A47/A11 Thickthorn Junction

Scheme Number: TR010037

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APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

The A47/A11 Thickthorn Junction Development Consent Order 202[x]

ENVIRONMENTAL STATEMENT APPENDICES
Appendix 10.4 – Minerals impact assessment

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10. Minerals impact assessment

10.1. Minerals safeguarding policy

Legislative context

10.1.1. A summary of the legislative context of the Proposed Scheme and the requirement for an Environmental Impact Assessment (EIA) is provided in Chapter 1, Introduction of this Environmental Statement (ES) **(TR010037/APP/6.1)**.

National planning policy context

10.1.2. A general summary of the national planning policy context is provided in ES Chapter 1, Introduction **(TR010037/APP/6.1)**.

10.1.3. The National Policy Statement for National Networks (NPS NN) (2014) sets out the need for, and Government's policies to deliver, development of nationally significant infrastructure projects on the national road and rail networks in England. This includes requirements to consider sustainability within the development.

10.1.4. Consideration of mineral resources is included in paragraph 5.169 which states '*Applicants should safeguard any mineral resources on the proposed site as far as possible'* and Paragraph 5.182 which states ''*Where a proposed development has an impact on a mineral safeguarding area, the Secretary of State should ensure that the applicant has put forward appropriate mitigation measures to safeguard mineral resources*'.

10.1.5. The National Planning Policy Framework (NPPF) was revised in February 2019. Section 17 of the NPPF outlines the planning policy mechanisms required to facilitate the sustainable use of minerals. The NPPF states that planning policies should '*safeguard mineral resources by defining mineral safeguarding areas, and adopt appropriate policies so that known locations of specific minerals resources of local and national importance are not sterilised by non-mineral development where this should be avoided*' and '*set out policies to encourage the prior extraction of minerals, where practical and environmentally feasible, if it is necessary for non-mineral development take place'.*

Local planning policy

10.1.6. The Norfolk Minerals and Waste Development Framework was adopted on 1 January 2010 and will run for a 17-year period until 31 December 2026 (in line with Planning Policy Statement 12: Local Spatial Planning (PPS12)).

10.1.7. The Minerals and Waste Development Framework comprises three mineral and waste planning policy documents and a policies map:

- Core Strategy and Minerals and Waste Development Management Policies Development Plan Document 2010-2026 (adopted September 2011)
- Minerals Site Specific Allocations Development Plan Document (adopted October 2013, amendments adopted December 2017)

- Waste Site Specific Allocations Development Plan Document (adopted October 2013).

10.1.8. The purpose of the Minerals and Waste Development Framework is to provide a series of policies used to plan for mineral extraction and associated development and waste management facilities in the most sustainable way in line with the Government's sustainable development strategy in Planning Policy Statement 1: Delivering Sustainable Development (PPS1).

10.1.9. The Core Strategy document sets out the spatial vision for future mineral extraction and associated development through a series of strategic objectives and policies.

10.1.10. Norfolk County Council is preparing a Norfolk Minerals and Waste Local Plan Review to consolidate the three adopted plans which form the current Minerals and Waste Framework. This review will extend the plan period to the end of 2036. It is anticipated that the adoption of the Norfolk Minerals and Waste Local Plan Review will occur by March 2022.

10.1.11. The legislative and policy framework is summarised in Section 10.3 of ES Chapter 10, Material assets and waste **(TR010037/APP/6.1)**.

10.2. Need for the Proposed Scheme and further minerals assessment

10.2.1. The requirement for the Proposed Scheme is discussed in ES Chapter 2, The proposed scheme) **(TR010037/APP/6.1)**.

10.2.2. An EIA Scoping Report was submitted to the Planning Inspectorate in February 2018 **(TR010037/APP/6.5)**. The subsequent Scoping Opinion was adopted by the Secretary of State in March 2018 **(TR010037/APP/6.6)**. Norfolk County Council were consulted as part of the EIA scoping exercise for the Proposed Scheme. Norfolk County Council identified the DCO boundary as being partly underlain by a mineral resource (sand and gravel) which is safeguarded as part of the Mineral and Waste Core Strategy and as such, the council have a duty to ensure that the mineral resources are not needlessly sterilised. To determine whether the excavated minerals can be re-used on the Proposed Scheme, further minerals impact assessment is required.

