
The Norfolk County Council (Norwich Northern Distributor Road (A1067 to A47(T))) Order

Applicant's comment on Written Representations by Environmental Agency

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Infrastructure Planning

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Introduction

This document provides the Applicant's responses in respect of selected issues raised by Environmental Agency in their Written Representation to the Examining Authority dated 3 July 2014. The Written Representation covers many issues. Some of these have been addressed elsewhere (including the Applicant's comments on Relevant Representations, and the Applicant's comments on other Written Representations). Therefore a limited selection of issues raised have been extracted and comments provided.

The points have been responded to where possible in the order they were raised. Each issue, or in some cases a summary of it, is shown in italics.

This document should also be read in conjunction with the Statement of Common Ground NCC/EX/6.

Applicant's comment on Written Representations

Representation

1.1. Construction Phase

Issue - Land Contamination

As highlighted as part of our Relevant Representation, the appropriate management of contaminated soils is required. Any known or subsequently identified land contamination should be appropriately managed to ensure the risk to controlled waters is adequately mitigated. In particular, the risk of disturbance to the Deighton Hills historic landfill during the construction works should be considered and adequately addressed.

Impact

There is a risk that existing contamination could become mobilised during construction, causing deterioration in the quality of the water environment.

Solution

As previously identified, the Environmental Statement (ES) outlines procedures to be put in place for dealing with unsuspected contamination (Volume 1, Paragraph 9.5.14), and states that: "Guidance regarding the correct procedure for storage, handling and disposal of contaminated soils will be detailed in the CEMP". The draft Construction Environment Management Plan (CEMP) does not include this level of detail and should therefore be expanded upon within the final CEMP.

The draft DCO includes Requirement 8 - Contamination. We are not currently included as a named consultee in respect of Requirement 8, and request that we are added so we can review and comment on measures proposed.

Furthermore, Requirement 8 should also specifically require remediation that is sufficient to protect water resources, in particular groundwater quality. This may require different standards or mitigation to the currently required remedial measures, the purpose of which is to render the land fit for purpose.

Applicant's comment

- 1.1.1 Norfolk County Council (NCC) agreed with the EA that the Construction Environment Management Plan should include these matters. The parties also agreed that the EA should be a consultee on Requirement 8 of the Development Consent Order. Refer to SoCG point 3.1.2(Document Ref NCC/EX/6).

Representation

2.1 Issue - Protection of groundwater and surface waters

Section 14.6 of the Environmental Statement outlines example mitigation measures to be included in the Construction Environmental Management Plan (CEMP). These measures will need to be considered further and site specific detail agreed prior to commencement of each phase.

Impact

Insufficient mitigation measures may lead to adverse impacts on water resources (surface water and groundwater) through the uncontrolled release of pollutants or sediment. Discharges to any surface water systems during the construction phase of the project may require approval from us prior to release. This is due to the greater risk of sediment laden water passing through the settlement/infiltration ponds without receiving the necessary level of settlement.

Solution

As previously highlighted, we are satisfied that in principle, the mitigation measures proposed to be employed during construction activities should prevent any adverse impacts on water resources (surface water and groundwater), but we would wish to review the detailed proposals.

Further detail on the proposed mitigation and procedures should be provided through the preparation of the Construction Environment Management Plan (CEMP), necessary to satisfy draft DCO Requirement 19, or the scheme for pollution control,

necessary to satisfy draft DCO Requirement 15 (Safeguarding of watercourses and drainage). In particular, further detail should be provided on the remedial measures proposed in the event of a major storm causing sediment laden run-off to overwhelm site protective measures.

We are not currently included as a consultee for either Requirement 15 or 19, and request that we are specifically named so we can review and comment on the details proposed.

We also remain unclear as to how these two Requirements will interact. There appears to be the potential for duplication between the controls required to protect the water environment during construction as part of Requirement 15, and those in the CEMP under Requirement 19?

Applicant's comment

- 2.1.3 Refer to point 3.1.3 of the SoCG. NCC agreed with the EA that the further information will be supplied in the Addendum to the Habitats Regulations Assessment (which is currently with Natural England for final review) and the final version of the Addendum to the Environmental Statement Volume 1: Chapter 14 and Volume 2: Chapter 21 Flood Risk will provide sufficient evidence to meet the Environment Agency's concerns regarding major storms.
- 2.1.3 Further detail on the proposed mitigation and procedures will be provided as part of the Construction Environment Management Plan (CEMP). The CEMP will be produced to satisfy draft DCO Requirement 19.
- 2.1.4 Regarding interaction between Requirement 15 and 19, refer to SoCG point 3.1.4, where NCC clarified that Requirement 19 ("Construction Environment Management Plan") is primarily associated with environmental protection (including the protection of ground and water sources) during construction of the scheme. Requirement 15 ("Safeguarding of Water Courses and Drainage") is primarily associated with the operation of the scheme.

Representation

3.1 Issue - Dewatering

As part of our Relevant Representation, we highlighted the need for the applicant to contact us prior to any dewatering activity being undertaken to ensure that the current regulatory requirements are complied with. This advisory comment remains valid, and we maintain our request for advanced discussions on this issue.

Applicant's comment

3.1.1. Refer to SoCG point 3.1.5 where NCC confirmed that the EA will be consulted before any temporary dewatering begins.

