman pottery and features (MOX12267) recorded on Bicester Perimeter Road, and a windmill mound (MOX5020) is located to the west of the compound area. The location also includes elements of the agrarian landscape that appears to have been associated with medieval settlements in the vicinity of the Site. SUMO (2017) undertook a geophysical survey of the Site and recorded no archaeological features within the Site, although some medieval to modern agricultural remains, including evidence of ridge and furrow cultivation, were found. This assessment has considered geophysical surveys undertaken in 2017 and LiDAR data, both of which indicate no features of note within the Site itself. Consequently, there is judged to be a Low potential for pre-medieval remains and a High potential for medieval to modern agricultural remains to survive within the Site. These remains, if present, are likely to be agricultural in origin and of Negligible/Low importance. The possibility of encountering hitherto unknown remains cannot be discounted. Therefore, in accordance with national and local planning policy and in line with the project wide ES, an Archaeological Fieldwork Strategy will be required to mitigate against the possibility of impacts upon hitherto unknown remains within the Site. Following mitigation there will be no significant residual adverse effects on cultural heritage.

Air quality – The existing air quality around Compound A1 is good. There are fewer than 10 receptors within 100 m of the site boundary and the closest properties are located approximately 125 m south west of Compound A1. There are also allotment gardens immediately to the west of the site, between Bicester Road and Charbridge Lane. Construction traffic emissions were assessed as part of the Project ES. No significant residual effects on local air quality are expected because of vehicle emissions during construction or use of Compound A1. The dust mitigation measures set out within the Project CoCP will be supplemented with medium to high risk measures during peak flow for trackout as set out in Appendix 8.2 to the CoCP. The addition of a jet wash at the site exit during compound construction will be applied to limit the trackout of dust in advance of the installation of a wheel wash within the sites. Crushing and screening of material will be carried out in accordance with DEFRA's Process Guidance Note 3/16(12) and a permit obtained as necessary. With effective mitigation in place, there are not expected to be any significant residual air quality effects associated with the construction or use of Compound A1.

Ecology – there will be a small loss of hedgerow to facilitate access to the site and to the railway. Adjacent habitats such as scrub and hedgerow may also experience degradation during construction by the increase in potential damage from road vehicles and proximity to the works, but will not be directly removed. Any trees adjacent to the Site that have potential to support roosting bats will be retained and are unlikely to be directly affected by the construction of the compound. Some of the potential roosts are in trees within 20 m of the border of the Site and these may experience noise and light disturbance from the works. Due to the temporary nature of the compound, the above impacts are reversible but may adversely affect the local population of bat species present throughout the duration of the compound, in the absence of mitigation. During compound operation, measures will be employed through the application of CoCP. Considering the mitigation measures to be implemented, it is not expected that the use of the compound for works will have a significant residual effect on bats.

Noise – Noise levels from the construction and use of compound A1 are expected to be below the thresholds for significant adverse effects.

Geology, soils and land contamination – An assessment has been undertaken of the effects of the Project on ground conditions, geology as a valuable resource, ground contamination, soils reuse and waste. With the proposed incorporated mitigation measures, negligible and minor beneficial effects are generally predicted during construction; these are not significant. With appropriate mitigation measures incorporated within design, negligible or minor beneficial effects are anticipated during the operation of the Project; these are not significant.

Landscape and visual impact – Compound A1 will be in a relatively enclosed location on a greenfield site. Both the construction and use of Compound A1 will have a limited influence on the landscape character of the area beyond its local environs. There will be temporary visual effects on users of public rights of way and Launton Allotments, primarily due to the height of new features and the presence of construction activities and movements across the site. Identified impacts will be temporary in nature and wholly reversible once Compound A1 has fulfilled its function and the site has been restored to its baseline condition, as mature field trees within the site will be protected for the duration.

Water quality and flood risk – Compound A1 is shown to be within Flood Zone 1 and will not have an adverse impact on floodplain areas. The Compound design and Drainage Strategy will seek to ensure that any adverse impacts will be avoided or minimised, as far as practicably possible. Measures to protect the water environment during construction are included within the CoCP and will cover the prevention of pollution, procedures in case of accidental spillages and monitoring. The impacts will be direct and temporary, as the construction compound will be removed on completion of the works and ground levels restored to pre-development conditions. Consequently, allowing for the proposed mitigation measures there are anticipated to be no permanent residual adverse effects. The Flood Risk Assessment (FRA) that accompanies this application provides more information relating to flood risk issues.

1.1 Introduction

1.1.1 To help ensure that the Project can be constructed in a timely and cost-effective manner, the Alliance proposes to set up some of the strategic and satellite construction compounds in advance of the making of the TWAO. Some of these advance compounds, once constructed, would also be available for use before the TWAO has been made, if this process follows the programme set out in the Project ES that accompanied the EWR2 TWAO Application, which shows the TWAO being made in September 2019. Therefore, the Alliance proposes to use these advance compounds to undertake some preliminary works along the western part of the Project, within the existing NR land. More detail on the advantages of this advance construction and use of the compounds is provided in Section 1.4 of the report.

If the TWAO is not made or is to be delayed by an indeterminate period, then the Alliance will ensure removal of the advance works compounds and reinstatement (where needed) of the affected sites such that they can be returned to their original use.

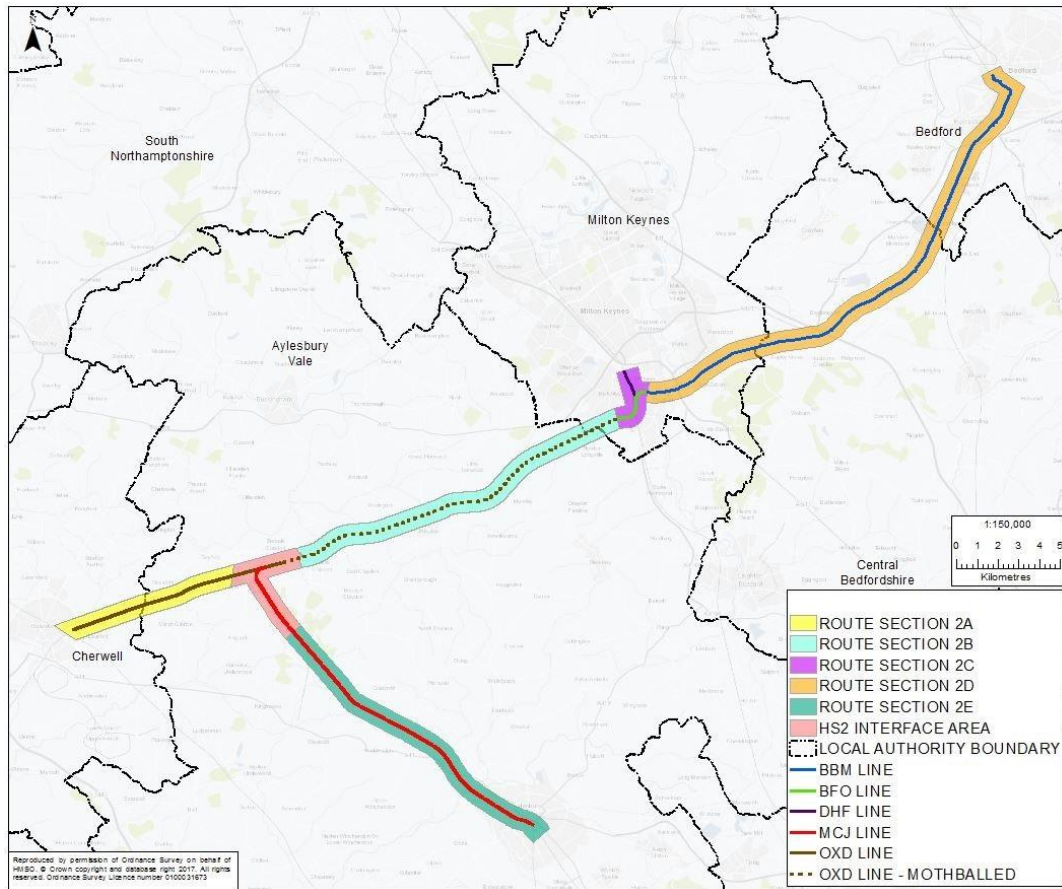
1.2 Purpose and structure of the report

- 1.2.1 From the environmental assessment as reported in the Project ES and from the additional survey and appraisal work carried out in relation to this application, no significant adverse residual effects are anticipated from this advance works compound proposal. Therefore, this document is an Environmental Appraisal Report (EAR) and not an ES.
- 1.2.2 This report describes the advance works entailed in providing compound A1, northeast of Charbridge Lane, Bicester, and sets out what preliminary works could be undertaken from this compound, to provide a basis for the scope of this EAR. The EAR also sets out what the environmental effects of these advance works are expected to be, to accompany the EWR Alliance application on behalf of NR for this advance compound.
- 1.2.3 As the purpose and design of these compounds are intrinsically related to the entire EWR2 Project, the appraisal topic chapters refer to and summarise relevant sections of the Project ES, as well as providing additional appraisal detail that, for some topics, may include additional survey data.
- 1.2.4 This report starts with an overview of the advance compounds proposal for the Project and then provides details of the layout of the compound that is the subject of this application, including access from the public highway and any works needed to the highway to enable construction of the compound. This is supported by drawings of the compound site and proposed layout (133735_2A-EWR-OXD-XX-DR-L-019009 - 019011) and a Transport Statement in Appendix B.
- 1.2.5 The environmental appraisals presented within the topic chapters consider the effects on the environment arising during both construction and use of the compounds, in relation to the current baseline conditions. The environmental appraisal is provided in the same topic order as that used in the Project ES:
- Land use and agriculture
 - Cultural heritage
 - Air quality
 - Ecology
 - Noise and vibration
 - Geology, soils and land contamination
 - Landscape and visual impact
 - Water quality and flood risk.
- 1.2.6 A Transport Statement is provided in Appendix B and an Ecological Impact Assessment is provided in Appendix C.

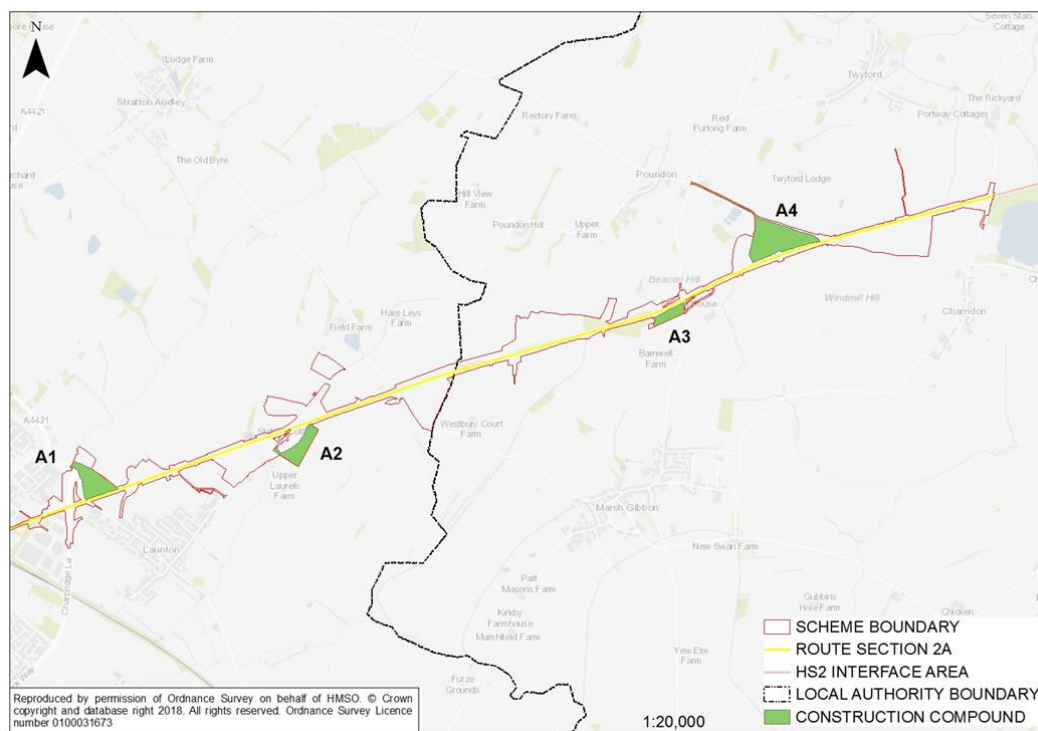
1.3 Location of proposed advance compounds

- 1.3.1 The Project has been split into six Route Sections based on geography, operation and construction programme and methods. This has been reflected in the structure of the Project ES. The Route Sections are 2A, 2B, 2C, 2D, 2E and the HS2 Interface Area.
- 1.3.2 Network Rail apply line references to different sections of the railway network. The line through Route Sections 2A and 2B is the OXD line; the line in Route Section 2C is the BFO line and the DHF line. Structures along the route include these line references in their naming.
- 1.3.3 These Route Sections and the line references are illustrated on Insert 1.1.
- 1.3.4 Advance construction is proposed for eleven of the proposed Project strategic and satellite compounds, at the locations indicated on Insert 1.2:
- Four in Route Section 2A
 - Six in Route Section 2B
 - One in Route Section 2C

Insert 1.1: Route Sections



Insert 1.2: Compound locations



1.3.5 Some temporary highways improvements are proposed to be implemented along their respective Construction Access Routes in advance of the TWA0. These temporary works will be limited to works that can be completed within the existing highway boundary, without any requirement for third party land. The advance compound locations and associated temporary highways works are summarised in Table 1.1 below.

Table 1.1: Summary of proposed advance compound locations

Ref. No.	Name / Type	Location	Area (ha)	HGV Access via	Temp highway works	Local authority area
A1	Northeast of Charbridge Lane Strategic	East of Bicester, northwest of Launton	4.1	A41 & A4421	None	CDC
A2	East of Station Road Satellite	Northeast of Launton	3.8	A41 & A4421 & site	Passing bays and junction improvements	CDC
A3	West of Station Road Satellite	South of Poundon, north of Marsh Gibbon	1.9	A4421 & local roads	Passing bays and junction improvements	AVDC
A4	South of Twyford Lodge Farm Strategic	South of Green Lane, east of Poundon	11.1	A4421 & local roads	Passing bays and junction improvements	AVDC
B1	West of Queen Catherine Road Satellite	East of Steeple Claydon	3.7	A413 & local roads	Passing bays and junction improvements	AVDC
B2	West of Verney Junction Satellite	West of Verney Junction	3.4	A413 & local roads	Passing bays and junction improvements	AVDC
B3	South of A413 Buckingham Road Satellite	Furze Lane, west of Winslow	1.8	A413 & local road	Passing bays and junction improvements	AVDC
B4	East of Station Road Satellite	Between Little Horwood and Mursley	2.8	A4421 & local roads or A4146 & local roads	Passing bays and junction improvements	AVDC
B5	West of Whaddon Road Satellite	West of Newton Longville	2.4	A4421 & local road	None	AVDC
B6	South of Newton Road Strategic	South of Far Bletchley	7.0	A421 & B4034 & local road	None	AVDC/ MKC
C1	South of Wellington Place Satellite	South of Bletchley Station	0.3	A4146/A5 & B4034 & local road	None	MKC