10.2.3. Within the Scoping Opinion, the Inspectorate notes the consultation response from Norfolk County Council and stated that the extent to which the Proposed Development would impact mineral reserves should be assessed in the ES and that the Applicant should seek to agree the approach to the assessment.

Mineral resources

10.2.4. The BGS 1:50,000 scale geological map indicates that sections of the Proposed Scheme are underlain by superficial deposits of sands and gravels attributed to the Sheringham Cliffs Formation as shown on Figure 10.1, Superficial deposits **(TR010037/APP/6.2)**.

10.2.5. The Sheringham Cliffs Formation has been designated as a Mineral Safeguarding Area (MSA) as part of the adopted Norfolk Minerals and Waste Development Framework

(Figure 2). Additional deposits of alluvium are located adjacent to the Cantley Stream. These deposits of alluvium have also been designated as a MSA. Further assessment of the alluvium will be undertaken as part of a second phase of ground investigation and therefore has not been considered within this assessment. It is unlikely that significant quantities of alluvium will be excavated as part of the construction.

10.2.6. The inclusion of land in a MSA does not necessarily mean that planning permission would be granted for mineral extraction and there may be sound planning reasons why proposals would be rejected. Designation of these areas is intended to ensure that mineral interests are taken into account at the appropriate time.

10.2.7. For example, circumstances may arise where it may appropriate to undertake mineral extraction in advance of development. MPS1 (paragraph 13) states that planning authorities should encourage the prior extraction of minerals, where practicable, if it is necessary for non-mineral development to take place in MSAs.

10.2.8. The most recent ground investigation for the Proposed Scheme was undertaken between 26 March and 18 July 2018. The following paragraphs present a summary of the ground conditions across the Proposed Scheme and descriptive and interpretative detail of the strata at the site.

10.2.9. The Sheringham Cliffs Formation, encountered as glaciogenic sequences of sands and gravels, was typically described as brown/grey slightly clayey slightly silty SAND or GRAVEL, mostly of flint with some other minor lithologies.

10.2.10. The material was predominantly encountered as a sand, with localised extents (particularly at depth) encountered as gravel. Greater proportions of fine (clay and silt) secondary constituents were generally noted at boundaries with cohesive glacial deposits of the Lowestoft Formation, where interbedded or discrete pockets or bands of brown/grey sandy gravelly CLAY were noted.

10.2.11. The sands and gravels of the Sheringham Cliffs Formation were encountered across the entire Proposed Scheme extents, overlying Chalk bedrock. In the southern, eastern and western extents of the Proposed Scheme, the Sheringham Cliffs Formation was generally encountered at shallow depths, underlying topsoil or Made Ground. In the northern extents of the Proposed Scheme the Sheringham Cliffs Formation was typically encountered at depth, overlain by a thick (typically between 4 and 7 m thickness) band of cohesive glacial deposits of the Lowestoft Formation.

10.2.12. Typical thicknesses of the Sheringham Cliffs Formation encountered during the 2018 ground investigation ranged from between 3m and 6 m thickness in the southern extents of the Scheme, and between 6m and 10 m thickness in the northern extents of the Proposed Scheme.

10.2.13. This assessment focuses on the excavated material from the proposed A11–A47 connector road as the predominant source of site-won material for the Proposed Scheme. Predominantly in cutting with associated underpass structures, the proposed A11–A47 connector road is anticipated to encounter the Sheringham Cliffs Formation in varying

thicknesses, locally interbedded with and overlain by the cohesive material of the Lowestoft Formation.

10.3. Practicability and environmental acceptability for the extraction of mineral reserves and infrastructure

Prior extraction

10.3.1. Paragraph 143 of the NPPF requires Local Plans to:

> '*Set out policies to encourage the prior extraction of minerals, where practicable and environmentally feasible, if it is necessary for non-mineral development to take place'*.

10.3.2. Prior extraction is the process by which mineral is won from a site prior to non-mineral development taking place. This can take place at a number of different scales, which would depend on the size of the site, the depth of mineral, the type and quality of the mineral, and the nature of the proposed development. For example, it may take the form of a Materials Management Plan.

10.3.3. Constraints to prior extraction of mineral resources include:

- existing landscape features
- designated habitats and species
- sites of archaeological significance
- historic buildings and their settings
- existing sensitives developments (including residential properties)

10.3.4. To determine whether the above constraints would inhibit the practical prior extraction of Sheringham Cliffs Formation, a desktop was undertaken using GIS mapping produced for the Proposed Scheme.