Representation

4.1 Issue - Waste Management

Our Relevant Representation included advisory comments in respect of ensuring compliance with the Environmental Permitting (England and Wales) Regulations 2010, in terms of waste management and disposal. The preliminary Site Waste Management Plan (SWMP), and draft Construction Environment Management Plan (CEMP) outline the approach to be followed. We recommended that further consultation is undertaken with us on these issues prior to any works being carried out.

Impact

A detailed Site Waste Management Plan will be necessary to ensure effective waste management that meets regulatory requirements.

Solution

As previously highlighted, Requirements 17 and 19 in the draft DCO require the submission and approval of final versions of the SWMP and CEMP prior to the commencement of works. The above issues should be addressed, as appropriate, within these documents.

Requirements 17 and 19, as currently drafted, do not allow us to review or comment on those documents prior to their approval. We would request that we are added to the required consultees for each of these documents.

Applicant's comment

- 4.1.1. Refer to SoCG, point 3.2 where NCC confirmed that the advisory comments were noted and informed that NCC's proposals associated with waste management are outlined in the Construction Environmental Management Plan.
- 4.1.2. As stated in SoCG, point 3.2.2, NCC agreed that the EA should be consulted on the proposals for the storage, treatment and use of the waste materials.
- 4.1.3. The parties also agreed that the Environment Agency should be included as a consultee in relation to Requirements 17 and 19 of the Development Consent Order. Refer to SoCG, point 3.2.4.

Representation

5.1 Operational Phase

Issue - Protection of groundwater and surface waters

The scheme will discharge road run-off primarily to ground through infiltration lagoons. Principal aquifer, which supports water supply and river base flows, underlies the route. The ES also identifies the groundwater as being highly vulnerable for the majority of the route, due to the high leaching potential of the soils.

The option to discharge run-off to surface waters is stated within the ES as generally not available. Discharge to surface water is however proposed at three locations.

One of these is to the River Yare via the existing A47 system at the Postwick junction. The others are as a result of high groundwater levels making infiltration at those locations inappropriate. Significantly, the two receiving watercourses in that instance both feed into The Springs County Wildlife Site, described within the ES as

being of high conservation value.

Impact

Without sufficient treatment steps and safeguards, there is the potential for adverse impacts on the receiving waters from routine run-off or accidental spillages. An appropriate level of detail is required to demonstrate that the receiving groundwater and surface waters will be afforded an adequate level of protection during the operation of the proposed scheme.

Solution

As highlighted in our Relevant Representation, the scheme proposes the use of sustainable drainage systems (SuDS) to manage surface water run-off. We note the reference within the ES (Volume 2, Chapter 14, Section G paragraph G.1.16), stating that the specific details of the pollution prevention measures for the drainage scheme will be confirmed and developed in the detailed design phase.

However, further information is required from the applicant prior to the granting of the DCO on the individual aspects of the proposed drainage scheme as detailed below in sections 2.1.1 – 2.1.6. This is to ensure that the principle requirements necessary to protect the water environment are capable of being integrated into the scheme design.

The draft DCO includes Requirement 25 (Surface water drainage), which requires the approval of a detailed surface water strategy prior to the commencement of the scheme. This Requirement should be amended to specifically refer to a surface water drainage strategy that includes pollution control measures. We request that we are added to the consultees that would be required to review the strategy.

Requirement 25 should address the detailed design issues in relation to how the scheme will comply with the agreed principles, following the confirmation that the key drainage principles will be incorporated into the scheme. The sections below detail our current position on the aspects of the scheme necessary to protect the water environment.

Applicant's comments

- 5.1.1. Refer to SoCG, point 3.3.1. NCC agreed to amend Requirement 25 and include the EA as a consultee.

Representation

6.1 *SuDS treatment steps*

Our Relevant Representation highlighted the requirement for the SuDS management train to include at least three treatment steps, in accordance with the requirements of the SuDS Manual (CIRIA C697, 2007), and the draft National Standards for Sustainable Drainage Systems (DEFRA, 2011). Further information received from the applicant provides more detail with respect to the proposed treatment trains for each catchment. However, it has not yet been demonstrated that the requirement for three treatment steps has been satisfied for each SuDS management train and further information or clarification will need to be provided to demonstrate this.

Additional information has also been received from the applicant on the proposed discharge to surface water via lagoons 17, 18 and 18A. The proposals demonstrate the inclusion of appropriate treatment measures ahead of lagoon 17 and 18A, and we can confirm that we are satisfied in that respect. However, some uncertainty remains for lagoon 18, and we are seeking further clarification from the applicant on the functioning of that system.

Applicant's comments

- 6.1.1 Refer to SoCG, point 3.3.2. Norfolk County Council acknowledges that three stage treatment steps are not provided in all instances. However, the final version of the Addendum to the Environmental Statement Volume 1: Chapter 14 and Volume 2: Chapter 21 Flood Risk Assessment will provide further assessment of the treatment stages proposed and the risk of accidental spillage and routine road run off to groundwater.