1.4 The need for advance construction of compounds

- 1.4.1 The early establishment of these eleven main works construction compounds and the potential undertaking of preliminary works from them will bring significant time benefits and facilitate the timely construction of EWR2, once the TWAO is made. The proposed preliminary works will enable a smoother transition to the further phases of construction that are the subject of the TWAO, such as the track works and works to platforms and stations. The early set-up of the construction compounds and associated highway works will each require a separate planning permission. This application focuses on Compound A3.
- 1.4.2 The proposed preliminary works from the compounds will not require formal planning approval and could take place, subject to obtaining the requisite Licences. If the TWAO is not made, then a scheme of restoration would apply to those elements that are not repair or maintenance works, i.e. the main works construction compounds and related highway improvements.
- 1.4.3 The proposal to set-up the construction compounds and undertake highway improvements, along with preliminary works from them, will enable the Project to move to its operational phase more expediently. This will assist in the public benefits being realised as soon as possible, including improving the east-west public transport connectivity through rail links and providing a sustainable transport solution to support economic growth in the area. These public benefits are supported by national and local planning policy, such as the National Policy Statement for National Networks (2014), National Infrastructure Delivery Plan (2016) and Buckingham Thames Valley Strategic Economic Plan (2014). Although the Project does not qualify as an Nationally Significant Infrastructure Project (NSIP), the National Policy Statement for National Networks (NPS NN) is a material consideration for other applications of this scale and paragraph 2.30 to 2.34 of the NPS NN set out the drivers for the development of the rail network, including increasing demand and relieving overcrowding, and paragraph 2.35 recognises that rail transport can play a crucial role in delivering significant reductions in pollution and congestion. The National Infrastructure Delivery Plan identifies that Phase 2 of EWR is a key project and 'Phase 2 linking Oxford to Bedford and Milton Keynes is being developed and construction will start as soon as possible'. The Buckingham Thames Valley Strategic Economic Plan Refresh recognises the importance of East West Rail and suggests that it is 'delivered without unnecessary delay'.
- 1.4.4 Route Sections 2A, 2B and 2C require the existing trackside and adjacent vegetation to be cleared before construction work can begin on upgrading the railway track bed to the required width and standard. The construction programme for Route Sections 2A, 2B and 2C has vegetation clearance works starting as soon as is practicable after the TWAO has been made, to ensure these works can be completed before onset of the bird nesting season in March 2020. Having the main and satellite compounds in these route sections already in place by the time the TWAO is made will help ensure that this seasonal programme target is met; if the target is not met, the remaining vegetation clearance will be delayed until at least August 2020, unless some can be undertaken after extensive and detailed pre-clearance checks for breeding birds during the clearance period.
- 1.4.5 Repair and maintenance works are proposed to various bridges and culverts, involving re-lining of existing culverts, brickwork repairs or other non-invasive techniques, to improve the structural integrity of these assets. The detailed pre-construction surveys and the clearance of dense trackside vegetation may reveal additional works that are required to some railway assets, which could delay the Project programme. Having the compounds in place and beginning the preliminary works early will help to prevent such delays and their associated costs. The preliminary works are not proposed to include any replacement or extension of culverts or structural alterations to the bridges, such as the installation of walkways or raising of parapets, which are subject to the TWAO.
- 1.4.6 Some of the proposed environmental mitigation works can also be managed from these compounds as preliminary works, where these are within the existing NR boundary and in locations not affected by other construction activity, as these do not require formal planning approval. These works include planting of hedgerows and provision of badger setts and barn owl boxes. These mitigation measures will provide replacement habitats and improve biodiversity; early establishment will enable them to be completed in the appropriate season to ensure their effectiveness.
- 1.4.7 The early provision of the construction compounds will enable the preliminary works to be undertaken from managed sites and access routes, which will ensure that the potential transport and amenity impacts are kept to acceptable levels. The early provision may also reduce some of the peak traffic levels during the initial phases of the main works construction.

1.5 Advance compounds construction programme

- 1.5.1 The compound construction works are programmed to commence in February 2019 and run through to December 2019, prior to the making of the TWAO. Construction periods will be staggered at adjacent locations to avoid peaks in activity and vehicle movements to minimise effects on the local communities and road network, apart from vehicle journeys planned to serve more than one compound, such as for sites A3 and A4. Strategic compounds will take about 16 weeks to construct; satellite compounds about 10-12 weeks.
- 1.5.2 Compound A1 is proposed to be constructed between September 2019 and December 2019, prior to the making of the TWAO.
- 1.5.3 For the purposes of assessment in the Project ES, it was assumed that each construction compound will remain in place throughout the duration of the Project construction, i.e. for a maximum of five years if they are set up at the beginning of the works. This compound duration could be several months longer if constructed in advance; however, this will vary according to the construction programme for the individual Route Section, so some will still be less than five years.
- 1.5.4 All construction compounds will be temporary and will be removed as part of the last phase of construction in each Route Section; the land will then be restored and returned to its previous use, except for any elements that are intended to form part of the permanent works, such as a maintenance access.

1.6 Typical compound description

Layout

- 1.6.1 Strategic compounds will provide main office space, main canteen areas, main welfare facilities and processing and storage of site materials. Satellite compounds will be similar but with smaller offices, welfare facilities and areas for storage of plant and materials and material processing.
- 1.6.2 Insert 1.3 shows the general set-up of a strategic compound, taken from a previous railway project.

Insert 1.3: Example set-up of a strategic compound



- 1.6.3 An internal fence can be seen within the picture, which separates the office and car parking area from the rest of the compound in which construction plant may be operating and where staff are required to wear personal protection equipment.

Construction

- 1.6.4 Initial works will be to provide access into the compound areas. Where a suitable access already exists, such as a suitable farm gate, this will be used but may need to be widened; otherwise a new access will be constructed. Access will require the following works:

- Cut back and, in some places, remove highway and field boundary vegetation as necessary to create appropriate access width and sightlines.
- Improve or construct the connection to the highway as required to create appropriate swept paths for vehicle manoeuvres.
- Install traffic control where required.
- Install temporary signs along the designated routes to direct compound construction traffic and install temporary signs prohibiting access for construction traffic along other routes.

1.6.5 Once access is in place, the following works will be undertaken to construct the compound:

- Mark out the site boundary and install site fence, which will be off-set from existing boundary vegetation that is to be retained, sufficiently to ensure that it lies beyond root protection areas.
- Install temporary protective fencing around the full extents of the root protection areas of any hedgerows or mature trees that are to be retained within or around the compound areas. This fencing will be installed prior to any plant, machinery or materials being brought onto site and shall be retained for the full duration of the works, including during the reinstatement period.
- Clear the compound site and remove its existing vegetation (apart from that to be retained), if seasonally appropriate or after being checked for breeding birds and protected species.
- Strip topsoil, generally down to 300mm.
- Strip subsoil where required on poor ground, or provide ground stabilisation; excavate subsoil for foundations, pipe trenches, etc.
- Create 2m high topsoil bunds around sections of the compound perimeter or in designated areas, for storage until reinstated after completion, with separate subsoil bunds as needed; the bunds will be seeded to control weed growth and surface water run-off.
- Install drainage ditches and silt mitigation, where required (compound specific).
- Install general compound surface, usually granular material laid on geotextile, unless suitable hardstanding already exists.
- Erect compound office, security, storage and welfare buildings (modules) on concrete strip or pad foundations.
- Construct macadam roads and demarcate footpaths and parking areas.
- Establish plant, materials and fuel storage areas and areas for sorting and storing materials from site.
- Install security lighting and closed-circuit television (CCTV) systems.

1.6.6 The above works will require delivery of the following construction plant and materials to the compound sites, in quantities varying according to the size and current condition of each of the locations:

- Fencing materials, using rigid wheelbase self-unloading lorries (known as 'hiab' lorries), or similar
- Construction plant, including excavators, dumpers, rollers, telehandlers, etc, using articulated heavy goods vehicles (HGVs).
- Removal of excavated material, concrete and tarmac arisings, etc. (when not stockpiled on site for future re-use or reinstatement), using 8-wheel rigid wheelbase tipper lorries
- Concrete for foundations, laydown areas, access roads, etc, using 6m³ concrete mixer lorries
- Tarmacadam, aggregate and fill materials, using 8-wheel rigid wheelbase tipper lorries
- Accommodation units (typically 10m long), using articulated HGVs – note these deliveries will be focused over a period of 2-3 days
- A mobile crane, for installation of site accommodation units
- Cables, drainage materials, construction materials, etc. by rigid wheelbase hiab lorries
- Tools, equipment and smaller materials, using light goods vehicles (LGVs)

- Site vans and workforce vehicles.
- 1.6.7 Deliveries will be scheduled to avoid peak traffic hours. All deliveries will be marshalled off the public highways and will be unloaded within the compound site footprint.
- 1.6.8 Each compound will require utilities. Where local services are available this will be provided from mains connections, determined on a site-by-site basis:
- Electricity – where available and with agreement of the statutory provider, a compound will be connected to a mains electrical supply. Where a suitable connection is not available, power will be via a generator fuelled from a double-bunded tank, plus renewable source if practicable. It is likely that each compound will require a generator during initial set up until the mains electricity supply is established.
 - Water – where available and with agreement of the statutory provider, connection via a 32mm diameter pipe to the local water main will be provided. Where a suitable supply is not available, drinking water will be provided in 25 litre bottle-feed water coolers at regular intervals. Grey, not potable, water for toilet facilities will be provided via water tanks on site.
 - Surface water drainage will be managed on a site-by-site basis, in most cases via grading of the compound area towards perimeter attenuation ditches, plus use of permeable finishes to car parking areas; storage areas for fuel and other potentially polluting substances will be bunded to prevent any spillage affecting the surface water runoff.
 - Foul water drainage from welfare facilities will be discharged to the local foul drainage network if a connection is available. Otherwise there will be a below-ground foul tank, emptied regularly by tanker for appropriate disposal.

Construction Access Routes

- 1.6.9 Several Construction Access Routes will be used by road vehicles to access the compound sites. Construction traffic will comprise both Heavy Goods Vehicles (HGVs) (over 7.5 Te) and Light Goods Vehicles (LGVs) (under 7.5 Te), carrying materials and staff to and from the compound sites. The Construction Access Routes that will be utilised by the Project are summarised in Table 1.1 above and illustrated on Figure 2.1 in the Transport Statement (Appendix B). They will connect the Project Area with the nearby M1 and M40 motorways, which provide access to and from the rest of the country.
- 1.6.10 Each compound site has its own dedicated Construction Access Route or Routes, which have been chosen using the following principles:
- Using the widest and most direct routes to access the M1, M40 or A5.
 - Avoiding travel through villages and residential areas, wherever possible.
 - Avoiding routes that pass sensitive receptors such as schools, wherever possible.
 - Avoiding routes that are winding or involve many turning manoeuvres, wherever possible.
- 1.6.11 The Construction Access Routes identified by these criteria have been assessed for constraints and developed in consultation with the local highway authorities. Vehicle tracking exercises have been completed for each compound to ensure HGVs can safely arrive at and leave the compound sites and to inform the design of the site accesses.

Fencing, security and lighting

- 1.6.12 Fencing will be installed to the perimeter of the site compounds in accordance with Network Rail Standards, which will generally consist of 2.4m high metal palisade fencing, with access gates to the highway and the works site. Access to the site will be controlled by a gateperson stationed within a security office at each gate, and vehicle access will be controlled by barrier, with sufficient space allowed for vehicles to pull-in off the highways safely, whilst waiting for access to the site compound.
- 1.6.13 CCTV will be installed at access points, around the perimeter fencing and at the site buildings. This will be linked to a control office, enabling security guards to be dispatched to locations as necessary.
- 1.6.14 The construction of these compounds is generally planned to take place during the lighter summer months, therefore, there will be minimal requirement for the use of temporary mobile lighting towers

during the compound construction works.

- 1.6.15 Security lighting will be installed around the perimeter of the compound, to vehicle and pedestrian access routes and around site offices and welfare. These lights will be on timers, so as they are only operational during the working hours of the sites, but once the compounds are constructed, they will be on movement detectors so that they are only operated by motion, as a deterrent to intruders. Floodlights will be directional, so as they do not pollute areas beyond the extents of the compounds.
- 1.6.16 Detailed lighting and CCTV plans will be developed with the contractor who will carry out the works, who will be selected during the procurement process.

2. Compound A1

2.1 Context

Existing conditions

- 2.1.1 The site for Compound A1 lies on the north side of the OXD line, on the outskirts of Bicester approximately 2km east of the centre. To the west of the site is the A4421, beyond which is the urban area of Bicester and an extensive area of industrial units; to the north and east of the site are open agricultural areas; to the south of the site, beyond the OXD line, are Manor Farm and The Tythe Barn wedding venue and the north end of Launton, including St Mary's Church.
- 2.1.2 The site is a large field sloping gently southwards between 73m and 71m OD. The field is bounded by hedgerows and there are three mature trees within the field. The site is adjacent to Bicester Road on the west with an area of allotments between Bicester Road and the A4421. Bicester Road joins the A4421 at a roundabout adjacent to the north west of the site.
- 2.1.3 The eastern boundary is formed by a hedgerow and to the east of the site is a large field. The OXD line forms the southern boundary of the site, with hedgerows alongside the railway line. The Langford Brook flows south west about 90m northwest of the northern boundary. Bicester Airfield Local Wildlife Site (LWS) is located 520 m north of the site at its closet point.

Insert 2.1: Aerial view of compound A1 in context



Insert 2.2: Aerial view of Site A1



- 2.1.4 Drawings 133735_2A-EWR-OXD-XX-DR-L-019009 – 019011 are provided with the planning documents and present a site plan, proposed layout and environmental constraints for Compound A1.

2.2 Description of proposals

Compound description

- 2.2.1 Drawing 133735_2A-EWR-OXD-XX-DR-L-019011 shows the proposed layout of compound A1.
- 2.2.2 Site access will be from Bicester Road, via a new access from the highway into the western side of the site; an existing farm access near this location will be formalised and retained as an emergency access point. An access to the OXD line will be created at the south eastern corner of the site to allow vehicles to access the rail corridor.
- 2.2.3 The site will include 42 units for office accommodation and welfare facilities in three storeys of fourteen as well as car parking spaces for staff and operatives. Excavated topsoil and subsoil from the compound site will be stored in the southern part of the site, with the laydown area for construction materials and plant also in the southern part of the site, closest to the railway.
- 2.2.4 The HGV route to the compound will be from the A4421, along which there is no requirement for any highway improvement works associated with this proposal. The A4421 joins Bicester road at the roundabout beside the northwest corner of the site.
- 2.2.5 The expected traffic effects generated by this compound are described in the Transport Statement in Appendix B; the peak weekday flows are summarised in Table 2.2 below.

Table 2.1: Daily trip generation for compound A1 (two-way vehicle trips)¹

Activity	Daily Two-Way Vehicle Trips			
	Cars (Staff and Operatives)	LGVs	HGVs	Total
Main compound set up	127	60	36	223
Preliminary works	87	40	12	139

Compound activity to support preliminary works

2.2.6 The preliminary works that could be undertaken from this compound, in advance of the EWR2 TWAO being made, are:

- Vegetation clearance along the railway, where this has not already been undertaken as part of recent maintenance, if seasonally appropriate and in accordance with licences.
- Repair works to culverts
- Track and ballast removal
- Environmental mitigation works where required

2.2.7 The activities expected within the compound to support these would be:

- Office operation and staff commuting
- Workers using welfare facilities
- Movement of construction plant, including access to the railway
- Delivery and movement of construction materials to do the maintenance works
- Sorting and storage of materials arising from the preliminary works, to enable efficient re-use within the Project or removal from site if unusable
- Compound lighting outside daylight hours between 7am and 6pm (8am and 4pm on Saturdays); security lighting overnight.

2.2.8 During compound construction and use, mitigation measures will be implemented as stated in the Code of Construction Practice (CoCP) in Appendix A.

¹ Assuming 1.5 passengers per vehicle for staff and operatives in line with TA methodology (Appendix 14.1 of the ES). Values for HGV and LGV trips have been rounded to nearest even number, assuming all vehicles arrive and depart within the same hour.

3. Land use and agriculture

3.1 Baseline information

Baseline information within the Project ES

- 3.1.1 Section 6.4, Chapter 6 (Land use and agriculture) of the ES Volume 2i Project-wide provides the Project baseline information. Over half of the Project Study Area is agricultural land, primarily arable land followed by grass fields. There is also smaller areas of equestrian use and very small areas of horticulture and nursery. Agriculture within the Study Area is predominantly mixed farming, comprising arable and livestock, with the livestock enterprises being dairy, beef and sheep with some pigs and poultry. Most of the land use within the Route Section 2A Study Area is agricultural as described in Section 6.2, Chapter 6 (land use and agriculture) of the Project ES Volume 2ii.
- 3.1.2 Agricultural land quality is assessed through the Agricultural Land Classification (ALC) system. Within the ALC system agricultural land is graded as 1-5, where 1 is of the highest quality and 5 is of the lowest quality, Grades 1, 2 and 3a on the ALC system are classed as Best and Most Versatile (BMV) land which is a finite resource given special consideration in national policy and guidance.
- 3.1.3 Agricultural land quality was assessed through a review of a range of published datasets and small areas were surveyed to a detailed level to check the provisional and predictive ALC grading. Further information on the assessment of agricultural land quality is provided in the ALC report in Appendix 6.2 in Volume 3 and the results of the detailed survey and desk study is mapped on Figure 6.2 in Volume 4 of the Project ES.
- 3.1.4 The assessment indicated that approximately 20% of the Project Study Area is predicted to be BMV land, which is protected in national and local policy. The BMV land is predicted to comprise of mainly Sub-grade 3a land with a very small quantity of Grade 2 land. Within Route Section 2B approximately 25% of the Route Section Study Area is predicted to be BMV land, comprising Sub-grade 3a land.