10.3.5. The main points arising from the assessment of environmental constraints are discussed in the following sections.

Within the DCO boundary

10.3.6. No significant environmental constraints would preclude the prior extraction of the granular Sheringham Cliffs Formation (SCF) within the Proposed Scheme's DCO boundary.

10.3.7. The safeguarded granular SCF intersects the Proposed Scheme in the footprints of the existing A47, A11 (Hethersett Bypass) and B1172 Norwich Road infrastructure. This precludes prior extraction as the carriageways will be retained and amalgamated into the Proposed Scheme.

10.3.8. Safeguarded granular SCF deposits are mapped in four general locations of proposed infrastructure as shown on Figure 10.2, mineral safeguarding areas **(TR010037/APP6.2).**

10.3.9. Safeguarded SCF deposits are mapped in the vicinity of the proposed Drainage Basin 1 and the western extent of the A11-A476 link road (location 1 above). SCF deposits are encountered directly beneath topsoil and there will be areas of cutting which will remove a portion of the SCF deposits and there will be areas where the design levels will require materials import. Additionally, there will be a requirement to excavate material to form the drainage basin which, based on the geological profile established, is likely to result in the excavation of SCF deposits. Prior excavation of SCF deposits in the areas where the design levels will be built up would require a greater volume of materials to be imported as part of the Proposed Scheme.

10.3.10. Safeguarded SCF deposits are mapped at the southern extent of the proposed link road between the B1172 and Cantley Lane South (location 2 above). SCF deposits are at the surface, so substantial import of material will be undertaken at this location. SCF deposits are variable in thickness in this general location but generally were encountered directly beneath the topsoil. Thickness of the SCF deposits ranged from 10m to less than 5m. Additionally, an area of made ground was identified in this location, with SCF largely recorded beneath cohesive glacial deposits. Due to the volume of material required to be imported at this general location and the presence of made ground and cohesive materials at a greater ratio than 1:1 (overburden: safeguarded deposits) it is not considered economically viable to prior-excavate the SCF deposits at this location.

10.3.11. Safeguarded SCF deposits are mapped in the vicinity of the proposed A11-A47 connector road (adjacent to the east of the existing A47 carriageway) as a thinner layer of granular SFC (maximum recorded depth of 5 mbgl) underlain by cohesive glacial deposits. Additionally, this thinner upper layer of SFC deposits may be interbedded by the cohesive glacial deposits. The proposed design level at this location will require the excavation of this thinner upper layer of SCF, the majority of the cohesive glacial deposits and localised underlying SCF. Further excavation of the underlying SCF deposits in this location would require net import of material.

10.3.12. Safeguarded SCF deposits are mapped in the vicinity of the proposed drainage basin and A11-A47 connector road within the triangular area of land bound by Cantley Lane South, the existing A47 structure and railway line. There is a substantial thickness of made ground in the vicinity of the proposed drainage basin. This is associated with the areas historical use as a borrow pit which was subsequently infilled as landfill. Within this location there is no proposed change to the existing ground level with the exception of the excavation of the drainage basin. The depth and thickness of the SCF at this location suggests prior extraction would not be economically viable.

Outside the DCO boundary

10.3.13. Safeguarded deposits of SCF are located to the east of the existing A47 carriageway. Due to the built-up nature of this location further extraction would likely be restricted to small-scale excavation during new development. The Proposed Scheme is not considered to be a restriction to any such further extraction in this location.

10.3.14. Safeguarded deposits of SCF are located to west the of the Proposed Scheme (between the existing B1172 Norwich Road and A11 carriageways). The Proposed Scheme will not

restrict further extraction of safeguarded minerals within this location, however, due to the presence of sensitive receptors (residential properties and surface water) it is unlikely that the extraction of these minerals will be undertaken within this general location.

10.3.15. Safeguarded deposits of SCF are located to the south of the A11 and railway line and west of the A47. The Proposed Scheme is not considered likely to restrict the future extraction of SCF within this general location. Restrictions to future extraction include residential and agricultural farming infrastructure, use of the general location as agricultural land. Extraction of SCF deposits is also restricted by the presence of the existing road and rail infrastructure.

10.3.16. In summary, there are no significant environmental constraints to the prior excavation of mineral resources within the DCO boundary. Where the safeguarded deposits are known to be present withing the Proposed Scheme's DCO boundary, they predominantly intersect the existing A47 carriageway which will not be suitable for prior-extraction.