6.1.2 Regarding Lagoon 18, further information will be submitted to the EA as part of the above report.

Representation

7.1 Swales

As part of our Relevant Representation, we repeated our previously made comment that swales should generally be lined where soils have good infiltration characteristics and the groundwater vulnerability is high. This is because unlined swales can allow run-off to infiltrate directly to groundwater, by-passing the subsequent treatment steps in the management train, and subsequently presenting a risk to the quality of the receiving groundwater. Under the Water Framework Directive (WFD) and the Groundwater Daughter Directive (GWDD), in order to protect groundwater quality, inputs of hazardous substances should be prevented and pollution from non-hazardous pollutants limited ('prevent and limit').

The applicant has subsequently provided us with further information on this matter, including the completion of a groundwater risk assessment as part of the draft Addendum to the ES and FRA. This considers the risk to groundwater from infiltration through unlined swales. We are currently reviewing the submitted risk assessment documents and will advise the applicant as to whether we agree with the results of the risk assessment, and consider the risk to have been adequately characterised and mitigated.

Applicant's comments

7.1.1 This matter is covered under the SoCG, point 3.3.3. NCC has noted the above comment.

Representation

8.1 *Depth of unsaturated zone*

Our Relevant Representation highlighted concerns in respect of the unsaturated zone thickness beneath infiltration lagoons 4, 8 and 9. We had previously agreed with the applicant that there would be a minimum of 1.2 metres of unsaturated zone beneath the infiltration basins to afford appropriate protection to the receiving groundwater resource and to allow adequate infiltration to manage surface water run-off. The SuDS Manual (CIRIA C697, 2007) specifies that the infiltration surface should be at least 1 metre above the maximum anticipated groundwater level.

We stated that the identified unsaturated zone thickness of 1.11m for lagoon 8, and 1.12m for lagoon 9 may be sufficient provided groundwater at those locations does not rise further, and this should be appropriately considered. The ES (Volume 1, paragraph 14.6.9) also confirms that detailed design measures that could further reduce the risk to groundwater will be discussed with us.

We raised particular concerns in respect of lagoon 4, which was described within the ES as having only 0.4m depth between its base and the maximum groundwater level. Subsequent information (draft ES and FRA Addendum) and correspondence from the applicant has stated that this high groundwater level related to a perched water table (above the principal aquifer). Boreholes and trial pits have suggested that this perched water table is not present beneath lagoon 4, and therefore the unsaturated zone is considered to be 8.1m. On this basis, we would be satisfied with the design of lagoon 4, but would suggest that this situation is monitored and remains capable of being addressed at the detailed design stage if the higher groundwater levels are subsequently found to be present.

Applicant's comments

8.1.1 Refer to SoCG, point 3.3.4. Following receipt of the Relevant Representation, NCC investigated this issue further and will provide information as part of the final version of the Addendum to the Environmental Statement Volume 1: Chapter 14 and Volume 2: Chapter 21 Flood Risk Assessment. The Applicant understands the EA is now

satisfied with the depths beneath Lagoons 4 and 8. Lagoon 9 is the only location where 1.2m unsaturated depth is not achieved (i.e. 1.12m), however the EA considers that the depth may be sufficient providing groundwater levels do not rise. NCC agreed to monitor the depth of groundwater in the vicinity of Lagoon 9 until completion of construction.

Representation

9.1 *Spill containment capacity*

Confirmation that the primary lined ponds will be capable of isolating and retaining at least one tanker load plus fire fighting water in the event of an accident is required, an issue we raised in our Relevant Representation. The ES (Volume 2, Chapter 14: Road Drainage and the Water Environment, Section G) stated that this volume would equate to 20m³ and could be accommodated. However, it is our understanding that a road going tanker can carry as much as ~ 42,000 litres (42 m³), and as such we are seeking confirmation to ensure that the proposed system is appropriately sized.

Applicant's comments

9.1.1 Refer to SoCG, point 3.3.5. The capacity of the smallest primary lined pond is in excess of 250m³ . On that basis, NCC agreed with the EA that the pollution control measures are capable of retaining at least one tanker load plus fire fighting water.

Representation

10.1 *The Springs County Wildlife Site*

Our Relevant Representation response recommended that monitoring of water quality, flows and groundwater levels at The Springs should be carried out pre-, during and post-construction to confirm that there will be no adverse impacts on the conservation value of the CWS. The ES Volume 1 at paragraph 14.6.2 states that monitoring shall be required through the CEMP pre- and during construction. Our position remains that this monitoring should continue post-construction. We would suggest that the applicant drafts a monitoring protocol for us to review.

Our previously raised comment in respect of the detailed design considerations for Lagoon 17, given its proximity to 'Lake 2' which is utilised for spray irrigation, remains valid.

Applicant's comments

10.1.1 Refer to SoCG, point 3.3.6. As part of the final version of the Addendum to the Environmental Statement Volume 1: Chapter 14 and Volume 2: Chapter 21 Flood Risk Assessment, NCC will provide further information on the water environment surrounding The Springs and identify how the proposed scheme design interacts with these water bodies. The report will also summarise the potential impacts of the scheme.

10.1.2 Section 14.6.2 of Volume 1 of the Environmental Statement (Document Ref 6.1) outlines that "monitoring of surface water and groundwater quality, groundwater levels and flows in the streams at 'The Springs' will commence six months prior to any pre-construction works. The monitoring will continue during construction at frequencies to be agreed with the Environment Agency." NCC agreed with the EA that groundwater and water table monitoring should be undertaken as outlined in the above document.