Additional baseline information

- 3.1.5 The site of construction compound A1 consists of agricultural land. Based on the desk study the predicted agricultural land quality at compound A1 is predominantly Sub-grade 3b land with a small portion of non-agricultural land. This is not BMV land.
- 3.1.6 Compound A1 is located within an agricultural field belonging to a single farm holding, Farm 2A-1. Based on information obtained from Land Parcel Identification System (LPIS) data² the farm holding is approximately 520 ha in size. For this assessment, a farm holding is defined as a single unit, operating under single management, which undertakes agricultural activities.

3.2 Predicted effects of the proposal

Compound construction

Agricultural land quality

- 3.2.1 Potential effects on agricultural land quality comprise direct loss of agricultural land and changes to the quality of land disturbed during construction. Therefore, the assessment of impacts on agricultural land quality considered both the quantity and quality of land that would be temporarily affected during compound construction. The majority of land take for the construction compound will be temporary land take which will be reinstated in accordance with a Soil Management Plan (SMP) following the completion of the Project, with no long-term significant residual effects. There would be a period of aftercare, which lasts for about five years following soil placement to ensure that soil structure has stabilised satisfactorily.
- 3.2.2 To determine the significance of effects from the construction of compound A1, the criteria provided in

² The LPIS data used is confidential, used by permission of Defra 2017.

Section 6.2, Chapter 6 (Land use and agriculture) Volume 2i Project-wide was used ('the ES criteria').

- 3.2.3 For the purposes of this assessment, the ES criteria indicate that Grade 1 and 2 land is considered high sensitivity, and Sub-grade 3a land is of medium sensitivity. Grades 3b, 4 and 5 are considered of low sensitivity. The agriculture land at compound A1 is predicted to be Sub-grade 3b land and is of low sensitivity.
- 3.2.4 Impact magnitude on agricultural land depends on the amount of land to be lost due to the Project. The Natural England consultation threshold for the loss of BMV agricultural land is 20 ha, and any project-wide losses below this level are considered negligible. Losses of more than or equal to 100 ha, the equivalent size of a large farm, would be considered high magnitude and medium and low thresholds are set at 50-100 ha and 20-50 ha respectively. To account for the magnitude of soil resource losses, land graded as low or negligible (3b, 4 and 5) are also considered.
- 3.2.5 The construction of compound A1 would result in the land take of approximately 4.1 ha of mainly Sub-grade 3b land with a small portion of non-agricultural land (approximately 0.44 ha). The majority of the land take will be temporary with only a small area being retained for the Project maintenance access. In accordance with the ES criteria, the loss less than 50 ha of Sub-grade 3b land is of negligible magnitude and negligible significance.
- 3.2.6 As detailed in Section 6.6, Chapter 6 (Land use and agriculture) Volume 2i Project-wide, the temporary land take will be restored back to agriculture. A comprehensive SMP will be developed and implemented to protect soils affected by the construction of compound A1. The SMP will be supported by a soil resource survey to assist in the categorisation of soils.

Farm holding

- 3.2.7 To determine the significance of effects from the construction of compound A1 on farm holdings, the criteria provided in Section 6.2, Chapter 6 (Land use and agriculture) Volume 2i Project-wide was used, which is reproduced below for reference.
- 3.2.8 The sensitivity of farm holdings has been determined by the extent to which they are able to absorb or adapt to the impacts, where different farms have different sensitivities due to a range of factors including the size and nature of the holding. Sensitivity has been assessed using the above factors into high, medium and low. Compound A1 is sited within the farm holding of Farm 2A-1. Farm 2A-1 is approximately 520 ha in size, exceeding the large farm size threshold, and is thus considered to be of low sensitivity.
- 3.2.9 The ES criteria for the assessment of magnitude is broken down to consider the impacts of land take, severance, infrastructure and nuisance. Compound A1 would result in the temporary land take of approximately 4.1 ha of land from Farm 2A-1, which represents approximately 0.8% of the farm holding.
- 3.2.10 Initially compound A1 extended over the whole of the agricultural field but the compound size has been reduced at the request of the landowner to enable them to use the northern portion of the field. Access is provided around the compound to the fields to the east of the compound. Therefore, the compound is unlikely to cause new severance.
- 3.2.11 Infrastructure effects are assessed in terms of farm buildings, drainage, water supply and other service supply. The location of the compound does not appear to affect any farm buildings. It is assumed that wherever land (field) drainage is adversely impacted by construction works (temporary or permanent), the likely impact will be assessed and suitable remedial works undertaken to ensure that effective land drainage is maintained. Similarly, it is assumed that wherever water supply (mains or private) is adversely affected by construction works (temporary or permanent), it will be replaced to maintain the supply of potable (safe to drink) water. Early consultation will be undertaken with landowners to locate services and drainage to ensure that these are protected or remediated during the construction period.
- 3.2.12 Nuisance effects would be adequately controlled through the Code of Construction Practice (CoCP).
- 3.2.13 Compound A1 represents less than 5% of all land farmed, would not cause new severance or adverse impact on farm infrastructure, land use or enterprise. The effect of the construction of the compound is considered to be of negligible magnitude and negligible significance.

Compound use for preliminary works

- 3.2.14 Compound use for the preliminary works would result in increased activity and traffic. Provided that these are adequately controlled through the CoCP, nuisance effects on adjacent land in the farm

holding will be of negligible magnitude and significance.

- 3.2.15 The compound will include a clear demarcation of the construction area and prevent access onto adjacent areas of agricultural land that could result in damage of land. Best practice construction measures will be adopted to control the spread of dust, contamination, invasive species, weeds and soil-borne, crop and animal diseases as detailed within the CoCP. With these measures in place the effects on adjacent agricultural land will be of negligible magnitude and significance.

3.3 Summary

- 3.3.1 The agricultural land at compound A1 is likely to be Sub-grade 3b land. The temporary land take of less than 50 ha of Sub-grade 3b land is of negligible magnitude and significance.
- 3.3.2 Compound A1 represents less than 5% of the total agricultural land of Farm 2A-1. Furthermore, the construction of the compound would not result in new severance, impact on farm infrastructures or cause nuisance on land use or enterprise. The effect of compound A1 on the farm holding will be of negligible magnitude and negligible significance.
- 3.3.3 The use of the compound for preliminary works will be controlled through the CoCP so that the effects on adjacent agricultural land will be of negligible magnitude and negligible significance.
- 3.3.4 Following the construction of the Project, the temporary land take will be reinstated to agriculture in accordance with a SMP.

4. Cultural heritage

4.1 Baseline information

Baseline and assessment information within the Project ES

- 4.1.1 The ES baseline methodology included a search of designated assets within a 1km Study Area (Figure 4.1) and non-designated assets within a 250m Study Area (Figure 4.2) obtained from local authority Historic Environment Records (HERs). Consultation with Historic England (HE) and local planning authorities was also undertaken (EWR2 ES Vol 2i, Chapter 7: Section 7.3).
- 4.1.2 The ES Project Wide Assessment (EWR2 ES Vol 2i) recognised that the perimeter of the Site contained Iron Age to Roman Pottery and Features (MOX12267) recorded on Bicester Perimeter Road and a windmill mound (MOX5020) located to the west of the A4421 near the Site. It also records the scale and extent of the agrarian landscape that appears to have been associated with medieval settlements in the vicinity of the Site. Evidence of this can be partially seen within the preservation of the medieval fieldscape, with a significant example seen at Launton near the Site.
- 4.1.3 The ES states that the Iron Age/Romano-British features (MOX12267) are of low value and will be subject to a high adverse magnitude of impact as they lie within the Scheme Area to be used for Compound A1, as well as environmental design for reinstatement and woodland planting. Construction activity will result in the total loss of the features, which is a moderate adverse effect.
- 4.1.4 Given the extent of the known medieval landscape within the Study Area, there is a moderate to high potential for undiscovered medieval archaeological remains to be encountered within the Scheme Area. These remains are likely to comprise evidence for medieval agricultural activity or land division and would likely be of low value.
- 4.1.5 The ES also included a settings assessment with regard to potential impacts upon the settings of designated assets within Route Section 2A. The designated assets had been previously assessed as part of the desk-based assessment (DBA) (below) and were not thought to be significantly impacted by works on the Site.

Table 4-1: Potential impacts upon the setting of designated assets within 1km of Compound A1

Name of Asset	Designation	List Entry Number	Distance from Site	Value	ES Impact and Effect
Manor Farmhouse	Grade II Listed Building	1232878	0.35km south-east	Medium	Low adverse/ Minor adverse
Barn approximately 50 m south of Manor Farmhouse	Grade II* Listed Building	1232879	0.45km south-east	High	Low adverse/ Minor adverse
Church of St Mary	Grade I Listed Building	1369735	0.55km south-east	High	Low adverse/ Minor adverse
Greyhound House	Grade II Listed Building	1046510	0.95km south-east	Medium	Low Adverse/ Minor adverse
RAF Bicester World War II Airfield Scheduled Monument	Scheduled Monument	1021455/ 1021455	1km north	High	Low adverse/ Minor adverse

- 4.1.6 The DBA, which includes assessment for the EWR Route Section 2A area (or the Cherwell District Sub-Section), can be found in the EWR ES Vol 3 Appendix 7.2. A gazetteer of designated and non-designated heritage assets within Route Section 2A can be found in the EWR2 ES Vol 3 Section 2 and in EWR2 ES Vol 2ii, Table 7.1.

- 4.1.7 As the DBA covered the whole EWR2 scheme, its conclusions for archaeological potential were broad. The DBA concluded that there was potential for previously unrecorded archaeology from the prehistoric to modern era to be uncovered within the area proposed for works associated with EWR2 (EWR2 ES Vol 3 Appendix 7.2;232).
- 4.1.8 A settings assessment of designated assets within a 1km Study Area was undertaken for Route Section 2A within the DBA (EWR2 ES Vol 3: 90-100), which included a settings assessment of the Grade I, Church of St Mary (1369735) in the village of Launton, 0.5km south of the Site, as well as Grade II Listed Buildings in Launton and Scheduled Monuments (RAF Bicester World War II Airfield) to the north of the Site. The DBA concluded that due to the distances involved, undulating local topography and intervening vegetation there would be no impact on the setting of the designated assets to the east of the Site (EWR2 ES Vol 3i: 90-100).

Additional baseline information

Compound A1

- 4.1.9 The ES identified heritage assets for all works connected with EWR2. This assessment has been undertaken with specific reference to the works required for the construction of Compound A1 and any potential associated impacts on the cultural heritage resource.
- 4.1.10 The ES is thorough in its data sources consulted, particularly its assessment of HER data. The ES is necessarily broad and there are sources of data that benefit appraising within this site specific (Compound A1) assessment due to the value of heritage assets within, and close to, the Site. The following data sources have therefore been highlighted as part of this assessment:
- Geophysical data: - From SUMO, 2017, Geophysical Survey Report: East West Rail
 - LiDAR survey data: - From the Environment Agency online open source data.
 - Aerial Photography: - From the National Collection of Aerial Photography (NCAP) online.
 - Historical Mapping: - From the National Library of Scotland online collection including old Ordnance Survey maps (1st & 2nd Edition, small- and large-scale and pre-Ordnance Survey historical maps.
- 4.1.11 Using the HER data detailed in the EWR2 ES Vol 3 Section 7 1, and the above sources, a short description of the heritage assets recorded within the Site and in the immediate vicinity is provided below.
- 4.1.12 The Site slopes gently southwards between 73m and 71m OD. The OXD line railway formation provides the southern boundary of the Site.
- 4.1.13 SUMO Survey undertook a magnetometry survey on the Site in 2017 and recorded no magnetic responses that could be interpreted as being of archaeological interest (SUMO, 2017: 3). The survey recorded widely spaced, slightly curved, parallel linear anomalies across the area on a northwest-southeast alignment and these were interpreted as being a result of previous ridge and furrow cultivation. Also, weakly magnetic bipolar linear anomalies were identified running roughly east-west across the Site and are indicative of modern land drains. The relative paucity of features other than agricultural features identified by the survey may indicate that any archaeological features within the Site have been destroyed or truncated by ploughing. The following table lists additional designated assets within 1km of the Site.

Table 4-2: Additional designated assets within 1km of Compound A1

Name of Asset	Designation	List Entry Number	Distance from Site	Value	ES Impact and Effect
Jones Memorial Approximately 5 m South of South Aisle of Church of St Mary	Grade II Listed Building	1232877	0.55km south- east	Medium	Low adverse/ Minor adverse

Name of Asset	Designation	List Entry Number	Distance from Site	Value	ES Impact and Effect
Churchyard Cross Approximately 6 m South of Church of St Mary	Grade II Listed Building	1276857	0.55km south-east	Medium	Low Adverse/ Minor adverse
The Old Rectory	Grade II Listed Building	1300750	0.55km south-east	Medium	Low Adverse/ Minor adverse

4.1.14 Pre-Ordnance Survey mapping of the area surrounding the Site labels nearby towns, villages and major road networks, but does not show detail on land-use of the Site itself. Ordnance Survey (OS) maps dating from 1896 onwards show the Site in more detail and show it to be mostly unchanged in character since that date. Bicester Road is present on the western periphery of the Site on all the OS maps; however, the road takes a different route and the roundabout is not present as this was not built until the 2000s. Possible ridge and furrow is visible within the Site on LiDAR data (Environment Agency Open Source, 2009) and take a northwest to southeast alignment (Plate 1), which agrees with the geophysical survey undertaken by SUMO Survey in 2017. This alignment can also be seen faintly on Aerial Photography from 1981 (ASTRAL/OXF/TRACK/0015, Frame 0515) and 1983 (CLY/8306/01, Frame 0891); however, plough marks on a rough east to west alignment can be seen overlying the historic ridge and furrow.

Insert 4.1: LiDAR imagery of Site (Environment Agency Open Source, 2014)



Updated National Planning Policy Framework

4.1.15 Since the production of the ES in 2017, the Government has published a new National Planning Policy

Framework (NPPF). The National Planning Policy Framework (NPPF) was published by the Ministry of Housing Communities and Local Government (MHCLG) on 24th July 2018.

- 4.1.16 The content of the NPPF with regard to heritage remains broadly unchanged and therefore has not impacted on any changes in interpretation or assessment of impact or potential at Compound A1 from that stated in the ES.

Local Planning Policy

- 4.1.17 The Cherwell District Council Local Plan (adopted July 2015) remains unchanged since the writing of the ES and the following policies still apply:

- Policy ESD 13: Local Landscape Protection and Enhancement
- Policy ESD 15: The Character of the Built and Historic Environment

Walkover and Settings Assessment

- 4.1.18 A summary of the conclusions of the Site visits and settings assessment for potential indirect effects that were conducted in 2017 for the production of the DBA (EWR2 ES Vol 3 Appendix 7.2) and ES (EWR ES Vol 2ii-Section 7.3) for EWR2 is provided in Section 4.1.6-4.1.9. Both assessments were undertaken on the assumption that the compound would be of single storey construction. Further site visits were undertaken in August 2018 to inform the assessment of the effect on settings of the current compound design. These updated setting assessments established that no changes to the predicted impacts on setting have occurred since the ES of 2017.