10.3.17. Safeguarded deposits are located in four general areas of proposed new infrastructure. Prior excavation of the deposits in these locations is restricted by the presence of significant thickness of made ground (in the vicinity of landfill site/sites of infilled borrow pits), depths of overburden (including cohesive glacial deposits), requirement to import materials at these general locations and requirement to maintain existing ground level.

10.3.18. Where the safeguarded SCF deposits extend beyond the DCO boundary extraction is unlikely to be constrained by the construction of the Proposed Scheme. Conversely, future extraction may benefit from the proposed improvements to the road network and reductions in congestion.

10.4. Mineral infrastructure sites

10.4.1. The mineral impact assessment also considers the constraints the Proposed Scheme may place on existing and proposed mineral extraction and mineral infrastructure sites.

10.4.2. The Norfolk County Council Adopted Revised Policies Map (2017) identifies:

- Existing mineral extraction sites and mineral infrastructure
- Existing mineral sites and mineral infrastructure consultation area
- Mineral extraction site specific allocation or consultation area for mineral site specific allocations and their indicative access routes.

10.4.3. There are no such designated sites within 3 km of the Proposed Scheme. It is concluded that the Proposed Scheme will not unduly restrict existing and proposed mineral operations within the Norfolk.

10.5. Policy tests

10.5.1. This section examines the degree to which the Proposed Scheme satisfies the test set out in Policy CS16 of the Norfolk Minerals and Waste Development Framework Core

Strategy and Minerals and Waste Development Management Policies Development Plan Document (2010-2026 (published 2011).

Policy CS16 Safeguarding mineral and waste sites and mineral resources

10.5.2. Policy CS16 states that Norfolk County Council will safeguard existing, permitted and allocated mineral extraction and associated development, which is currently active, has planning permission and is an allocated site.

10.5.3. Norfolk County Council will oppose development proposals which would prevent or prejudice the use of safeguarded sites unless suitable alternative provision is made. The Policy cites paragraph 13 of Minerals Policy Statement 1: planning and minerals which '*cautions against proven mineral resources being 'needlessly' sterilised by non-mineral development'.*

10.5.4. Although no further definition of '*needlessly sterilised'* is provided within the Council's Norfolk Minerals and Waste Development Framework, it can be assumed that this would include excavation and disposal of the safeguarded mineral resource, reduced access to safeguarded resources through development, proximal sterilisation and encroachment of existing development onto safeguarded resources.

10.5.5. To determine whether the Sheringham Cliffs Formation is suitable for reuse within the Proposed Scheme, the material has been compared to the geotechnical parameters provided within Table 6/2 of the Manual of Contract Document for Highway Works: Vol 1: Specification for Highway Works Series 600.

10.5.6. The sands and gravels of the Sheringham Cliffs Formation were encountered across the entire Proposed Scheme extents, overlying Chalk bedrock. In the southern, eastern and western extents of the Proposed Scheme, the Sheringham Cliffs Formation was generally encountered at shallow depths, underlying topsoil or Made Ground.