- 10.1.3 Regarding detailed design considerations for Lagoon 17, the EA reviewed information provided in a draft Addendum to the Environmental Statement Volume 1: Chapter 14 and Volume 2: Chapter 21 Flood Risk Assessment and confirmed in their letter dated 3 July 2014 (see appendix A), Section E that the treatment measures ahead of Lagoon 17 are satisfactory.

Representation

11.1 *Postwick Hub*

We previously stated that we were satisfied with the drainage proposals for the ‘Postwick Hub’ element of the scheme, subject to the acceptability of the associated detailed groundwater risk assessment. This concerns the NDR drainage lagoons 27, 28, 29 & 30. These lagoons are proposed to discharge to ground via infiltration within an area now defined as Source Protection Zone 1 (SPZ1), designated as such due to the public water supply groundwater abstraction at Postwick. For discharges to ground within an SPZ1 it must be ensured that the groundwater is afforded an appropriately high standard of protection and any discharge must be supported by a risk assessment demonstrating that the potential risks are adequately mitigated.

We have had further discussions with the applicant in respect of the detailed design proposals, and these remain on-going. Our view is that an appropriate drainage scheme can be secured at the Postwick Hub junction.

We understand that this scheme is currently progressing.

Applicant’s comments

- 11.1.1 Refer to the SoCG, point 3.3.8. NCC agreed with the EA that further details will be provided and agreed prior to the Postwick Hub Junction becoming operational.

Representation

12.1 Infiltration lagoons

As discussed below in section 2.2.4.1, the applicant has proposed to introduce infiltration trenches at the base and sides of a number of infiltration lagoons where the drain down times have been found to be very poor. The trenches will be backfilled with a more permeable material. Although it is proposed that silty sand material will be used to backfill the trenches as discussed in submitted documents, we consider the proposal to be similar to a deep bore soakaway, which has the potential to act as a preferential pathway for introducing pollutants to the groundwater below. As such, the applicant should have regard to our Groundwater Protection: Principles and Practice (GP3 v1.1, 2013) position statement G9. The applicant should ensure that the resultant increased risk is adequately mitigated in line with the requirements of this position statement.

Applicant's comments

12.1.1 Following the submission of this Written Representation it has been confirmed with the Environment Agency that there is sufficient unsaturated zone beneath the base of the trenches for them to not represent deep bore soakaways.

Representation

13.1 Flood risk management

Issue - Fluvial and Tidal Flood Risk & 2.2.2 Issue - Surface Water Flood Risk

As stated in our Relevant Representation, the scheme will not be at risk from either of these existing sources of flooding.

Applicant's comments

13.1.1 NCC has noted this comment.

Representation

14.1 Issue - Overland Flow Routes

As highlighted within our Relevant Representation, there is a residual risk associated with overland flows impacting on third parties in catchment OL12, if the proposed culvert were to become completely blocked in a 1 in 100 year rainfall event including climate change.

Impact

The FRA details the flood extents and levels in mAOD, but not the potential flood depths. While it is shown that no residential or commercial buildings would be at risk of flooding with the culverts operating as intended or in a blockage scenario, for catchment OL12 if the culvert were to be blocked flood water would extend right up to a residential property and would inundate an outbuilding.

Solution

Further detail should be provided on the likely flood depths, and it should subsequently be determined whether this increased risk of flooding to third party land would be acceptable.

Applicant's comments

14.1.1 Refer to the SoCG, point 3.4. NCC has provided flood depths as requested, as part of Addendum to the Environmental Statement Volume 1: Chapter 14 and Volume 2: Chapter 21 Flood Risk Assessment.

14.1.2 NCC considers this risk to be very low and acceptable, as Plan No MMD-233906-DT-0948 in the Drainage and Surface Water Management Plans (Document Ref 2.11) shows the flooding extent that would be reached for a 1 in 100 storm event plus a simultaneous complete blockage of the culvert at chainage 10800. This culvert would be listed on the County Council's bridge database and managed in accordance with its current Transport Asset Management Plan with inspection every three years.

Initially following construction of the scheme the culvert would be inspected on an annual basis to check for blockages. The culvert design will enable a screen to be retro fitted at the inlet, if this is considered necessary.

Representation

15.1 Catchment OL29

We also previously raised concerns that catchment OL29 is proposed to drain to lagoon 25, which has very low infiltration rates, and a drain down time considerably in excess of that recommended by the SuDS Manual (CIRIA C697, 2007). Further information received from the applicant (titled draft Addendum to Environmental Statement: Volume I: Chapter 14 and Volume II: Chapter X Flood Risk Assessment), has proposed alternative options to improve the drainage performance of a number of lagoons (see section 2.2.4.2 below), including lagoon 25.

The proposed solution involves improving the infiltration rate by installing granular filled trenches at the base and side of the basin. This would reduce the drain down times to an acceptable level (see below for more detail on this). We would be satisfied with this approach subject to the submission of the supporting modelling calculations, which should include the catchment drainage, to demonstrate that the half drain times have been correctly modelled and the validity of proposals.