4.2 Predicted effects of the proposal

Assessment information within the Project ES

Compound construction

- 4.2.1 The ES attributed a Low value to the Iron Age/Romano-British features (MOX12267) that lies within the Scheme Area to be used for Compound A1 (EWR2 ES Vol 2i: Table 7.10). The ES Project Wide Assessment (EWR2 ES Vol 2i- Chapter 7; 28) and the ES Chapter for Route Section 2A (EWR2 ES Vol 2ii-Table 7.2) concluded that the construction of a compound on the Site would have a 'moderate adverse significance of effect' on this non-designated asset. Following mitigation, the ES concluded that there would be a moderate adverse residual impact arising from the construction of Compound A1. The construction works would potentially truncate any buried remains and the ES states that an Archaeological Fieldwork Strategy will be produced in consultation with local authority archaeological advisors (EWR2 ES Vol 2i; 7-13).
- 4.2.2 The DBA concluded that within the Route Section 2A 'there is the potential for previously unrecorded buried archaeology from the prehistoric to the modern period to be present' (EWR2 ES Vol 3 Appendix 7.2).

Compound use for preliminary works

- 4.2.3 The ES does not specifically consider the use of the compound following its construction and as such no effects from its use for preliminary works are identified.

Additional assessment

- 4.2.4 As detailed above (see Section 4.1.11-4.1.21), sources have been re-appraised within this assessment to ascertain Site specific (Compound A1) baseline information. These sources of information aim to provide an improved and specific assessment of direct and indirect impacts from the construction of the compound on the Site.
- 4.2.5 The Site lies in a field in which Iron Age/Romano-British features (MOX12267) have previously been discovered and there is a known medieval landscape including windmill mound(s) within the Study Area. SUMO's magnetometry survey, undertaken in 2017, recorded ridge and furrow and modern agricultural linear features, however the survey did not find any anomalies thought to be of archaeological origin on the Site. However, the potential for remains of these dates to be located within

the Site cannot be discounted.

- 4.2.6 Therefore, there is judged to be a Low potential for pre-medieval remains to survive and a High potential for medieval to modern features, most likely of an agricultural origin, to survive within the Site.

Compound construction

- 4.2.7 It is understood that construction of the compound would require a topsoil strip, to a depth of 300mm and a subsoil strip, up to a depth of 1200mm as described in Section 1.4.4 of this document.
- 4.2.8 The identified known post medieval and modern agricultural remains within the Site are deemed to be of Negligible to Low importance and as such any material change will result in Negligible harm.
- 4.2.9 This assessment has identified that the potential for hitherto unknown buried archaeological remains to survive within the Site cannot be discounted. The Site lies in an area judged by this assessment to have a Low potential for prehistoric and Roman remains and a High potential for medieval to modern agricultural remains. The depth of the archaeological horizon on the Site is unknown and as such the construction of the compound has the potential to result in a High magnitude of direct change possibly resulting in a Moderate adverse level of effect on unknown remains.
- 4.2.10 In accordance with national and local planning policy and in line with the project wide ES an Archaeological Fieldwork Strategy will be required to mitigate against the possibility of impacts upon hitherto unknown remains within the Site. Such a strategy would enable the identification and preservation by record of any hitherto unrecorded archaeological remains. Details of the mitigation strategy would require to be agreed in advance with the local authority archaeological advisor. Following the implementation of the mitigation there would be no significant residual adverse effects on cultural heritage from the compound construction.
- 4.2.11 Potential effects on the settings of designated heritage asset have been assessed in further detail following settings assessment site visits undertaken in August 2018. The site visits confirmed that owing to the presence of intervening local topography, vegetation and built structures that effects on setting are unlikely to result in material change to the settings of designated assets within the vicinity of the Site. No harm to the settings of such features is thus currently anticipated.

Compound use for preliminary works

- 4.2.12 Following construction of the compound it would be used for a range of activities including vehicle movement and parking, materials storage, welfare, fuel storage and wheel washing. It is not anticipated that any of these activities would require any ground-breaking works. Consequently, no impacts upon cultural heritage assets are anticipated from the use of the Compound for preliminary works

4.3 Summary

- 4.3.1 The perimeter of the site contains Iron Age to Roman pottery and features (MOX12267) recorded on Bicester Perimeter Road, and a windmill mound (MOX5020) is located to the west of the compound area. It also includes elements of the agrarian landscape that appears to have been associated with medieval settlements in the vicinity of the Site. SUMO (2017) undertook a geophysical survey of the Site and recorded no archaeological features within the Site, although some medieval to modern agricultural remains, including evidence of ridge and furrow cultivation, were found. These agricultural remains were also visible on LiDAR data from 2014. The ES consequently judged that the construction within this area of Route Section 2A would have a Moderate Adverse residual impact and a Moderate Adverse residual effect on the known remains within the Site and that there was potential for similar levels of effect on hitherto unknown buried remains, should these survive on Site.
- 4.3.2 This assessment has considered geophysical surveys undertaken in 2017 and LiDAR data, both of which indicate no features of note within the Site itself. Consequently, there is judged to be a Low potential for pre-medieval remains and a High potential for medieval to modern agricultural remains to survive within the Site. These remains, if present, are likely to be agricultural in origin and of Negligible/Low importance.
- The possibility of encountering hitherto unknown remains cannot be discounted. Therefore, in accordance with national and local planning policy and in line with the project wide ES, an Archaeological Fieldwork Strategy will be required to mitigate against the possibility of impacts upon hitherto unknown remains within the Site. Following mitigation there would be no significant residual adverse effects on cultural heritage.

5. Air Quality

5.1 Baseline information

- 5.1.1 Project-wide baseline air quality conditions are described in the Project ES Volume 2i, Chapter 8 – Air Quality, Section 8.4.
- 5.1.2 Baseline air quality conditions for Route Section 2A are described in the Project ES Volume 2ii, Route Section 2A, Section 8.2, and summarised below:
- CDC's AQMA No.4 in Central Bicester, is approximately 1 km west of the Project Boundary and 2 km west of Construction Access Route.
 - Defra mapped background concentrations of annual mean NO₂ across the study area for Route Section 2A are between 6.3 and 19.1 µg/m³; annual mean background PM₁₀ concentrations are 11.6 to 16.5 µg/m³.
 - Measured concentrations for Route Section 2A were below the annual mean NO₂ Air Quality Standard (AQS) objective of 40 µg/m³ in 2016. Concentrations around Compound A1 were between 21 and 34 µg/m³ (ES Vol 3, Appendix 8.4 Table 1.8).
 - Human health receptors were identified within the Route Section 2A study area (ES Vol 4, Figure 8.2); there are fewer than 10 receptors within 100 m of Compound A1. The nearest properties are located approximately 125 m to the south west.
 - Human health receptors for construction traffic assessment were identified within the Project ES Volume 2i, Chapter 8 – Air Quality, Section 8.5, Table 8.11, (ES Vol 4, Figure 8.3).
 - There are no statutory or non-statutory designated ecological sites within the air quality study area for Route Section 2A (ES Vol 2ii, 2A, paragraph 8.2.8).
 - Stoke Little Wood is identified as ancient woodland. It is located on the construction traffic network in the vicinity of Route Section 2A, approximately 5.5 km north west of Compound A1. It is located on Banbury Road, B4100 south of Stoke Lyne and M40 Junction 10, (ES Vol 4, Figure 8.3).

Additional baseline information

- 5.1.3 No additional baseline assessment or survey work has been undertaken in the preparation of this EAR for Compound A1, beyond that presented in the Project-wide and Route Section 2A reports prepared and submitted as part of the Project ES (Volumes 2i and 2ii).

5.2 Predicted effects of the proposal

Assessment information within the Project ES

- 5.2.1 The Project ES indicates that no significant residual air quality effects are anticipated for construction activities associated with Compound A1. A summary of the assessment findings that are relevant to Compound A1, as presented in the ES (Vol 2i and 2ii), is provided below.
- Compound construction*
- 5.2.2 The assessment considered the potential for significant effects on sensitive receptors within a 350 m Study Area around the Scheme Boundary for construction dust and within a 200 m Study Area around the construction traffic network and rail corridor.
- 5.2.3 Activities likely to be undertaken for the construction of Compound A1 are summarised in sections 1.6 and 2.2 above. These have the potential to generate dust if not suitably managed and controlled.
- 5.2.4 Effects of construction dust were initially assessed within the Project ES at the Project-wide level (ES Vol. 2i, Chapter 8 Table 8.9). This used a very conservative basis taking the total dust generation potential across each Route Section. The Project-wide risks for Route Section 2A are reproduced below.

Table 5.1: Initial Project Wide Construction Dust Assessment – Route Section 2A

Potential impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	High	Low	Medium
Human Health	Negligible	Low	Negligible	Low

Note: “Negligible” = mitigation beyond what is legally required is not necessary

- 5.2.5 For Route Section 2A, the risk of dust soiling could not be screened out on this conservative basis as low for all activities; therefore, a more detailed dust risk assessment for specific activities in this Route Section was undertaken for demolition, earthworks and trackout.
- 5.2.6 No demolition activities are associated with the set-up of Compound A1. Dust soiling risks associated with the set-up of Compound A1 were assessed as low for earthworks (ES Vol 2ii, Route Section 2A, Chapter 8, Table 8.2) as there are fewer than 10 receptors within 100 m, the closest properties being Manor Farm and Tythe Barn, approximately 125 m south west of Compound A1. The trackout risk for Compound A1 was also assessed as low (ES Vol. 2ii, Route Section 2A, Chapter 8, paragraph 8.3.8) based on the peak outbound HGV flow during the construction phase.
- 5.2.7 For Route Section 2A, human health effects due to construction dust from all activities were assessed as low risk due to very low background PM₁₀ concentrations (ES Vol. 2ii, 2A, Chapter 8, para 8.3.4).
- 5.2.8 Measures for the control of dust are presented in the CoCP (ES Vol 3, Appendix 2.1, paragraphs 5.1.8 to 5.1.12) and will be applied during compound preparation works. There are not expected to be any significant residual effects of construction dust following application of these measures.

Compound use for maintenance works

- 5.2.9 Dust soiling risks associated with the use of Compound A1 for maintenance works identified in Section 2 of this report were assessed as low for construction activities (ES Vol 2i, Chapter 8, Table 8.9). The trackout risk for Compound A1 was also assessed as low (ES Vol. 2ii, Route Section 2A, Chapter 8, paragraph 8.3.16) based on the peak outbound flow during the construction phase.
- 5.2.10 The low risk mitigation measures included within the CoCP (ES Vol 3, Appendix 2.1, paragraphs 5.1.8 to 5.1.12) will be applied for all activities associated with the use of Compound A1.
- 5.2.11 A detailed dispersion modelling study was undertaken for the assessment of construction vehicle emissions (ES Vol. 2i, paragraphs 8.5.30 – 8.5.37). This applied robust assumptions for the anticipated traffic flow, e.g. the maximum estimated monthly vehicle flow at any point during the construction programme was assessed in the year 2019 (ES Vol. 2i, paragraphs 8.3.23). The impact in terms of changes in NO₂ and PM₁₀ concentrations at sensitive receptors in Route Section 2A (R1 to R5, R7, R11 and R12 in ES Vol.3 Appendix 8.5, Table 1.5, and ES Vol 4, Figures 8.3A and 8.3 B) were found to be negligible (ES Vol.3 Appendix 8.5, Table 1.8), and effects were concluded not to be significant.
- 5.2.12 Assessment of changes in NO_x concentrations and nitrogen deposition at Stoke Little Wood ancient woodland in Route Section 2A (R100 to R104, ES Vol.3 Appendix 8.5, Table 1.6, Table 1.11 and Table 1.12) found no significant effects on ecological sites are likely to occur during construction of the Project
- 5.2.13 The Construction Traffic Management Plan (ES Vol.3, Appendix 2.2) includes measures to manage construction traffic and trackout of dust from construction sites.
- 5.2.14 In considering all reasonably foreseeable future projects (RFFPs), none would introduce new sensitive receptors near Compound A1, whereby the combined effect of concurrent construction activities would result in a higher risk for associated dust raising activities (ES Vol 2ii, 2A, paragraph 8.6.5). Note that the distance between Compound A1 and the RFFP boundary to the north (‘Land North East of Skimmingdish Lane’) is greater than that assessed in the ES due to retraction of the red line boundary.

Additional assessment

- 5.2.15 The information presented in the Project Wide and Route Section 2A reports prepared and submitted as part of the Environmental Statement (Volumes 2i and 2ii, 2A) has been used to prepare this

assessment for Compound A1. No additional assessment or survey work has been undertaken. Some additional commentary on the construction and use of Compound A1 is provided below for context.

Compound construction

- 5.2.16 Construction traffic flows during the set up of Compound A1 have been reviewed and do not change the affected road network that was assessed for the Project Wide ES (Vol 2i), which identified no significant effects (ES Vol 2i, Chapter 8, paragraph 8.5.37). The duration of the compound construction phase will be less than six months.
- 5.2.17 During compound set up, prior to completion of the internal road network, jet washing facilities will be used temporarily to ensure trackout of dust onto the public highway is not significant.

Compound use for maintenance works

- 5.2.18 Construction traffic flows during the use of Compound A1 for preliminary works have been reviewed and do not change the affected road network that was assessed for the Project Wide ES (Vol 2i), which identified no significant effects (ES Vol 2i, Chapter 8, paragraph 8.5.37).
- 5.2.19 Specific measures for medium risk activities (described in Appendix 8.2 in Volume 3) are recommended for trackout during the use of Compound A1 due to the high number of vehicles leaving Compound A1 during peak use for preliminary works, and the proximity of the Construction Access Route to a sensitive receptor³:
- Use of water assisted dust sweepers on local and access roads rather than dry sweeping
 - Hard surfaced haul routes, with regular inspections for integrity and repairs made as soon as reasonably practicable
 - Covering vehicles entering and leaving site
 - Wheel washing system with an adequate area of hard surfaced road before site exit
 - Access gates located at least 10 m from sensitive receptors
- 5.2.20 Wheel washing facilities for Compound A1 will be included on site, as recommended at paragraph 5.1.12 of the CoCP (ES Vol 3, Appendix 2.1). The location of these facilities provides an adequate area of the hard surfaced internal road network (over 100 m) between the wheel wash and the site exit onto the public highway.
- 5.2.21 The CoCP states that the site layout will be planned so that temporary stockpiles, machinery and dust causing activities are located away from receptors where practicable (ES Vol 3, Appendix 2.1 paragraph 5.1.8). The topsoil stockpile area will occupy the south west corner of the site, closest to the Launton allotments gardens, while the track access and materials storage / processing area are over 100 m away, towards the south eastern extent of the site.
- 5.2.22 Materials processing activities at Compound A1 are anticipated to include mobile crushing and screening. With reference to paragraphs 5.1.3 and 5.1.4 of the CoCP (ES, Vol 3, Appendix 2.1) the following requirements apply:
- Mobile plant will be designed, operated and permitted in accordance with DEFRA's Process Guidance Note 3/16(12) for Mobile Crushing and Screening. Where necessary, mobile plant will be regulated under the Environmental Permitting (England and Wales) Regulations 2010 (as amended) via an environmental permit.
 - If on-site concrete batching is employed, such operations will be undertaken using enclosed plant and in accordance with DEFRA's Process Guidance note 3/1 and permitted under the Environmental Permitting (England and Wales) Regulations 2010 (as amended). These will be placed as far from sensitive receptors as reasonably practicable.

5.3 Summary

- 5.3.1 The air quality around Compound A1 is good. There are fewer than 10 receptors within 100 m of the site boundary and the closest properties are located approximately 125 m south west of Compound A1.

³ This is precautionary, based on assigning high sensitivity to allotment gardens to the west, between Bicester Road and Charbridge Lane (A4421), which is within 20 m of the A4421.

There are also allotment gardens immediately to the west of the site, between Bicester Road and Charbridge Lane.

- 5.3.2 Construction traffic emissions were assessed as part of the Project ES (Vol.2i Chapter 8). No significant residual effects on local air quality are expected because of vehicle emissions during construction or use of Compound A1.
- 5.3.3 The dust mitigation measures set out within the Project CoCP (ES. Vol.3 Appendix 2.1) will be supplemented with medium to high risk measures during peak flow for trackout as set out in Appendix 8.2 to the CoCP. The addition of a jet wash at the site exit during compound construction will be applied to limit the trackout of dust in advance of the installation of a wheel wash within the sites.
- 5.3.4 Crushing and screening of material will be carried out in accordance with DEFRA's Process Guidance Note 3/16(12) and a permit obtained as necessary.
- 5.3.5 With effective mitigation in place, there are not expected to be any significant residual air quality effects associated with the construction or use of Compound A1.