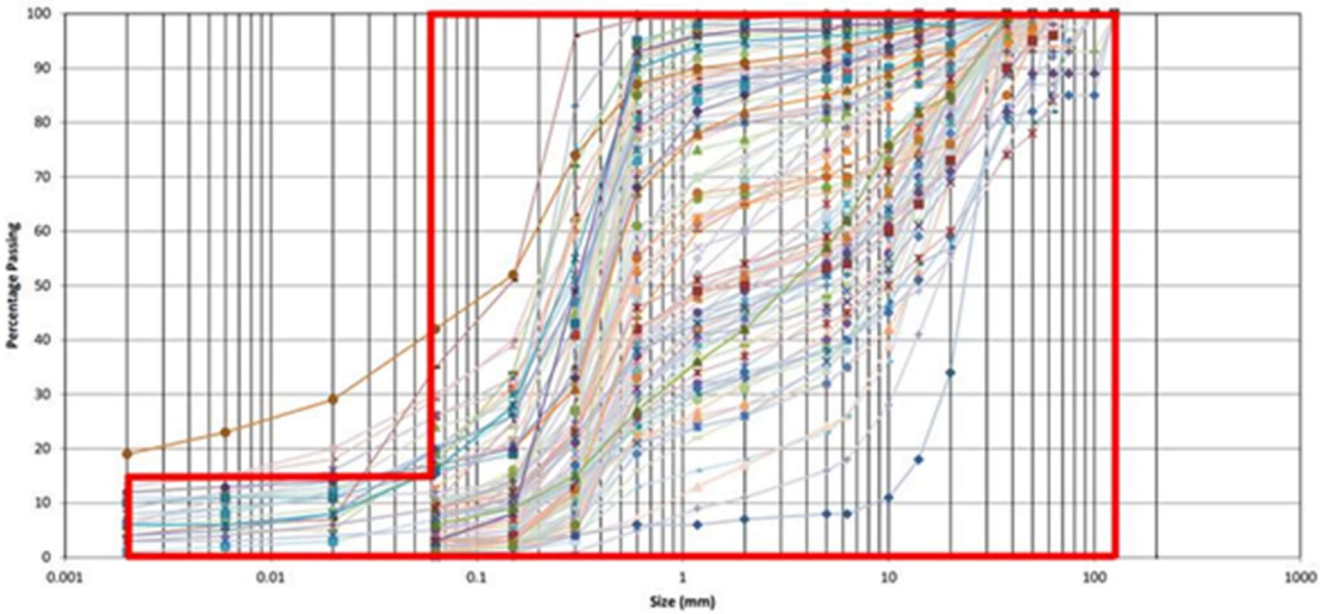
10.5.7. Particle size distribution (PSD) testing results for the Sheringham Cliffs Formation (Figure 1) indicate a relatively wide grading envelope owing to proportions of fine (clay and silt) secondary constituents at boundaries with cohesive glacial deposits of the Lowestoft Formation. Generally, however, the material was encountered as a sand or gravel indicating that the excavated material may be predominantly suitable for reuse as a general granular fill.

10.5.8. Particle size distribution testing generally indicates that the Sheringham Cliffs Formation would classify as a Class 1A/B material by grading as the % passing the 63microns sieve is predominantly less than 15%.

10.5.9. The grading requirement for Class 1A/B material is shown in the figure below in line with Table 6/2 of the Manual of Contract Documents for Highway Works: Vol. 1: Specification for Highway Works (SHW) Series 600.

10.5.10. Particle size distribution testing indicates that approximately 80% of the Sheringham Cliffs Formation would classify as a Class 1A/B material by grading.

Figure 1 PSD distribution of the Sheringham Cliffs Formation.



10.5.11. This preliminary assessment focuses on the cuttings which form the proposed A11–A47 connector road as the predominant (greater than 80%) source of site-won material for the Scheme. Whilst elements of the Scheme layout continue to develop, at the time of undertaking this assessment the three proposed cuttings and associated underpass structures are anticipated to generate a volume of excavated material of the order of 215,000m^3, excluding stripped topsoil.

10.5.12. Preliminary interpretation and inferred geological boundaries from the available ground investigation information suggests that approximately 50% (107,500m^3) of the material excavated from the cuttings which form the proposed A11–A47 connector road will comprise the Sheringham Cliffs Formation.

10.5.13. Based on the grading results only, of this 107,500m^3 of the Sheringham Cliffs Formation, approximately 80% (86,000m^3) is anticipated to classify as a Class 1A/B material by grading, with the remaining 20% (21,500m^3) anticipated to classify as a Class 2A/B material by grading.

10.5.14. A full assessment of reuse potential has not been carried out and the reusability of material will depend on strength, moisture content and condition upon excavation and the feasibility to treat the material. However, as the Proposed scheme has a significant earthworks material deficit, any opportunity to reuse this material in the works will be exploited and as much material as possible will be reused as general embankment fill (Class 2A / 2B) or alternatively for landscaping.

10.5.15. The Proposed Scheme has been designed to avoid and minimise the impacts on material resources through the process of the assessment of alternatives and 'embedded' mitigation as defined in *DMRB LA 104 (Environmental Assessment and Monitoring*). Design measures integrated into the Proposed Scheme for the purpose of minimising the

environmental effects is reported in ES Chapter 2, The proposed scheme **(TR010037/APP/6.1)**.