Applicant's comments

15.1.1 Refer to the SoCG, point 3.4.1 and 3.4.2. NCC agreed with the EA further measures to improve the infiltration rates for Lagoon 25. The modelling calculations including the catchment drainage will be contained in the final version of the Addendum to the Environmental Statement Volume 1: Chapter 14 and Volume 2: Chapter 21 Flood Risk Assessment.

Representation

16.1 *Proposed Surface Water Drainage Scheme*

Infiltration Basins

The majority of the road is proposed to drain through swales into primary lagoons and then infiltration basins, incorporating SuDS features in accordance with the National Planning Policy Framework. The infiltration basins have been designed to contain the peak duration 1 in 100 year rainfall event including an allowance for climate change.

Issue

We previously raised the issue within our Relevant Representation that in a number of cases the half drain down times of the proposed basins exceeded the recommended 24 hours in the SUDS Manual (CIRIA C697, 2007). Five infiltration basins (13, 18a, 23, 24, 25) were proposed to have half drain down times of greater than seven days, although the actual drain down times did not appear to have been calculated. The long drain down times were due to the proposed location of the basins in areas with poor infiltration rates. In such areas the SuDS Manual does not consider it appropriate to use infiltration features.

In response to concerns raised on this issue at the pre-application stage, Appendix F of the FRA included the statement that: “we propose that during the detailed design process further permeability testing is undertaken, and modifications to the designs and management of the basins be investigated in order to increase drainage rates. This could include the use of trenches in the bases of the lagoons, or other treatments to promote more effective infiltration.”

Our Relevant Representation highlighted the importance of demonstrating the effective functioning of the proposed drainage scheme prior to any approval given. This was due to concerns that any subsequently required changes to improve infiltration rates may not be capable of being accommodated within the scope of an already agree scheme. We consequently requested further information on this matter.

Impact

Infiltration basins should be sited in highly pervious areas with good infiltration rates as detailed in Table 15.1 of the SUDS Manual. Half drain times of greater than 24 hours should not be exceeded to allow for adequate storage for multiple storms, and to minimise the risk of compaction of soils at the base of the infiltration feature. The SuDS Manual also states that ‘Infiltration basins ... should not be used as regional solutions due to the increased risk of sediment loadings and pollution events from large contributing areas’. In this instance, the proposed basins will be draining very large areas, with large volumes of water being contained.

The basins with long drain down times had been designed to contain an additional 1 in 10 year rainfall event, to seek to ensure that subsequent storage would be available while the surface water from the previous event was still draining. Despite this, we had concerns that the basins with low infiltration rates will not drain sufficiently, with water being retained and large ponds forming. The large volumes of water being stored might also compact the soils at the base and so further reduce the infiltration rates. Furthermore, the drainage plans show that any flows that exceed the capacity of basins 24 and 25 will drain to the carriageway of the new road.

Therefore we questioned the sustainability and functionality of the proposed infiltration basins in the areas of low infiltration rates and considered that it should be demonstrated that all options for improved drainage in these locations has been considered and assessed, including drainage via positive outfall to watercourse or sewer rather than use infiltration.

Solution

We have since received, directly from the applicant, a draft Addendum to Environmental Statement: Volume I: Chapter 14 and Volume II: Chapter X Flood Risk Assessment.

In order to resolve the issue of poor infiltration rates and long drain down times, alternative options have been considered for basins 13, 13A, 18A, 22, 23, 24 and 25. These consisted of: 1) Outfall to a watercourse, 2) Construction of granular filled

trenches at the base or sides of the basin to provide good infiltration medium which extends down to the crag with good infiltration rates, 3) Installation of Aquacell trenches extending down to the crag with good infiltration rates, and 4) Outfall to another infiltration basin with better infiltration rates.

The viability of each option was assessed and where more than one option was deemed viable, which included a consideration of the resultant unsaturated zone, the cheapest option was selected.

For Basin 18A Option 1 was selected, with a positive restricted outfall to Dobbs Beck. The revised half drain time has not been detailed.

For Basin 22 Option 4 was selected, with a positive outfall to Basin 21 with very good infiltration rates. This reduced the half drain time for Basin 22 from 8 days to 12 hours which is a significant betterment and ensures that the basin meets the recommended 24 hour half drain time in the SUDS Manual.

For the remaining basins 23, 24 and 25, Option 2 was selected; the use of granular filled trenches at the base or sides of the basin to provide good infiltration medium which extends down to the crag with good infiltration rates. The use of this option reduced the half drain times for the basins, which were previously between 8 to 125 days, to between six and seven days. While the half drain times are greater than the industry standard of 24 hours as recommended in the SUDS Manual, it provides greater confidence that the basins will drain, and that the proposed basins will function as required. As previously proposed an additional storage volume equating to the 1 in 10 year storm event has been provided in case a subsequent storm occurs while the previous event is draining.

However, the supporting modelling calculations for the above lagoons have not been submitted to demonstrate that the half drain times have been correctly modelled. The full basin drainage calculations (including the proposed infiltration trenches) will need to be submitted to demonstrate the validity of proposals.

Basin 25 was previously modelled as accepting OL29 catchment flows – it is not clear if this included in the new modelling with the infiltration trench, so again this needs to be confirmed, and the modelling submitted.

We can therefore confirm our view that, subject to a review of the full basin drainage calculations, the approach proposed in the draft Addendum to the ES and FRA will appropriately improve the drainage performance of those infiltration basins where this was previously inadequate. The amended designs and plans, along with the modelling calculations, will need to form part of the DCO application.