6. Ecology

6.1 Baseline information

Baseline information within the Project ES

- 6.1.1 This chapter should be read in conjunction with the ecological impact assessment (EclA) in Appendix C.
- 6.1.2 A desk study was undertaken in November 2017 as part of the ES relevant data has been used to inform this EclA, including records of statutory and non-statutory designated sites and protected and notable species within the initial Ecological Zone of Influence (EZoI) of the Site. The EclA also relies on ecological information obtained during the surveys undertaken between 2016 and 2018 as part of the Environmental Statement (ES) for the EWR TWAO production⁴, and additional information obtained from surveys in 2018 since the submission of the ES.

Additional baseline information

- 6.1.3 An ecological walkover survey of areas within and adjacent to the Site, including land up to 50 m from the Site boundary where access was allowed (the Survey Area), was undertaken on 31 May 2018 broadly following the Phase 1 habitat survey methodology⁵. The walkover survey records information on the habitats within the Survey Area and was extended to include a search for evidence of the presence of, and an assessment of the potential of each habitat to support, notable and protected species as recommended by CIEEM⁶.
- 6.1.4 Full details and results of the extended Phase 1 habitat survey methodology are provided in Appendix C.

6.2 Predicted effects of the proposal

Compound construction

Main habitats

- 6.2.1 The means of access to the Site will be via an access point to the west via an existing gap in the hedgerow which will need to be widened by the removal of small section of hedgerow to facilitate access to the Site and the access to the railway to the south will require the removal of a section of hedgerow (approximately 100 m in total).
- 6.2.2 Adjacent habitats such as scrub and hedgerow may also experience degradation during construction by the increase in potential damage from road vehicles and proximity to the works but will not be directly removed.
- 6.2.3 The compound will be removed following completion of the EWR2 Project. Following this, any hedgerow and scrub lost will be reinstated with a mix of native species of local provenance such as hawthorn, blackthorn and elm. Broadleaved woodland and scrub will be compensated for as part of the wider scheme.
- 6.2.4 Considering the agreed mitigation measures detailed above, the construction of the Site is not expected to result in a significant residual effect on these habitats.

Notable Species

Terrestrial Invertebrates

- 6.2.5 Most of the Site is pasture and not considered suitable to support important populations of terrestrial invertebrates. The habitat (hedgerow, scrub and semi-natural grassland) with potential to support notable species is considered common in the wider landscape and as such, the temporary loss of this

⁴ The Network Rail (East West Rail Bicester to Bedford Improvements) Order Environmental Statement, July 2018

⁵ Joint Nature Conservation Committee (2010). *Handbook for Phase 1 habitat survey - a technique for environmental audit*.

⁶ Chartered Institute of Ecology and Environmental Management (2017). *Guidelines for Preliminary Ecological Assessment 2nd edition*.

habitat is unlikely to impact the species.

- 6.2.6 During construction, measures to protect retained habitats will be employed through the application of the CoCP in Appendix A of this EAR.
- 6.2.7 As such, taking into account the habitat being retained adjacent to the site and in the wider area, and the small amount of suitable habitat being lost, it is considered unlikely to result in a negative effect on the conservation status of terrestrial invertebrates.

Bats

- 6.2.8 The trees within the Site have potential to support roosting bats. They will be retained during the works, but if bats are roosting in them they will be subject to significant disturbance and likely roost abandonment. As such, prior to the works, surveys will be completed on these trees to identify if there are roosts present. If roosts are present, then a Natural England licence will be required for the works. If no roosts are present, the trees will be retained so will be available for the use by roosting bats following the completion of the works.
- 6.2.9 Any trees adjacent to the Site which have potential to support roosting bats will be retained and are unlikely to be directly affected by the construction of the compound. Some of the potential roosts are in trees within 20 m of the border of the Site and may experience noise and light disturbance from the works.
- 6.2.10 Due to the temporary nature of the compound, the above impacts are reversible but may impact the local population of species present throughout the duration of the construction (and operation) in the absence of mitigation.
- 6.2.11 The impacts will be mitigated through a detailed lighting plan and will include limiting night working where possible and the use of directional lighting into the site to limit light spill on adjacent habitats. Lighting will not be directed towards trees with bat roosting potential or the hedgerow to the east of the Site.
- 6.2.12 Considering the agreed mitigation measures detailed above, the construction of the Site is not expected to result in a significant residual effect on bats.

Compound use for preliminary works

- 6.2.13 No operational impacts are predicted on terrestrial invertebrates or any habitats that haven't been detailed in the construction impact section.

Bats

- 6.2.14 During the compound use (operation) it is possible that the introduction of artificial lighting could affect commuting and roosting bats.
- 6.2.15 This will be mitigated through a detailed lighting plan and will include limiting night working where possible and the use of directional lighting into the site to limit light spill on adjacent habitats. Lighting will not be permitted to directly illuminate trees with bat roosting potential or the hedgerow to the east of the Site.
- 6.2.16 During operation, measures will be employed through the application of CoCP in Appendix A of EAR.
- 6.2.17 Considering the agreed mitigation measures to be implemented, it is not expected that the use of the compound for works will have a significant residual effect on bats.

6.3 Summary

- 6.3.1 Impacts from the construction or operational phases of the compound are not predicted to result in any significant negative residual effects within the final EZoI as a result of:
- Undermining of the conservation objectives or condition of designated sites and their features of interest;
 - A change in ecosystem structure and function; and
 - A threat to the conservation status of undesignated habitats or protected and notable species.

7. Noise and vibration

7.1 Baseline information

Baseline information within the Project ES

- 7.1.1 Noise monitoring for the ES has been undertaken and is reported in the Route Section 2A Assessment, Section 10.2 in Volume 2ii with further details provided in Appendix 10.2 in Volume 3.
- 7.1.2 The nearest noise monitoring locations to Compound A1 are measurement positions AML2 and ML33. This is reported in Table 3.1 in Appendix 10.2, and the results are repeated in Table 7.1.

Table 7.1: Summary of baseline noise measurements – Route Section 2A

Receptor Number	Receptor Name	Area	Representative Existing Noise Levels (Free-field), dB	
			Daytime (0700 – 2300), L _{Aeq,16hour}	Night-time (2300 – 0700), L _{Aeq,8hour}
AML2	National Cycle Route, OX25 6EP	Launton	55	35
ML33	28 Blenheim Drive, OX26 5EA	Launton	60	42

- 7.1.3 The closest receptor to Compound A1 are Manor Farm and The Tythe Barn wedding venue, Bicester Road, approximately 125m away.

7.2 Predicted effects of the proposal

Assessment information within the Project ES

- 7.2.1 Chapter 2 of the ES explains that where work takes place under 'greenfield' conditions (i.e. there are no restrictions in place arising from the operational railway), or under long-term blockade of the railway (where the railway is closed, to allow work), working hours will be:
- 07:00 to 18:00 weekdays
 - 08:00 to 16:00 on Saturdays
 - No work on Sundays without express agreements with local councils (for works required during highways closures)
- 7.2.2 Chapter 10 of the ES provides the noise thresholds for adverse and significant effects. These are reported in Table 10.4 of Volume 2i and Table 7.2 in this report.

Table 7.2: BS 5228 Part 1 examples of times periods, averaging times and noise levels associated with the determination of eligibility for noise insulation and re-housing

Day	Time (hours)	Averaging period T	Example noise insulation trigger level L _{Aeq,T} (dB) ^{A)}
Mondays to Fridays	0700 - 0800	1 hour	70
	0800 - 1800	10 hours	75
	1800 - 1900	1 hour	70
	1900 - 2200	1 hour	65
	2200 - 0700	1 hour	55

Day	Time (hours)	Averaging period T	Example noise insulation trigger level $L_{Aeq,T}$ (dB) ^{A)}
Saturdays	0700 - 0800	1 hour	70
	0800 - 1300	5 hours	75
	1300 - 1400	1 hour	70
	1400 - 2200	1 hour	65
	2200 - 0700	1 hour	55
Sundays and Public Holidays	0700 - 2200	1 hour	65
	2200 - 0700	1 hour	55

^{A)} All noise levels are predicted or measured at a point 1 m in front of the most exposed of any windows and doors in any façade of any eligible dwelling

Source: BS 5228 Part 1 Annex E, Table E.2.

7.2.3 In line with common practice on similar infrastructure construction on schemes, a “significant time period” for the levels shown in Table 7.2 to be exceeded for is either of the following:

- a period of 10 or more days of working in any 15 consecutive days during construction
- for a total of 40 days or more in any 6 consecutive months during construction

7.2.4 Where works are undertaken during the time period 08:00 to 18:00 Monday to Friday and 08:00 to 13:00 on Saturday, construction activities could give rise to a significant adverse effect when noise levels exceed 75dB L_{Aeq} . Where works are undertaken during the time period 07:00 to 08:00 Monday to Friday and 13:00 to 14:00 on Saturday, significant adverse effects could arise when noise levels exceed 70dB L_{Aeq} . Where works are undertaken during the time period 14:00 to 16:00 noise could give rise to significant adverse effects when noise levels exceed 65dB L_{Aeq} .

Compound construction

7.2.5 Appendix 10.3 of the ES provides the noise assessment for the construction of compounds. The assumed plant, equipment and operating characteristics are given as Activity 1 in Table 1.1 in this appendix. This shows that overall, compound construction is expected to generate noise levels of 83dB L_{Aeq} at 10m.

7.2.6 Table 1.2 of Appendix 10.3 of the ES indicates that compound construction may give rise to 75 dB L_{Aeq} at receptors within 25m of the compound and may give rise to 65dB L_{Aeq} at receptors within 63m of the compound.

7.2.7 The closest receptor to Compound A1 are Manor Farm and The Tythe Barn, Bicester Road, approximately 125m away. This receptor is not within the distances stated in Section 7.2.6 above; therefore, there will be no significant adverse effects from the construction Compound A1.

7.2.8 However, a potential cumulative noise effect from RFFP ID no. CH1 has been identified for the construction of compound A1 (Section 10.6 of Chapter 10, Volume 2ii of Compound Section 2A). No other significant adverse impacts are identified from the construction of Compound A1.

Compound use for preliminary works

7.2.9 Appendix 10.3 of the ES provides the noise assessment for the use of the compounds. The assumed plant, equipment and operating characteristics are given as Activity 2 in Table 1.1 in this appendix. This shows that overall, compound construction is expected to generate noise levels of 81dB L_{Aeq} at 10m.

7.2.10 Table 1.2 of Appendix 10.3 of the ES indicates that the use of the compound may give rise to 75 dB L_{Aeq} at receptors within 21m of the compound and may give rise to 65dB L_{Aeq} at receptors within 52m of the compound.

7.2.11 The closest receptors to Compound A1 are not within the distances stated in Section 7.2.10 above, therefore there are no significant adverse effects from the use of the compound.

7.2.12 A potential cumulative noise effect from RFFP ID no. CH1 has been identified for the use of compound A1 (Section 10.6 of Chapter 10, Volume 2ii of Compound Section 2A). No other adverse impacts or significant impacts are identified from the use of Compound A1.

- 7.2.13 Volume 2i, Chapter 10, indicates that construction traffic would be below the threshold for adverse effects at most receptors (paragraph 10.5). Receptors are considered when within 100m of haul routes or directly adjacent existing roads used by construction traffic. No impacts were reported for construction traffic near Compound A1.

Additional assessment

- 7.2.14 To verify the assessment undertaken for the ES, the distances to the nearest receptors have been measured. Similarly, receptors near to haul routes within 1km of compound locations have been identified.
- 7.2.15 The closest receptor to Compound A1 are Manor Farm and The Tythe Barn, Bicester Road, approximately 125m from the compound. This distance is significantly greater than the distances identified in paragraphs 7.2.6 and 7.2.10, confirming that adverse noise effects are not expected from the construction or use of Compound A1.
- 7.2.16 Construction traffic on the road network including Bicester Road will have a negligible effect compared to existing traffic noise (less than 1dB). This confirms adverse noise effects are not expected from construction traffic near Compound A1.

7.3 Summary

Noise levels from the construction and use of compound A1 are expected to be below the thresholds for significant adverse effects.

8. Geology, soils and land contamination

8.1 Baseline information

Baseline information within the Project ES

8.1.1 A summary of the geology, soils and land contamination baseline information within Compound A1 (Project Area) and the Study Area (within 500 m of the Project Boundary) is provided in Table 1 1. Preliminary works within Route Section 2A will also be undertaken from Compound A1. However, as these works are being undertaken over the full length of Route Section 2A, these locations have not been summarised as part of the baseline information. The baseline information for these locations and for Route Section 2A has been included within Appendix 11.1, Volume 3 of the Geology, Soils and Land Contamination ES chapter.

Table 8-1: Summary of Existing Environment

Aspect	Description
Published Geology	<p>Made Ground: none recorded to be present under Compound A1⁷.</p> <p>Superficial: superficial deposits are absent under most of Compound A1. Alluvium is indicated to be present adjacent to the northern boundary of Compound A1.</p> <p>Bedrock: the Kellaways Sand Member (Sandstone and Siltstone) underlies Compound A1 with the Kellaways Clay Member (Mudstone) adjacent to the northern boundary.</p> <p>No British Geological Survey (BGS) logs are available for Compound A1. There are 38No. No BGS logs present within the Study Area.</p>
Geological Features / Hazards	<p>Hazards: no hazard for ground dissolution. Very low risk for collapsible ground. Low risk of running sand hazards. No hazard for shrinking and swelling clay hazards⁸.</p> <p>Radon: Compound A1 is located within a lower probability radon area, with less than 1% of homes at or exceeding the Action Level⁸.</p> <p>Geological Features: no Important Geological Sites within Compound A1 or Study Area⁸.</p>
Mining and Mineral Extraction	<p>Coal mining: none present within Compound A1 or Study Area⁹.</p> <p>Mineral resources: no Geologically Designated Sites are present within Compound A1 or Study Area⁸. Several Mineral safeguarding areas are present within Route Section 2A¹⁰.</p> <p>Mineral workings: none present within Compound A1 or Study Area⁸.</p>
Hydrogeology	<p>Superficial Aquifer: superficial deposits are absent under Compound A1. The Alluvium adjacent to the northern boundary of Compound A1 is classified as a Secondary A Aquifer¹¹.</p> <p>Bedrock Aquifer: Secondary A Aquifer (Kellaways Sand Member) underlying the Compound and Unproductive Strata (Kellaways Clay Member) adjacent to the northern boundary underlying the Alluvium deposits.</p>

⁷ The Network Rail (East West Rail Western Section Phase 2) Order. Environmental Statement, Chapter 11: Geology, Soils and Land Contamination (July 2018).

British Geological Survey. [online]. <http://www.bgs.ac.uk/GeoIndex/> (accessed September 2017).

⁸ Landmark. (2017). Envirocheck Report, EWR Route (September of 2017). Supplied as GIS Data.

⁹ British Geological Survey. [online]. Coal Authority Interactive Map. <http://mapapps2.bgs.ac.uk/coalauthority/home.html> (accessed October 2017).

¹⁰ The Oxford Minerals and Waste Core Strategy (August 2015)

¹¹ Environment Agency. What's in your backyard [online]. <http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=e> (accessed September 2017).