10.5.16. Section 10.9 of ES Chapter 10, Material assets and waste **(TR010037/APP/6.1)** reports on 'essential' mitigation required in addition to embedded mitigation to reduce and offset likely significant adverse environmental effects

10.5.17. The following essential mitigation has been outlined to ensure that excavation material attributed to the Sheringham Cliffs Formation is not '*needlessly sterilised'*:

- In accordance with the EA Waste Framework Directive 2008/98/EC 'waste hierarchy', the Proposed Scheme aims to prioritise waste prevention, followed by preparing for re-use, recycling and recovery and lastly disposal to landfill
- Design for re-use and recovery by identifying, securing and using materials that already exist on the Proposed Scheme
- Design for materials optimisation by simplifying the layout and form to minimise material use and balancing cut and fill.

10.5.18. In accordance with *DMRB LA 120 (Environmental Management Plan)* an Environmental management plan (EMP), first iteration **(TR010037/APP/7.4)** has been prepared parallel to the development of the Proposed Scheme design and construction methodologies. Measures and procedures within the EMP include design, construction and operational mitigation, which have been developed in-line with the requirements arising from the ES.

10.5.19. The Principal Contractor will refine the EMP **(TR010037/APP/7.4)** prior to commencement of works based on the EMP (second iteration). As part of this, the Principal Contractor will be required to generate a materials management plan (MMP).

10.5.20. The MMP would be developed in accordance with the *CL:AIRE Definition of Waste Code of Practice (DoW CoP), Version 2, 2011 CL:AIRE Code of Practice*. This approach offers the most effective method of ensuring materials can be re-used on or off the Proposed Scheme. The MMP will detail the procedures and measures to be implemented to classify, track, store, re-use and dispose of all excavated materials encountered during the construction phase.

10.5.21. In addition to the mitigation outlined in ES Chapter 10, Material assets and waste **(TR010037/APP/6.1),** the chapter also outlines potential enhancement measures to be incorporated into the Proposed Scheme including re-use of suitable surplus material outside of the Proposed Scheme's DCO boundary. Examples include the use of suitable surplus materials in engineered noise and landscaping bunding and on local projects such as fenland restoration that are concurrent to the construction phase of the Proposed Scheme.

10.6. Conclusions

10.6.1. Under the Roads Investment Strategy (RIS2), it has been identified that there is a requirement to improve transport infrastructure at the A47/A11 Thickthorn Junction. The proposed upgrade is part of the wider programme of A47/A11 corridor improvement

programme required to improve connectivity and stimulate growing economic activity in Norwich and South Norfolk.

10.6.2. The existing Thickthorn Junction connecting traffic between the A11 and A47 experiences high levels of congestion, acting as a bottleneck and leading to longer and unreliable journey times

10.6.3. The proposals will create a new A11-A47 connector road, a new link road between Cantley Lane South and the B1172 Norwich Road and upgrade the existing Thickthorn roundabout that will relieve congestion, provide extra road space, improve safety and help provide a free-flowing network.

10.6.4. Due consideration of the environmental impacts of the Proposed Scheme in the context of applicable National and local planning policy confirms that there is a clear need for the Proposed Scheme to proceed.

10.6.5. The Norfolk Minerals and Waste Development Framework identifies the presence of Minerals Safeguarding Areas which intersect the Proposed Scheme in the footprint of the existing A47 road infrastructure. In these instances, mineral resources are sterilised by the existing development, whilst prior extraction is prohibited as the carriageway will be in use during the offline construction works and will be retained or amalgamated into the Proposed Scheme.

10.6.6. However, for some parts of the Proposed Scheme, the opportunity is presented to undertake prior excavation of the granular Sheringham Cliffs Formation designated as a Mineral Safeguarding Area (MSA). The intention is to use excavated materials within the Proposed Scheme in accordance with the wider measures developed to avoid and minimise the impacts on material resources through the process of the assessment of alternatives and 'embedded' mitigation.

10.6.7. Where deposits of safeguarded minerals are present outside of the DCO boundary the Proposed Scheme is not considered likely to further constrain future extraction of deposits.

10.6.8. The Proposed Scheme has an earthworks materials surplus, however, any opportunity to reuse this safeguarded material in the works will be exploited and as much material as possible will be reused. This approach is in accordance with the EA Waste Framework Directive 2008/98/EC "Waste Hierarchy" and is considered to present an appropriate means of ensuring proven mineral resources are not '*needlessly*' sterilised by non-mineral development.

10.7. References

- Department for Transport (2014) National Policy Statement for National Networks (NPSNN). Available online at: *https://www.gov.uk/government/publications/national-policy-statement-for-national-networks*
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