Applicant's comments

16.1.1 Refer to the SoCG, point 3.4.2. The parties agree that Norfolk County Council's approach to dealing with the above concerns is appropriate subject to the Environment Agency reviewing the final drainage calculations.

Representation

17.1 *Attenuation Basins*

We previously confirmed as part of our Relevant Representation that we were satisfied that the two lagoons proposed to discharge to surface water (lagoons 17 and 18), appear appropriately sized and capable of draining within an acceptable timeframe, although this would take longer than the usually required 24 hour half drain time.

As highlighted in 2.2.4.1, further information received from the applicant (the draft Addendum to the ES and FRA), and subsequent correspondence has confirmed that lagoon 18A is now also proposed to be lined with an outfall to surface waters. We can confirm that we are also satisfied with the drainage performance of this lagoon, although please also see our comments in section 2.1.1 of this response regarding the SuDS management train requirements.

For all three lagoons, the full drainage calculations are required to be submitted to demonstrate the validity of proposals.

Applicant's comments

17.1.1 Refer to the SoCG, point 3.4.3. The parties agree that the proposed arrangements for outfalls will be shown in the final version of the

Addendum to the Environmental Statement Volume 1: Chapter 14 and Volume 2: Chapter 21 Flood Risk Assessment. Drainage calculations will be contained in the final version of the above report.

Representation

18.1 Habitats Regulation Assessment (HRA)

Our Relevant Representation highlighted that, as agreed with Natural England, we were unable to support the conclusion that there would be no adverse impact on the River Wensum SAC. We had previously requested that the applicant provide further information to demonstrate that overall sediment generation from the local road network would not increase as a result of the NDR, or that measures would be put in place to prevent any increase in sediment reaching the Wensum. Further information has subsequently been provided, and an update to our position is outlined below.

Applicant's comments

18.1.1 NCC has noted this comment

Representation

19.1 Issue – surface water quality

Increased use of the local road network following construction of the NDR has the potential to increase sediment generation through the erosion of grass verges. This sediment, which may include silt and other pollutants, could reach the Wensum directly through road run-off, or indirectly via the surface water drainage network.

Impact

Diffuse pollution is currently identified by Natural England as one of the reasons for the adverse condition of the River Wensum SAC. It can lead to a lowering of water quality and can further impact on biodiversity by having the effect of smothering habitats within the channel. Measures to reduce diffuse pollution are included in the River Wensum Diffuse Water Pollution Plan, currently being updated by Natural England.

Solution

Following our previous Relevant Representation comments and our comments to the applicant on the draft HRA (23 January 2014), the applicant has provided additional information and proposed amended text in a draft HRA Addendum on this issue. This has identified a number of locations where traffic will increase following the construction of the NDR, and where there is also a direct or indirect connection to the Wensum.

A number of possible mitigation measures are included in the draft HRA Addendum. We are currently working with Natural England and the applicant to ensure that these will be sufficiently robust to avoid adverse effects.

Applicant's comments

19.1.1 Refer to the SoCG, point 3.4.4. Following the NE and EA comments on the draft Addendum to the HRA, NCC agreed to include specific requirements concerning surface water drainage of Weston Hall Road. NCC also proposes to monitor sediment at the A1067 at Attlebridge and Lenwade.

Representation

20.1 *Issue – Groundwater Protection*

We have previously stated that we are satisfied that there will be no adverse impact on the Wensum SAC via groundwater, provided the quality of groundwater at the discharge point is afforded an appropriate level of protection. This includes the lining of swales and appropriate SuDS treatment steps.

Surface water drainage from catchments CA1 and CA2 has the potential to impact on the Wensum SAC. The applicant has stated as part of the draft Addendum to the ES and FRA, that any swales that serve catchments CA1 and CA2A will be lined. A part of surface water run-off from catchment CA2 is drained via kerbs and gullies, and a central bitumen channel, feeding a detention basin and infiltration lagoon. It is proposed that an additional treatment step will be included as part of the CA2 system, to ensure the presence of three SuDS treatment steps. Providing these measures are incorporated, we can confirm that we are satisfied that an appropriate level of protection will be afforded.

Applicant's comments

20.1.1 Comment noted. NCC will incorporate the above measures into NDR drainage.

Representation

21.1 *Nature conservation*

We previously proposed as part of our Relevant Representation that consideration should be given to incorporating areas of increased ecological value into the proposed surface water treatment features, so seeking to achieve net gains in biodiversity. Those comments remain valid, and apply equally to the systems that are proposed to discharge to ground and surface waters. In all cases the drainage performance of the features should be retained.

We would further emphasize that the use of vegetation within the SuDS treatment train components has the potential to greatly augment treatment capacity. This is highlighted within the Highways Agency Design Manual for Roads and Bridges (DMRB), HA 103/06 Vegetated Drainage Systems for Highway Runoff. The design of the drainage system should comply with best practice as set out in DMRB.

This is an issue that we would suggest could be addressed through either draft DCO Requirement 7 Ecology, or Requirement 25 Surface Water Drainage.