Aspect	Description
	<p>Groundwater Source Protection Zone: none present within Compound A1 or Study Area⁸.</p> <p>Abstractions: no abstractions located within Compound A1 or Study Area. There is one BGS groundwater well located approx. 500 m south east within the Study Area⁸.</p> <p>Discharge consents: none present within Compound A1 or Study Area⁸.</p>
Hydrology	<p>Surface water features: Langford Brook is present approximately 100 m to the north of Compound A1. Track drainage is present along the existing railway line within Route Section 2A which is located adjacent to the south of Compound A1. Field drains within the surrounding agricultural land⁸.</p> <p>Flood Risk: the northern area of Compound A1 and several areas present within the Study Area located to the north and west of Compound A1 are identified to be at risk of flooding from the Langford Brook⁸.</p> <p>Abstractions: none located within Compound A1 or Study Area⁸.</p> <p>Discharge consents: one discharge consent located approx. 225 m west of Compound A1 (downstream of the compound) for the discharge of other surface matter into the Langford Brook by Pickard Interiors Ltd⁸.</p>
Historical and Ecological Important Sites	<p>Historical important sites: one Grade I, two Grade II and one Grade II* listed buildings are present within the Study Area. The nearest listed building is located approx. 158 m south⁸.</p> <p>Ecological important sites: no statutory designated sites within Compound A1 or Study Area⁸.</p>
Site History	<p>Compound A1: agricultural activities¹².</p> <p>Within 500 m: Route Section 2A railway line adjacent to the south, farms and agricultural activities in surrounding area. Former railway line approx. 347 m east.</p>
Landfills / Waste Management Sites / Recorded Pollution Incidents	<p>Landfills: no historic or recorded operating landfills present within Compound A1 or Study Area⁸.</p> <p>Waste Management Sites: none present within Compound A1 or Study Area⁸.</p> <p>Pollution Controls: no fuel station entries present within Compound A1 or Study Area. Four Local Authority Pollution Prevention and Control (LAPPC) permits located within the Study Area. The nearest is located approx. 245 m west of Compound A1⁸.</p> <p>Recorded Pollution Incidents: none present within Compound A1 or Study Area⁸.</p>
Unexploded Ordnance (UXO)	<p>UXO: low risk of UXO within Route Section 2A¹³. A specific UXO assessment for Compound A1 has not been undertaken.</p>
Previous Ground Investigations (GI)	<p>Previous GI: a GI was undertaken in Route Section 2A along the OXD line from Bicester to Claydon Junction between May and September 2015 by WSP Parsons Brinkerhoff, although drilling within the Compound A1 boundary was not undertaken.</p> <p>The GI comprised the drilling of 66 windowless sample holes, three hand window samples, 63 dynamic probes, 11 cable percussive boreholes and a single deep rotary borehole on a spacing of 500 m centres along the length of Route Section 2A.</p> <p>The GI was predominantly undertaken for geotechnical purposes, with limited contamination testing and no gas or groundwater monitoring undertaken. Soil results were screened against Generic Assessment Criteria (GAC) derived for a</p>

¹² Old-maps (2018) [online]. <https://old-maps.co.uk> (accessed July 2018).

¹³ Bomb Search (2014) Preliminary Unexploded Ordnance (UXO) Risk Assessment: East West Rail Phase 2.

Aspect	Description
	commercial land use setting. Elevated levels of chromium above GAC were reported in most of the samples within Route Section 2A. However, exceedances were reported in samples from both the Made Ground and natural strata. Asbestos was not detected in any of the samples tested.

Preliminary Conceptual Site Model

8.1.2 Three Preliminary Conceptual Site Models (PCSMs) (baseline, construction and operational) have been prepared for Compound A1 identifying potential sources of contamination, migration or exposure pathways and receptors for Compound A1. The PCSMs are discussed in the sections below.

8.1.3 The following assumptions have been made in the development of the PCSMs:

- Members of the public will not have any access to the Project Area (the area within the Compound A1 redline boundary) during the construction and operation of the Project. A gatehouse and security barrier is proposed to limit access to non-authorized personnel to Compound A1 and to Route Section 2A.
- Risks to construction and maintenance workers have not been addressed, as the assessment presented herein relates to the long-term (chronic) risk posed by contamination, not short-term exposure (acute risk) which is applicable to construction workers and which will be managed through the application of suitable health and safety assessments and working methods.
- It has been assumed that the following works will be undertaken for the construction of the compound area:
 - Vegetation clearance and installation of fencing around Project Area;
 - Topsoil strip to 300 mm and subsoil strip (where required) to no more than 1,200 mm below ground level or required level of ground stabilisation. This will include any soft spots will be filled with suitable material.
 - Installation of granular material laid on geotextile placed below compacted layers of stone / stabilised material (as required) to act as a development platform;
 - Creation of 2 m high topsoil bunds with separate subsoil bunds as needed around compound perimeter for storage until reinstatement on completion of the works;
 - Installation of below ground services including electricity, water and drainage and septic tanks;
 - Installation of concrete strip or pad foundations for temporary site accommodation; and
 - Installation of temporary site accommodation including welfare facilities, offices and storage buildings. It has been assumed that the temporary site accommodation will be modular portacabins and/or shipping container type units likely to be raised with a ventilated void beneath. Therefore, these structures have been excluded as 'built environment' receptors.
- It has been assumed that the following activities will be undertaken from Compound A1 as part of its operation during the preliminary works:
 - Vegetation clearance;
 - Materials stripping, import and storage (including storage of topsoil and subsoil where needed);
 - Vegetation clearance along the railway within NR land in Route Section 2A (where possible and licensed to do so);
 - Environmental mitigation works where required (e.g. badger sets, hedgerow planting); and
 - Repair works to culverts as necessary.
- It is noted that these activities are not included in the PCSM for Compound A1, as these works will be undertaken within Route Section 2A, within NR land only and have been assessed previously as part of the ES⁷.

8.1.4 A summary of potential contamination sources identified from the baseline information is provided in

table 8-2

Table 8-2: Potential sources of contamination

Location	Distance	Potential source of contamination	Potential contamination
On-site	-	Agricultural land use	A range of inorganic and organic contaminants including heavy metals, fuels / oils from machinery, herbicides and pesticides.
Off-site	0 – 500 m	Agricultural activities within the area surrounding Compound A1.	A range of inorganic and organic contaminants including heavy metals, fuels / oils from machinery, herbicides and pesticides.
	0 – 10 m	The operation of and Made Ground associated with the construction of the railway within Route Section 2A located adjacent to the south of Compound A1.	A range of inorganic and organic contaminants including heavy metals, hydrocarbons, Polyaromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs), solvents, creosote, asbestos.
	347 m	Former railway line	

8.1.5 Potential receptors relevant to the current land use and to the construction and operation of Compound A1 are provided in table 8-3.

Table 8-3: Potential Receptors

Receptor Group	Baseline	Construction	Operation
Human Health (off site)			
Members of the public accessing the surrounding area including the adjacent road.	Present	Present	Present
Farmers working on nearby agricultural land	Present	Present	Present
Occupants of nearby residential and commercial properties	Present	Present	Present
Controlled Waters: Groundwater (on site and off site)			
Groundwater in off-site superficial and on-site bedrock both classified as Secondary A Aquifers	Present	Present	Present
Controlled Waters: Surface Waters (off site)			
Langford Brook approx. 100 m to the north.	Present	Present	Present
Property (on site and off site)			
Off-site residential properties and commercial properties	Present	Present	Present
Proposed on site services and structures	Not present	Not present	Present

8.1.6 Potential exposure pathways between the sources of contamination and receptors identified above are outlined below.

Human Health Receptors

- Dermal contact with and / or ingestion of contaminants in windblown soil-derived dusts including Asbestos fibres and water which may have migrated off-site;

- Inhalation of contaminants in windblown dust, including asbestos fibres, which may have migrated off-site; and
- Inhalation of ground gases and / or vapours which may have migrated off-site.

Controlled Waters Receptors: Groundwater

- Leaching of contaminants from soils in the unsaturated zone into groundwater in underlying aquifers;
- Migration of contaminated water via preferential pathways to deeper groundwater in underlying aquifers; and
- Migration of contaminants via preferential pathways such as track drainage to deeper groundwater.

Controlled Waters Receptors: Surface waters

- Discharge of contaminants entrained in surface water run-off followed by overland flow and discharge;
- Leaching and migration of contaminants from soils in the unsaturated zone into groundwater then lateral migration into surface water features; and
- Migration of contaminants via preferential pathways such as track drainage, field drains and service runs to surface water.

Property Receptors

- Direct contact of buried services and foundations with contaminants in soil and/or groundwater; and
- Migration of ground gases or vapours along preferential pathways including permeable ground, track drainage, service trenches and service entry points and accumulation in enclosed spaces such as service ducts or access points.

- 8.1.7 For potential contaminant linkages (PCLs) to exist between the potential contaminant sources and the potential receptors identified, a pathway must exist i.e. a Source – Pathway – Receptor relationship^{14,15}. PCLs for Compound A1 and the Study Area have been identified for the current baseline and the construction and operation phases and a potential risk rating for each PCL has been assigned, through consideration of the potential consequence and likelihood of exposure occurring. The PCSM and risk assessment is presented in Table 8.4

¹⁴ Environment Agency and Defra Model (2004) Procedures for the Management of Contaminated Land. R&D Publication CLR11.

¹⁵ Environment Agency (2010) GPLC1: Guiding Principles for Land Contamination.

Table 8-4: Land Contamination PCSM and Risk Assessment during the Baseline, Construction and Operation of Compound A1

Source	Receptor	Pathway	Baseline			Construction (with mitigation)			Mitigation measures	Operation (including maintenance) (assuming all mitigation undertaken prior to and during construction)			Mitigation measures
			Probability	Consequence	Risk	Probability	Consequence	Risk		Probability	Consequence	Risk	
<p>On-site: Agricultural land use. <i>(A range of inorganic and organic contaminants including heavy metals, fuels / oils from machinery, herbicides and pesticides)</i></p> <p>Off-site: Agricultural activities within the area surrounding Compound A1. The operation of and Made Ground associated with the construction of the railway within Route Section 2A located adjacent to the south of Compound A1. Former railway line <i>(A range of inorganic and organic contaminants including heavy metals, hydrocarbons, PAHs, PCBs, fuels / oils from machinery, herbicides and pesticides, solvents, creosote, asbestos)</i></p>	<p>Human (off-site): Members of the public accessing the surrounding area including the adjacent road</p> <p>Human (off-site): Farmers working on nearby agricultural land</p> <p>Human (off-site): Occupants of nearby residential and commercial properties</p>	<p>Dermal contact with and / or ingestion of contaminants in windblown soil-derived dusts and water which may have migrated off-site;</p>	Unlikely	Medium	Low risk	Unlikely	Medium	Low risk	<p>Site will mostly be covered in hardstanding or compacted aggregate which will minimise dust and infiltration.</p> <p>Implementation of measures in the Code of Construction Practice (CoCP) such as good management of stockpiles, implementation of pollution incident control e.g. plant drip trays, dampening down of dust and spill kits.</p> <p>Implementing an appropriate Soils Management Plan (SMP), Materials Management Plan (MMP) and site waste management plan (SWMP) as required to provide assessment of the suitability of soils for re-use, storage, validation and the appropriate destination for waste.</p> <p>Implementation of a watching brief during site clearance and excavation works to identify any areas of suspected contamination and ensure appropriate management.</p>	Unlikely	Medium	Low risk	<p>The compound will be operated in accordance with the relevant regulations and best practice guidance.</p>
		<p>Inhalation of contaminants in windblown dust, including asbestos fibres, which may have migrated off-site; and</p>	Unlikely	Medium	Low risk	Unlikely	Medium	Low risk		Unlikely	Medium	Low risk	
		<p>Inhalation of ground gases and / or vapours which may have migrated off-site.</p>	Unlikely	Medium	Low risk	Unlikely	Medium	Low risk		Unlikely	Medium	Low risk	
	<p>Controlled Waters (on-site and off-site): Groundwater in off-site superficial and on-site bedrock Secondary A Aquifers.</p> <p>Leaching of contaminants from soils in the unsaturated zone into groundwater in underlying aquifers;</p> <p>Migration of contaminated water via preferential pathways to deeper groundwater in underlying aquifers; and</p> <p>Migration of contaminants via preferential pathways such as track drainage to deeper groundwater.</p>	<p>Controlled Waters (off-site): Langford Brook approx. 100 m north of Compound A1.</p> <p>Discharge of contaminants entrained in surface water run-off followed by overland flow and discharge;</p> <p>Leaching and migration of contaminants from soils in the unsaturated zone into groundwater then lateral migration into surface water features; and</p> <p>Migration of contaminants via preferential pathways such as track drainage, field drains and service runs to surface water.</p>	<p>Unlikely</p>	Medium	Low risk	Unlikely	Medium	Low risk		Unlikely	Medium	Low risk	
			<p>Low likelihood</p>	Mild	Moderate / Low risk	Unlikely	Medium	Low risk		Unlikely	Medium	Low risk	
			<p>Low likelihood</p>	Mild	Low risk	Low likelihood	Mild	Low risk		Low likelihood	Mild	Low risk	
			<p>Receptor not Present</p>	Receptor not Present	Low risk	Receptor not Present	Receptor not Present	Low risk		Low likelihood	Mild	Low risk	

Summary

- 8.1.8 As outlined in table 8.4, potential PCLs have been identified for Compound A1. However, the compound area will be covered with gravel development platform / hardstanding which will reduce dust and vapour generation and minimise infiltration. The temporary site accommodation will also be raised with a ventilated void beneath which will reduce risks from gas and vapour ingress. Although based on the PCSM the risk to receptors from the proposed development is low, limited soil sampling underlying Compound A1 will be undertaken to inform materials management/reuse of material.
- 8.1.9 The construction works will also be undertaken in accordance with the CoCP and various management plans which will reduce the risks of disturbance of existing contamination and introduction and migration of new contamination sources during the construction works. The compound will be operated in accordance with the relevant regulations and best practice guidance. Therefore, risks to human health, controlled waters and property receptors during construction and operation are considered to be low.

Additional Baseline Information

- 8.1.10 A GI was undertaken along Route Section 2A by the Alliance for GRIP 4 between July 2017 and October 2018. However, the GI did not target the Compound A1 area. The GI works included exploratory locations within the railway corridor and adjacent to the railway on third party land comprising trial pits, dynamic probing, window sampling and dynamic sampling with rotary follow on. Soil and leachate contamination testing and gas and groundwater monitoring were undertaken as part of the GI. Based on the contamination soil test results to date, there is considered to be a low risk to human health and controlled waters receptors presented by the soils within Route Section 2A. However, due to the historic use of areas of Route Section 2A as a railway, the presence of asbestos within the soils along the Route Section cannot be discounted.
- 8.1.11 Based on the PCSM, the risk to receptors from the proposed development is considered to be low. Limited soil sampling will be undertaken to inform materials management / reuse of materials.

8.2 Predicted effects of the proposal

Assessment information within the Project ES

- 8.2.1 A summary of the findings of the assessment of the potential effects of the Project on ground conditions, geology as a valuable resource, ground contamination, soils reuse and waste for the construction and operation of Compound A1, is provided in the following sections.
- 8.2.2 Full details of potential effects within Route Section 2A of which Compound A1 is located are provided in Chapter 11 (Geology, soils and land contamination) Volume 2i Route Section 2A⁷. The assessment has been undertaken in accordance with the approach detailed in Chapter 11 (Geology, soils and land contamination) Volume 2i Project-wide⁷ and has been based on information available at this time.

Compound Construction

- 8.2.3 Soil sampling in Compound A1 will be undertaken to inform materials management/reuse of material. Mitigation/remedial measures will be incorporated into the design of the compound (as required) to reduce impacts from contamination.
- 8.2.4 As outlined above, mitigation measures will also be incorporated into the construction process, as set out in the CoCP. These will include:
- Minimising soil exposure by timely reinstatement of vegetation or hardcover to prevent soil erosion and soil compaction;
 - Stockpile management to prevent windblown dust and surface water run-off of stripped top and sub soil;
 - Implementing of appropriate dust suppression measures to prevent migration of contaminated dust during construction;
 - Implementing working methods during earthworks to appropriately manage groundwater and surface water and ensure that there is no run-off from the works, any material / waste stockpiles, and storage containers into adjacent surface watercourses;

- Implementing appropriate pollution incident control e.g. plant drip trays and spill kits;
 - Implementing appropriate and safe storage of fuel, oils and equipment during construction;
 - Installing hardcover such as compacted aggregate across the compound to minimise the generation of dust and infiltration;
 - Implementing an appropriate SMP, MMP and SWMP as required to provide a detailed assessment of the suitability of soils for re-use and the appropriate destination for waste, if required; and
 - Implementation of a watching brief during site clearance and excavation works to identify any areas of suspected contamination and ensure appropriate management including testing, removal and disposal off-site (if required).
- 8.2.5 Materials Strategy Statement (Appendix 11.8, Volume 3 of the ES)⁷ has been developed to demonstrate how the EWR Alliance intends to manage excavated materials generated by the Project. The management of waste generated by the Project, is detailed within the draft SWMP (Appendix 11.7, Volume 3 of the ES)⁷.
- 8.2.6 Further details of the proposed mitigation measures are provided in Chapter 11 (Geology, soils and land contamination) Volume 2i Route Section 2A⁷.
- 8.2.7 With the effective application of the primary mitigation measures, temporary negligible and minor adverse effects are mainly anticipated during construction. These effects are assessed as not significant. The effect on ground stability and ground compaction during the construction is permanent and minor beneficial and assessed as not significant. Consequently, allowing for the proposed mitigation measures, there are anticipated to be no residual adverse impacts.
- 8.2.8 Further details of the construction impact assessment and anticipated residual effects within Route Section 2A are provided in Chapter 11 (Geology, soils and land contamination) Volume 2i Route Section 2A and Volume 3, Appendix 11.3⁷.