Applicant's comments

21.1.1 Refer to the SoCG, point 3.4.5. The infiltration lagoons will be seeded to encourage foraging for ground nesting and field birds and therefore will have conservation value. Lining any parts of infiltration lagoons would impede their function and therefore is not considered appropriate. NCC does not intend to enhance ecological value of the primary lined lagoons because they will be used as pollution containment as required. In view of the above NCC disagreed with the above recommendation.

Representation

22.1 Draft DCO

In addition to the above comments in respect of the proposed Requirements, minor amendments will be required to ensure that the references in Article 17 (Discharge of water) are up to date with relevant legislation.

- 22.1.1 The DCO will be amended with respect to the references within Article 17 to ensure they reflect current legislation.

Appendix A



Mark Kemp
Norfolk County Council
Environment, Transport, Development
County Hall Martineau Lane
Norwich
Norfolk
NR1 2SG

Our ref: AE/2014/117786/01-L01
Your ref: .
Date: 03 July 2014

Dear Mr Kemp

NORWICH NORTHERN DISTRIBUTOR ROAD. DRAFT ADDENDUM TO ENVIRONMENTAL STATEMENT AND FLOOD RISK ASSESSMENT

Thank you for forwarding for review the draft document titled 'Addendum to Environmental Statement: Volume I: Chapter 14 and Volume II: Chapter X Flood Risk Assessment'. We were able to make reference to the draft document in our 'Written Representation' response to the Planning Inspectorate, and state where this had satisfactorily addressed our previously raised concerns. Those comments also form part of this response, along with further more detailed comments on other parts of the draft Addendum.

Section C. Groundwater risk assessment

We have previously commented that a swale would provide a single level SuDS treatment train, which would not be acceptable given the environmental sensitivity of the road location unless it was demonstrated via a risk assessment that the potential risks could be adequately mitigated.

The risk assessment method employed for assessing routine run-off is the DMRB Method C (HD 45/09 Road Drainage and the Water Environment). However, we disagree with some of the input parameters, and the interpretation of results:

1. Both the Crag Group and the Chalk Group are designated as Principal Aquifers of regional importance. We would not agree to any risk assessment methodology that would describe these as low or medium importance. Additionally, Table 14.2 in the Environmental Statement attributes a 'Very

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High' or 'High' value to Principal Aquifer providing a regionally or locally importance resource.

2. Score <150 could result in impacts to groundwater classed as Minor Adverse, while Score 150-250 could result in impacts to groundwater classed as Moderate Adverse (HD 45/09, Table A4.4)

3. According to HD 45/09, Table A4.6 – Qualifying Conditions for Overall Assessment Scores, even potential low risk (score <150) of pollution to a principal aquifer providing a regionally important resource or supporting a river ecosystem is considered to result in significant effects (Moderate Adverse). As a consequence, we have not reviewed the input parameters to Method C matrices in detail.

Based on the above assessment methodology, and given the process indicated the presence of Moderate Adverse effects, it would appear that all swales where the receiving waterbody is groundwater within a Principal Aquifer should be lined.

However, we have previously advised that where swales are placed in clay geology lining may not be required. We would agree to unlined swales where they overlie 5 metres of clay geology / unproductive strata. We have not been provided with complete borehole logs, however, based on cross-sections provided within the original Environmental Statement, it would appear that this may be the case for (whole or parts of) catchments 21, 22, 23, 24 and 25, where the route of the NDR is indicated to overlie the superficial geology of Happisburgh Formation (Corton Formation) silts and clays (designated as Unproductive Strata). The applicant should be mindful of the potential for the trenches in the base of lagoons in these catchments to create preferential pathways to the underlying aquifers and increasing the overall level of risk.

Additional areas along the NDR route may be identified where the above requirement (swales placed in 5 metres of clay geology) would be satisfied.

Paragraph C.4.5 states that swales that serve catchment CA1 will be lined. It also states that surface water run-off from catchment CA2 is drained via kerbs and gullies, and a central bitumen channel, feeding a detention basin and infiltration lagoon. It is proposed that an additional treatment step will be included as part of the CA2 system, to ensure the presence of three SuDS treatment steps. Appendix B.5 also states that swales will be lined in catchment CA2A, although this is not addressed in paragraph C.4.5. Providing these measures are incorporated, we can confirm that we are satisfied in principle that an appropriate level of protection will be provided at the discharge point to ensure that there will be no adverse impact on the Wensum SAC via groundwater. We would still wish to be consulted on the detailed drainage scheme, likely to be via proposed Requirement 25.

The issue of treatment train components for the remainder of the route is not addressed specifically within the text of the draft Addendum document. However, Appendix B.1 does show the proposed treatment steps for each

system. This appears to show a number of systems where three treatment steps will not be provided, although it is not clear if that applies to all of the drainage from each system, as some systems are shown to include swales that the document does not highlight as a SuDS component. As previously discussed, a three stage treatment process should be provided, unless it can be demonstrated that fewer steps in specific locations would present an acceptable level of risk.

Section D. Improvements to lagoon infiltration

In order to resolve the issue of poor infiltration rates and long drain down times, alternative options have been presented for lagoons 13, 13A, 22, 23, 24 and 25. These consisted of: 1) Outfall to a watercourse, 2) Construction of granular filled trenches at the base or sides of the basin to provide good infiltration medium which extends down to the crag with good infiltration rates, 3) Installation of Aquacell trenches extending down to the crag with good infiltration rates, and 4) Outfall to another infiltration basin with better infiltration rates.