Compound use for preliminary works

- 8.2.9 The preliminary works proposed to be undertaken from Compound A1 will be restricted to NR owned land located within Route Section 2A. The preliminary works will be undertaken in accordance with mitigation / management measures as set out in the CoCP (refer to Section 15.1.1) to reduce impacts from contamination. It is also assumed that Compound A1 and wider Project will be operated in accordance with the relevant regulations and best practice guidance in applying BAT¹⁶ and pollution prevention¹⁷.
- 8.2.10 Therefore, negligible and minor beneficial effects are mainly anticipated during the operation of Compound A1 with implementation of the proposed mitigation measures. These effects are assessed as not significant. Consequently, allowing for the proposed mitigation measures, there are anticipated to be no residual adverse impacts.
- 8.2.11 Further details of the operation impact assessment and anticipated residual effects within Route Section 2A where Compound A1 is located are provided in Chapter 11 (Geology, soils and land contamination) Volume 2i Route Section 2A and Volume 3, Appendix 11.3⁷.

8.3 Summary

- 8.3.1 An assessment has been undertaken of the effects of the Project on ground conditions, geology as a valuable resource, ground contamination, soils reuse and waste.
- 8.3.2 With the proposed incorporated mitigation measures, negligible and minor beneficial effects are generally predicted during construction; these are not significant.
- 8.3.3 With appropriate mitigation measures incorporated within design, negligible or minor beneficial effects are anticipated during the operation of the Project; these are not significant.

¹⁶ CIRIA, Publication C736 Containment Systems for the Prevention of Pollution: Secondary, tertiary and other measures for industrial and commercial premises, 2014.

¹⁷ Environment Agency (2017) The Environment Agency's approach to groundwater protection; Guidance: Protect groundwater and prevent groundwater pollution; and Guidance: Groundwater protection technical guidance.

9. Landscape and visual impact

9.1 Baseline information

Baseline information within the Project ES

Landscape

- 9.1.1 Compound A1 is located across the boundary of the Otmoor Lowlands Landscape Character Area (LCA) as defined in the Cherwell District Landscape Assessment (Project ES, Volume 4, Figure 12.1).
- 9.1.2 An assessment of the landscape effects on National Character Areas has not been undertaken within this assessment as it is judged that the nature of the Project and the scale of the resulting impacts would not result in likely significant effects to landscape character at a national scale. However, the National Character Area profiles have been studied to inform an understanding of the baseline landscape.
- 9.1.3 This LCA is centred around, and includes, the town of Bicester, and encompasses the far western end of the Project.
- 9.1.4 As well as rural areas, this LCA incorporates the urban area of Bicester. The Study Area includes residential, commercial and light industrial areas, interspersed with frequent areas of open space. Many of these open spaces are located alongside the existing railway corridor, and they provide areas of naturalistic character within the urban fringe. There is ongoing and planned expansion of this part of Bicester that is continuing a process of urbanisation of the south-east fringes of the town.
- 9.1.5 Beyond the urban area the landscape comprises a mixture of large scale arable fields and smaller scale pasture. The railway corridor, whose boundaries are generally well wooded in this area, bisects the field pattern. This is a gently rolling lowland landscape with occasional isolated low hills that lie outside of the Study Area but are noticeable features on the skyline from within. Pasture dominates to the south of the railway corridor around the village of Launton. In this area the fields, tracks and lanes are frequently bounded by hedges with hedgerow trees, which creates a sense of enclosure and tranquillity, although woodland is scarce. This wooded nature is confirmed in the OWLS report as follows: "Mature ash, oak and sycamore hedgerow trees are scattered throughout the area. Pollarded crack willows also border small streams and grow in hedges next to ditches. A dense corridor of ash trees borders the railway line". Areas where arable is more predominant, generally to the north of the railway, have a more open character due to the more open field boundaries, more fragmented hedgerows and larger scale of the fields. There are occasional scattered farms and dwellings. The village of Launton lies just to the south east of the fringes of Bicester near the railway.
- 9.1.6 RAF Bicester conservation area lies within the Study Area approximately 670 metres from the railway corridor at its closest point. This area is described within the conservation area appraisal as: "the quintessential airfield of its age; almost better than any other site it typifies the public perception of the World War II airfield." The site incorporates a wide range of building types and infrastructure around the open 'flying field', many of which are individually listed.
- 9.1.7 The railway corridor is largely at grade, with a section on low embankment to the west of Station Road level crossing. It is lined with mature tree belts for the most part as it runs through this LCA. Sections are more open to the adjacent areas through the industrial areas of Bicester. It is frequently lined with acoustic fences as it passes residential areas within Bicester. Several public rights of way (PRoW) cross the railway corridor within the rural parts of this LCA.
- 9.1.8 The urban areas are variable, with no consistent pattern or form, although generally in good condition. Industrial areas are extensive and nondescript. Frequent tree belts and pockets of green open space unify the area to a degree. Parts of the very fringes of the Study Area within Bicester lie within the Bicester Conservation Area and there are numerous listed buildings within this area. The conservation area is some 750 m from the Scheme Area at its closest point. The railway corridor does not affect the setting of this area. The urban areas are judged to be of ordinary quality.
- 9.1.9 The rural areas exhibit a more harmonious character with many typical lowland features. Removal of hedgerows to create larger arable fields had disrupted the historic landscape pattern in places and urban edge developments around Bicester have eroded the rural quality in places. There are no landscape designations within the Study Area, although Bicester Airfield area is recognised by

designation as a conservation area due to its uniqueness and highly valued historic associations. Bicester airfield is judged to be of good quality due to its enhance value and the remainder of the rural areas within this LCA are judged to be of ordinary quality.

Visual

- 9.1.10 The zone of theoretical visibility produced for the Project ES (Volume 4, Figures 12.4 and 12.5) indicates that the potential visibility of Compound A1 will be limited to the west by the presence of buildings at the outskirts of Bicester, whilst to the south, potential visibility will extend towards the northern edge of Launton. To the north and east, potential visibility would be more open across the agricultural landscape (although the ZTV does not incorporate hedgerows in its visibility calculations).
- 9.1.11 Compound A1 is located to the north of Viewpoint 2A05 and west of Viewpoint 2A07 of the Project ES (Volume 4, Figure 12.7 for location and Figure 12.8 for photograph).
- 9.1.12 Viewpoint 2A05 is a view from the outskirts of the village of Launton, adjacent to St Mary's Church. Looking along the two-lane Bicester Road towards the existing railway bridge which is obscured by the curve of the road, mature churchyard trees and roadside hedgerow with trees. A decorative brick retaining wall separates the churchyard from the narrow footpath and grassed verge however there are open views across the churchyard towards the church.
- 9.1.13 Viewpoint 2A07 is an expansive view from a public right of way across an agricultural field towards the tree lined railway corridor on embankment. To the west the scrub and trees follow the alignment of a dismantled railway, now the preferred footpath route.

Additional baseline information

- 9.1.14 Compound A1 will be located on a greenfield site to the east of Bicester Road and north of the railway corridor, and includes three mature field trees. The local landscape context around Compound A1 includes the Launton Road Allotments, Industrial Estate and Retail Park to the west, and a narrow watercourse to the north running along a shallow valley. Bicester Road which runs alongside the western boundary of the site has street lighting.
- 9.1.15 Potential visual receptors within the area around Compound A1 include:
- Residential properties along the northern edge of Launton to the south of the railway corridor
 - Users of the Launton Road Allotments to the west of the site
 - Users of public footpaths 272/9/20, 272/14/10 and 272/11/10 (location shown on Project ES Volume 4, Figure 12.7)
 - Users of Bicester Road

9.2 Predicted effects of the proposal

Assessment information within the Project ES

Compound construction

- 9.2.1 The following aspects will be relevant to landscape and visual impacts during compound construction:
- Construction vehicle presence within the landscape, including the effects of construction material haulage
 - Removal of existing vegetation for the establishment of construction compounds and haul roads – principally to create gaps/access alongside the railway corridor
 - Earth movements and disturbance of ground and landcover
 - Presence of site hoarding/fencing
- 9.2.2 During compound construction, the following strategies will be adopted to mitigate effects on landscape and visual amenity:

- As far as practicable, all significant mature trees and hedges around working areas and compounds that can be retained are to be protected for the full duration of the works period
- Fencing to BS 5837 will be erected around the root protection area of all retained trees and hedgerows to create a construction exclusion zone
- Compound and working area lighting will be restricted to the minimum necessary for safety and security and will employ modern, directional lighting to reduce light pollution

9.2.3 The sensitivity of the Otmoor Lowlands LCA to the Project is judged to be Low. During compound construction, the effects on landscape character will be the introduction of some elements into the landscape, such as the three-storey office accommodation units and other construction machinery that would be in-keeping with the character of some existing features of the Otmoor Lowlands LCA, such as the industrial estate to the west, but that would be more conspicuous within the rural aspects of the LCA to the north and east. Lighting associated with the compounds will increase the prominence of these elements during the hours of darkness but will not be a noticeable change in the context of the already lit Bicester Road.

9.2.4 From viewpoint 2A05 during Compound A1 construction, there will be no change the overall nature of the view due to the presence of intervening vegetation.

9.2.5 From viewpoint 2A07 during Compound A1 construction, there will be no change the overall nature of the view due to the presence of dense vegetation along the railway corridor immediately to the west of the viewpoint.

Compound use for preliminary works

9.2.6 The assessment that included use of the compound to support the preliminary works raised similar issues and impacts as for the compound construction, above. In addition, the presence of a three-storey office building will be a notable change to the character and features of the site.

9.2.7 Where land is required on a temporary basis the land will be reinstated to its current landcover, condition and use at the end of the construction period.

Additional assessment

Compound construction

9.2.8 The landscape and visual impacts of construction of Compound A1 will be of a lower magnitude than the Project as assessed within the Project ES. The effects of compound construction in isolation will be more localised and therefore additional commentary has been provided to outline specific effects of the construction of Compound A1.

9.2.9 Whilst the compound construction will result in the introduction of some conspicuous elements into the landscape and removal of vegetation, the effects on landscape character will be small scale and localised to a contained area of the wider Otmoor Lowlands LCA. Vegetation clearance will be limited to creation access to the railway corridor, and other existing vegetation along the disused railway corridor and around the site will limit any influence of compound construction on the wider landscape character. The magnitude of impact on landscape character of the area is therefore judged to be Negligible, resulting in a Slight Adverse significance of effect, primarily due to vegetation removal.

9.2.10 The sensitivity of the public rights of way and allotments users to the type of development proposed is judged to be Medium. The sensitivity of residential properties on the northern edge of Launton to the type of development proposed is judged to be High.

9.2.11 The introduction of three-storey office facilities and activity within Compound A1 will be clearly visible from the Launton Allotments to the west of the site and public footpath 272/14/10 to the north. The presence of multiple construction elements, buildings, vehicles, storage areas and movements will be a notable change to the background of the view beyond the clearly visible Bicester Road and in the context of existing views towards the Launton Industrial Estate and Retail Park buildings. The magnitude of impact on these visual receptors is therefore judged to be Low, resulting in a Slight Adverse significance of effect.

9.2.12 The office facilities and taller components or machinery will be visible in glimpsed views from the wider area beyond/above intervening vegetation, but will only form a small component of a wider view, which

will remain as the baseline condition. From properties along the northern edge of Launton, vegetation alongside the railway corridor and on intervening field boundaries will screen potential views towards the Compound. The magnitude of impact on these visual receptors is therefore judged to be Negligible, resulting in a Neutral significance of effect.

Compound use for preliminary works

- 9.2.13 The use of the compound to support the preliminary works will lead to similar issues and effects as for the compound construction, above, but with machinery movement generally confined to the laydown and storage areas and the route onto the railway alignment. Lighting in the windows of the office accommodation units will also be visible when in use outside daylight hours.

9.3 Summary

- 9.3.1 Compound A1 will be in a relatively enclosed location on a greenfield site. Both the construction and use of Compound A1 will have a limited influence on the landscape character of the area beyond its local environs. There will be temporary visual effects on users of public rights of way and Launton Allotments, primarily due to the height of new features and the presence of construction activities and movements across the site.
- 9.3.2 Identified impacts will be temporary in nature and wholly reversible once Compound A1 has fulfilled its function and the site has been restored to its baseline condition, as mature field trees within the site will be protected for the duration.

10. Water quality and flood risk

10.1 Baseline information

Baseline information within the Project ES

10.1.1 This summary covers water quality and flood risk. Baseline information and potential impacts to groundwater quality are assessed in Geology, Soils and Land Contamination section. A full description of baseline conditions within Route Section 2A is provided in Volume 2ii of the ES, and Appendix 13.1, Volume 3 of the ES. The Flood Risk Assessment (FRA) which accompanies this application provides more information relating to flood risk issues.

Table 10-1: Summary of existing water environment

Aspect	Description
Flood Risk	<p>Main River: Compound falls within the Environment Agency Flood Zone 1</p> <p>Surface Water: Environment Agency's Risk of Flooding from Surface Water (RoFSW) maps show small areas of surface water floodplain within Compound A1.</p>
Geology	<p>Groundwater Flood Risk: located in an area identified by national scale modelling as having no groundwater flood risk.</p> <p>Superficial Aquifer: There are no superficial deposits mapped at this location.</p> <p>Bedrock Aquifer: Secondary A Aquifer (Kellaways Sand Member).</p> <p>Source Protection Zone: none present within 500 m.</p> <p>Abstractions: no abstractions or British Geological Survey (BGS) groundwater wells located within 500 m of Compound A1.</p>
Water Quality	<p>Pollution risks: associated with Compound A1 – to Langford Brook and associated tributaries.</p> <p>Discharge consents: none present within 500 m of Compound A1.</p> <p>Nearest watercourse: The Langford Brook (source to downstream A41) is adjacent to Compound A1, a Water Framework Directive (WFD) water body (GB106039030160, currently Moderate Status, objective Good Status).</p>

Additional baseline information

10.1.2 The Compound layout has been designed to avoid the fluvial flood risk predicted by the hydraulic model. The hydrological and hydraulic modelling have demonstrated that the entire proposed Compound area is outside of the floodplain at the 1% annual chance event (including 70% allowance for climate change).

10.2 Predicted effects of the proposal

Assessment information within the Project ES

Compound construction

10.2.1 Good construction site practice will be undertaken to minimise flood risk and drainage impacts. Measures to protect the water environment during construction are included within the CoCP and will include the prevention of pollution, procedures in case of accidental spillages and monitoring.

10.2.2 The construction compounds operating site drainage or dewatering systems during construction, could have an aggregate temporary effect between them, exacerbating the magnitude of impacts to water quality of the Langford Brook. However, with appropriate mitigation in place, in the form of best practice site management, the likelihood of combined negative effects is reduced. Appropriate connection or

discharge permits will be obtained.