For lagoon 22, Option 4 was selected, with a positive outfall to lagoon 21 which has very good infiltration rates. Table D.2 states that this approach would reduced the half drain time for lagoon 22 from 8 days to 12 hours. This is a significant betterment and would ensure that the lagoon meets the recommended 24 hour half drain time in the SuDS Manual.

For the remaining lagoons Option 2 was selected; the use of granular filled trenches at the base or sides of the basin to provide a good infiltration medium which extends down to the crag with good infiltration rates. It has been confirmed that the fill material will have an infiltration rate greater than 0.1m/hr, while the infiltration rate at the base of the trenches is assumed to be 0.1m/hr. The use of this option is stated to reduce the half drain times for the basins which were previously between 8 to 125 days, to between six and seven days.

While the half drain times are greater than the industry standard of 24 hours as recommended in the SuDS Manual, the proposals provide greater confidence that the basins will drain. As previously proposed an additional storage volume equating to the 1 in 10 year storm event has been provided in case a subsequent storm occurs while the previous event is draining.

The full basin drainage calculations (including the proposed infiltration trenches) should be submitted to demonstrate that the half drain times have been correctly modelled. For lagoon 25, this modelling will need to include the OL29 catchment flows.

We welcome and support the further work undertaken, and can therefore confirm our view that, subject to a review of the full basin drainage calculations, the approach proposed will appropriately improve the drainage performance of those infiltration lagoons where this was previously

inadequate. The amended designs and plans, along with the modelling calculations, will need to form part of the DCO application.

As part of our Written Representation, we also advised that the proposed infiltration trenches share some characteristics of deep bore soakaways. Therefore, these features can act as preferential pathways to the underlying principal aquifers. As such, regard should be given to our Groundwater Protection: Principles and Practice (GP3 v1.1, 2013) document, and in particular position statement G9 ('Use of deep infiltration systems for surface water and effluent disposal'). It should be ensured that the resultant increased risk is adequately mitigated in line with the requirements of this position statement.

The piped connection of lagoons 21 and 22 is not anticipated to have any water quality implications.

Regarding groundwater levels, paragraph D.5.11 details a change to the maximum groundwater level against borehole BH15P5, from 21.0mAOD to 20.28mAOD. This is stated to amend the unsaturated zone beneath lagoons 8, 8A & 9. The amended unsaturated zone underneath lagoon 9 was quoted as 0.82m, which is significantly less than the minimum we had previously requested. Additionally, table 14.7 of the ES (Volume 1, Chapter 14) already uses 20.38mAOD as the maximum GW level for lagoon 9, giving an unsaturated zone of 1.12m.

We have subsequently been advised that the unsaturated zone beneath lagoon 9 is indeed 1.12m. On that basis, our previous position that the identified unsaturated zone thickness of 1.12m for lagoon 9 may be sufficient, providing groundwater does not rise further, is still applicable. We also note and welcome the increase in unsaturated zone beneath lagoon 8.

Paragraph D.5.11 goes on to outline how locally perched water tables within the sands and gravels have led to a misrepresentation of the unsaturated zone in the ES. Most significantly, this is stated to have affected lagoon 4, which we previously had concerns about due to the inadequate unsaturated zone (0.4m only).

It has subsequently been confirmed that the perched water table is not expected to be present beneath lagoon 4, and therefore the unsaturated zone at this location is considered to be 8.1m. In our Written Representation we advised that, on this basis, we would be satisfied with the design of lagoon 4, but would suggest that this situation is monitored and remains capable of being addressed at the detailed design stage if the higher groundwater levels are subsequently found to be present.

Section E. Summary of potential impacts on 'The Springs', Rackheath

While paragraph E.3.6 states that Lagoon 18A will include an infiltration pond, the submitted drawing shows a discharge to watercourse. It has subsequently been confirmed that 18A will be lined with a positive outfall. We had previously

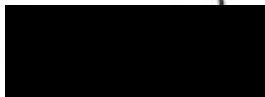
raised concerns in respect of the long drain-down times for 18A, but can confirm that we are now satisfied with the drainage performance of this lagoon subject to a review of the full basin drainage calculations. As with the infiltration basins, for all three attenuation lagoons, the full drainage calculations should be submitted to demonstrate the validity of proposals.

We can also confirm that the text at paragraph E.3.6, along with drawings R1C093-R1-4907 and R1C093-R1-4908, have demonstrated satisfactory treatment measures ahead of Lagoon 17 and 18A,

However, some uncertainty remains in respect of lagoon 18. The text at paragraph E.3.6 states that the discharge to lagoon 18 will be via lined swales. However, the associated drawing (R1C093-R1-4908) appears to show an element of the run-off transported via a central bitumen channel only ahead of piped discharge to lagoon 18? If this is the case, a further treatment step should be incorporated for this element of the run-off prior to discharge to lagoon 18.

Please do contact us if you would like to discuss any aspect of this response further. If you would like us to review any additional information prior to submission to the Examining Authority, this will need to be part of an extended charging agreement.

Yours sincerely



MR MARTIN BARRELL
Sustainable Places - Planning Specialist

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