- 10.2.3 Construction activities may give rise to potential (temporary) impacts to surface water quality, general Project Wide effects are described in the Project Wide Volume 2i.
- 10.2.4 Construction activities to prepare the compound site may include digging down up to 1.2m. Depending on the groundwater levels at the time of construction, excavating into the Kellaways Sand Formation which is designated as a secondary aquifer at this location, has potential to increase the groundwater flood risk.
- 10.2.5 The impacts will be direct and temporary. Construction compounds will be in place for up to five years and have been treated as permanent features. However, the compounds will be temporary and removed from site after construction.
- 10.2.6 The magnitude of any impact will depend on the scale and nature of any potential incident. Mostly, water quality within an affected watercourse/drain will improve over time as sediments settle or are trapped by vegetation.
- 10.2.7 Potential effects of construction activities on water quality of the groundwater bodies and designated superficial deposit aquifers are considered within the Geology, Soils and Land Contamination chapter. Potential quantitative impacts on groundwater are considered in the WFD assessment (Appendix 13.2).
- 10.2.8 Land raising or changing topography in the compound area, could modify flow paths and increase flooding in the immediate vicinity. Receptors adjacent the Compound include the A4421, agricultural land and the eastern extents of Bicester. Compound A1 is shown to be within Flood Zone 1 therefore will not affect flow routes.
- 10.2.9 The proposed Compound is therefore outside of the floodplain and a Compensatory Flood Storage Area (CFSA) is not required.
- 10.2.10 The Compound will increase hardstanding and therefore increase in the volume of runoff being shed from the site in comparison to the baseline, this could increase flood risk in the immediate vicinity. Therefore, the construction compound could provide a major adverse worst-case impact on drainage receptors. The potential increase in runoff will be managed through a Drainage Strategy, which may require approval from the Environment Agency or Lead Local Flood Authority (LLFA).
- 10.2.11 A Drainage Strategy for the compound will be developed to mitigate the increase in flows from the site by the use, where possible, of sustainable drainage systems. A Flood Management Plan should be included to ensure staff are aware of the risks and actions to take in the event of a flood. The hydrological and hydraulic modelling programmed as part of GRIP 5 should be used to inform these plans.
- 10.2.12 The impacts will be direct and temporary, as construction compounds and temporary works sites will be removed on completion of the works and ground levels restored to pre-development conditions. Consequently, allowing for the proposed mitigation measures there are anticipated to be no permanent residual adverse effects.

Compound use for preliminary works

- 10.2.13 The general construction mitigation measures, along with the Drainage Strategy, are all reported in detail in the Project wide ES (Volume 2i Section 13). Further work in developing mitigation measures is on-going as the design of the project progresses.
- 10.2.14 The principal purpose of the Drainage Strategy and the flood risk mitigation measures is to maintain the existing hydrological behaviour as far as reasonably possible. The finalised plan for mitigating flood risk will be reviewed and approved by the Environment Agency and LLFA (Oxfordshire County Council). Consequently, allowing for the proposed mitigation measures there are anticipated to be no permanent residual adverse effects.
- 10.2.15 Further details of the operation impact assessment and anticipated residual effects within Route Section 2A are provided in Chapter 13 (Water Quality and Flood Risk) Volume 2ii Route Section 2A and Volume 3, Appendix 13.1.

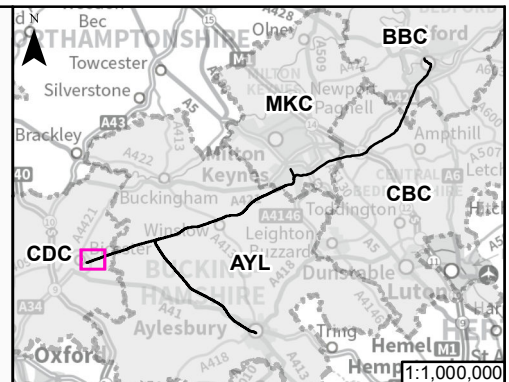
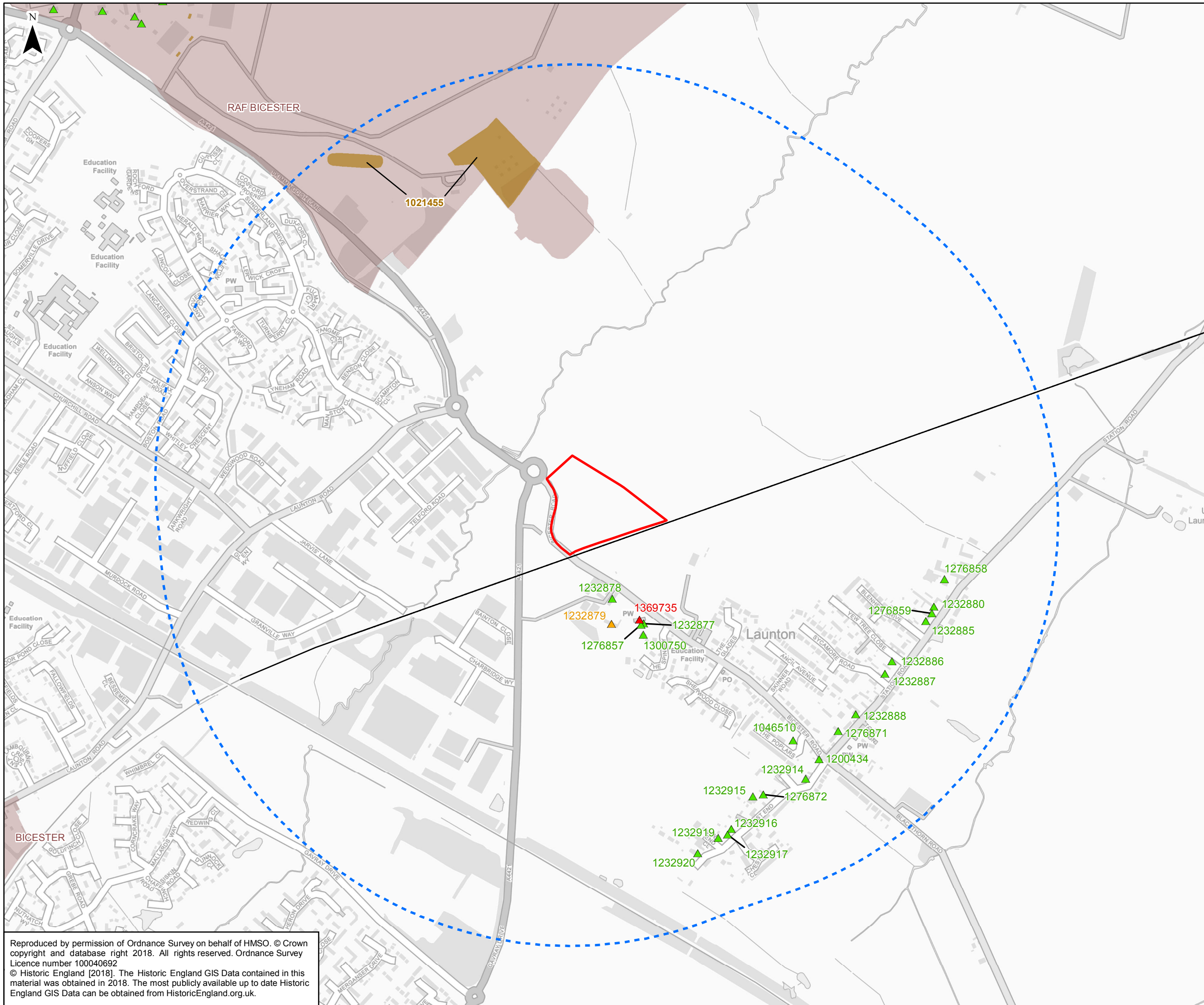
10.3 Summary

- 10.3.1 Compound A1 is shown to be within Flood Zone 1 and will not have an adverse impact on floodplain

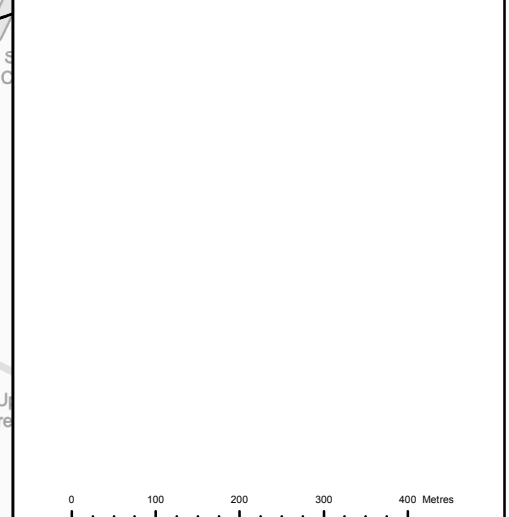
areas. The Compound design and Drainage Strategy will ensure that adverse impacts will be avoided or minimised, as far as practicably possible.

- 10.3.2 Measures to protect the water environment during construction are included within the CoCP and will include the prevention of pollution, procedures in case of accidental spillages and monitoring.
- 10.3.1 The impacts will be direct and temporary, as the construction compound will be removed on completion of the works and ground levels restored to pre-development conditions. Consequently, allowing for the proposed mitigation measures there are anticipated to be no permanent residual adverse effects.
- 10.3.2 The Flood Risk Assessment (FRA) which accompanies this application provides more information relating to flood risk issues.

Figures



- PROJECT EXTENTS
- - - LOCAL AUTHORITY BOUNDARY
- ▭ COMPOUND
- - - 1KM STUDY AREA
- ▲ LISTED BUILDING GRADE I
- ▲ LISTED BUILDING GRADE II*
- ▲ LISTED BUILDING GRADE II
- CONSERVATION AREA
- SCHEDULED MONUMENT



P01	29/03/19	1ST ISSUE	JM	RS	AFM
Rev	Date	Description of Revisions	Dsnd	Chkd	Appr
Status	PUBLISHED - STAGE APPROVED				A1



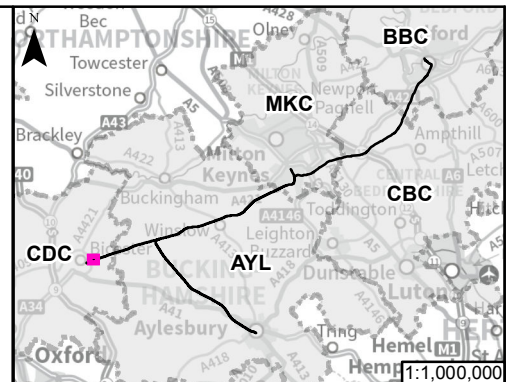
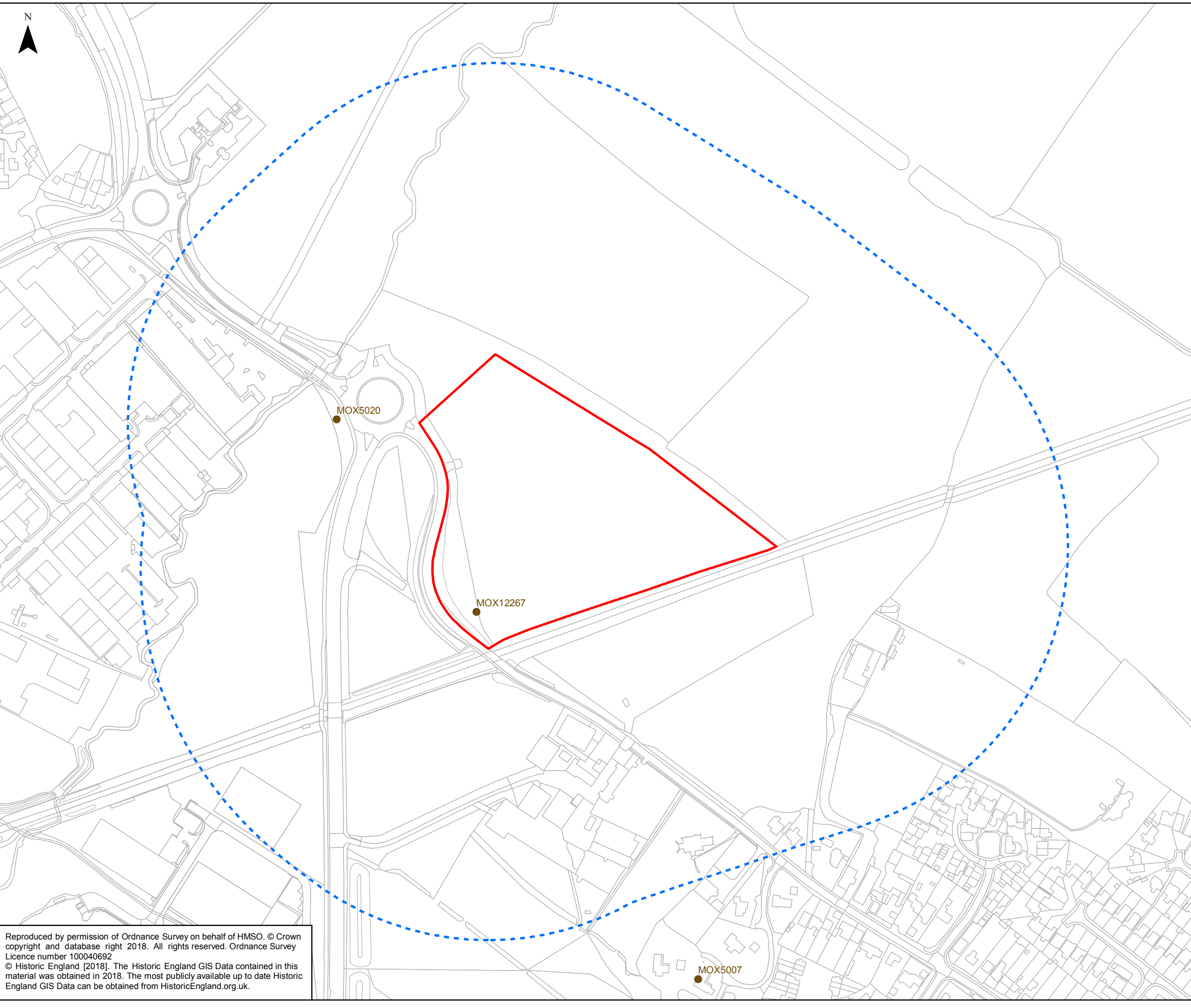
Project
THE NETWORK RAIL (EAST WEST RAIL BICESTER TO BEDFORD IMPROVEMENTS) ORDER

Drawing Title
**FIGURE 4.1
 COMPOUND A1
 DESIGNATED HERITAGE ASSETS**

Designed	Joanna Mierzynska	Signed	JM.	Date	29/03/2019
Drawn	Joanna Mierzynska	Signed	JM.	Date	29/03/2019
Checked	Richard Shortridge	Signed	RS	Date	29/03/2019
Approved	Amy Farrington McCabe	Signed	AMC	Date	29/03/2019

Scale(s)	1:9,000	ELR & Project Chainage	N/A
Design Package Risk Classification	NORMAL	Sheet	1 of 1
Alternative Reference	Alternative_Ref	Revision	P01
Drawing Number	133735_RW-EWR-XX-XX-DR-LH-010417		

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- PROJECT EXTENTS
- - - LOCAL AUTHORITY BOUNDARY
- ▭ COMPOUND
- ⋯ 250M STUDY AREA
- MONUMENT



P01	29/03/19	1ST ISSUE	JM	RS	AFM
Rev	Date	Description of Revisions	Dsnd	Chkd	Apr
Status	PUBLISHED - STAGE APPROVED				A1
Project THE NETWORK RAIL (EAST WEST RAIL BICESTER TO BEDFORD IMPROVEMENTS) ORDER					
Drawing Title FIGURE 4.2 COMPOUND A1 NON DESIGNATED HERITAGE ASSETS					
Designed	Joanna Mierzynska	Signed	<i>JM</i>	Date	29/03/2019
Drawn	Joanna Mierzynska	Signed	<i>JM</i>	Date	29/03/2019
Checked	Richard Shortridge	Signed	<i>RS</i>	Date	29/03/2019
Approved	Amy Farrington McCabe	Signed	<i>AM</i>	Date	29/03/2019
Scale(s)	1:3,000		ELR & Project Chainage		
Design Package Risk Classification	NORMAL		Sheet 1 of 1		
Alternative Reference	Alternative_Ref		Revision P01		
Drawing Number	133735_RW-EWR-XX-XX-DR-LH-010416				

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Appendices

Appendix A. Code of Construction Practice

Appendix B. Transport Statement

Appendix C. Ecological Impact Assessment

Appendix D. Arboricultural Impact Assessment

EWR Alliance

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